PSYCHONOMIC SOCIETY®

ABSTRACTS

of the PSYCHONOMIC SOCIETY

VOLUME 27 • NOVEMBER 2022

63rd ANNUAL MEETING

Sheraton Boston Hotel, Boston, Massachusetts, USA & Online
Thursday, November 17–Sunday, November 20, 2022
All times are listed in US Eastern Time.

A PSYCHONOMIC SOCIETY PUBLICATION
www.psychonomic.org

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PSYCHONOMIC SOCIETY STATEMENT ON HARASSMENT

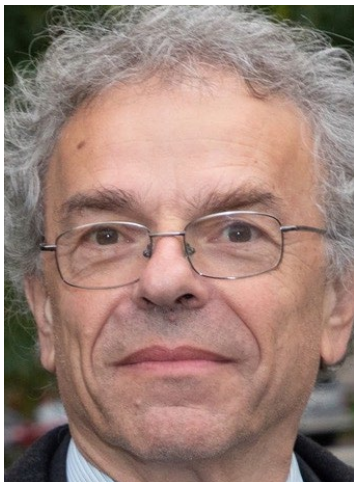
The Psychonomic Society is an inclusive and welcoming organization. Our annual and affiliate meetings and our professional communications should reflect those values. Society members, conference attendees, and virtual meeting participants should enjoy freedom of speech, freedom of thought, and freedom from harassment and discrimination of any kind.

We encourage members to be mindful of others' perspectives and to consider how a question, comment, or invitation might be received, particularly when there is a power differential between parties. Constructive criticism is an essential part of science. No participant should feel vulnerable to harassment or discrimination, nor should they endure a climate of fear or hostility, at our meetings or in our digital events.

Let's all work together to ensure that our values of inclusion, respect, and professionalism are ones that are enjoyed by all of our members and event participants.

KEYNOTE ADDRESS

Normal Blindness: Why We Look but Fail to See



Jeremy M. Wolfe
Harvard Medical School/Brigham & Women's Hospital, USA

Thursday, November 17, 7:30–8:30 pm US EST, Sheraton Grand Ballroom

Captioning and an American Sign Language (ASL) interpreter will be available for this address.

From typos to tumors, humans performing visual search tasks manage to miss targets that are "right in front of our eyes." In the psychologically most interesting cases, these are instances where observers fail to respond to stimuli that are clearly visible. The observers may be directly fixating on those stimuli. Such errors are not typically due to pathological visual impairments. They are examples of what I will call "normal blindness." Some demonstrations of these "Looked but Failed to See" (LBFTS) errors are famous (e.g., inattentional blindness for gorillas). Some LBFTS errors, like missing a target in a visual search for a "T" among "Ls," seem more mundane. I will argue that a wide array of seemingly disparate LBFTS errors have a common basis. Normal blindness is the inevitable by-product of the limited-capacity prediction engine that is our visual system. The processes that evolved to allow us to move through the world are virtually guaranteed to cause us to miss some significant stimuli. I will illustrate with examples from our work using eye tracking with radiologists and with "hybrid foraging" tasks, where observers look for multiple instances of multiple types of targets. If all goes well, you will look, you will fail to see, and you will gain insight into why that happens.

PSYCHONOMIC SOCIETY'S

ONE WORLD COGNITIVE PSYCHOLOGY SEMINAR SERIES

2022–2023 One World Cognitive Psychology Seminars

Barbara Tversky, ***Stanford University & Columbia University, USA***

September 21, 2022, 11:15 am–1:00 pm U.S. Eastern Time

Karla Evans, ***The University of York, UK***

October 19, 2022, 11:15 am–1:00 pm U.S. Eastern Time

Arthur Glenberg, ***Arizona State University, USA***

January 25, 2023, 11:15 am–1:00 pm U.S. Eastern Time

Rain Bosworth, ***Rochester Institute of Technology, USA***

February 22, 2023, 11:15 am–1:00 pm U.S. Eastern Time

Mark McDaniel, ***Washington University in St. Louis, USA***

March 22, 2023, 11:15 am–1:00 pm U.S. Eastern Time

Claudia von Bastian, ***The University of Sheffield, UK***

May 17, 2023, 11:15 am–1:00 pm U.S. Eastern Time

SCHEDULE AT A GLANCE

All times are listed in US EST. Please visit the Psychonomic Society website or the conference app (coming soon!) for up-to-date schedule and meeting room information.

	Hynes Convention Center Ballroom	Sheraton Grand Ballroom Foyer	Sheraton Grand Ballroom	Independence	Republic	Constitution AB	Back Bay C	Back Bay A	Back Bay B	Back Bay D	Commonwealth	Public Garden
Wednesday, November 16 *(See Affiliate organizations for agendas.)*												
8 am												
9 am												**8:30 am–5 pm** Configural Processing Consortium (CPC) Affiliate Meeting
10 am												
11 am												
12 pm												
1 pm												
2 pm												
3 pm												
4 pm												
Thursday, November 17 *(See Affiliate organizations for agendas.)*												
8 am	**8 am–2 pm** **Affiliate Posters** Society for Computation in Psychology (SCiP) Object Perception, Attention and Memory (OPAM) Auditory, Perception, Cognition, and Action Meeting (APCAM) Society for Mathematical Psychology (SMP)			**7:45 am–5 pm** OPAM Affiliate Meeting			**8 am–5 pm** APCAM Affiliate Meeting	**8 am–5:30 pm** SCiP Affiliate Meeting				
9 am											**9 am–5 pm** Tactile Research Group (TRG) Affiliate Meeting	**8:30 am–2 pm** SMP Affiliate Meeting
10 am												
11 am												
12 pm												
1 pm												
2 pm						**2:30–4 pm** SPARK Society Affiliate Meeting						
3 pm												
4 pm	**4:15–4:45 pm** Poster Setup	**3:30–9:30 pm** Exhibits			**4–7 pm** Women in Cognitive Science (WiCS) Affiliate Meeting							
5 pm	**5–7 pm** Poster Viewing											
6 pm	**6–7 pm** Poster Session I											
7 pm	**7–7:30 pm** Poster Teardown		**7:30–8:30 pm** Keynote Address									
8 pm		**8:30–9:30 pm** Opening Reception										
9 pm												

SCHEDULE AT A GLANCE

	Hynes Convention Center Ballroom	Sheraton Grand Ballroom Foyer	Sheraton Grand Ballroom	Independence	Republic	Constitution AB	Back Bay C	Back Bay A	Back Bay B	Back Bay D	Commonwealth	Public Garden
Friday, November 18												
7 am												
8 am				**8–10 am** Attention Capture	**8–9:40 am** Cognitive Aging I	**8–9:40 am** Event Cognition	**8–9:40 am** Recall I	**8–10 am** Visual Working Memory	**8–10 am** Perception & Action	**8–10 am** Discourse Processes		
9 am												
10 am	**10:15–10:45 am** Poster Setup	**10 am–4 pm** Exhibits	**10 am–Noon** Symposium I: Visual Statistical Learning and Attention: A Two-Way Street	**10:20 am–Noon** Attention I	**10 am–Noon** False Beliefs: Memory & Judgment Processes	**10 am–Noon** Test Effects	**10 am–Noon** Speech Perception I	**10:20 am–Noon** Neural Mechanisms of Memory & Cognition	**10:20 am–Noon** Bilingualism: Developmental Processes			
11 am	**11 am–1 pm** Poster Viewing **Noon–1 pm** Poster Session II											
12 pm											**Noon–1:30 pm** Lunchtime Workshop: Encouraging Future Scientists: Supporting Undergraduates at Psychonomics (UP)	
1 pm	**1–1:30 pm** Poster Teardown		**1:30–3:30 pm** Symposium II: Bridging the Gap Between Spoken and Written Language Research	**1:30–3:30 pm** Statistics & Methodology	**1:30–3:30 pm** Recognition I	**1:30–3:30 pm** Numerical Cognition	**1:30–3:30 pm** Decision Making I	**1:30–3:30 pm** Working Memory I	**1:30–3:30 pm** Attention Control I			
2 pm												
3 pm			**3:45–5:45 pm** Symposium III: Facilitating Belonging, Inclusion, & Equity in STEM (Special Symposium)									
4 pm	**4:15–4:45 pm** Poster Setup											
5 pm	**5–7 pm** Poster Viewing **6–7 pm** Poster Session III											
6 pm	Diversity & Inclusion (D&I) Reception											
7 pm	**7–7:30 pm** Teardown											

SCHEDULE AT A GLANCE

	Hynes Convention Center Ballroom	Sheraton Grand Ballroom Foyer	Sheraton Grand Ballroom	Independence	Republic	Constitution AB	Back Bay C	Back Bay A	Back Bay B	Back Bay D	Commonwealth	Public Garden
Saturday, November 19												
6 am												
7 am												
8 am				**8–9:40 am** Speech Perception II	**8–9:40 am** Cognition & Emotion I	**8–10 am** Bilingualism: Cognitive Control	**8–9:40 am** Attention: Automatic Processing	**7:40–9:40 am** Decision Making: Motivation & Reward	**8–10 am** Aging & Memory	**8–9:40 am** Cultural/Social Influences on Cognition		
9 am												
10 am	**10:15–10:45 am** Poster Setup	**10 am–4 pm** Exhibits	**10 am–Noon** Symposium IV: Age-Related Patterns for Memory & Future Projections During the COVID-19 Pandemic		**10 am–Noon** Language: Cognitive Control	**10:20 am–Noon** Bilingualism: Cognitive Processes	**10 am–Noon** Cognitive Development	**10 am–Noon** Visual Perception	**10:20 am–Noon** Learning & Instruction I	**10:20 am–Noon** Concepts & Categorization		
11 am	**11 am–1 pm** Poster Viewing **Noon–1 pm** Poster Session IV											
12 pm											**Noon–1:30 pm** Lunchtime Workshop: Funding at the National Science Foundation	
1 pm	**1–1:30 pm** Poster Teardown											
2 pm			**1:30–3:30 pm** Symposium V: Co-Registration of Eye Movements and EEG (Leading Edge Workshop)	**1:30–3:10 pm** Eyewitness Identification	**1:30–3:30 pm** Decision Making II	**1:30–3:30 pm** Autobiographical Memory	**1:30–3:10 pm** Cultural/Social Influences on Cognition II			**1:30–3:10 pm** Letter Word Processing		
3 pm												
4 pm	**4:15–4:45 pm** Poster Setup			**3:30–5:30 pm** Cognition & Emotion II	**3:50–5:30 pm** Recall II	**3:50–5:30 pm** Reasoning & Problem Solving	**3:30–5:30 pm** Metacognition I	**3:50–5:30 pm** Visual Search		**3:30–5:30 pm** Psycholinguistics I		
5 pm	**5–7 pm** Poster Viewing **6–7 pm** Live Poster Session V & Reception										**5:10–6 pm** Awards and Business Meeting	
6 pm												
7 pm	**7–7:30 pm** Poster Teardown											

SCHEDULE AT A GLANCE

	Hynes Convention Center Ballroom	Sheraton Grand Ballroom Foyer	Sheraton Grand Ballroom	Independence	Republic	Constitution AB	Back Bay C	Back Bay A	Back Bay B	Back Bay D	Commonwealth	Public Garden
Sunday, November 20												
7 am												
8 am					**8–10:20 am** Attention Control II	**8–10 am** Psycholinguistics II	**8–10 am** Reading	**8–9:40 am** Learning and Instruction	**8–9:40 am** Recognition II	**8–10 am** Judgment		
9 am												
10 am						**10:20 am–Noon** Metacognition II	**10:20 am–Noon** Working Memory II	**10 am–Noon** Cognitive and Motor Control of Performance	**10 am–Noon** Spatial Cognition	**10:20 am–Noon** Prospective Memory	**10:20 am–Noon** Language Production	
11 am												

GENERAL INFORMATION

REGISTRATION

Register online at www.psychonomic.org/2022registration. The meeting will be a hybrid event, with options for participating in person in Boston or online. **Attendees should register for *either* the in-person meeting *or* the virtual meeting.** In-person meeting attendees will also be given access to the online program.

Although registration will be accepted until the time of the meeting, attendees are strongly encouraged to register early to avoid long lines on site and possible delayed access to the online conference. The onsite registration desk will be located at the Sheraton Boston Hotel in the Grand Ballroom Foyer on floor 2.

Members

Registration is FREE for members and undergraduate students and includes unlimited access to the Keynote Address, symposia, talks, poster sessions, and receptions.

Nonmembers

The registration fee for guests and nonmembers is $75 USD. (Please note that undergraduate students may attend for free.) Membership in the Society is inexpensive and strongly encouraged, and it comes with many benefits, in addition to a complimentary registration for the Annual Meeting. To become a Society member, visit https://www.psychonomic.org/member.

Photographic Release

As part of your registration for the 2022 Annual Meeting, the Psychonomic Society reserves the right to use photographs, video, and any other images taken during the on-site and virtual meetings for future marketing purposes. If you do not wish to have your photograph or video used for such purposes, please notify us at info@psychonomic.org.

Become a Member!

Join the Psychonomic Society to connect with more than 4,300 cognitive and experimental psychologists from around the world! **Our members include** some of the most distinguished researchers in the field. Many of us are concerned with the application of psychology to health, technology, and education, and many of us use converging methods such as neuroscience and computational science to achieve our research goals.

Join online at **https://www.psychonomic.org/member**.

Membership Categories

Member
Qualifications: Must have a PhD or equivalent in psychology or an allied field.
2022 Dues: US: $35 USD; Outside US: $20 USD

Fellow (by application only)
Qualifications: (1) Must have a PhD or equivalent and be at least 3 years post PhD; (2) Published significant, peer-reviewed research beyond the doctoral dissertation, as evidenced by having at least six recent research publications in high-quality refereed journals, in addition to the publications resulting from the PhD; (3) Be actively involved in independent scientific research in psychology or allied sciences. Members wishing to apply to become Fellows can do so on a rolling basis, with applications reviewed twice a year.
2022 Dues: US: $75 USD; Outside US: $60 USD

Graduate Student
Qualifications: Actively enrolled in a graduate program in psychology or an allied field.
2022 Dues: $15 USD

Emeritus
Qualifications: Fellows and Members in good standing who have retired may request Emeritus status.
2022 Dues: No Fee

Undergraduate students do not qualify for Society membership but are welcomed and encouraged to attend and participate in the Annual Meeting. To make our conference as accessible as possible to undergraduate students and to encourage them to consider careers in the psychological sciences, we waive the registration fee and allow undergraduate students to attend the conference for FREE.

GENERAL INFORMATION

HEALTH AND SAFETY

The Psychonomic Society recognizes that the safety of our members and meeting attendees is our top priority. Health & Safety Requirements apply to all participants who will be on site at our 2022 Annual Meeting, November 17–20, 2022, at the Boston Sheraton Hotel in Boston, Massachusetts, USA. **In accordance with CDC and local guidelines, COVID-19 vaccinations are recommended of all attendees (unless there is a medical exception), and all attendees are recommended to wear face coverings when indoors at the conference facilities (unless eating or drinking).**

This attendee agreement is a living document that will continue to evolve based on federal and local guidance. Our policies are based on Centers for Disease Control and Prevention (CDC) Guidelines and requirements of the City of Boston and are subject to change without notice. Learn more about travel to the US and related COVID-19 requirements. The purpose of this agreement is to create a meeting space that is as safe as possible for those who choose to attend the meeting as well as for all the people we may interact with while participating in conference activities and traveling to and from the conference. Thank you for your commitment to health and safety.

Personal Accountability Commitment

Attendees are required to abide by certain health and safety conduct guidelines while at the 2022 Annual Meeting.

In accordance with public health guidance, we strongly recommend that attendees wear a face covering at all times while indoors. Face coverings may be required in some areas of the event and will become required if federal or local guidelines change to require them.

Please do not attend the event if

- you are not vaccinated **and** have recently been exposed to COVID-19
- you are feeling ill.

CDC Travel Recommendations & Restrictions

CDC is regularly updating its travel recommendations and restrictions to adapt to the changing nature of the COVID-19 pandemic. To view the latest recommendations and restrictions, please visit https://www.cdc.gov/coronavirus/2019-nCoV/index.html.

View the following sites for the latest guidelines for travel, as well as for information on additional safety measures being taken by airlines:

- US Bureau of Consular Affairs Travel Advisory website—https://travel.state.gov/content/travel/en/traveladvisories/traveladvisories.html
- American Airlines—https://www.aa.com/i18n/travel-info/travel-with-confidence.jsp
- Delta Airlines—https://www.delta.com/content/www/ca/en/travel-update-center/overview.html
- Southwest Airlines—https://www.southwest.com/Coronavirus
- United Airlines—https://www.united.com/en/us/fly/covid-update.html

Boston COVID-19 Current Guidelines

For the latest news and guidelines on COVID-19 specific to Boston, please visit https://www.boston.gov/government/cabinets/boston-public-health-commission/covid-19-boston.

Questions? Please stop by the Registration Desk.

HOTEL RESERVATIONS

The Psychonomic Society has secured a special rate at the Sheraton Boston Hotel for attendees of the 2022 Annual Meeting. To take advantage of this special rate, you must book your room by **October 31st.***

If the Psychonomic Society room block is full at the time of reservation, additional rooms have been secured at the Boston Marriott Copley Place Hotel. To take advantage of this special rate, you must book your room by **October 31st.***

Sheraton Boston Hotel

39 Dalton Street, Boston, Massachusetts, 02199 USA

+1 617-236-2000

https://www.marriott.com/en-us/hotels/bosbo-sheraton-boston-hotel/overview

Special Rate

Standard Room, $215 USD plus taxes and fees (single/double/triple/quad occupancy)

Special Rate reservation deadline: October 31, 2022

Phone Reservations: +1 800-325-3535

Online Reservations: https://book.passkey.com/e/50338706

**The hotel reservation cut-off date is October 31, 2022, or whenever the room block has been filled, whichever comes first.*

GENERAL INFORMATION

Boston Marriott Copley Place Hotel

110 Huntington, Ave., Boston, Massachusetts, 02116 USA

+1 617-236-5800

https://www.marriott.com/en-us/hotels/bosco-boston-marriott-copley-place/overview/

Special Rate

Standard Room, $215 USD plus taxes and fees (single/double/triple/quad occupancy)

Special Rate reservation deadline: October 31, 2022*

Phone Reservations: +1 800-325-3535 or +1 617-236-2000 and reference "Psychonomic Society 2022 Annual Meeting "

Online Reservations: https://book.passkey.com/e/50387020

**The hotel reservation cut-off date is October 31, 2022, or whenever the room block has been filled, whichever comes first.*

VENUES AND MEETING ROOMS

All spoken presentations and special events will take place at the Sheraton Boston Hotel. Poster presentations will take place at the nearby Hynes Convention Center in Ballroom ABC.

Sheraton Boston Hotel

39 Dalton Street, Boston, Massachusetts, 02199 USA

+1 617-236-2000

https://www.marriott.com/en-us/hotels/bosbo-sheraton-boston-hotel/overview

John B. Hynes Veterans Memorial Convention Center

900 Boylston Street, Boston, Massachusetts 02115 USA

+1 617-954-2000

https://www.signatureboston.com/hynes

Speaker Ready Room

Session chairs are encouraged to solicit papers from individuals in their sessions prior to the meeting and load presentations prior to the session in the speaker ready room.

Audiovisual support is available in the speaker ready room to help with loading presentations during the following hours:

Thursday, November 17 . . . . . 4–7 pm US EST
Friday, November 18. . . . . 7 am–5 pm US EST
Saturday, November 19 . . . . . 7 am–5 pm US EST
Sunday, November 20 . . . . . 7–11 am US EST

Lactation Room

There is a lactation room at the hotel. An access code is available at the main Psychonomic Society registration desk. The room is equipped with a private area for nursing, along with refrigeration. Attendees may not use this room for babysitting purposes.

Weather/Conference Attire

Boston's average temperature in November ranges from low 30s °F/0 °C to mid-50s °F/12 °C. Meeting room temperatures tend to vary. We recommend a light sweater or jacket for use in the hotel and conference center.

THINGS TO DO IN BOSTON

City of Boston: https://www.bostonusa.com

Things to Do and Nearby Attractions: https://www.bostonusa.com/things-to-do

Restaurants: https://www.bostonusa.com/restaurants

SCIENTIFIC PROGRAM

2022 Program

There were 1,343 submissions, of which 1,343 were valid. Of the 1,326 placed on the program, 303 are spoken and 1,023 are posters. In addition, there are five accepted symposia.

Program History

YEAR–SITE	VALID SUBMISSIONS
2022–Boston (hybrid)	1,326
2021–Virtual	1,297
2020–Virtual	1,294
2019–Montréal	1,507
2018–New Orleans	1,523
2017–Vancouver	1,438

Poster Sessions

Poster sessions are taking place both in person and virtually. All poster presentations will be available virtually on the conference website. In-person poster sessions will take place at the Hynes Convention Center during their scheduled poster sessions.

Abstracts and Program Book

The abstract book is provided as an interactive digital publication that can be downloaded as a PDF at www.psychonomic.org/2022program.

GENERAL INFORMATION

Designation of Award Recipients

Throughout the abstract book, our distinguished award recipients are identified as follows:

- Clifford T. Morgan Distinguished Leadership Award recipient
- Mid-Career Award recipient
- Early Career Award recipient
- Best Article Award recipient
- J. Frank Yates Student Conference Award recipient
- Graduate Conference Award recipient

EXHIBITS

Attendees are encouraged to visit our exhibitors located in the Grand Ballroom Foyer at the Sheraton Boston Hotel. Exhibit hours are

Thursday, November 17 . . . . . 3:30–9:30 pm US EST
Friday, November 18. . . . . 10 am–4 pm US EST
Saturday, November 19 . . . . . 10 am–4 pm US EST

RECEPTIONS AND COFFEE BREAKS

Opening Reception

Thursday, November 17, 8:30–9:30 pm US EST (immediately following the Keynote Address)
Grand Ballroom Foyer, Sheraton Boston Hotel (2nd floor)

Diversity and Inclusion Reception

Friday, November 18, 6–7 pm US EST
Ballroom ABC, Hynes Convention Center (3rd floor)

Saturday Reception

Saturday, November 19, 6–7 pm US EST
Ballroom ABC, Hynes Convention Center (3rd floor)

Complimentary coffee and tea will be available from 9:30 am to 10:30 am US EST on Friday, Saturday, and Sunday. Coffee may also be available at outlets in the hotel.

Program & Conference Organization

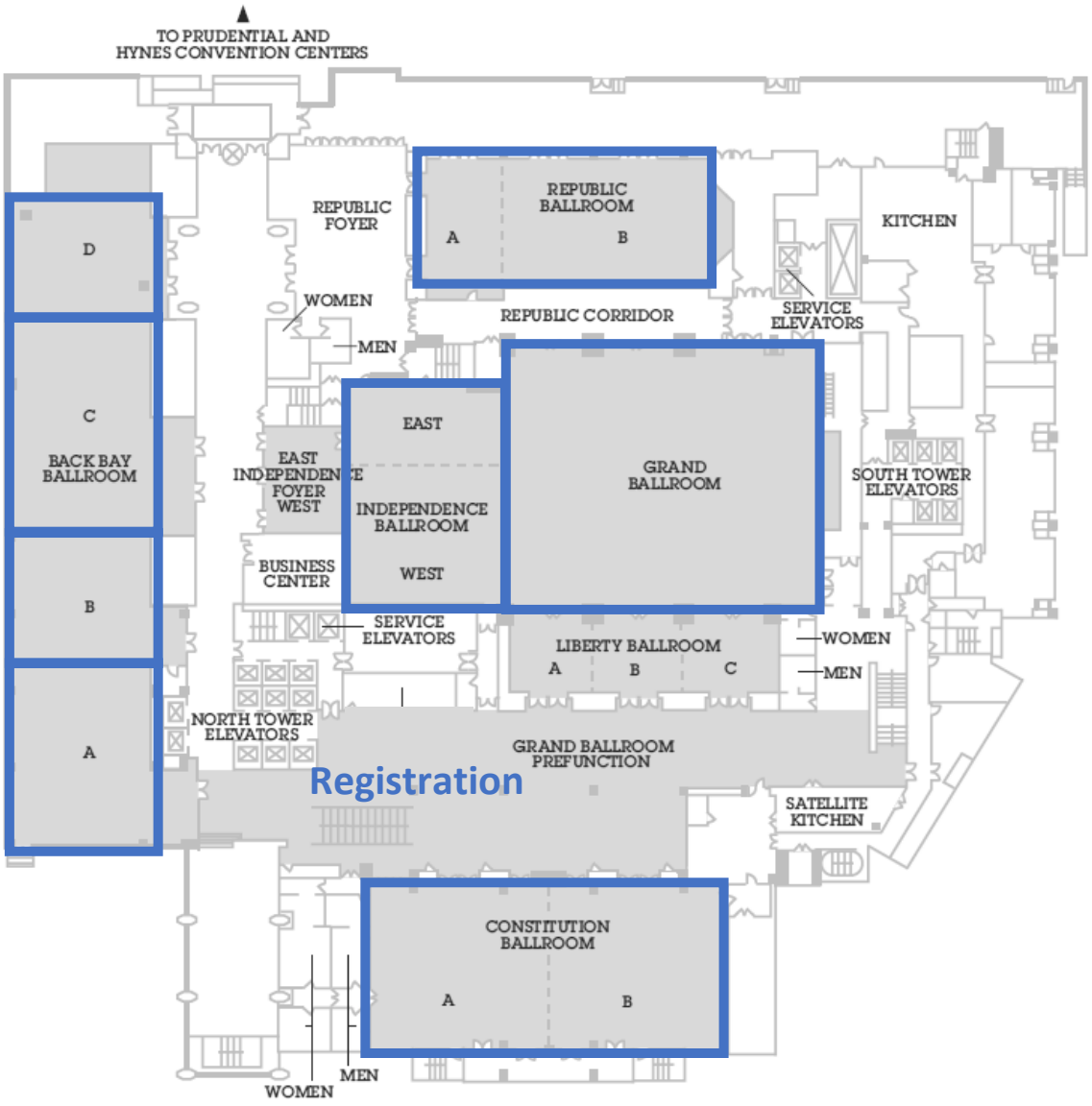
The Secretary, Reed Hunt, has the responsibility for organizing the program, and the Program Committee reviews all submissions. They do so with the indispensable help of Lou Shomette, Executive Director; Stephanie Dylkiewicz, Senior Director of Meetings; Michelle Whitworth, Director of Meetings; Tiffany Aurora, Director of Communications & Marketing; Peggy Doherty, Director of Membership & Operations; Angie Forbes, Director of Digital Learning Strategy; Natalia Kot, Registration Specialist; Kaitlin Leverenz, Meetings Administrator; Jerrod Liveoak, Senior Manager, Editorial & Content; Colleen Murphy, Partnership Manager; Phyllis Milz, Finance Manager; Julie Rogers, Senior Editorial & Content Manager; René Ostberg, Associate Editor; and Timothy Utesch, Graphic Designer.

Future Meetings

2023 San Francisco, California, USA, November 16–19
2024 New York, New York, USA, November 21–24
2025 Denver, Colorado, USA, November 20–23
2026 San Diego, California, USA, November 19–22

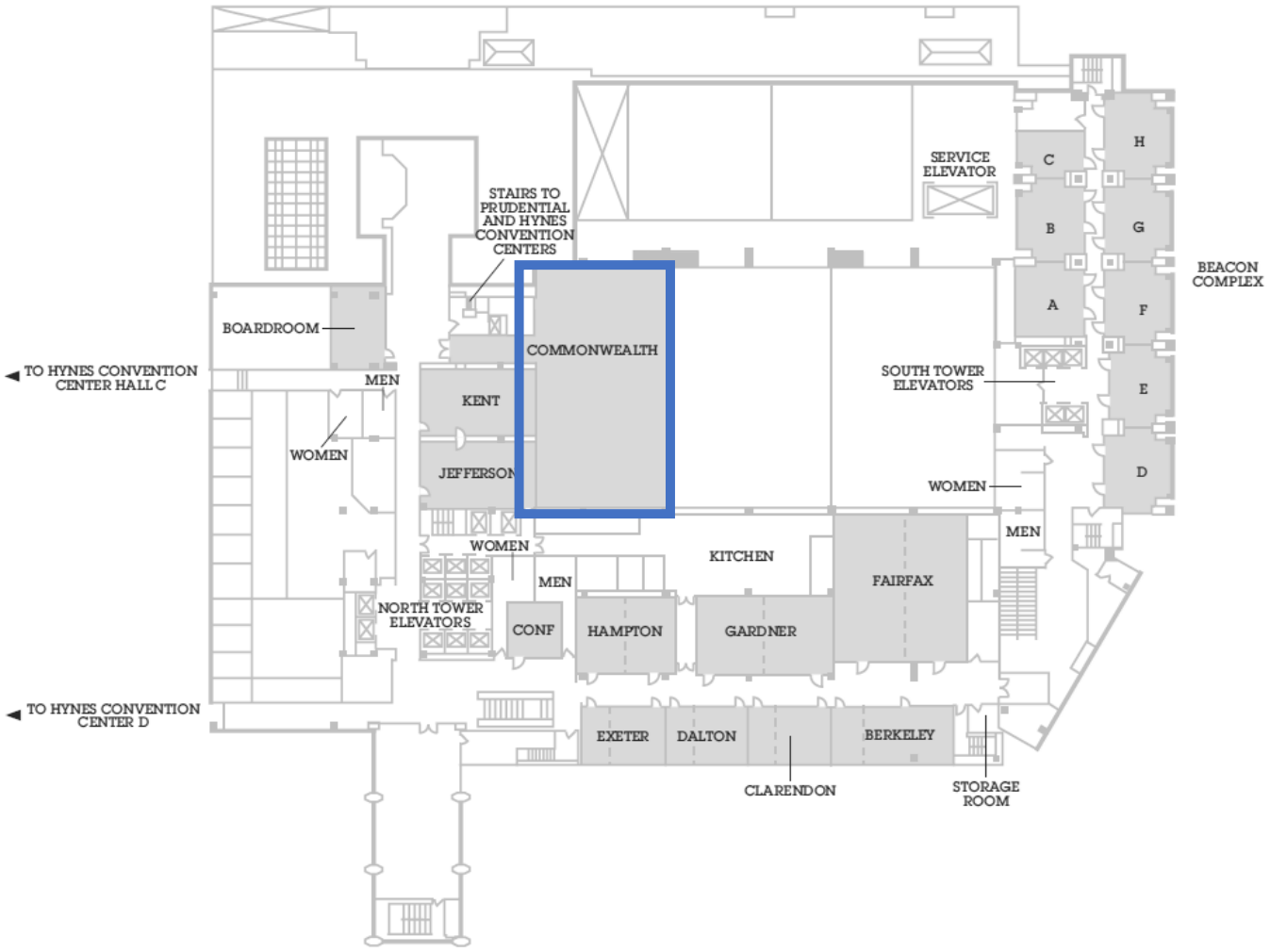
FLOOR PLANS

SHERATON BOSTON HOTEL, 2ND FLOOR



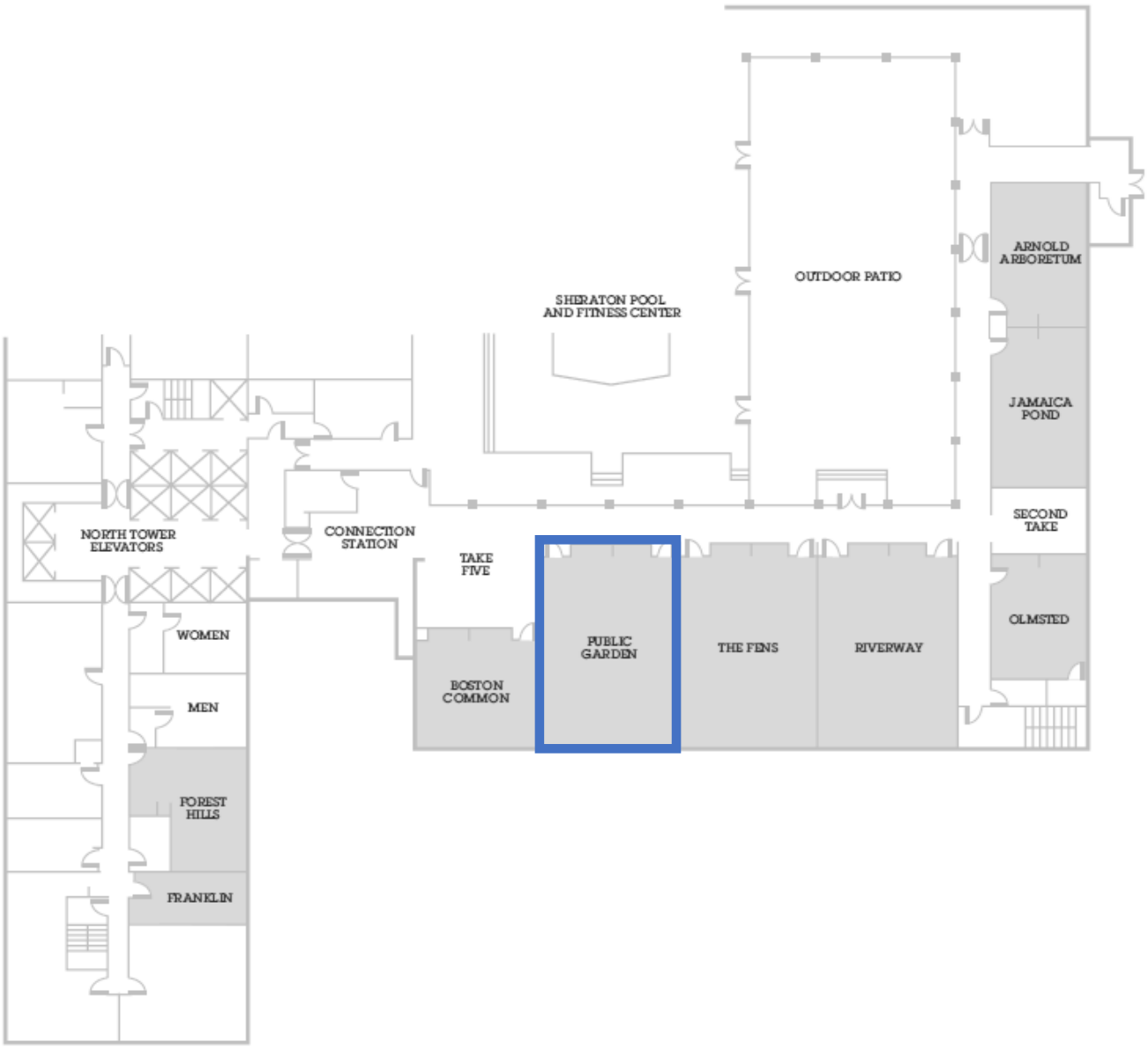
FLOOR PLANS

SHERATON BOSTON HOTEL, 3RD FLOOR



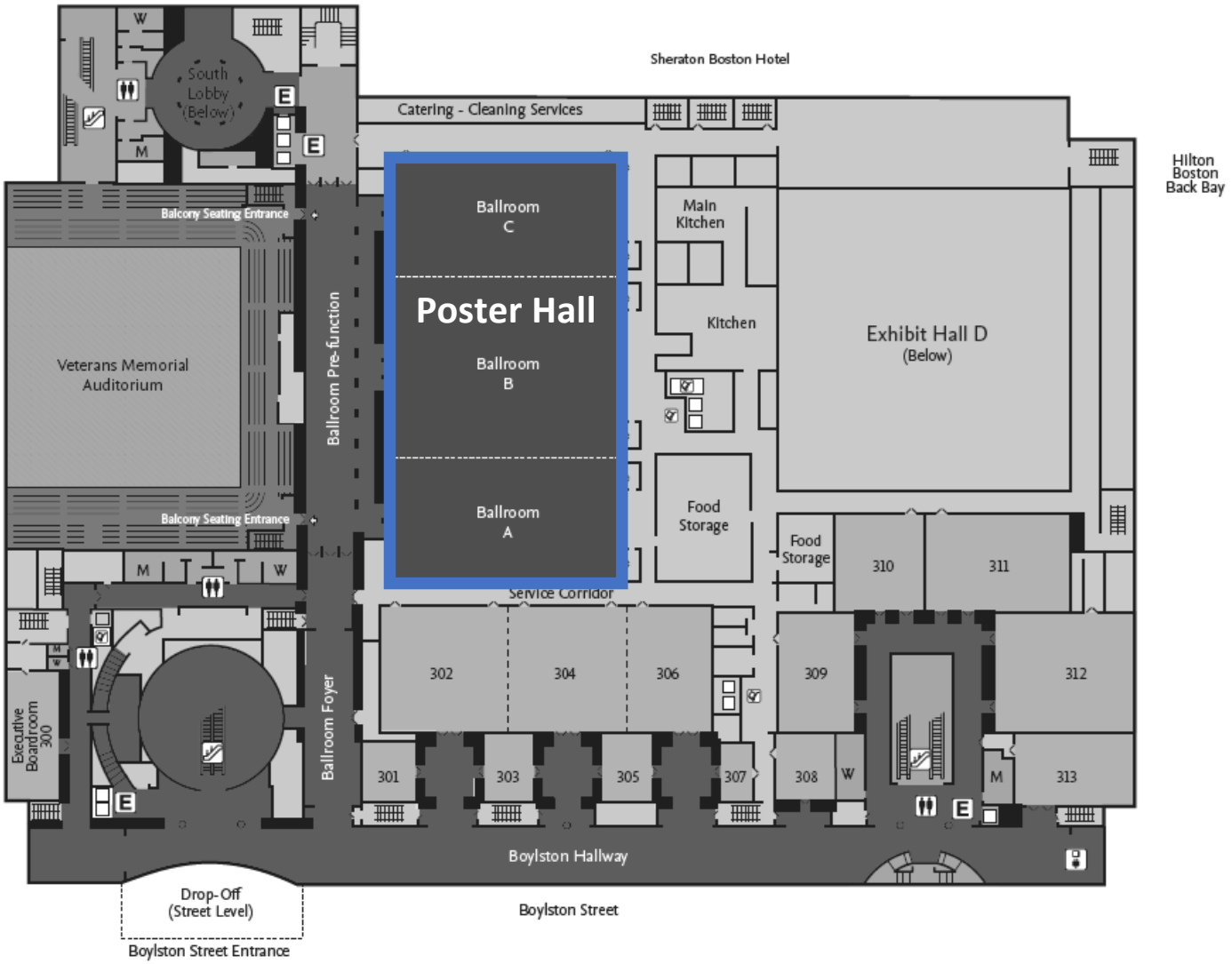
FLOOR PLANS

SHERATON BOSTON HOTEL, 5TH FLOOR



FLOOR PLANS

HYNES CONVENTION CENTER, 3RD FLOOR



SYMPOSIA *Times subject to change.*

SYMPOSIUM I: VISUAL STATISTICAL LEARNING AND ATTENTION: A TWO-WAY STREET

FRIDAY, NOVEMBER 18, 10 AM–NOON US EST

Sheraton Grand Ballroom

Organizer: Louisa Bogaerts, Ghent University, Belgium

Visual stimuli tend to repeatedly appear in the same sequences and spatial configurations. The process by which we detect the statistical regularities in our visual environment is known as "visual statistical learning." While statistical learning has long been described as a type of implicit learning that operates automatically, growing evidence suggests that it not only oftentimes requires attention but can also shape how attention is deployed. This symposium will highlight a series of findings that can help us understand the bidirectional relationship between observers, sensitivity to visual regularities, and the allocation of visual attention. It does this by bringing together speakers from different areas of research: experts on learning and memory who are investigating the modulation of statistical learning performance by attentional allocation on the one hand, and experts on attention who are investigating the ways in which statistical regularities shape attentional biases on the other hand. We end by discussing possible directions for taking an integrative approach to statistical learning and attention forward.

Knowledge and Similarity Shape Visual Statistical Learning—*Timothy J. Vickery, University of Delaware, USA; Leeland L. Rogers, University of Delaware, USA; and Alyssa Levy, University of Delaware, USA*

Learning from Multiple Statistical Sources Over Time—*Tess Forest, University of Toronto, Canada; Noam Siegelman, Haskins Laboratories, USA; and Amy Finn, University of Toronto, Canada*

What to Expect When You Are Not Expecting It: How Implicit Regularities Drive Attentional Selection—*Jan Theeuwes, Vrije Universiteit Amsterdam, Institute for Brain and Behavior Amsterdam, & Instituto Superior de Psicologia Aplicada (ISPA) William James Center for Research, Netherlands*

Learned Associations for Attentional Guidance and Identity Decisions—*Joy Geng, University of California, Davis, USA; Zhiheng Zhou, University of California, Davis, USA; Xinger Yu, University of California, Davis, USA; and Phil Witkowski University of California, Davis, USA*

SYMPOSIUM II: BRIDGING THE GAP BETWEEN SPOKEN AND WRITTEN LANGUAGE RESEARCH

FRIDAY, NOVEMBER 18, 1:30–3:30 PM US EST

Sheraton Grand Ballroom

Organizer: Kristi Hendrickson, University of Iowa, USA

Language relies on intricate relationships between several cognitive processes and multiple sensory modalities. For most individuals, language is accessed across two sensory modalities: auditory (spoken language) and visual (written language). While there is a rich history of literature documenting the cognitive mechanisms underlying each language system, historically these literatures have been somewhat disparate. In this symposium, we illustrate how research that examines spoken and written language in tandem can: (1) highlight the distinct sensory and cognitive challenges each language system faces; (2) identify a set of core mechanisms of each system in a common set of computational principles; and (3) delineate how each language system is shaped by the other at multiple time scales (from the millisecond unfolding of processing in real time to the time scale of behavior over years). The talks in this symposium highlight state-of-the-art methods for assessing language abilities and cut across several levels of language processing and production. Finally, an open forum Q&A at the conclusion of the symposium will provide an opportunity to discuss how to further bridge the gap between these literatures.

The Profile of Real-Time Competition in Spoken and Written Word Recognition: More Similar Than Different—*Kristi Hendrickson, University of Iowa, USA; Jina Kim, University of Iowa, USA; Hannah O'Donnell, University of Iowa, USA; and Bob McMurray, University of Iowa, USA*

The Development of Spoken- and Written-Word Recognition Across Early School-Age Years—*Keith Apfelbaum, University of Iowa, USA; Jamie Klein-Packard, University of Iowa, USA; and Bob McMurray, University of Iowa, USA*

Linking Speech Perception and Phonology to Reading Disability Via Neural Phase Locking to Speech—*Marc F. Joanisse, The University of Western Ontario, Canada; Christine Moreau, The University of Western Ontario, Canada; and Christina M. Van Den Bosch Der Nederlanden, University of Toronto Mississauga, Canada*

Articulation Rate and Cognitive Demands in Serial Naming and Reading—*Athanassios Protopapas, University of Oslo, Norway; Katerina Katopodi, University of Athens, Greece; Angeliki Altani, University of Oslo, Norway; Laoura Ziaka, University of Oslo, Norway; and George K. Georgiou, University of Alberta, Canada*

SYMPOSIA *Times subject to change.*

SYMPOSIUM III: FACILITATING BELONGING, INCLUSION, AND EQUITY IN STEM (SPECIAL SYMPOSIUM)

FRIDAY, NOVEMBER 18, 3:45–5:45 PM US EST

Sheraton Grand Ballroom

Organizers: Timothy J. Nokes Malach, University of Pittsburgh, USA; and Mary A. Peterson, University of Arizona, USA

The speakers in this symposium investigate the topics of belonging, inclusion, and equity with an emphasis on identity, mindsets, and equity in STEM. Their perspectives—from social and educational psychology—differ from, but are related to, the cognitive perspectives typically represented at the Psychonomic Society Annual Meeting. The speakers will cover challenges to creating an inclusive and equitable STEM community and will suggest approaches to addressing them. Our goals are to inspire attendees to work toward inclusion and equity within the cognitive psychology community and to provide effective tools for this effort.

Creating Contexts That Foster Equity and Belonging in College STEM Courses: An Ecological-Belonging Approach—*Kevin R. Binning, University of Pittsburgh, USA*

Creating Cultures of Inclusion—*Mary C. Murphy, Indiana University, USA*

Leveraging Counternarratives and Counterspaces to Facilitate the Physics Identity Development of Women—*Zhara Hazari, Florida International University, USA*

Making Hidden Knowledge Visible in a Minority Serving College Contexts—*Gerardo Ramirez, Ball State University, USA*

SYMPOSIUM IV: AGE-RELATED PATTERNS FOR MEMORY AND FUTURE PROJECTIONS DURING THE COVID-19 PANDEMIC

SATURDAY, NOVEMBER 19, 10 AM–NOON US EST

Sheraton Grand Ballroom

Organizer: Lauren L. Richmond, Stony Brook University, USA

Although the COVID-19 pandemic was a collectively experienced event, memories from the COVID-19 pandemic period may be varied, particularly as a function of age. Moreover, memories and future projections are known to be tightly related to one another; therefore, understanding features of memories formed during the COVID-19 period, such as valence, is also expected to provide insights into how people will think about the future moving forward from this period. Older adults are at greater health risk under COVID-19 and may therefore have different memories and future projections than younger-aged adults that may be more negative in nature. At the same time, older adults are known to possess better emotion regulation skills and to remember information more positively than younger-aged cohorts, suggesting a potential benefit to emotional memory associated with being older during the COVID-19 pandemic. Finally, due to the stressful nature of the COVID-19 period, emotion-focused processing may impact memory accuracy for both emotional information that is unrelated to COVID-19 as well as information related to the COVID-19 pandemic itself.

Memories and Future Thinking Under COVID-19: Durability of Age-Related Patterns Up to 10-Year Future Projections—*Lauren L. Richmond, Stony Brook University, USA; Tori Peña, Stony Brook University, USA; Lois K. Burnett, Stony Brook University, USA; and Suparna Rajaram, Stony Brook University, USA*

The Impact of Covid-19 Related Stress on Emotional Reactivity and Memory Across the Adult Lifespan—*Audrey Duarte, The University of Texas at Austin, USA; and Kyoungeun Lee, The University of Texas at Austin, USA*

Differences in Remembering the Panic Memories: Findings from 15 Countries—*Sezin Oñer, Kadir Has University, Turkey*

Pandemic Memories: Differences Across the Generations and Suggestions of Inter-Generational Transfer—*Elizabeth A. Kensinger, Boston College, USA; Tony Cunningham, Boston College, USA; Eric Fields, Westminster College, USA; Jaclyn H. Ford, Boston College, USA; Sandry M. Garcia, Boston College, USA; and Hannah Yoon, Boston College, USA*

Empathy and Memory During the COVID-19 Pandemic and Effects of Aging—*Isu Cho, Brandeis University, USA; Ryan T. Daley, Boston College, USA; Tony J. Cunningham, Boston College, Harvard Medical School, & Beth Israel Deaconess Medical Center, USA; Elizabeth A. Kensinger, Boston College, USA; and Angela Gutchess, Brandeis University, USA*

Thinking Beyond COVID-19: Thinking About the Personal Past and Future During the Pandemic—*Donna Rose Addis, Baycrest Health Sciences & University of Toronto, Canada; Samuel Gynes-Clinton, Baycrest Health Sciences, Canada; Ziming Cheng, Baycrest Health Sciences & University of Toronto, Canada; Riya Trikha, Baycrest Health Sciences & York University, Canada; and Audrey Li-Chay-Chung, Baycrest Health Sciences & York University, Canada*

SYMPOSIUM V: CO-REGISTRATION OF EYE MOVEMENTS AND EEG (LEADING EDGE WORKSHOP)

SATURDAY, NOVEMBER 19, 1:30–3:30 PM US EST

Sheraton Grand Ballroom

Organizers: Elizabeth R. Schotter, University of South Florida, USA; Brennan R. Payne, University of Utah, USA; and Trafton Drew, University of Utah, USA

Visual attention is critical for many real-world cognitive tasks that have important consequences for our daily lives (e.g., reading, visual search, object perception). Recent technological innovations have allowed for the simultaneous study of behavioral and neural measures of visual and cognitive processes in naturalistic

free-viewing scenarios, moving beyond the constraints of traditional laboratory paradigms (e.g., through co-registration of EEG while people freely move their eyes). Because much of the prior eye movement and EEG research on visual attention has been developed in largely independent research areas, each with their own theories, foci, and best practices, rapid progress in answering these questions requires integrating these long-siloed domains through collaborative cross-talk, which was the topic of the 2022 Psychonomic Society Leading Edge Workshop on EEG and eye movement co-registration. This symposium highlights a broad overview of the workshop and features some of the latest empirical, theoretical, and methodological work on eye movement and EEG co-registration in cognitive science.

Eye Movements Are Not Automatically Preceded by the N2pc Component—*Nicholas Gaspelin, Binghamton University SUNY, USA; and Travis N. Talcott, Binghamton University SUNY, USA*

The Role of Prediction and Extrafoveal Preview in Naturalistic Visual Perception—*David Melcher, New York University Abu Dhabi, UAE; Christoph Huber-Huber, Donders Institute for Brain, Cognition and Behavior, Netherlands; Antimo Buonocore, Suor Orsola Benincasa University of Naples, Italy; and Xiaoyi Liu, New York University Abu Dhabi, UAE*

Effects of Stimulus Quality and Word Frequency During Sentence Reading—*Simon P. Liversedge, University of Central Lancashire, UK; Federica Degno, Bournemouth University, UK; Fruzsina Soltész, University of Southampton, UK; Piril Hepsomali, University of Roehampton, UK; and Nick Donnelly, Liverpool Hope University, UK*

The Eye as a Window to the Brain and Mind: Co-Registration of Pupillometry and Cognitive ERPs—*Brennan Payne, University of Utah, USA; and Jack Silcox, University of Utah, USA*

Reading Fluency Deficits in Schizophrenia: Evidence from Computational Modeling and Fixation-Related Potentials—*Heather Sheridan, University at Albany, SUNY, USA; Elisa C. Dias, Nathan S. Kline Institute for Psychiatric Research/New York University School of Medicine, USA; and Daniel C. Javitt, Nathan S. Kline Institute for Psychiatric Research/Columbia University/New York State Psychiatric Institute, USA*

AWARDS

2022 CLIFFORD T. MORGAN DISTINGUISHED LEADERSHIP AWARD RECIPIENTS

The Psychonomic Society is pleased to announce the 2022 recipients of our Clifford T. Morgan Distinguished Leadership Award: **Randall W. Engle,** Georgia Institute of Technology, USA; and **Jeremy M. Wolfe,** Harvard Medical School/ Brigham & Women's Hospital, USA.

Randall W. Engle

Georgia Institute of Technology, USA

Randall W. Engle received his BS from West Virginia State College, an HBCU. His PhD is from The Ohio State University. His first job was at King College in Tennessee. He taught 10 classes per year, which made him a teacher. He then moved to the University of South Carolina for the next 21 years before moving to Georgia Institute of Technology as Chair of Psychology. He was Editor of *Current Directions in Psychological Science* for 10 years. His research for the past 40 years has explored the nature of working memory, executive attention, and cognitive control. His work has been funded by various agencies, including the National Institute of Health and Human Development, Air Force Office of Scientific Research, and Office of Naval Research. Harzing's Publish or Perish shows that Engle's work has been cited over 58,000 times. He is a fellow of the American Psychological Association, Association of Psychological Science, American Association for the Advancement of Science, and Society of Experimental Psychologists. He has served as Chair of the Governing Board of the Psychonomic Society and President of Division 3 of the American Psychological Association. He received the first the American Psychological Association Division 3 Lifetime Achievement Award in 2013. He was elected to the National Academy of Sciences in 2020.

Jeremy M. Wolfe

Harvard Medical School/Brigham & Women's Hospital, USA

Jeremy Wolfe is Professor of Ophthalmology and Professor of Radiology at Harvard Medical School. He is Director of the Visual Attention Lab at Brigham and Women's Hospital. Wolfe received an AB in Psychology in 1977 from Princeton and his PhD in Psychology in 1981 from the Massachusetts Institute of Technology. His research focuses on visual search and visual attention with a particular interest in socially important search tasks in areas such as medical image perception (e.g., cancer screening), security (e.g., baggage screening), and intelligence. His lab has been funded by the National Institutes of Health (National Eye Institute, National Institute of Mental Health, National Cancer Institute), National Science Foundation, Air Force Office of Scientific Research, Office of Naval Research, Army Research Office, Homeland Security, and National Geospatial Agency, as well as by IBM, Google, Toshiba, Hewlett-Packard, and General Electric. He has served as Past President or Chair of the Federation of Associations in Behavioral and Brain Sciences, Psychonomic Society, American Psychological Association Division 3, Eastern Psychological Association, and National Academy of Sciences Panel on Soldier Systems. Wolfe was Founding Editor-in-Chief of *Cognitive Research: Principles and Implications* (CR:PI), the newest Psychonomic Society journal, and Past Editor of *Attention, Perception, and Psychophysics* (AP&P). He was elected to the American Academy of Arts and Sciences in 2019.

The 2022 Clifford T. Morgan Distinguished Leadership Award and Mid-Career Award Subcommittee members are Michael J. Kane, University of North Carolina at Greensboro, USA (chair); Jan De Houwer, Ghent University, Belgium; Myra Fernandes, University of Waterloo, Canada; Klaus Oberauer, University of Zurich, Switzerland; Brian Ross, Minerva University, USA; and Jyotsna Vaid, Texas A&M University, USA. The recipients will be recognized at the Awards and Business Meeting on Saturday, November 19, 5:10–6 pm US EST in the Commonwealth room at the Sheraton Boston Hotel. Read more about the award at www.psychonomic.org/page/leadershipaward.

About Clifford T. Morgan

Born in 1915 in Minolta, New Jersey, Clifford Thomas Morgan received his undergraduate education at Maryville College and his PhD from Rochester University in 1939. Morgan held academic positions at Harvard University; Johns Hopkins University; University of Wisconsin; the University of California, Santa Barbara; and, finally, at the University of Texas. He was a founding member of the Psychonomic Society and the first Governing Board Chair, and he led the Society's journal program for many years. He passed away in 1976 in Austin, Texas.

AWARDS

2022 MID-CAREER AWARD RECIPIENTS

The Psychonomic Society is pleased to announce the recipients of the 2022 Mid-Career Award: **Elizabeth Kensinger**, Boston College, USA; **Charan Ranganath**, University of California, Davis, USA; and **Eric-Jan Wagenmakers**, University of Amsterdam, The Netherlands.

Elizabeth Kensinger

Boston College, USA

Elizabeth Kensinger is Professor and Chairperson of the Department of Psychology and Neuroscience at Boston College. She received her undergraduate degree from Harvard University and her PhD from the Massachusetts Institute of Technology. At Boston College, she directs the Cognitive and Affective Neuroscience Laboratory, using multiple methods (behavioral, eye tracking, electrophysiological, functional neuroimaging) to understand the bidirectional links between emotion and memory and how those links change across the adult lifespan. She regularly collaborates with the Innocence Program clinic at Boston College Law School, conducting seminars on the science of memory, and is a faculty lead of the Boston College Consortium for Translational Research on Learning and Memory. She is coauthor, with Dr. Andrew Budson, of the forthcoming book *Why We Forget and How to Remember Better: The Science Behind Memory* (Oxford University Press).

Charan Ranganath

University of California, Davis, USA

Charan Ranganath is the Director of the Memory and Plasticity Program and a Professor of Psychology and Neuroscience at the University of California, Davis. He has been a pioneer in the use of brain imaging techniques like functional magnetic resonance imaging to study the mechanisms in the brain that allow us to remember past events. His Dynamic Memory Lab is using computational models and multiple neuroscience and behavioral methods to study how we remember complex events and how we use memory in the service of navigation and goal-directed behavior. He has also studied how memory is affected by emotion, stress, and curiosity, as well as age-related changes in memory and effects of memory disorders like epilepsy, stroke, schizophrenia, and Alzheimer's disease. He is completing a trade book on the neuroscience of memory, to be published in fall 2023.

Eric-Jan Wagenmakers

University of Amsterdam, The Netherlands

Eric-Jan (EJ) Wagenmakers is Professor at the Psychological Methods Unit of the University of Amsterdam. He was mentored by Ritske de Jong, Jeroen Raaijmakers, Richard Shiffrin, Roger Ratcliff, and Han van der Maas. He has served as Action Editor for *Psychonomic Bulletin & Review*, *Cognitive Psychology*, and *Journal of Mathematical Psychology*. Wagenmakers published a course book on Bayesian cognitive modeling (with Michael D. Lee) and the children's book *Bayesian Thinking for Toddlers* (https://psyarxiv.com/w5vbp) and edited the Methodology volume of *Stevens' Handbook of Experimental Psychology and Cognitive Neuroscience*. He is a staunch advocate of Bayesian inference and Open Science procedures such as preregistration, multi-analyst projects, and scientific transparency in general. Together with his collaborators, he initiated and coordinated the development of JASP (jasp-stats.org), an open-source software program that offers both classical and Bayesian inference methods. He has published over 290 articles in peer-reviewed journals.

The 2022 Clifford T. Morgan Distinguished Leadership Award and Mid-Career Award Subcommittee members are Michael J. Kane, University of North Carolina at Greensboro, USA (chair); Jan De Houwer, Ghent University, Belgium; Myra Fernandes, University of Waterloo, Canada; Klaus Oberauer, University of Zurich, Switzerland; Brian Ross, Minerva University, USA; and Jyotsna Vaid, Texas A&M University, USA. The recipients will be recognized at the Awards and Business Meeting on Saturday, November 19, 5:10–6 pm US EST in the Commonwealth room at the Sheraton Boston Hotel. Read more about the award at www.psychonomic.org/page/midcareeraward.

AWARDS

2022 EARLY CAREER AWARD RECIPIENTS

The Psychonomic Society is pleased to announce the recipients of the 2022 Early Career Award: **Felipe De Brigard,** Duke University, USA; **Brendan T. Johns,** McGill University, Canada; **Beatrice G. Kuhlmann,** University of Mannheim, Germany; and **Vishnu "Deepu" Murty,** Temple University, USA.

Felipe De Brigard

Duke University, USA

Felipe De Brigard, PhD, is the Fuchsberg-Levine Family Associate Professor of Philosophy and Associate Professor in the departments of Psychology and Neuroscience and the Center for Cognitive Neuroscience at Duke University. He is also Principal Investigator of the Imagination and Modal Cognition Laboratory within the Duke Institute for Brain Sciences. His research focuses on the nature of memory and its relations to other cognitive faculties such as perception, imagination, attention, and consciousness, but he is also interested in the foundations of neuroscience and moral psychology.

Brendan T. Johns

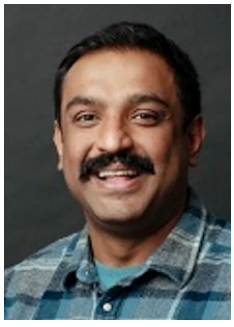
McGill University, Canada

Dr. Brendan Johns is an Assistant Professor in the Department of Psychology at McGill University, where he directs the McGill Cognitive Computing Laboratory. He is also Associate Editor of *Behavior Research Methods*. The goal of his research is to redefine the field of computational cognitive science through the development of new theoretical approaches to cognitive science grounded in modern machine learning and big data methodologies, with both theoretical and applied research prongs. Dr. Johns has published over 50 peer-reviewed articles, many in top journals.

Beatrice G. Kuhlmann

University of Mannheim, Germany

Beatrice G. Kuhlmann is Professor of Cognitive Psychology and Cognitive Aging at the University of Mannheim in Germany. In her research, she combines behavioral experimental manipulations with cognitive modeling to study the interplay of episodic memory, semantic memory, and metacognition across adult age. Some of her main contributions have been insights on younger and older adults' use of prior knowledge in source guessing and the identification of encoding strategies improving source memory even in old age. In collaboration with colleagues from the University of Mannheim, she founded the One World Cognitive Psychology Seminar Series, now a Psychonomic Society program.



Vishnu "Deepu" Murty

Temple University, USA

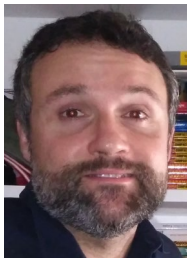
Vishnu "Deepu" Murty is the Principal Investigator of the Adaptive Memory Lab, which is housed in the Department of Psychology and Neuroscience at Temple University. His research program characterizes how engagement of neuromodulatory systems influences memory and memory-guided decision making. To approach these questions, he uses a combination of novel behavioral paradigms, functional neuroimaging, computational modeling, and natural language processing. He probes these systems in individuals with or at risk for psychopathology to better understand the role of memory in adaptive behavior, specifically in the domains of psychosis and post-traumatic stress disorder.

The 2022 Early Career Award Subcommittee members are Michael J. Kane, University of North Carolina at Greensboro, USA (chair); Ian Dobbins, Washington University in St. Louis, USA; Christopher Donkin, Ludwig Maximilian University of Munich, Germany; Candice Morey, Cardiff University, UK; and Priti Shah, University of Michigan, USA. Recipients will be recognized at the Awards and Business Meeting on Saturday, November 19, 5:10–6 pm US EST. Read more about the Early Career Award at https://www.psychonomic.org/page/early_career_award.

AWARDS

2022 BEST ARTICLE AWARD RECIPIENTS

The Psychonomic Society is pleased to announce the recipients of the 2022 Best Article Awards.



Attention, Perception, & Psychophysics

Editor: Sarah Shomstein

Pedro R. Montoro & Marcos Ruiz

"Incidental Visual Memory and Metamemory for a Famous Monument"

DOI: 10.3758/s13414-022-02472-9

Behavior Research Methods

Editor: Marc Brysbaert

Felix Henninger, Yury Shevchenko, Ulf K. Mertens, Pascal J. Kieslich, & Benjamin E. Hilbig

"lab.js: A Free, Open, Online Study Builder"

DOI: 10.3758/s13428-019-01283-5

Cognitive, Affective, & Behavioral Neuroscience

Editor: Diego Pizzagalli

Elise Demeter, Brittany Glassberg, Marissa L. Gamble, & Marty G. Woldorff

"Reward Magnitude Enhances Early Attentional Processing of Auditory Stimuli"

DOI: 10.3758/s13415-021-00962-1

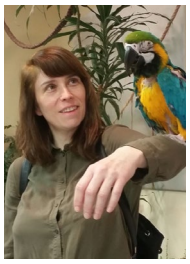
Cognitive Research: Principles & Implications

Editor: Sarah Creem-Regehr

Madison Fansher, Tyler J. Adkins, Poortata Lalwani, Ayşecan Boduroğlu, Madison Carlson, Madelyn Quirk, Richard L. Lewis, Priti Shah, Han Zhang, & John Jonides

"Icon Arrays Reduce Concern over COVID-19 Vaccine Side Effects: A Randomized Control Study"

DOI: 10.1186/s41235-022-00387-5



Learning & Behavior

Editor: Jonathon D. Crystal

Julie Morand-Ferron, Michael S. Reichert, & John L. Quinn

"Cognitive Flexibility in the Wild: Individual Differences in Reversal Learning Are Explained Primarily by Proactive Interference, Not by Sampling Strategies, in Two Passerine Bird Species"

DOI: 10.3758/s13420-021-00505-1

Memory & Cognition

Editor: Ayanna Thomas

Naomi Vingron, Noah Furlani, Olivia Mendelson, & Debra Titone

"I See What You Mean: Semantic but Not Lexical Factors Modulate Image Processing in Bilingual Adults"

DOI: 10.3758/s13421-021-01229-3

Psychonomic Bulletin & Review

Editor: James R. Brockmole

Ashleigh M. Maxcey, Richard M. Shiffrin, Denis Cousineau, & Richard C. Atkinson

"Two Case Studies of Very Long-Term Retention"

DOI: 10.3758/s13423-021-02002-y

The Psychonomic Society Best Article Award recognizes the best article published in each of the Psychonomic Society's journals during the last year. Selections are made by the editorial team of each journal. Award recipients (the lead author) receive a certificate and honorarium of $1,000 USD and will be recognized at the Awards and Business Meeting on Saturday, November 19, 5:10–6 pm US EST in the Commonwealth room at the Sheraton Boston Hotel. Visit www.psychonomic.org/page/BestArticleAward for more information and to view previous recipients.

AWARDS

2022 J. FRANK YATES STUDENT CONFERENCE AWARD RECIPIENTS

Supporting Diversity and Inclusion in Cognitive Psychology

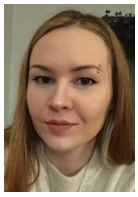
The Psychonomic Society Diversity & Inclusion Committee selected 12 recipients of the J. Frank Yates Student Conference Award for the 2022 Annual Meeting.

Teairra Z. Evans
The University of Alabama, USA

Abstract 1050: DIACOG: A Cognitive Intervention for African American Adults with Type 2 Diabetes

Sara B. Félix
University of Aveiro, Portugal

Abstract 5090: Animates Help You Remember What to Do! Evidence from a Nonfocal Prospective Memory Task



Gizem Filiz
Washington University in St. Louis, USA

Abstract 3130: The Limitations of Memory for Value Following Value Directed Encoding

Merve Ileri-Tayar
Washington University in St. Louis, USA

Abstract 2098: Transfer of Learned Cognitive Control Settings Within and Between Tasks

Adva Levi
Tel Aviv University, Israel

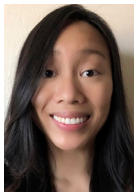
Abstract 1151: A Comparison in Recognition-Memory Data of Type I Error Rates: Comparing d', Percent Correct and d_a

Zoe Loh
University of California, Merced, USA

Abstract 4032: Physiological and Perceived Processing and Recall of Information from Social Media Scrolling Feeds

Vaishnavi Mohite
University of Hyderabad, India

Abstract V240: Brief Cues Influence Suppression of Singleton Distractors During Visual Search

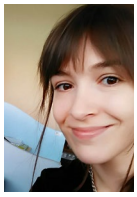


Julie Pham
Southern Methodist University, USA

Abstract 2144: Influence of Future Time Perspectives and Risk Perception During COVID-19 on Emotional Memory in Older and Younger Adults

Stephany Duany Rea
The University of Texas at Austin, USA

Abstract 5081: Students Can (Mostly) Recognize Effective Learning, So Why Don't They Do It?



Sónia M. P. Santos
University of Aveiro, Portugal

Abstract V115: "Have I seen that before?": Enhanced Recognition (with a Remember Experience) for Potential Sources of Contamination

Toni Smith
Michigan State University, USA

Abstract 5040: Speech Rhythm Is Important for Selective Attention to Target Speech Amidst Noise

Rhiannon N. Soriano Smith
University of Nevada, Las Vegas, USA

Abstract 3145: Forgetting in Item Recognition and Pattern Separation

Diversity & Inclusion Committee members include Jeanette Altarriba, University at Albany, State University of New York, USA (chair); Matthew Dye, Rochester Institute of Technology, USA; Kathy Rastle, Royal Holloway, University of London, UK; Priti Shah, University of Michigan, USA; Jill Shelton, University of Tennessee at Chattanooga, USA; Sharda Umanath, Claremont McKenna College, USA; and Maria Zaragoza, Kent State University, USA. Please join the committee in congratulating the recipients of the 2022 J. Frank Yates Student Conference Award. Each recipient receives an award of $1,000 USD and will be recognized at the Awards and Business Meeting on Saturday, November 19, 5:10–6 pm US EST. Visit https://www.psychonomic.org/page/yatestravelaward for more information.

AWARDS

2022 GRADUATE CONFERENCE AWARD RECIPIENTS

The Psychonomic Society Program Committee selected 20 recipients for the Graduate Conference Award for the 2022 Annual Meeting based on the quality of the abstracts submitted by student members of the Society.

Nada Alaifan
University of British Columbia, Canada

Abstract V157: The Heart Remembers What the Mind Forgets: Meta-Analysis of Emotional Enhancement on Episodic Memory for Valenced Pictures

Eleanora Beier
University of California, Davis, USA

Abstract 3067: Discourse Focus Facilitates Processing During Online Sentence Comprehension: A Successful Replication of Cutler and Fodor's (1979) Influential Findings

Maria Gabriele Brucato
Temple University, USA

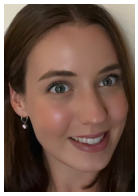
Abstract 4140: Cognitive, Affective, and Spatial Perspective-Taking: Shared or Distinct Processes?

Rebecca Crowley
Royal Holloway University of London, UK

Abstract 2026: Forgetting of Newly-Learned Words: Fragmented or Holistic Depending on the Nature of Encoding

Michael Geers
Max Planck Institute for Human Development, Germany

Abstract V190: Individuals with Higher Metacognitive Insight into their Political Knowledge Have Higher Need for Evidence and Lower Faith in Intuition and Belief that Truth Is Political



Lena Hildenbrand
University of Illinois at Chicago, USA

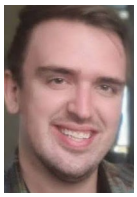
Abstract 5139: Conceptual Overlap among Texts Impedes Comprehension Monitoring

Victoria Johnson
University of Minnesota, USA

Abstract 1104: In Science We Trust? Factors Influencing Belief and Trust Across Scientific Domains

Myungjin Jung
University of Mississippi, USA

Abstract 2115: Hemodynamic and Psychological Mechanisms of Cognitive Impairment during Exercise



Kyle LaFollette
Case Western Reserve University, USA

Abstract 3039: Solutions To the Explore-Exploit Dilemma Vary with Perception of Stress and Intolerance of Uncertainty

Skylar J. Laursen
University of Guelph, Canada

Abstract 5108: Does Restudying Impair Memory for Non-restudied Information? A Real Word Application of the List-Strength Effect

Alyssa Lawson
University of California, Santa Barbara, USA

Abstract 2003: Role of Executive Function in Learning From Immersive Virtual Reality

Emma Libersky
University of Wisconsin-Madison, USA

Abstract 5031: Processing and Learning from Speech Disfluencies: Effects of Testing Delay and Bilingualism

Jessica Macaluso
University of Pittsburgh, USA

Abstract 5141: Study-strategy Perceived Effort and Familiarity Influence Self-regulated Learning Decisions via Perceived Fluency

Eric Martell
University of Michigan Ann Arbor, USA

Abstract 3060: Title: Is Syntactic Priming Modulated by Socio-Political Stance?

AWARDS

2022 GRADUATE CONFERENCE AWARD RECIPIENTS

The Psychonomic Society Diversity & Inclusion Committee selected 12 recipients of the J. Frank Yates Student Conference Award for the 2022 Annual Meeting.

Philipp Musfeld
University of Zurich, Switzerland

Abstract 5124: Hebb Repetition Learning: Neither Continuous nor Implicit - Insights from a New Modeling Approach

Sophie Su
Washington University in St. Louis, USA

Abstract 1073: Predictive Looking and Predictive Looking Errors in Daily Activities

Mar Suárez Ortega
University of Salamanca, Spain

Abstract 1089: First and Second Language Associative Network in Second Language Learners: an ERP Study

Joyce Tam
Pennsylvania State University, USA

Abstract 4055: What Can the P-N Flip Tell Us about Proactive Suppression?

Kirsten Verhaegen
KU Leuven, Belgium

Abstract 2062: Thinking and Doing: The Behavioral Mechanisms Underlying Concurrent Cognitive and Motor Control

Hyeonbo Yang
Pusan National University, South Korea

Abstract 5152: Incongruent Emotion Labels Increase Visual Mismatch Negativity (vMMN) in Facial Expression Processing: An ERP Study

The 2022 Program Committee members are Angela Gutchess, Brandeis University, USA (chair); Jeanette Altarriba, University at Albany, State University of New York, USA; Aysecan Boduroglu, Boğaziçi University, Turkey; Kimberly Fenn, Michigan State University, USA; John Henderson, University of California, Davis, USA; Michael J. Kane, University of North Carolina at Greensboro, USA; Stephan Lewandowsky, University of Bristol, UK; Penny M. Pexman, University of Calgary, Canada (Governing Board chair); and Reed Hunt, University of Mississippi, USA (ex officio). Each recipient receives an award of $1,000 USD and will be recognized at the Awards and Business Meeting on Saturday, November 19, 5:10–6 pm US EST in the Commonwealth room at the Sheraton Boston Hotel. Learn more about the Graduate Conference Award at https://www.psychonomic.org/page/graduatetravel.

SPECIAL EVENTS

ENCOURAGING FUTURE SCIENTISTS: SUPPORTING UNDERGRADUATES AT PSYCHONOMICS (UP)

FRIDAY, NOVEMBER 18, NOON–1:30 PM US EST

Commonwealth

Organizers: Jen Coane (co-chair), Colby College, USA; Sharda Umanath (co-chair), Claremont McKenna College, USA; Nate Kornell, Williams College, USA

Speakers: Suparna Rajaram, Stony Brook University, USA; Shana Carpenter, Iowa State University, USA; and Thomas Redick, Purdue University, USA

Current undergraduate and graduate students are the future of the Psychonomic Society. The goal of this lunchtime workshop is to welcome talented young scientists to Psychonomics, provide them with some tips for preparing and applying to graduate programs in psychology, and encourage them to network with one another and more senior scientists.

- **Noon–12:05 pm**—Welcome & Introductions
- **12:05–12:15 pm**—"Psychonomics 101" orientation: A brief overview of conference and networking opportunities
- **12:15–1 pm**—Graduate Path Advising Panel: Each speaker will provide a brief presentation on how to identify potential mentors and programs, prepare a strong application for graduate programs, and make informed choices on where to go and how to succeed. A Q&A period will follow.
- **1–1:30/1:45 pm**—Networking time: Launch will include pointing out tips and tricks for networking at the conference and how to make those interactions meaningful.

Current graduate students and faculty who mentor graduate students, especially those who are actively recruiting, are invited. In addition, attendees at various stages in their careers—from graduate students, to senior faculty, to those outside academia who went to primarily undergraduate institutions themselves—are invited.

DIVERSITY & INCLUSION RECEPTION

FRIDAY, NOVEMBER 18, 6–7 PM US EST

Hynes Convention Center Ballroom

As the preeminent society for the experimental study of cognition, the Psychonomic Society celebrates scientific merit and the diversity of researchers in the field and the Society. Please join members of the Governing Board and the Diversity & Inclusion Committee for a reception open to all scientists, including graduate students, early and mid-career investigators, as well as senior researchers.

JOGONOMICS

SATURDAY, NOVEMBER 19, 6 AM US EST

Sheraton Boston Hotel Lobby

Organizers: Jeffrey Zacks, Washington University in St. Louis, USA, and Marianne Lloyd, Seton Hall University, USA

Join your fellow Psychonomes on a 5k or 5-mile run. You choose a distance that works best for you. Sign up for Jogonomics when you register for the meeting. Participants will meet in the Sheraton Boston Hotel lobby to depart.

INFORMATION SESSION: FUNDING AT THE NATIONAL SCIENCE FOUNDATION

SATURDAY, NOVEMBER 19, NOON–1:30 PM US EST

Commonwealth

Organizer/Speaker: Betty Tuller, PhD, Director, Perception, Action, and Cognition Program, National Science Foundation, USA

National Science Foundation opportunities change all the time! Come hear the latest and get your questions answered. This presentation and Q&A session will provide information on current funding opportunities relevant to the Psychonomics community, National Science Foundation merit criteria, and the review process. Program officers will discuss. We will also cover (1) how to find the appropriate program for your work, (2) how to apply for National Science Foundation funding, and (3) the grant writing process and tips for writing successful proposals. Program directors will also be available to schedule one-on-one meetings to discuss specifics of your research and how to get it funded.

AWARDS AND BUSINESS MEETING

SATURDAY, NOVEMBER 19, 5:10–6 PM US EST

Commonwealth

Join the Psychonomic Society's leadership as they provide updates on Society business and honor the 2022 award recipients.

Individuals to be recognized include recipients of the following awards:

- Clifford T. Morgan Distinguished Leadership Award
- Mid-Career Award
- Early Career Award
- Best Article Award
- J. Frank Yates Student Conference Award
- Graduate Conference Award
- Governing Board Service Recognition
- Outgoing Editor-in-Chief Recognition Award
- Keynote Speaker Award

AFFILIATES

AFFILIATE MEETINGS

Auditory Perception, Cognition, and Action (APCAM)
Thursday, November 17, 2022
8 am–5 pm US EST
Back Bay C
https://apcsociety.org

Configural Processing Consortium
Wednesday, November 16, 2022
8:30 am–5:30 pm US EST
Public Garden
www.configural.org

Object Perception, Attention and Memory (OPAM)
Thursday, November 17, 2022
7:45 am–5 pm US EST
Independence
www.opam.net

Society for Computation in Psychology (SCiP)
Thursday, November 17, 2022
8 am–5:30 pm US EST
Back Bay AB
https://computationinpsych.com

Society for Mathematical Psychology Symposium on Current Trends in Mathematical Psychology (SMP)
Thursday, November 17, 2022
8:30 am–2 pm US EST
Public Garden
www.mathpsych.org

SPARK Society
Thursday, November 17, 2022
2:30–4 pm US EST
Constitution AB
https://www.sparksociety.org

Tactile Research Group (TRG)
Thursday, November 17, 2022
9 am–5 pm US EST
Commonwealth
http://trg.objectis.net

Women in Cognitive Science (WiCS)
Thursday, November 17, 2022
4–7 pm US EST
Republic
http://womenincogsci.org/meetings

AFFILIATE MEETINGS OCCURRING INDEPENDENT OF THE 2022 ANNUAL MEETING

Society for Judgment and Decision Making (SJDM)
SJDM Annual Meeting
November 10–13, 2022
University of California, San Diego, USA
www.sjdm.org

NO PROGRAM IN 2022

BMW: Bilingualism Matters Across the World
https://sites.google.com/view/bilingualism-matters-world/home

The Brunswik Society
http://brunswik.org

Comparative Cognition Society
http://comparativecognition.org

International Meeting for Metacognition
http://iametacognition.wix.com/metacognition

Culture and Cognition
https://www.brandeis.edu/gutchess/culture-cog-pre-conference.html

EXHIBITORS

Cambridge University Press (Virtual)

Cambridge University Press is a not-for-profit publisher that dates from 1534 and is part of the University of Cambridge. Our mission is to unlock people's potential with the best learning and research solutions by combining state-of-the-art content with the highest standards of scholarship, writing and production. Visit our stand to discuss publishing with us, browse our latest publications and pick up some free journal samples. All the books we have on display are available for purchase at a 30% discount.

Contact:
212-337-5000
information@cambridge.org
1 Liberty Plaza, Floor 20
165 Broadway
New York, NY 10006, USA
www.cambridge.org/academic

Exponent (Booth 12)

Exponent is a leading engineering and scientific consulting firm that brings together more than 90 different disciplines – including human factors (perceptual, cognitive, developmental psychology and neuroscience) – to solve the most pressing and complicated challenges facing stakeholders today. Our vision is to engage the brightest scientists and engineers to empower clients with solutions for a safe, healthy, sustainable, and technologically complex world. We leverage over 50 years of experience in analyzing accidents and failures to advise clients as they innovate their technologically complex products and processes, ensure the safety and health of their users, and address the challenges of sustainability.

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Sam Walter
Recruiting Coordinator
+1-650-688-6743
swalter@exponent.com
149 Commonwealth Drive
Menlo Park, CA 94025, USA
www.exponent.com

FindingFive Corporation (Booth 11)

FindingFive is a non-profit tech startup with a mission of building the technological infrastructure for online behavioral research. We focus on eliminating the pain points faced by researchers such as programming an online study and securely collecting and storing participant data. Our web platform, findingfive.com, enables researchers to rapidly create browser-based online studies with academic terms that are already familiar to them. FindingFive now also has its own participant pool so that researchers can create studies and recruit participants all in the same place.

Contact:
hello@findingfive.com
168 Barclay Farm Center #321
Cherry Hill, NJ 08034, USA
www.findingfive.com

MIT Press (Booth 4)

Established in 1962, the MIT Press is one of the largest and most distinguished university presses in the world and a leading publisher of books and journals at the intersection of science, technology, art, social science, and design. MIT Press books and journals are known for their intellectual daring, scholarly standards, interdisciplinary focus, and distinctive design. Learn more about our history. The MIT Press is committed to responsible and ethical conduct in our workplace. To support the Press's mission to push the boundaries of scholarly publishing and advance knowledge, and in alignment with MIT's policies and procedures, we embrace a code of conduct that governs all of our collaborations.

Contact:
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12th Floor
Cambridge, MA 02142
617-253-5646
https://mitpress.mit.edu/contact-us/

Psychology Software Tools (Booth 2)

Psychology Software Tools is celebrating 35 years! E-Prime 3.0 stimulus presentation software includes E-Prime Go for remote data collection. Cloud Licensing now available! Integrate with eye tracking and EEG with E-Prime Extensions. Use Chronos for millisecond-accurate responses, sound output, and triggers to external devices. Chronos Adapters provide a simple connection to EEG, fNRIS, and Physiological devices.

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gretchen.brauch@pstnet.com
311 23rd Street Ext., Suite 200
Pittsburgh, PA 15215, USA
www.pstnet.com

EXHIBITORS

Sona Systems (Booth 3)

Sona Systems cloud-based participant pool management software helps researchers and research coordinators at more than 1,000 universities across the world manage participants and research studies. Schools that switch to our software from a paper-based system typically see overall participation rates increase by 25-50% and no-show rates drop to below 5%.

Contact:
800-775-3772
sales@sona-systems.com
6106 Wilson Lane
Bethesda, MD 20817, USA
www.sona-systems.com

Springer (Booth 1)

Springer is a leading global scientific, technical and medical portfolio, providing researchers in academia, scientific institutions and corporate R&D departments with quality content through innovative information, products and services. Springer has one of the strongest STM and HSS eBook collections and archives, as well as a comprehensive range of hybrid and open access journals. Springer is part of Springer Nature, a global publisher that serves and supports the research community

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www.springer.com

SR-Research (Booth 10)

SR Research is known for outstanding technical specifications, versatility and rigour in eye-tracking hardware and software. Experiment Builder natively supports synchronization with BioSemi, Brain Products, EGI/NetStation, Neuroscan and other EEG systems. WebLink is new versatile software enabling tablet and web browser tracking, scene and participant camera setups, and more. In the lab or the field, MEG and fMRI scanner, our systems support tracking in normal, infant, patient and NHP populations. EyeLink systems enable research with over 10000 peer-reviewed publications!

Contact:
William Schmidt
613-271-8686
william@sr-research.com
35 Beaufort Drive
Ottawa, ON K2L 2B9
www.sr-research.com

EXHIBITORS

EXHIBIT HALL FLOOR PLAN—SHERATON GRAND BALLROOM FOYER

Booth 1: Springer
Booth 2: Psychology Software Tools
Booth 3: Sona Systems
Booth 4: MIT Press
Booth 10: SR-Research
Booth 11: Finding Five
Booth 12: Exponent

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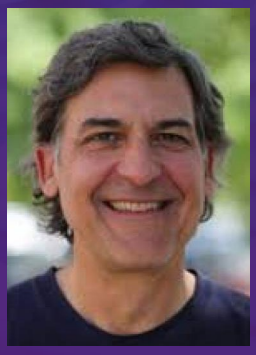

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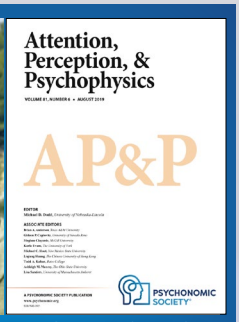
The Psychonomic Society publishes seven highly respected, peer-reviewed journals covering all aspects of cognitive and experimental psychology. Select a Psychonomic Society journal to showcase your science and to ensure that your research delivers the maximum impact to the global scientific community. Members receive free online access to all seven Psychonomic Society journals. Visit https://www.psychonomic.org/page/journals to learn more about each title.



ATTENTION, PERCEPTION, & PSYCHOPHYSICS

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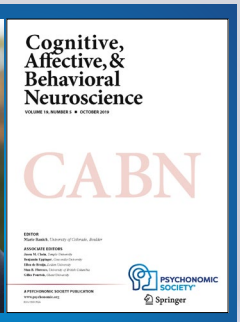

COGNITIVE, AFFECTIVE, & BEHAVIORAL NEUROSCIENCE

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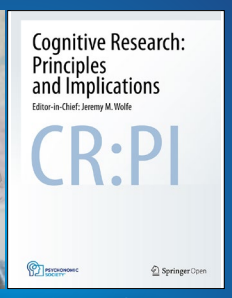

COGNITIVE RESEARCH: PRINCIPLES & IMPLICATIONS

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LEARNING & BEHAVIOR

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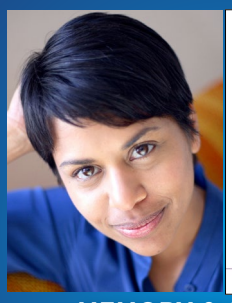

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PSYCHONOMIC SOCIETY DIGITAL CONTENT

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IN MEMORIAM

Psychonomic Society Members • July 1, 2021–June 30, 2022

The Psychonomic Society honors deceased members by publishing obituaries on our website. If you know a member of our community who has recently passed away, please contact Colin MacLeod. Particularly valuable would be suggestions for who might write the obituary. For consistency, the text is to be no more than 150 words, adding one or two links to longer tributes published elsewhere.

SALLY MARGARET ANDREWS (1953–2022)

Sally Andrews died in Sydney, Australia, on 4 May 2022, after a brief battle with cancer. After receiving her honours degree (1975) and PhD (1983) at University of New South Wales, Australia, she held faculty positions before serving as Head of Psychology. Sally was appointed Professor of Cognitive Psychology at The University of Sydney in 2002 and served as Head of School (2004–2011), where she had a transformative impact. Sally was a Fellow of the Academy of the Social Sciences in Australia and recognised as an international leader, particularly in the areas of reading and language. Sally was a deeply committed scientist who took no nonsense yet remained inclusive, mentoring many, and was a champion for women. Sally influenced generations of cognitive scientists and was highly respected and much loved amongst her colleagues for her sharp intellect, her inimitable style, and her great sense of humour. She is hugely missed. More information about Sally can be found here.

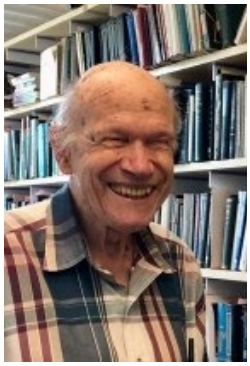
—Sachiko Kinoshita

MARK H. ASHCRAFT (1949–2022)

Mark Ashcraft, professor emeritus, passed away on September 5, 2022 after a difficult battle with cancer. Mark earned his Ph.D. from the University of Kansas and spent the first half of his academic career at Cleveland State University before moving to the University of Nevada, Las Vegas (UNLV) in 2004. He served as chair of psychology at both institutions and had retired in 2020. Mark started his career studying semantic memory, but he spent most of his career conducting research in math cognition where he explored how people solve math problems and how math anxiety affects that process. In addition to that research, he is well known for authoring many editions of a popular textbook in the field of cognitive psychology, Cognition (early editions were titled Human Memory and Cognition). Mark is survived by his wife, Mary, and his children, Jordan and Laura.

More information about Mark can be found here.

—David Copeland



RUSSELL MILLER CHURCH (1930–2021)

Russell (Russ) Miller Church graduated from the University of Michigan in 1952 and earned his PhD from Harvard University in 1956. He spent his 63-year career in experimental psychology at Brown University, where he was appointed to the distinguished position of Edgard L. Marston Professor. At the time of his retirement in 2018, Russ was the longest tenured faculty member in the university's history. Russ was well-known for being a caring and gifted mentor and served as the primary advisor for 21 PhD students. Russ repeatedly reshaped the research landscape with his innovative ideas. He was a pioneer (with John Gibbon and Warren Meck) of what became the dominant theory of timing, Scalar Timing Theory. Russ was an exceptional leader and role model, and he has left behind many tools, practices, and ideas on which to build the future of behavioral science. More information about Russ can be found here.

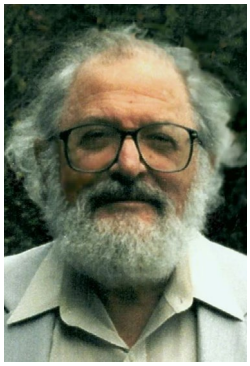
—Jonathon D. Crystal and Kimberly Kirkpatrick

IN MEMORIAM

MICHAEL CHARLES CORBALLIS (1936–2021)

Mike Corballis died in Auckland, New Zealand, on 13 November 2021, after a brief battle with lymphoma. After initial training in New Zealand, Mike earned his PhD from McGill University in 1965. He held faculty positions at the University of Auckland (1967–1969) and McGill (1969–1977) before returning to Auckland as professor of psychology in 1978. Mike made major contributions to a number of research domains, including statistical inference, cerebral asymmetry, visual perception, mental imagery, language evolution, and mental time travel. He authored 13 books and more than 400 articles, reviews, and chapters. His contributions earned numerous awards, including an honorary doctorate from the University of Waterloo (1998), the New Zealand Order of Merit (2002), and the Rutherford Medal (2016), New Zealand's highest scientific honor. Mike's erudition, mentorship, and tutelage will be fondly remembered by generations of students, research fellows, and collaborators. He is survived by two sons and three granddaughters. More information about Mike can be found here.

—Paul Corballis



JULIAN HOCHBERG (1923–2022)

Julian Hochberg, Columbia University Centennial Professor Emeritus of Psychology and beloved husband, father, grandfather, and friend, died on May 22, 2022, in New York City, USA, after a brief illness. Born in Brooklyn on July 10, 1923, to Edward Hochberg and Dora Wiener Hochberg, he graduated from Stuyvesant High School and the City College of New York and received his PhD from the University of California, Berkeley. He was a professor at Cornell University and New York University before moving to Columbia University where, in addition to teaching and conducting important research on perceptual organization, he served two terms as Chairman of the Psychology Department and was a member of the University Senate. An elected member of the National Academy of Sciences, he received the Distinguished Scientific Contribution Award from the APA. A talented designer, he built a large three-story home in upstate New York for his family with his own hands. He is survived by his wife, three children, and six grandchildren. More information about Julian can be found here and here.

—J.D.S. Hochberg

GEOFF HOLLIS-HAYNES (1983–2021)

Geoff Hollis-Haynes (né Hollis) died on November 8, 2021, of organ failure secondary to cancer. After his undergraduate studies at the University of Alberta, Geoff completed his masters and PhD with Guy Van Orden at the University of Cincinnati. He returned to Edmonton to teach psychology and computer science at the University of Alberta. In his brief career, he published many articles on computational psycholinguistics, venturing occasionally into other areas. Among his contributions, he championed the use of best/worst judgments, described the principal components of word-embedding models, wrote on using such models to predict word affect and humour judgments, deconstructed the lexical measure of contextual diversity, and developed a vector-based model of discriminative learning that addressed several weaknesses in the Rescorla-Wagner model. He was a friendly, good-humored, curious, creative, and much-loved man. More information about Geoff can be found here.

—Chris F. Westbury

IN MEMORIAM

MICHAEL S. HUMPHREYS (1942–2021)

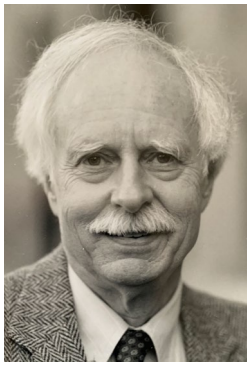
Mike Humphreys was born in California, USA, and passed away at age 79 in Brisbane, Australia, where he had lived for 42 years. He received his BA from Reed College and his PhD from Stanford University (1970), supervised by William K. Estes. Mike was Professor Emeritus of the University of Queensland; he was elected Fellow of the Academy of the Social Sciences in Australia in 1991. Well known for his encyclopedic knowledge of the psychological literature, he was both an empiricist and a quantitative theorist and published extensively in the areas of human memory, attention, and cognition. With former PhD student Kerry Chalmers, he published *Thinking About Memory* in 2016, presenting a novel approach that considered the task goals, available cues and information, opportunity to learn, and interference from irrelevant information. Mike was also a staunch environmentalist who worked tirelessly to restore the native bush of the Moggill Creek catchment area.

—*Bill Hockley*

BENNET BRONSON MURDOCK JR. (1925–2022)

Ben Murdock passed away in Toronto, Canada, in March 2022 at the age of 96. Ben received his PhD (1951) from Yale University, supervised by Leonard Doob. He was at Wesleyan University (1950–1951), the University of Vermont (1951–1964), and the University of Missouri, Columbia (1964–1965) before joining the University of Toronto in 1965, where he stayed until he retired as Professor Emeritus in 1991. His many honours include National Science Foundation Fellowships at Cambridge (1962–1963) and Stanford (1970–1971), a Killam Research Fellowship (1984–1986), Visiting Scholar at Harvard (1984–1986), and the Norman Anderson Lifetime Achievement Award from the Society of Experimental Psychologists (2003). Ben was first known for his pioneering research into short-term memory and later for his quantitative Theory of Distributed Associative Memory (TODAM), developed to describe the encoding and retrieval of item, associative, and serial order information. Ben supervised numerous graduate and postdoctoral students, many of whom became members of the Society. More information about Ben can be found here.

—*Bill Hockley*



ROGER NEWLAND SHEPARD (1929–2022)

Roger Newland Shepard, cognitive scientist and Stanford professor emeritus, died peacefully in Tucson, Arizona, USA, on May 30, 2022, at age 93 from Parkinson's Disease. He is survived by his wife of 70 years (Barbaranne), three children, and a granddaughter. Shepard earned his BA at Stanford and his PhD at Yale, both in Psychology, and was a professor in the Psychology Departments at Harvard (1966–1968) and Stanford (1968–1996). Well-known for his research in the areas of visual and auditory perception, memory, mental imagery and representation, learning theory, music cognition, and generalization, he received many accolades, most notably The National Medal of Science (1995). In addition to a keen mind and a delightful sense of humor, he composed music, wrote poetry, pursued photography, and published a book of his hand-drawn optical illusions called *Mind Sights* (1990). He was supportive of both his family and the researchers with whom he collaborated. More information about Roger can be found here.

—*Shenna Shepard*

2022

APCAM

21st Annual Auditory Perception, Cognition, and Action Meeting

Thursday, November 17, 2022

Sheraton Boston Hotel; Boston, Massachusetts

8:00 am - 5:00pm EST

Keynote address by Dr. Josh McDermott

APCAM brings together researchers from various theoretical perspectives and empirical traditions to share research on auditory perception, cognition, and action. We offer a unique meeting in our broad inclusion of multiple theoretical and methodological perspectives on a wide range of basic and applied research.

APCAM is supported by the Psychonomic Society and by the Auditory Perception and Cognition Society. Brief reports based on accepted abstracts can be submitted for consideration for a special issue of *Auditory Perception & Cognition* focused on APCAM.

Organizers:
Timothy L. Hubbard (Chair)
J. Devin McAuley
Kathleen C. McCulloch
Kristopher J. Pattern
Peter Q. Pfordresher
Hannah Shatzer

APCAM is committed to scientific merit, which entails the inclusion of scientists regardless of gender, race, sexual orientation, disability status, country of origin, geographic location, and disciplinary expertise.

Visit www.apcsociety.org for more information.

Boston, Massachusetts

opam30

November 17, 2022

Join us to witness outstanding research by graduate and postdoctoral scientists at the annual Object Perception, Attention, and Memory conference.

Date and Location

Thursday, November 17, 2022
7:45 AM - 5:00 PM

Sheraton Boston Hotel
Boston, Massachusetts

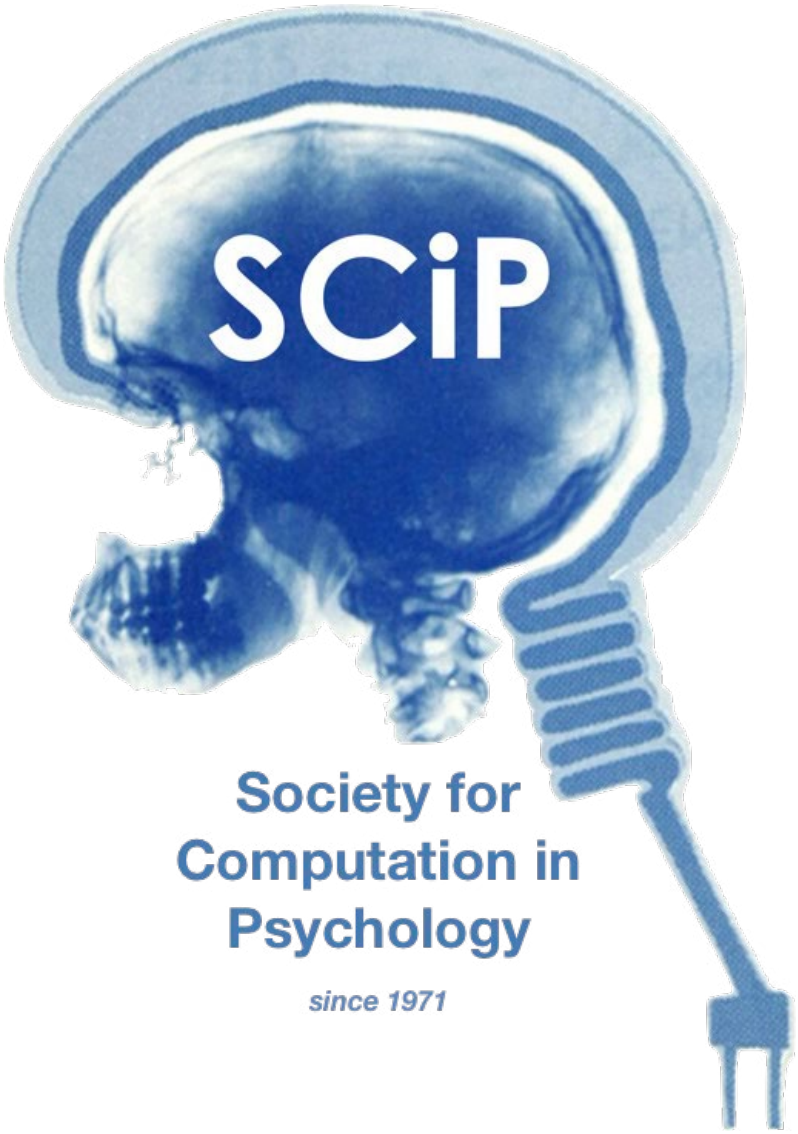
Keynote Address

Dr. Julie Golomb
Thursday, November 17, 2022
4:00 PM - 5:00 PM

Visit www.opam.net for more details

2022 Organizers

Xiaoli Zhang
Doug Addleman
Chenxiao Guan
Cristina Ceja



The 52st Annual Meeting of the Society for Computation in Psychology

Psychology in the Age of Technology: Implications for Philosophy, Methods, and Practice

November 17th, 2022

https://computationinpsych.com/

5th Annual Meeting of the

SPARK Society

in partnership with

reviewer zero

Changing the Culture of Peer Review: How to Be the Reviewer You've Always Wanted

Join us in-person for an interactive workshop.

Thursday, November 17th, 2021
2:30-4:00 pm ET

Moderated By:

Matt Goldrick
Professor
Northwestern University

Pablo Gomez
Associate Professor
CSU San Bernadino

The SPARK Society's mission is to establish a society of Cognitive Scientists and Psychologists of color that improves the visibility of its membership, creates mentorship opportunities for junior scholars of color, and provides a venue for allies to help us achieve these goals.

Join us for our annual meeting

to be held on

Thursday November 17th, 2022

9 a.m. to 5 p.m. CST

The meeting will be held in person (with an online option)!

From its humble beginning as a handful of colleagues sitting on beds in a hotel room discussing research on the perception of touch, the TRG has become an international collection of over 100 people conducting research on a wide variety of topics related to tactile perception. Our members come from both academia and industry and span a wide range of exciting topics including tactile acuity in the blind, haptic interfaces for driving and aviation, simulation of object texture in VR, sensory integration, synesthesia, and haptic space perception (and more!).

The purpose of the TRG is to facilitate interaction between tactile researchers and to provide a venue to share new research findings. This is primarily achieved through the TRG annual meeting held in conjunction with the meeting of the Psychonomic Society.

For more information or to be added to our mailing list,
please contact:
tactileresearchgroup@gmail.com
facebook.com/tactileresearchgroup

The 22nd Annual Meeting of Women in Cognitive Science

Thursday, November 17, 2022
Panel and Q&A: 4 - 6 EDT
Social Hour & Speed Mentoring: 6 - 7 EDT

Stepping Out of the Narrow Path:
Exploring Experiences Outside Academia

Cognitive science engages a range of skills and perspectives that are in demand in many settings. Yet, early career researchers, as well as more advanced academics, often struggle to find opportunities to share their skills. Our panel of speakers brings a wealth of experience in different sectors outside the traditional academic path. Join the workshop to hear them share stories of their paths. Stay for the social hour and speed mentoring sessions.

Panelists:
Leslie Lai, Google
Laura Matzen, Sandia National Laboratories
Betty Tuller, National Science Foundation
Starla Weaver, Leidos

Not going to be in Boston?
No problem—join us online.

WiCS Leadership Team:
Kate Arrington, Chair, Lehigh University
Karin Butler, Sandia National Laboratory
Kristi Multhaup, Davidson College
Bonnie Nozari, Carnegie Mellon University
Joo-Hyun Song, Brown University

Find WiCS online:
Website: http://www.womenincogsci.org/
Twitter: @WomenInCogSci
Facebook: WomenInCognitiveScience
Email: womenincognitivescience@gmail.com

Connect with WiCS Chapters in Canada and Europe

Twitter: @WiCSCanada
Facebook: WiCSC

Twitter: @WiCSEurope
Facebook: WiCSEurope
Email: wics.europe@gmail.com

Women in Cognitive Science is affiliated with the Psychonomic Society and its activities are funded by the Perception, Action & Cognition program at the National Science Foundation.

CONDENSED SCHEDULE A

THURSDAY, NOVEMBER 17, 2022

Poster Session I with Authors Present ..... **6:00-7:00 PM EST, Hynes Convention Center Ballroom**

Attention I (1001-1026)
Concepts and Categorizations (1028-1045)
Decision Making I (1046-1061)
Embodied Cognition (1062-1067)
Event Cognition (1068-1073)
Numerical Cognition (1074-1084)
Bilingualism: Development and Memory (1085-1091)
Language: Discourse Processes (1092-1104)
Language: Letter and Word Processing (1105-1116)
Autobiographical Memory (1117-1131)
Eyewitness Identification (1133-1144)
Statistics and Methodology I (1146-1153)
Sensation and Perception (1155)
Emotion and Cognition (1156)
Human Learning and Instruction (1157)

FRIDAY, NOVEMBER 18, 2022

Spoken Sessions and Symposia

Attention Capture (1-6) ..... 8:00-10:00 AM EST, Independence
Perception and Action (7-12) ..... 8:00-10:00 AM EST, Back Bay B
Discourse Processes (13-18) ..... 8:00-10:00 AM EST, Back Bay D
Visual Working Memory (19-24) ..... 8:00-10:00 AM EST, Back Bay A
Recall I (25-29) ..... 8:00-9:40 AM EST, Back Bay C
Event Cognition (30-34) ..... 8:00-9:40 AM EST, Constitution AB
Cognitive Aging I (35-39) ..... 8:00-9:40 AM EST, Republic

Symposium I: Visual Statistical Learning and Attention: A Two-Way Street (SYM1-SYM4) ..... 10:00 AM-12:00 PM EST, Sheraton Grand Ballroom
Neural Mechanisms of Memory and Cognition (40-44) ..... 10:20 AM-12:00 PM EST, Back Bay A
Attention I (45-49) ..... 10:20 AM-12:00 PM EST, Independence
Bilingualism: Developmental Processes (50-54) ..... 10:20 AM-12:00 PM EST, Back Bay B
Test Effects (55-60) ..... 10:00 AM-12:00 PM EST, Constitution AB
Speech Perception I (61-66) ..... 10:00 AM-12:00 PM EST, Back Bay C
False Belief: Memory and Judgment (67-72) ..... 10:00 AM-12:00 PM EST, Republic

Poster Session II with Authors Present ..... **12:00-1:00 PM EST, Hynes Convention Center Ballroom**

Learning and Instruction I (2001-2024)
Test Effects (2025-2035)
Visual Working Memory (2036-2056)
Performance and Control (2057-2077)
Sensation and Perception (2078-2091)
Neural Mechanisms of Cognition (2092-2097)
Attention: Cognitive Control I (2098-2118)
Attention: Individual Differences (2119-2131)
Bilingualism: Cognitive Control (2132-2141)
Cognitive Aging (2142-2162)
Cognitive Development (2165-2168)

Spoken Sessions and Symposia

Symposium II: Bridging the Gap Between Spoken and Written Language Research (SYM5-SYM8) ..... 1:30-3:30 PM EST, Sheraton Grand Ballroom
Statistics and Methodology (73-78) ..... 1:30-3:30 PM EST, Independence
Recognition I (79-84) ..... 1:30-3:30 PM EST, Republic
Decision Making I (85-90) ..... 1:30-3:30 PM EST, Back Bay C
Attention: Control I (91-96) ..... 1:30-3:30 PM EST, Back Bay B
Numerical Cognition (97-102) ..... 1:30-3:30 PM EST, Constitution AB
Working Memory I (103-108) ..... 1:30-3:30 PM EST, Back Bay A

Symposium III: Facilitating Belonging, Inclusion, and Equity in STEM (Special Symposium) (SYM9-SYM12) ..... 3:45-5:45 PM EST, Sheraton Grand Ballroom

CONDENSED SCHEDULE A

FRIDAY, NOVEMBER 18, 2022 *(continued)*

Poster Session III with Authors Present ..... **6:00-7:00 PM EST, Hynes Convention Center Ballroom**

Social/Cultural Influences on Cognition (3001-3011)
Decision Making II (3012-3033)
Judgment (3034-3046)
Music Cognition (3047-3048)
Language Production (3051-3057)
Psycholinguistics I (3058-3075)
Reading (3076-3094)
False Memory (3095-3121)
Implicit Memory (3122-3127)
Recognition Memory (3128-3151)
Working Memory (3152-3167)
Emotion and Cognition (3168)

SATURDAY, NOVEMBER 19, 2022

Spoken Sessions and Symposia

Decision Making: Motivation and Reward (109-114) ..... 7:40-9:40 AM EST, Back Bay A
Cognition and Emotion I (115-117, 119) ..... 8:00-9:40 AM EST, Republic
Attention: Automatic Processing (120-124) ..... 8:00-9:40 AM EST, Back Bay C
Cultural/Social Influences on Cognition (125-127, 118, 128) ..... 8:00-9:40 AM EST, Back Bay D
Aging and Memory (129-134) ..... 8:00-10:00 AM EST, Back Bay B
Bilingualism: Cognitive Control (135-140) ..... 8:00-10:00 AM EST, Constitution AB
Speech Perception II (304, 141-145) ..... 8:00-10:00 AM EST, Independence

Symposium IV: Age-Related Patterns for Memories and Future Projections During the COVID-19 Pandemic (SYM13-SYM18) ..... 10:00 AM-12:00 PM EST, Sheraton Grand Ballroom
Bilingualism: Cognitive Processes (146-150) ..... 10:20 AM-12:00 PM EST, Constitution AB
Concepts and Categorizations (151-155) ..... 10:20 AM-12:00 PM EST, Back Bay D
Learning and Instruction I (156-160) ..... 10:20 AM-12:00 PM EST, Back Bay B
Visual Perception (161-166) ..... 10:00 AM-12:00 PM EST, Back Bay A
Cognitive Development (167-172) ..... 10:00 AM-12:00 PM EST, Back Bay C
Language: Cognitive Control (173-178) ..... 10:20 AM-12:00 PM EST, Republic

Poster Session IV with Authors Present ..... **12:00-1:00 PM EST, Hynes Convention Center Ballroom**

Metamemory (4001-4012)
Perception and Action (4013-4020)
Technology and Cognition (4022-4035)
Attention: Cognitive Control II (4036-4051)
Attention: Visual Search (4052-4068)
Bilingualism: Comprehension and Production (4070-4076)
Decision Making III (4077-4090)
Reasoning and Problem Solving (4091-4118)
Cognition and Emotion (4119-4139)
Spatial Cognition (4140-4160)

Spoken Session and Symposia

Symposium V: Co-Registration of Eye Movements and EEG (Leading Edge Workshop) (SYM19-SYM23) ..... 1:30-3:30 PM EST, Sheraton Grand Ballroom
Letter Word Processing (179-183) ..... 1:30-3:10 PM EST, Back Bay D
Cultural/Social Influences on Cognition (184-188) ..... 1:30-3:10 PM EST, Back Bay C
Eyewitness Identification (189-193) ..... 1:30-3:10 PM EST, Independence
Decision Making II (194-199) ..... 1:30-3:30 PM EST, Republic
Autobiographical Memory (200-205) ..... 1:30-3:30 PM EST, Constitution AB

Visual Search (206-210) ..... 3:50-5:30 PM EST, Back Bay A
Reasoning and Problem Solving (211-215) ..... 3:50-5:30 PM EST, Constitution AB
Recall II (216-220) ..... 3:50-5:30 PM EST, Republic
Psycholinguistics I (221-226) ..... 3:30-5:30 PM EST, Back Bay D
Metacognition I (227-232) ..... 3:30-5:30 PM EST, Back Bay C
Cognition and Emotion II (233-237) ..... 3:30-5:30 PM EST, Independence

CONDENSED SCHEDULE A

SATURDAY, NOVEMBER 19, 2022 *(continued)*

Poster Session V with Authors Present ..... **6:00-7:00 PM EST, Hynes Convention Center Ballroom**

Associative Learning (5001-5013)
Cognitive Skill Acquisition (5014-5018)
Learning and Memory: Reward, Motivation, and Emotion (5019-5027)
Psycholinguistics II (5028-5037)
Speech Perception (5038-5058)
Learning and Instruction II (5059-5083)
Prospective Memory (5084-5095)
Recall Memory (5096-5121, 5162)
Working Memory II (5122-5132)
Metacognition (5133-5149)
Vision (5150-5160)
Statistics and Methodology II (5161)

SUNDAY, NOVEMBER 20, 2022

Spoken Sessions

Psycholinguistic II (238-243) ..... 8:00-10:00 AM EST, Constitution AB
Attention: Control II (244-250) ..... 8:00-10:20 AM EST, Republic
Reading (251-255) ..... 8:00-10:00 AM EST, Back Bay C
Judgment (256-261) ..... 8:00-10:00 AM EST, Back Bay D
Learning and Instruction (262-266) ..... 8:00-9:40 AM EST, Back Bay A
Recognition II (267-271) ..... 8:00-9:40 AM EST, Back Bay B

Language Production (272-276) ..... 10:20-12:00 PM EST, Commonwealth
Cognitive and Motor Control of Performance (277-282) ..... 10:00-12:00 PM EST, Back Bay A
Spatial Cognition (283-288) ..... 10:00-12:00 PM EST, Back Bay B
Metacognition II (289-293) ..... 10:20-12:00 PM EST, Constitution AB
Prospective Memory (294-298) ..... 10:20-12:00 PM EST, Back Bay D
Working Memory II (299-303) ..... 10:20-12:00 PM EST, Back Bay C

THURSDAY, NOVEMBER 17–SUNDAY, NOVEMBER 20, 2022

Virtual-Only Posters

Attention (V001-V007, V209-V210)
Concepts and Categories (V008-V010, V211)
Decision Making (V011-V018, V140-V143, V203-V204, V212, V251)
Cognitive Skill (V019-V021)
Bilingualism: Memory (V022-V024)
Event Cognition (V025)
Numerical Cognition (V026, V213)
Bilingualism: Development and Individual Differences (V027)
Letter/Word Processing (V028-V035)
Eyewitness Identification (V036)
Autobiographical Memory (V037-V042, V214-V215, V241, 244)
Associative Learning (V043-V052)
Cognitive Control (V053-V054, V065-V068, V216, V131-V136, V205-V206, V216)
Motor Control (V055-V057)
Performance (V058-V062)
Statistics and Methodology (V063-V064, V202, V217)
Cognitive Aging (V069-V077)
Judgment (V078-V086, V218)
Music Cognition (V087-V090)
Language Production/Writing (V091-V094, V219-V220)
Psycholinguistics (V095-V099, V167-V170)
Reading (V100-V109, V221-V222, V252)
False Memory (V110-V114, V223-V224)
Recognition (V115-V120, V225-V226)
Metamemory (V121-V124, V245)
Perception and Action (V125-V126, V248)
Technology and Cognition (V127-V130, V227)
Bilingualism: Comprehension and Production (V137-V139, V228)
Reasoning/Problem Solving (V144-V150, V229, V247)
Emotion and Cognition (V151-V159)
Spatial Cognition (V160-V166)
Speech Perception (V171-V172)
Human Learning and Instruction (V173-V176, V230-V233, V243, V249)
Prospective Memory (V177-V178, V234)
Recall (V179-V183)
Working Memory (V184-V188, V242)
Metacognition (V189-V194)
Sensation and Perception: Vision (V195-V201)
Neural Mechanisms (V207)
Visual Search (V208, V238-V240)
Test Effects (V235)
Performance and Control (V236)
Cognitive Development (V237, V250)
Learning and Memory: Reward, Motivation, and Emotion (V246)

CONDENSED SCHEDULE B

THURSDAY, NOVEMBER 17, 2022

6:00 PM–7:00 PM EST, HYNES CONVENTION CENTER BALLROOM
POSTER SESSION I WITH AUTHORS PRESENT (1001–1157)

Attention I (1001–1026)
(1001) Bennett, McGinley, Hicken, Hilchey, Weidler
(1002) Britt, Haponenko, Sun
(1004) Marsh, Hughes, Degno, Hughes
(1005) Aita, Baschnagel, Sutton
(1006) Adams, Gaspelin
(1007) De Pooter, Burgess, Hauck, Ruthruff, Lien
(1008) Hauck, Lien, Ruthruff
(1009) Ju, Cho
(1010) Kerzel
(1011) Williams, Ferber, Pratt
(1012) Yoon, Cho
(1013) Zhao, Chau, Sun, Jia, Britt, Sun
(1014) Yan, Anderson
(1015) Grégoire, Anderson
(1016) Slabbekoorn, Minor, Stevenson, Helmstetter, Hannula
(1017) Poulos, Zamani, Pillemer, Leichtman, Christoff, Mills
(1018) Booth, Kane
(1019) DiStefano, Race
(1020) Huestegge, Weller, Pieczykolan
(1021) Nydam, Lor, Pratt
(1022) Rodriguez, Becker
(1023) Li, Agnihotri, Xiong, Wall
(1024) Crouse, Seymour
(1025) Martínez-Pérez, Andreu, Sandoval-Lentisco, Tortajada, Palmero, Castillo, Campoy, Fuentes
(1026) Torres, Brewer, Robison, McClure, Tillery

Concepts and Categorizations (1028–1045)
(1028) Chang, Kalish
(1029) Conway, Cohen
(1030) Longo, Mason, Kurtz
(1031) Nikiforova, Winkielman, Huber, Cowell
(1033) Yang, Worthy
(1034) Glass, Kurtz
(1035) Sanchez, Church, Smith
(1036) Stivers, Whitehead, Marsh
(1037) Burkle, Corral
(1038) Douglass, Mendoza, Kalish
(1039) Clapper, Alvarez
(1040) Do, Hughes, Thomas
(1041) Jacoby, Massey, Mettler, Kellman
(1042) Jackson, Church, Smith
(1043) Lawrence, Knoph, Lin, Hwang, Hagen
(1044) Seow, Anderson, Betts
(1045) Szollosi, Bramley

Decision Making I (1046–1061)
(1046) Stenson, Gray, Kurinec, Hinson, Whitney
(1047) Lee, Levin
(1049) Dobbs, Joseph, An, Swire-Thompson
(1050) Evans, Black
(1052) Doonan, Buchanan
(1053) Levine, Dhaliwal, Jones, Chahal
(1054) Makani, Appiah, Sullivan, Spaniol
(1055) Barbosa, Sánchez-Mora, Corredor
(1056) Breaux, Bixter
(1057) Dhaliwal, Levine, Wong, Giles
(1058) Duvall, Hislop, Janise, Duff, LaCour
(1059) Lynch
(1060) Corredor, Sánchez-Mora, Hernandez-Posada
(1061) Schmidt, Heck

Embodied Cognition (1062–1067)
(1062) Grossi, Olmstead, Conklin, Vermilyea
(1063) Lautz, Yee
(1064) Kelly, Dudhat, Chrysikou
(1065) Lana, Kuperman
(1066) Sun, Davidson
(1067) Bueno, Seigneuric, Megherbi

Event Cognition (1068–1073)
(1068) Chen, Swallow
(1069) Pugh, Kersten, Earles, Escuage
(1070) Smithwick, Kersten, Earles, Vaca Angus
(1071) Ding, Lee, Levin
(1072) Nguyen, Bezdek, Gershman, Bobick, Zacks
(1073) Su, Bezdek, Hall, Zacks

Numerical Cognition (1074–1084)
(1074) Poletti, Krenger, Létang, Thevenot
(1075) Barth, Vaidya, Delgado, Hammond, Hsu, Litts, Hu, Pordy, Soans, Wolk, Patalano
(1076) Gwiazda, Bondhus, Kayton, Barth, Patalano
(1077) Kayton, Mittal, Barth, Patalano
(1078) Patalano, Kayton, Fischer, Barth
(1079) Ren, Libertus
(1080) Wieth, Francis, Lorenzoni, McDonald
(1081) Retanal, Delage, Risko, Maloney
(1083) Park, Varma
(1084) Wu, Lee, Wong, Sung, Li

CONDENSED SCHEDULE B

Bilingualism: Development and Memory (1085-1091)
(1085) Tkacikova, Tokowicz, Warren
(1086) Hernández-Rivera, Beatty-Martínez, Tiv, Titone
(1087) Moro, Schmidtke
(1088) Mendoza, Weast, Nakamura, Rosales, Rossi, Kroll
(1089) Suarez, Beato
(1090) Masoura, Karagiorgou, Kioseoglou
(1091) Li, Benitez

Language: Discourse Processes (1092-1104)
(1092) Burey, Johnson, Kendeou
(1093) Paxton, Varoquaux
(1094) Carrella, Aroyehun, Lasser, Simchon, Garcia, Lewandowsky
(1095) Harada, Takawaki, Tanaka
(1096) Duffau, Fox Tree
(1097) Galati, Alviar, Dale, Coco
(1098) Nguyen, Fox Tree
(1099) Flynn, Magliano, Feller, McCarthy, McNamara, Allen
(1100) Oncel, Creer, Lagos, McCarthy, Allen
(1101) van den Broek, Bruïne, Helder, Dahl, Carlson, Bohn-Gettler
(1102) Evans, Brown-Schmidt, Hong
(1104) Johnson, Butterfuss, Kendeou

Language: Letter and Word Processing (1105-1116)
(1105) Zelihic, Ziaka, McMurray, Apfelbaum, Simonsen, Protopapas
(1106) Baek, Gordon, Choi
(1107) Kochupurackal, Goldberg
(1108) Labusch, Fernández-López, Baciero, Marcet, Perea
(1109) Midgley, Sehyr, Holcomb, Emmorey
(1110) Fernández-López, Gomez, Perea
(1111) Yang, Lupker
(1112) Marcet, Labusch, Fernández-López, Gomez, Muñoz, Perea
(1113) Milligan, Estevez, Schotter
(1114) Vandendaele, Grainger
(1115) Kim, Hendrickson
(1116) Robert-Louche, Hirshorn

Autobiographical Memory (1117-1131)
(1117) Takarangi, Hutchison
(1118) Yöyen, Tekcan
(1119) Tezel, Tekcan
(1120) Jäggi, Zerr, Wertsch, Roediger
(1121) Hou, Umanath, Abel, Corning, Whitman
(1122) Herrera, Hopkins, Skaine, Mullen, Carr, Hendrix
(1124) Coane, Xuan, Greenberg, Chang, Umanath
(1125) Ekinci, Uzer, Lee, Brown
(1126) Henkel, Meyer, Blozzon
(1127) Yeung, Fernandes
(1129) Multhaup, Hu

(1131) Rubinova, Price

Eyewitness Identification (1133-1144)
(1133) Goodsell, Gronlund, Carlson, Marzec
(1134) Hoover, Cohen, Starns
(1135) Ayala, Smith, Wells
(1136) Hemby, Carlson, Carlson
(1137) Davis, Ingram, Peterson
(1138) Lockamyeir, Carlson, Wooten, Jones, Carlson, Hemby
(1139) Tuttle, Starns, Cohen
(1140) Gettleman, Nguyen, Dodson
(1141) Shoham, Yovel, Goshen-Gottstein
(1142) Haldeman, Rodrigues, Berman, Toglia
(1143) Akan, Starns, Cohen
(1144) Inoue

Statistics and Methodology I (1145-1153)
(1146) Leon Villagra, Castillo, Chater, Sanborn
(1147) Borghesi, Mancuso, Bruni, Pizzolante, Chirico, Riva, Pedroli, Cipresso
(1148) Chen, Regenwetter
(1149) Scheuler, Faulkenberry
(1150) Line, Regenwetter
(1151) Levi, Rotello, Goshen-Gottstein
(1152) Jang, Kim
(1153) Guitard, Rainville, Perron, Roy-Charland

Sensation and Perception (1155)
(1155) Ridley, Maass

Emotion and Cognition (1156)
(1156) Kim, Kim

Human Learning and Instruction (1157)
(1157) Ahn, Chan, Szpunar, Gill, O'Donnell

CONDENSED SCHEDULE B

FRIDAY, NOVEMBER 18, 2022

8:00–10:00 AM US EST

SPOKEN SESSIONS (1–39)

Attention Capture (1–6), Independence

8:00 AM–8:15 AM Chang, Dube, Golomb, Leber
8:20 AM–8:35 AM Stilwell, Egeth, Gaspelin
8:40 AM–8:55 AM Ma, Abrams
9:00 AM–9:15 AM Ruthruff, Lien, Hauck
9:20 AM–9:35 AM Hauck, Ruthruff, Lien
9:40 AM–9:55 AM Zhang, Tyler, Lee, Jonides

Perception and Action (7–12), Back Bay B

8:00 AM–8:15 AM Durgin
8:20 AM–8:35 AM Whitaker, Finney, Elston, Epperson, Creem-Regehr, Stefanucci
8:40 AM–8:55 AM Maxwell, Hajnal, Huff, Surber
9:00 AM–9:15 AM Thomas, McManus
9:20 AM–9:35 AM Chan, Yamamoto
9:40 AM–9:55 AM Gallup, Wozny

Discourse Processes (13–18), Back Bay D

8:00 AM–8:15 AM Simovic, Chambers
8:20 AM–8:35 AM King, Gentner
8:40 AM–8:55 AM Viswanathan, Olmstead
9:00 AM–9:15 AM Pardo, Budha, Bell
9:20 AM–9:35 AM James, Penaloza, Levitt, Panique
9:40 AM–9:55 AM Karimi

Visual Working Memory (19–24), Back Bay A

8:00 AM–8:15 AM Ricker, Souza, Vergauwe
8:20 AM–8:35 AM Kaplan, Kravitz
8:40 AM–8:55 AM Loaiza, Cheung, Goldenhaus-Manning
9:00 AM–9:15 AM Wolfe, Lyu
9:20 AM–9:35 AM Chen, Zhu, Fu, Wyble, Shen
9:40 AM–9:55 AM Sakamoto, Ashida, Nishida, Miyoshi

Recall I (25–29), Back Bay C

8:00 AM–8:15 AM Broitman, Swallow
8:20 AM–8:35 AM Zhang, Griffiths, Norman
8:40 AM–8:55 AM Brown-Schmidt, Jaeger, Evans, Benjamin
9:00 AM–9:15 AM Tamminen, March, Ricketts
9:20 AM–9:35 AM Tempel

Event Cognition (30–34), Constitution AB

8:00 AM–8:15 AM Crystal, Sheridan, Panoz-Brown
8:20 AM–8:35 AM Kumar, Goldstein, Michelmann, Zacks, Norman
8:40 AM–8:55 AM Smith, Srinivasan, Zacks
9:00 AM–9:15 AM Saad, Hemmer, Musolino
9:20 AM–9:35 AM Yang, Corter

Cognitive Aging I (35–39), Republic

8:00 AM–8:15 AM Spaniol, Swirsky, Sparrow, Sullivan, Valenzano, Chowdhury
8:20 AM–8:35 AM Yang
8:40 AM–8:55 AM Ben-David, Harel-Arbeli, Palgi
9:00 AM–9:15 AM De Pue, Gillebert, Dierckx, van den Bussche
9:20 AM–9:35 AM O' Dowd, Hirst, Setti, Donoghue, Kenny, Newell

10:00 AM–12:00 PM

SYMPOSIUM I (SYM1-SYM4) AND SPOKEN SESSIONS (40–72)

Symposium I: Visual Statistical Learning and Attention: A Two-Way Street (SYM1-SYM4), Sheraton Grand Ballroom

10:05 AM–10:30 AM Vickery, Rogers, Levy
10:35 AM–11:00 AM Forest, Siegelman, Finn
11:05 AM–11:30 AM Theeuwes
11:35 AM–12:00 PM Geng, Zhou, Yu, Witkowski

Neural Mechanisms of Memory and Cognition (40–44), Back Bay A

10:20 AM–10:35 AM Gow, Avcu, Schoenhaut, Sorensen, Lynch, Ahlfors
10:40 AM–10:55 AM Hunter
11:00 AM–11:15 AM Basak, Rajesh, Moorman, Basak-Odisio, Moturi, Ali
11:20 AM–11:35 AM Livesey, Tran, McNair, Whitton, Whitford
11:40 AM–11:55 AM Gilbert, Tsai, Scarampi, Sachdeva

Attention I (45–49), Independence

10:20 AM–10:35 AM Woodman, Wang
10:40 AM–10:55 AM Schabacker, Williams
11:00 AM–11:15 AM Horowitz, Treviño, Birdsong, Carrigan, Choyke, Drew, Eckstein, Fernandez, Giger, Hewitt, Jiang, Kudrick, Martinez-Conde, Mitroff, Nebeling, Saltz, Seltzer, Shabestari, Shankar, Siegel, Tilkin, Trueblood, Van Dyke, Venkatesan, Whitney, Wolfe
11:20 AM–11:35 AM Brosowsky, Lee
11:40 AM–11:55 AM Wang, Weber, Cunningham, Beck, Sadaghiani

Bilingualism: Developmental Processes (50–54), Back Bay B

10:20 AM–10:35 AM Rossi, Cañarte, Perez, Navarro
10:40 AM–10:55 AM Degani, Barak, Novogrodsky
11:00 AM–11:15 AM Caldwell-Harris, Wenrich, Welch
11:20 AM–11:35 AM Siew, Castro, Chern
11:40 AM–11:55 AM Privitera, Momenian, Weekes

CONDENSED SCHEDULE B

Test Effects (55–60), Constitution AB
10:00 AM–10:15 AM Mulligan, Buchin, West
10:20 AM–10:35 AM Ariel, Tauber
10:40 AM–10:55 AM Butler, Wang, Smith-Peirce, Woodward
11:00 AM–11:15 AM Ranganath, Liu, O'Reilly
11:20 AM–11:35 AM Higham, Alamri
11:40 AM–11:55 AM Carvalho, Sana, Koedinger

Speech Perception (61–66), Back Bay C
10:00 AM–10:15 AM Bradlow, Bassard, Paller
10:20 AM–10:35 AM Kellogg, Chang
10:40 AM–10:55 AM Teubner-Rhodes, Luu, Dunterman
11:00 AM–11:15 AM Fostick, Taitelbeum-Swead, Lifshitz-Ben-Basat
11:20 AM–11:35 AM Mattys, Knight
11:40 AM–11:55 AM Bujok, Peeters, Meyer, Bosker

False Belief: Memory and Judgment (67-72), Republic
10:00 AM–10:15 AM Pillai, Fazio
10:20 AM–10:35 AM Brashier, Pennycook, Berinsky, Rand
10:40 AM–10:55 AM Nadarevic, Erdfelder
11:00 AM–11:15 AM Brainerd, Bialer, Chang, Liu, Reyna
11:20 AM–11:35 AM Anderson, Michael
11:40 AM–11:55 AM van der Linden, Lewandowsky, Roozenbeek, Rathje, Goldberg

12:00 PM–1:00 PM EST
POSTER SESSION II WITH AUTHORS PRESENT (2001–2168), HYNES CONVENTION CENTER BALLROOM

Learning and Instruction I (2001-2024)
(2001) Torrance, Bulevich, Thomas
(2003) Lawson, Mayer
(2005) DiFava, Kurpad, Aube, Wilford
(2007) Nepangue, Holt-Wyindon, Little
(2008) Babineau, Aydelott, Tauber
(2009) Whitehead, Marsh
(2010) Zhao, Mayer
(2011) Chrysikou, Kim, Milovanovic, Boda, Navea, Gero
(2012) Jaeger
(2013) Blalock, Kelly
(2014) McCook, Soares, Ditta
(2015) Marcus, King, Markant
(2016) Mason, Salovich, Rapp
(2017) Badali, Rawson, Dunlosky
(2018) Bianchi, Park, Smith, Kearns, Smilek, Craven, Risko
(2019) Guo, Fisher, Forrin, Sana, Kim
(2020) Knopps, Wissman
(2021) Northern, Tauber
(2022) Taylor, Kang, Mason, Hughes, Thomas
(2023) Guerrero, Griffin, Wiley
(2024) Reintjes, Marty-Dugas, Kim, Sana

Test Effects (2025-2035)
(2025) Tullo, Feng, Pahor, He, Seitz, Jaeggi
(2026) Crowley, Tamminen, Javadi
(2027) Imundo, Denton, Brabec, Bjork
(2028) Rivers, Northern, Tauber
(2029) Smith-Peirce, Woodward, Butler
(2030) Wertz, Benz, Arnold
(2031) Boustani, Don, Shanks
(2032) James, Storm
(2034) Rivers, Pan
(2035) McCarter, Huber, Cowell

Visual Working Memory (2036-2056)
(2036) Kim, Green, Javoris
(2037) Saito, Printzlau, Yeo, Fukuda
(2038) Doyle, Ferber
(2039) Goldenhaus-Manning, Cooper, Loaiza
(2040) Yildirim, Boduroglu, Semizer
(2041) Zepp, Dube
(2042) Sheremata
(2043) Starling, Dube
(2044) Thalmann, Schaefer, Theves, Doeller, Schulz
(2045) Tortajada, Fahrenfort, Martínez-Pérez, Palmero, Sandoval-Lentisco, Castillo, Fuentes, Olivers, Campoy
(2046) Cheung, Geeraert, Loaiza
(2047) Rodriguez, Souza, Oberauer
(2048) Zhou, Gora, Ricks, Laubach
(2049) Jiang, Jones, von Bastian
(2050) Carlos, Tamber-Rosenau, Kulesz
(2051) #VALUE!
(2052) Paranjape, Shomstein, Kravitz
(2053) Vilanova-Goldstein, Brockmole
(2054) Catington, Pratte
(2056) Sargent, Trammel, Allen, Wasche

Performance and Control (2057-2077)
(2057) Burnett, Richmond
(2058) Wernette, Fenn, Altmann
(2059) Teng, Lomayesva, Isham
(2060) Ridgway, Morgan, Rabinowitz
(2062) Verhaegen, Stuyck, Aben, Hughes, Reynvoet, Van den Bussche
(2063) Politano, Chesney
(2064) Han, Proctor
(2065) Mahesan, Janczyk, Fischer
(2066) Capodanno, Kleider-Offutt, Horgan

CONDENSED SCHEDULE B

(2067) Dali, Orr, Hester
(2068) Majoubinia, Paap, Balakrishnan, Anders-Jefferson
(2069) Radovic, Manzey
(2070) Tran, Prieto, Otto, Livesey
(2071) Zhong, Chen, Proctor
(2072) Menceloglu, Song
(2073) Cole, Skarratt
(2074) Kolenik, Del Tufo
(2075) Mocke, Benini, Parmar, Schiltenwolf, Kunde
(2076) Schmidt, Anderson, Tempel
(2077) Tidler, Catrambone

Sensation and Perception (2078-2091)
(2078) Castañeda Olayo, Mock, Golob
(2079) McMullin, Higgins, Gygi, Snyder
(2080) Constantine, Hannon
(2081) McCracken, Neuhoff
(2082) Getz
(2083) Mitchel, Perry, Furano, Pardee, Roache
(2084) Bruns, Thun, Röder
(2085) Reeder
(2086) McFeaters, Voyer
(2087) Baciero, Isler, Gomez
(2088) Cavdan, Kapucu, Doerschner, Drewing
(2089) Grekin, Badde
(2090) Sturgill, Rosenbaum
(2091) Tesch, Patten, Knowles, Becker

Neural Mechanisms of Cognition (2092-2097)
(2092) Malayang, Kavanagh, Yick, Fawcett, Matheson
(2093) Finlinson, Behmer
(2094) Bell, Anguiano, Krehbiel, Zakrzewski, Wisniewski, Bailey
(2095) Fischer, Moscovitch, Alain
(2096) Jeanneret, Bartsch, Turoman, Fiave, Vergauwe
(2097) Weber, Karimi

Attention: Cognitive Control I (2098-2118)
(2098) Tayar, Moss, Bugg
(2099) Nack, Chiu
(2100) Shoemaker, Siqi-Liu, Egner
(2101) Ziaka, Katsamanis, Protopapas
(2102) Villalonga, Sekuler
(2103) Kürten, Raettig, Gutzeit, Huestegge
(2104) Mashburn, Engle
(2105) Meier, Daniel, Smith, Brosowsky, Seli
(2106) Seitz, Seago, Sali
(2107) Benson, Pavlou, Manoli, Hadwin
(2108) Colvett, Suh, Bugg
(2109) Brzac, Meyers, Petley
(2110) Rotolo, Maquestiaux, Ruthruff, Picard
(2111) Charbonneau, Hutchison, Watson
(2112) Junker, Habib
(2113) Skrotzki, Kandasamy, Yang
(2114) Deakin, Heinke
(2115) Jung, Kang, Loprinzi
(2116) Astacio, Welhaf, Hood, Goller, Banks
(2117) Narkar, Fenske
(2118) Macias, Schneider

Attention: Individual Differences (2119-2131)
(2119) Palmero, Tortajada, Martínez-Pérez, Sandoval-Lentisco, Campoy, Fuentes
(2120) Tsukahara, Engle
(2121) Welhaf, Smeekens, Kane
(2122) Frischkorn, Rebmann, Oberauer
(2123) McHale, Kane
(2124) Ratiu, LaCroix
(2125) White, Mulligan
(2126) Pardy, Clancy, Bain, Mahood, Fenske
(2127) Robison
(2128) Zhao, Vogel
(2129) Barnett, Mashburn, Burgoyne, Engle
(2130) Burgoyne, Tsukahara, Mashburn, Engle
(2131) Saneyoshi, Inada, Tsujita, Hayakawa, Toyama-Kuraho, Kumagaya, Michimata, Kumagaya

Bilingualism: Cognitive Control (2132-2141)
(2132) Benini, Koch, Mayr, Philipp
(2133) Saleemi, Kousaie
(2134) Graham, Monsell, Elchlepp, Lavric
(2135) Hendel, Roy-Charland, Guitard, Dickinson, Saint-Aubin
(2136) Chan, Iwasaki, Kroll
(2137) Takahesu Tabori, Kroll
(2138) Yurtsever, Grundy
(2139) Rogers, Albuja
(2140) Evans, McDonald
(2141) Román Irizarry, Kroll, Torres

Cognitive Aging (2142-2162)
(2142) Latthirun, Huang, Yang
(2143) Bradford, Ferguson
(2144) Pham, Rosenfield, Bowen
(2145) Apostolou, McDonough
(2146) Reed, Denaro, Petropoulos, Joshi, Thapar, Hartley
(2147) Goring, Abrams, Conway
(2148) Steinkrauss, Carpenter, Overman, Dennis
(2149) Acevedo-Molina, Thayer, Horn, Nkulu, Ryan, Andrews-Hanna, Grilli
(2150) Schorn, Gorijavolu, Knowlton
(2151) Kimura, Blujus, Driscoll

CONDENSED SCHEDULE B

(2152) Hirst, Newell, Dowd, Setti, Kenny
(2153) Ryan, Smitko, Campbell
(2154) Wereszczyński, Niedźwieńska
(2155) Overman, Stephens, Cowan, Tarkenton
(2156) Wear Jones, Lipowski, Canda, Demonte, Ginther, Riveros
(2157) Zaborowska, Kuhlmann, Zawadzka, Hanczakowski
(2158) Smith, DeCaro, Hughes, Marin, Rivard, Feinn, Trevithick, Budson
(2159) Chao, Koen, Xie, Henrickson, Xu, Rose
(2160) Xie, Reuter-Lorenz, Lee
(2161) DeMaio, Zhao
(2162) Church, Jackson, Lane, Rodgers, Lopata, Mercado

Cognitive Development (2165–2168)
(2165) Lipowski, Tameling, Brook, Canda, Pyc
(2166) Dorgnier, Picard, Maquestiaux, Mazerolle
(2167) Addleman, Stoermer
(2168) Langley, Van Houghton, McBeath, Lucca

1:30 PM–3:30 PM
SYMPOSIUM II (SYM5–SYM8) AND SPOKEN SESSIONS (73–108)

Symposium II: Bridging the Gap Between Spoken and Written Language Research (SYM5–SYM8), Sheraton Grand Ballroom
1:35 PM–1:50 PM Hendrickson, Kim, O'Donnell, McMurray
1:55 PM–2:15 PM Apfelbaum, Klein-Packard, McMurray
2:20 PM–2:40 PM Joanisse, Moreau, Nederlanden
2:45 PM–3:05 PM Protopapas, Katopodi, Altani, Ziaka, Georgiou

Statistics and Methodology (73–78), Independence
1:30 PM–1:45 PM Houpt, Kneeland
1:50 PM–2:05 PM Cervantes, Benjamin
2:10 PM–2:25 PM Rothschild, Gordon, Pe'er, Damer, Evernden
2:30 PM–2:45 PM Wilbiks, Hirst
2:50 PM–3:05 PM Henninger
3:10 PM–3:25 PM Schweickert

Recognition I (79–84), Republic
1:30 PM–1:45 PM Cox
1:50 PM–2:05 PM Robinson, Wixted, Brady
2:10 PM–2:25 PM Utochkin, Grigorev, Mikhalishchina
2:30 PM–2:45 PM Goshen-Gottstein, Levi, Rotello
2:50 PM–3:05 PM Wixted, Shen, Huang, Lam
3:10 PM–3:25 PM Nosofsky, Meagher

Decision Making I (85–90), Back Bay C
1:30 PM–1:45 PM Pascual-Ezama, Prelec, Muñoz
1:50 PM–2:05 PM Servant, Logan, Gajdos, Evans
2:10 PM–2:25 PM Steyvers, Bower, Han, Eckstein
2:30 PM–2:45 PM Dawson, Julku, Pihlajamäki, Kaakinen, Schooler, Simola
2:50 PM–3:05 PM Chang, Sundh, Zhu, Chater, Sanborn
3:10 PM–3:25 PM Teal, Kusev, Peebles, Vukadinova, Buontempo, Martin, Ngo

Attention: Control I (91–96), Back Bay B
1:30 PM–1:45 PM Weissman, Jones, Smith, Erb
1:50 PM–2:05 PM Nag, Cox, Mitroff, Kravitz
2:10 PM–2:25 PM Carlisle
2:30 PM–2:45 PM Goodhew, Edwards
2:50 PM–3:05 PM Montefinese, Benavides-Varela, Ambrosini
3:10 PM–3:25 PM Moretti, Koch, Steinhauser, Schuch

Numerical Cognition (97–102), Constitution AB
1:30 PM–1:45 PM Reeves, Lei
1:50 PM–2:05 PM Frissen, Levene, Kaipa, Ziat
2:10 PM–2:25 PM Sander, Gvozdic, Scheibling-Sève
2:30 PM–2:45 PM Thevenot, Rugani, Giurfa
2:50 PM–3:05 PM Faulkenberry, Scheuler
3:10 PM–3:25 PM Wolk, Hadad, Rubinsten

Working Memory I (103–108), Back Bay A
1:30 PM–1:45 PM Rose, Chao, Xu, Loaiza
1:50 PM–2:05 PM Wyble, Hedayati, O'Donnell
2:10 PM–2:25 PM Barrouillet, Camos, Beaudet, Croizet, Pougeon, Belletier
2:30 PM–2:45 PM Ward
2:50 PM–3:05 PM Logie, Forsberg, Doherty, Cowan, Camos, Naveh-Benjamin, Barrouillet, Belletier, Graham, Rhodes
3:10 PM–3:25 PM Oberauer

CONDENSED SCHEDULE B

3:45 PM–5:45 PM
SYMPOSIUM III (SYM9–SYM12)

Symposium III: Facilitating Belonging, Inclusion, and Equity in STEM (Special Symposium) (SYM9–SYM12), Sheraton Grand Ballroom
3:55 PM–4:20 PM Binning
4:20 PM–4:45 PM Murphy
4:45 PM–5:10 PM Hazari
5:10 PM–5:35 PM Ramirez

6:00 PM–7:00 PM EST
POSTER SESSION III WITH AUTHORS PRESENT (3001–3168), HYNES CONVENTION CENTER BALLROOM

Social/Cultural Influences on Cognition (3001-3011)
(3001) Lee, Lee, Kim
(3002) Julku, Pihlajamäki, Dawson, Kaakinen, Simola
(3003) Soares, Hinkle, Sammarco, Bohil
(3004) Taylor, Miller, McCutcheon
(3005) Armstrong, Iricinschi
(3006) Schmidtke, Kuperman
(3007) Mert, Wang
(3008) Barber, Gutchess, Goh, Leger, Valoumas, Wong
(3009) Greeley, Chan, Choi, Rajaram
(3010) Zhu, Lin, Wang, Sekuler, Gutchess
(3011) Robinson, Pusser, Wells, Shelton

Decision Making II (3012-3033)
(3012) Totino, Sutton, Yang
(3013) Liu, Trueblood
(3014) Pypno, Paruzel-Czachura, Eerola
(3015) Levy, Chesney, Manzano, Arakelow
(3016) Lee, Xiong
(3017) Embrey, Gelagin, Newell
(3018) Khairalla, Berube, Wang, Wilford, Douglass
(3019) Navarro, Giles, Elkin-Frankston, Cantelon, Eddy, Brunye
(3020) Ostrovsky, Liew, Newell
(3021) Fific, Kneeland, Houpt
(3022) Voudouri, Białek, Neys
(3023) Yesilada, Lewandowsky, Walsh
(3024) Cai, Xiong
(3025) Hasan, Trueblood
(3026) Sanchez, Hildenbrand, Zhang, Fitter
(3027) Langston, Kittani
(3028) Fansher, Tyler, Lalwani, Boduroglu, Carlson, Quirk, Lewis, Shah, Zhang, Jonides
(3030) Ding, Whitlock, Sahakyan
(3031) Parmar, Rothermund
(3032) Taylor, Marsh
(3033) Asmar, Lattanzio, Kluger, Buard, Chiew

Judgment (3034-3046)
(3034) Harding, Garvie, Boudreau
(3035) Corredor, Jerez-Garcia, Cely-Acosta, Luna-Cisneros, Uribe-Barreto
(3036) Mallik, Hubbard, Adams, Martin, Murphy, Weant
(3037) Nakamura
(3039) LaFollette, Demaree
(3040) Kreis, Pachur, Groß
(3041) Lipourli, Gardikiotis
(3042) Harsch, Kendeou
(3043) Gallant, Njomo, Roy-Charland
(3044) Tumen, Boduroglu
(3045) Lu, Martin, Fischer-Baum, Tang
(3046) Aslan, Geipel, Han, CAI, Keysar

Music Cognition (3047-3048)
(3047) Santoyo, Gonzales, Iqbal, Backer, Balasubramanian, Bortfeld, Shahin
(3048) Jackson, Patten, Azuma

Language Production (3051-3057)
(3051) Williams, Wolff, Ivanova
(3052) Alderete, Baese-Berk, Brasoveanu, Law
(3053) Chen, O'Séaghdha
(3054) Guydish, Tree
(3055) Long, Kaschak
(3056) Piazza, Kartushina, Flege, Martin
(3057) Uribe, Ivanova

Psycholinguistics I (3058-3075)
(3058) Altman, Kuperman
(3059) Barker, Huang, Ferreira
(3060) Martell, Boland
(3061) Mirea, Goldrick
(3062) Riedmann, Horton
(3063) Ku
(3064) Nakamura, Rosales, Mendoza, Weast

CONDENSED SCHEDULE B

(3065) Lopez, McDonald
(3066) Volante, Kaschak, Chia
(3067) Beier, Ferreira
(3068) Blasko, Kazmerski, Dawood
(3069) Langley, Almor
(3070) Chia, Kaschak
(3071) Lowder, Ryan
(3072) Luan, Kuno, Sugawara, Kawasaki, Sugimori
(3073) Maher, Edwards, Novick
(3074) Patson, Karrick, Quinn
(3075) Pyers, Marton, Ruelas-Vargas

Reading (3076-3094)
(3076) Byers, Stacey, Levasseur, Titone, Whitford
(3077) Johnson, Wootten, Spear, Smolensky
(3080) Nestor, Schotter, Milligan
(3082) Zang, Lu, Bai, Yan, Liversedge
(3084) Altani, Katsamanis, Kouzelis, Voukelatou, Zelihic, Simonsen, Ziaka, Protopapas
(3085) Chavers, Del Tufo
(3086) Eskenazi, Lipkin, Shaw, Surrency, Pavek
(3087) Valderrama, Zhou, Christianson
(3088) Cooley, Schotter
(3089) Louis-Jean, Goldberg
(3090) Simonsen, Altani, Zelihic, Ziaka, Braze, Protopapas
(3091) Christofalos, Laks, Wolfer, Dias, Javitt, Sheridan
(3092) Guedea, MacIsaac, Joanisse, Whitford
(3093) Hannon
(3094) Abraham, Bradley, Smith, de Long

False Memory (3095-3121)
(3095) Kurinec, Stenson, Whitney, Hinson
(3096) Marsh, McBride
(3097) Kirsch, Salovich, Rapp
(3098) Moon, Gray, Boyd, Bowen
(3099) Race, Siegel, Ratzan, Karanian, Thomas
(3100) Mazela, Huff, Umanath
(3101) O'Donnell, Chan, Garry, Foster
(3103) Braun, Zaragoza, Chrobak
(3104) Su, Brainerd
(3105) Swire-Thompson, Dobbs, Thomas, DeGutis
(3106) Chang, Levina, Davy, Nwanma, Coane
(3108) Maxwell, Huff, Mitchell
(3109) Bilgin, Wang
(3110) Suarez, Cadavid, Beato
(3111) Karanian, LaGanza, Marino, Race, Thomas
(3112) Kawasaki, Craik
(3113) Reid, Jamieson
(3115) Martin, Corea, McBride
(3116) Benartzi, Raveh
(3117) Bond, Bond, Washburn
(3118) Peng, Sala, Logie
(3119) Shives, Ihejirika, Crump
(3120) Zeelenberg, Pecher
(3121) Houts, Levine

Implicit Memory (3122-3127)
(3122) Gupta, Rickard
(3123) Jurchis, Dienes
(3124) Eibner, Bennett, McGinley, Hicken, Weidler
(3125) Byrnes, Was, Hamrick
(3126) Kemény
(3127) Araya, Oberauer, Saito

Recognition Memory (3128-3151)
(3128) Chien, Eich
(3129) Ferreira, Bugaïska
(3130) Filiz, Dobbins
(3131) Bishop-Chrzanowski, Johnson
(3132) Heald, Bongiovanni, Nusbaum, Van Hedger
(3133) de la Rosa-Rivera, Huber, Cowell
(3135) Bialer, Brainerd, Mirza
(3136) Jeye, Chatterjee
(3137) Kryder, Drummey, Kan
(3138) Lloyd, Morgan, Capriglione
(3139) Graves
(3140) Carlaw, Huebert, McNeely-White, Rhodes, Cleary
(3141) Dollois, Fiacconi
(3142) Hunsberger, Geraci
(3143) Lee, Werner, Mohawk, McMullin, Snyder, Parks
(3144) Li, Layher, Miller
(3145) Soriano Smith, Parks
(3146) Tanyas, Kuhlmann, Erdfelder
(3147) Zhang, Hupbach
(3148) Caplan
(3149) Osmanski, Parks
(3150) Amado, Karataş, Yüvrük, Kapucu
(3151) Zhang, Osth

Working Memory (3152-3167)
(3152) Greve, Was
(3153) Dames, Popov, Oberauer
(3154) Alucard, Murphy, Brewer
(3155) Bullard, Roberts, Alderson, Tatsuki
(3156) Fordyce, Schiro, Redick
(3157) Strachan, Bushinski, Redick
(3158) Hautekiet, Langerock, Vergauwe
(3159) Roberts, Alderson, Bullard, Tatsuki
(3160) Xu, Chao, Rose
(3161) Wagner, AuBuchon

CONDENSED SCHEDULE B

(3162) Debraise, Fartoukh, Friedman, Vanni, Mathy
(3163) Louis, Van Langhenhove, Roualdes, Moussaoui, Milleville-Pennel
(3164) Gauselmann, Tempel
(3165) Ashley, Tanenbaum, Connor, Holden
(3166) Campbell, Robison
(3167) Cotton, Ricker

Emotion and Cognition (3168)
(3168) Kim, Kim

SATURDAY, NOVEMBER 19, 2022

7:40 AM–10:00 AM US EST
SPOKEN SESSIONS (109–145)

Decision Making: Motivation and Reward (109–114), Back Bay A
7:40 AM–7:55 AM Pepperberg, Rosenberger
8:00 AM–8:15 AM Metcalfe, Kennedy-Pyers, Jacobs, Vuorre
8:20 AM–8:35 AM Morein-Zamir
8:40 AM–8:55 AM Mason, Madan, Simonsen, Spetch, Ludvig
9:00 AM–9:15 AM Patt, Hunsberger, Jones, Verfaellie
9:20 AM–9:35 AM Fitneva, Slinger

Cognition and Emotion I (115–117, 119), Republic
8:00 AM–8:15 AM McBeath, Yu, Li, Zapp, Benitez
8:20 AM–8:35 AM Bąk, Altarriba
8:40 AM–8:55 AM Feeney, Lorimer, Graham, McCormack, Hoerl, Johnston, Beck
9:20 AM–9:35 AM Weisberg, Hardner

Attention: Automatic Processing (120–124), Back Bay C
8:00 AM–8:15 AM Haponenko, Britt, Sun
8:20 AM–8:35 AM Zinchenko, Conci, Müller, Geyer
8:40 AM–8:55 AM McCulloch, Richardson, Marsh, Ball
9:00 AM–9:15 AM Santacroce, Swami, Tamber-Rosenau
9:20 AM–9:35 AM Pearson, Pelley

Cultural/Social Influences on Cognition (125–127, 118, 128), Back Bay D
8:00 AM–8:15 AM Iricinschi, Armstrong
8:20 AM–8:35 AM Simchon, Smith, Holford, Lewandowsky
8:40 AM–8:55 AM Lasser, Aroyehun, Simchon, Carrella, Garcia, Lewandowsky
9:00 AM–9:15 AM Cohen, Halewicz, Yildirim, Kable
9:20 AM–9:35 AM McCrackin, Colombatto, Fratino, Scholl, Ristic

Aging and Memory (129–134), Back Bay B
8:00 AM–8:15 AM Halpern, Slevc
8:20 AM–8:35 AM Chamberlain, Dennis, Bowman
8:40 AM–8:55 AM Campbell, Henderson, Davis
9:00 AM–9:15 AM Greene, Naveh-Benjamin
9:20 AM–9:35 AM Markostamou, Kvavilashvili
9:40 AM–9:55 AM Kvavilashvili, Brazauskiene, Markostamou

Bilingualism: Cognitive Control (135–140), Constitution AB
8:00 AM–8:15 AM Hernandez
8:20 AM–8:35 AM Grundy, Yurtsever
8:40 AM–8:55 AM Paap
9:00 AM–9:15 AM Graham, Monsell, Elchlepp, Lavric
9:20 AM–9:35 AM Li, Gollan
9:40 AM–9:55 AM Roembke, Koch, Philipp

Speech Perception II (304, 141–145), Independence
8:00 AM–8:15 AM McAuley, Mamidipaka, Yi, Smith, Kidd
8:20 AM–8:35 AM Samuel, Dumay
8:40 AM–8:55 AM Avcu, Hwang, Brown, Gow
9:00 AM–9:15 AM Choi
9:20 AM–9:35 AM Incera, Marroquin, Hamilton, Shoemaker, Cruz
9:40 AM–10:00 AM Wagner

10:00 AM–12:00 PM US EST
SYMPOSIUM IV (SYM13–SYM18) AND SPOKEN SESSIONS (146–178)

Symposium IV: Age-Related Patterns for Memories and Future Projections During the COVID-19 Pandemic (SYM13–SYM18), Sheraton Grand Ballroom
10:00 AM–10:20 AM Richmond, Peña, Burnett, Rajaram
10:20 AM–10:40 AM Duarte, Lee
10:40 AM–11:00 AM Oñer
11:00 AM–11:20 AM Kensinger, Cunningham, Fields, Ford, Garcia, Yoon
11:20 AM–11:40 AM Cho, Daley, Cunningham, Kensinger, Gutchess
11:40 AM–12:00 PM Addis, Gynes-Clinton, Cheng, Trikha, Li-Chay-Chung

Bilingualism: Cognitive Processes (146–150), Constitution AB
10:20 AM–10:35 AM Titone, Senaldi
10:40 AM–10:55 AM Hamrick, Pandža
11:00 AM–11:15 AM Prior, Nativ, Nov, Ordan, Wintner
11:40 AM–11:55 AM Jouravlev, Charanek, Athanasopoulos

Concepts and Categorization (151–155), Back Bay D
10:20 AM–10:35 AM Soto, Hays
10:40 AM–10:55 AM Cruz, Minda
11:00 AM–11:15 AM Roark, Chandrasekaran

CONDENSED SCHEDULE B

11:20 AM–11:35 AM Kalra, Minda
11:40 AM–11:55 AM Mack, Heffernan, Xie, Perovic, Gumus, Schlichting

Learning and Instruction I (156–160), Back Bay B
10:20 AM–10:35 AM Markant, Rogha, Karduni, Wesslen, Dou
10:40 AM–10:55 AM Knabe, Yuksel, Barmore, Vlach
11:00 AM–11:15 AM Miyake, Benjamin-Pollak, Kindschi, Zhang, Kane
11:20 AM–11:35 AM Sullivan
11:40 AM–11:55 AM Kurpad, Wilford

Visual Perception (161–166), Back Bay A
10:00 AM–10:15 AM Moore, Zheng
10:20 AM–10:35 AM Huber, Nikiforova, Cowell
10:40 AM–10:55 AM Li, Carbon, Ziat
11:00 AM–11:15 AM Kon, Francis
11:20 AM–11:35 AM Mahableshwarkar, Houck, Kravitz, Philbeck
11:40 AM–11:55 AM Plancher, Purkart, Versace, Cavalli

Cognitive Development (167–172), Back Bay C
10:00 AM–10:15 AM Pierre, Harris, Johnson
10:20 AM–10:35 AM Matsuda, Okazaki, Asano, Yokosawa
10:40 AM–10:55 AM Varga, Roome, Molitor, Martinez, Hipskind, Mack, Preston, Schlichting
11:00 AM–11:15 AM Schlichting, Abolghasem, Teng, Nexha, Zhu, Jean, Castrillon, Che, Nallo
11:20 AM–11:35 AM Graham, Cherry, McCormack
11:40 AM–11:55 AM Paes, Lin, Duncan, Purpura, Schmitt

Language: Cognitive Control (173–178), Republic
10:00 AM–10:15 AM Gollan, Garcia
10:20 AM–10:35 AM Ovans, Huang, Novick
10:40 AM–10:55 AM Ness, Langlois, Chow, Phillips, Novick, Kim
11:00 AM–11:15 AM de Bruin, Hoversten, Martin
11:20 AM–11:35 AM Goldrick, Gollan
11:40 AM–11:55 AM Valdés Kroff, Kroll

12:00 PM–1:00 PM EST
POSTER SESSION IV WITH AUTHORS PRESENT (4001–4160), HYNES CONVENTION CENTER BALLROOM

Metamemory (4001–4012)
(4001) Lu, Risko
(4002) Krogulska, Cieplińska, Moran-Morbey, Poyner, Maylor
(4003) Trillo, Hausman, Kubik
(4004) Witherby, Carpenter
(4005) Shoval, Gronau, Sidi, Makovski
(4007) Churey, Laursen, Fiacconi
(4008) Kelly, Risko
(4009) Besken, Filiz, Bal
(4010) Myers, Loaiza, Soderstrom, Rhodes
(4011) Pierce, McCain, Stevens, Frank
(4012) Umanath, Coane, Lee, Hwang, Hoover

Perception and Action (4013–4020)
(4013) Tran, Grant, Weissman
(4014) Terry, Trick
(4015) Laurent, Cichon, Vegas
(4016) Dowell, Hajnal
(4017) Gagnon, Finney, Bodenheimer, Stefanucci, Creem-Regehr
(4018) Veillette, Lopes, Nusbaum
(4019) Bei, Chen
(4020) Lin, Drewing, Doerschner

Technology and Cognition (4022–4035)
(4022) Scarince, Moreno, Clausen, Payne
(4023) Hyde, von Bastian
(4024) Hays, Smith
(4025) Hinkle, Soares, Sammarco, Leite, Bohil
(4026) Oliva, Storm
(4027) Riordan, Glikson
(4028) Ramirez-Perez, Ditta, Julia Soares
(4029) Bittner, Storm
(4030) Sachdeva, Scarampi, Tsai, Gilbert
(4032) Loh, Hosseinpour, Padilla, Castro
(4033) Peña, Maswood, Chen, Rajaram
(4034) Asano, Yokosawa, Ichinose, Tajima
(4035) Ross, Wang

Attention: Cognitive Control II (4036–4051)
(4036) Malykke, Almasi, Tae, Lee, Sohn
(4037) Sohn, Reck, Almasi, Tae, Lee
(4038) Braun, Arrington
(4039) Baran, Froeber, Arrington
(4040) Almasi, Sohn, Tae, Lee
(4041) Charbonneau, Hood, Hutchison
(4042) Reimer, Rivera, Fenton, Romero
(4043) Geddert, Egner
(4044) Bognar, Aczel, van Steenbergen
(4045) Lee, Cho
(4046) Dunaway, Weissman
(4047) Mögling, Mittelstädt, Mackenzie, Fischer
(4048) Namias, Huff
(4049) Schacherer, Hazeltine
(4050) Strayer, Robison, Unsworth
(4051) Baldwin, Hall, Hiscock, Fawcett, Rash, Fawcett, LaSaga

CONDENSED SCHEDULE B

Attention: Visual Search (4052-4067)
(4052) Lamy, Toledano
(4053) Lee, Khan, Anderson
(4054) Yaoyun Cui, Lleras, Hummel, Buetti
(4055) Tam, Callahan-Flintoft, Wyble
(4056) Bahle, Luck
(4057) Clement, Anderson
(4058) Gibson, Trost, Maxwell
(4059) Van den Driessche, Turc, Beceril, Zemkova, Sackur
(4060) Talcott, Luck, Gaspelin
(4061) O'Donnell, Wyble
(4062) Kim, Cho
(4063) Gil-Gomez De Liano Wolfe
(4064) Danforth, Paternoster, Wilson, Sobel, Puri
(4066) Lim, Pratt
(4067) Mckinley, Peterson, Hout

Bilingualism: Comprehension and Production (4070-4076)
(4070) Coumel, Liu, Trenkić, De Bruin
(4071) Salig, Valdés Kroff, Novick, Slevc
(4072) Lauro, Toassi
(4074) Tarín-Murillo, Hernández-Rivera, Whitford, Titone
(4075) Vernooij, Boland
(4076) Gleason, Francis

Decision Making III (4077-4090)
(4077) Ridchenko, Berles, Buffington, Morgan-Short
(4078) Haller
(4079) Illingworth, Thomas
(4080) Plant
(4081) Pettit, Huang, Johnson, Regenwetter, Cavagnaro
(4082) Wilke, DeLaBruere, Brown, Spilman, Garcia, Pedersen, Han, Barrett, Todd, Wertz
(4083) Chung, Fu, Yang
(4084) Thurmann, Moon, Gray, Ng, Bowen, Chiew
(4085) Goschke, Wolff, Mohr, Kräplin, Smolka, Bühringer, Krönke
(4086) Prutean, Steendam, Boehler, Notebaert
(4087) Kearley, Richmond, Schwartz, Hargis
(4088) Weatherford, Dicke-Bohmann
(4089) Martinez, Koff
(4090) Akgür, Farooqui

Reasoning and Problem Solving (4091-4118)
(4091) Altunisik, Jarosz
(4092) Raffaelli, Malusa, Stefano, Fitzgerald, Keeney, Zabelina, Andrews-Hanna
(4093) Dubova, Moskvichev
(4094) Sumakpoyaa, Corral
(4095) Franiatte, Boissin, Neys
(4096) Goswami, Hayes
(4098) Michal, Shah
(4099) Monteza, Bonsel, Perez, De Leon, Koshino, Ricco
(4100) Vargas, Starns, Cohen
(4101) Ralston, Sloutsky
(4103) Miller, Wiley
(4104) Mason, Kurtz
(4105) Wilson, Marsh
(4106) Yamagishi
(4107) Zhao, Roskos
(4108) Krishnamurthy, Holmes
(4109) Didierjean, Navarre, Thomas
(4110) Neaton, Hambrick, Altmann
(4111) Kershaw, Clark
(4112) Chesebrough, Chrysikou, Kounios, George
(4113) George
(4114) Koenen, Varma
(4115) Sagi
(4116) Protzko
(4117) Brooks, Mao, Noyes, Yi, Hutchinson, Kensinger, Norman, Ritchey
(4118) Stirling, Takarangi

Cognition and Emotion (4119-4139)
(4119) Tae, Almasi, Lee, Sohn
(4120) Liao, Garcia, Vierkant, Woodson, Lulo, Kotek, Anderson
(4121) Cervantes, Wiley
(4122) Kazmerski, Ashour, Eaton, Abraham, Pollard, Cordero, Waslosky
(4123) Weldon, Behrens, Jones, Drake, Fragetta
(4124) Martin, Ritchotte, Orman, Cumberbatch, Schneider
(4125) Burgess, Lien
(4126) Plonski, Patel, Ossenfort, Taylor, Brunyé, Urry
(4127) Plouffe-Demers, Fiset, Gingras, Blais
(4128) Jones, Kazanas
(4129) Chiew, Ferron, Sellers
(4130) Matson, Moeck, Molyneux, Takarangi
(4131) Sklenar, Frankenstein, Urban Levy, Leshikar
(4132) Clark, Altarriba
(4133) Friedman-Oskar, Makovski, Sahar, Okon-Singer
(4134) Dubravac, Schmeichel
(4135) Singh, Delgado-Sanchez, Mancini, Treister, Talmi
(4136) Lund, Weidler
(4137) Mancuso, Malandrone, Borghesi, Carletto, Riva, Ostacoli, Pedroli, Cipresso
(4138) Walker, MacCann
(4139) Singh, Intraub

Spatial Cognition (4140-4160)
(4140) Brucato, Chein, Newcombe
(4141) Lin, Chang, Maschke, Lin, Goh
(4142) Desme, Pruden

CONDENSED SCHEDULE B

(4143) Chamberlain, Tighe, Saxon, Fernberg, Spencer, Johnson, Creem-Regehr, Stefanucci
(4144) Marupudi, Varma
(4145) Qi, Mou
(4146) Fox, Walker, Hollan
(4147) Smith, Moore
(4148) Gardony, Kim, Powell, Hart-Pomerantz, Okano
(4149) Kunz, He, Protzko, Schooler, Hegarty
(4150) Newman, McNamara, Bodenheimer
(4151) Faulkner, Whitaker, Rand
(4152) Mason, Thomas, Wolford, Taylor
(4153) Lee, Kim, Cho
(4154) Baess, Bermeitinger
(4155) McIntire, Dopkins
(4156) Bilge
(4157) Tansan, Shipley, Newcombe
(4158) Munns, Kunz, He, Hegarty
(4159) Robinson, McAvan, Starrett, Chambers, Isham, Ekstrom
(4160) Sivashankar, Sauzéon, Fernandes

1:30 PM–3:30 PM US EST
SYMPOSIUM V (SYM19–SYM23) AND SPOKEN SESSIONS (179–205)

Symposium V: Co-Registration of Eye Movements and EEG (Leading Edge Workshop) (SYM19–SYM23), Sheraton Grand Ballroom
1:35 PM–1:55 PM Gaspelin, Talcott
1:55 PM–2:15 PM Melcher, Huber-Huber, Buonocore, Liu
2:15 PM–2:35 PM Liversedge, Degno, Soltész, Hepsomali, Donnelly
2:35 PM–2:55 PM Payne, Silcox
2:55 PM–3:15 PM Sheridan, Dias, Javitt

Letter Word Processing (179–183), Back Bay D
1:30 PM–1:45 PM Buchanan, Accelerator
1:50 PM–2:05 PM Kinoshita, Mills
2:10 PM–2:25 PM Adelman, Trifonova
2:30 PM–2:45 PM Dumay
2:50 PM–3:05 PM Treiman, Kessler

Cultural/Social Influences on Cognition (184–188), Back Bay C
1:30 PM–1:45 PM McDonough, Byrd, Choi
1:50 PM–2:05 PM Lewandowsky, Lasser, Carrella, Aroyehun, Simchon, Garcia
2:10 PM–2:25 PM Cassidy, Wiley, Sim, Hugenberg
2:50 PM–3:05 PM Onyper, Oakes

Eyewitness Identification (189–193), Independence
1:30 PM–1:45 PM Hyman
1:50 PM–2:05 PM Starns, Tuttle, Cohen
2:10 PM–2:25 PM Smalarz, Smith
2:30 PM–2:45 PM Smith, Ayala, Ying
2:50 PM–3:05 PM Cohen, Tuttle, Starns

Decision Making II (194–199), Republic
1:30 PM–1:45 PM Otto, Castanheira
1:50 PM–2:05 PM Reyna, Edelson, Hayes, Garavito
2:10 PM–2:25 PM Hayes, Lee, Li
2:30 PM–2:45 PM Dhami, Derbyshire, Belton, Onkal
2:50 PM–3:05 PM Day, Victor
3:10 PM–3:25 PM Wang, Lu

Autobiographical Memory (200–205), Constitution AB
1:30 PM–1:45 PM Radvansky, Parra, Doolen
1:50 PM–2:05 PM Brown, Heanoy, Schwartz, Conrad, Morales
2:10 PM–2:25 PM Knoff, Wilson, Andrews-Hanna, Grilli
2:30 PM–2:45 PM Kyröläinen, Kuperman
2:50 PM–3:05 PM Otgaar, Howe
3:10 PM–3:25 PM Kizilöz, Ray, Husnu

3:30 PM–5:30 PM US EST
SPOKEN SESSIONS (206–237)

Visual Search (206–210), Back Bay A
3:50 PM–4:05 PM Anderson, Lee
4:10 PM–4:25 PM Maniglia, Galera
4:30 PM–4:45 PM Intraub, Phillips, Cantatore, Lane, Singh
4:50 PM–5:05 PM Krzyś, Avitzur, Williams, Castelhano
5:10 PM–5:25 PM Ristic, Colombatto, Fratino

Reasoning and Problem Solving (211–215), Constitution AB
3:50 PM–4:05 PM Smith, Mansharamani
4:10 PM–4:25 PM Reis, Pfister
4:30 PM–4:45 PM Wolfe, Tirzmalis, Marroquin, Brace
4:50 PM–5:05 PM Conway, Abrams, Goring, Schmank, Bauer, Pallentin
5:10 PM–5:25 PM Pelakh, Good, Kuo, Tumminia, Jahanian, Nokes-Malach, Galla

CONDENSED SCHEDULE B

Recall II (216–220), Republic
3:50 PM–4:05 PM Wahlheim, Kemp, Sinclair, Adcock
4:10 PM–4:25 PM Madan
4:30 PM–4:45 PM Osth, Hurlstone
4:50 PM–5:05 PM Erdfelder, Pütter, Schnuerch
5:10 PM–5:25 PM Shiffrin, Maxcey, Nosofsky, MacLeod, Cutler, Joykutty

Psycholinguistics (221–226), Back Bay D
3:30 PM–3:45 PM Morett, Ciesla, Hughes-Berheim, Emmorey
3:50 PM–4:05 PM Read
4:10 PM–4:25 PM Pitt, Benecke, Kim
4:30 PM–4:45 PM Kapatsinski
4:50 PM–5:05 PM Getty, Fraundorf
5:10 PM–5:25 PM Stella

Metacognition I (227–232), Back Bay C
3:30 PM–3:45 PM Dunn, Kracinovich, Walker, Schrom, Dehy, Lukos, Markwald
3:50 PM–4:05 PM Koriat
4:10 PM–4:25 PM Thomas, DeCaro, Torrance
4:30 PM–4:45 PM Halamish, Undorf
4:50 PM–5:05 PM Farooqui, Gürcan, Catalkaya
5:10 PM–5:25 PM Curley

Cognition and Emotion II (233–237), Independence
3:30 PM–3:45 PM Leppanen, Siegal, Kim, Sanislow
3:50 PM–4:05 PM Symeonidou, Kuhlmann
4:10 PM–4:25 PM Howe, Knott, Bland
4:30 PM–4:45 PM Brunstein, Brunstein, Rosenstock
5:10 PM–5:25 PM Bridgland, Bellet, Jones

6:00 PM–7:00 PM EST
POSTER SESSION V WITH AUTHORS PRESENT (5001–5160), HYNES CONVENTION CENTER BALLROOM

Associative Learning (5001–5013)
(5001) Moul, Livesey, Robinson
(5002) Kary, Beesley, Moul
(5003) Wurgaft, Mack
(5004) Lazartigues, Mathy, Lavigne
(5005) Arunkumar, Rothermund, Giesen
(5006) Ricks, Berg
(5007) Mundorf, Uitvlugt, Healey
(5008) Neveu, Kaushanskaya
(5009) Garlitch, Wahlheim
(5010) Barra Rodriguez, Caplan
(5011) Lo, Sahakyan
(5012) Roberts, MacLeod, Fernandes
(5013) Pages, Brewer

Cognitive Skill Acquisition (5014–5018)
(5014) Osman, Jaffe, Ng, Kerlan, Madore, Schafer
(5015) Guba, Fyfe, Motz
(5016) Reis, Heald, Fenn, Uddin, Nusbaum
(5017) Gilad-Gutnick, Musser, Groth, Fux, Shah, Gupta, Sinha
(5018) O'Bryan, Liddy, Song

Learning and Memory: Reward, Motivation, and Emotion (5019–5027)
(5019) Sanders, Denis, Kensinger, Payne
(5020) McClay, Sachs, Clewett
(5022) Sinclair, Wang, Adcock
(5023) Wang, Sinclair, Adcock
(5024) Bhui, Dorfman, Gershman
(5025) Wenger, Wilck
(5026) Job, Clay, Mlynski, Korb, Goschke
(5027) Festini

Psycholinguistics II (5028–5037)
(5028) Christianson, Deshaies, Dempsey, Tsiola, Valderrama
(5029) Black, Cauble, Evans, Jackson
(5030) Giovannone, Theodore
(5031) Libersky, Kaushanskaya
(5032) Tovar, Tokowicz
(5033) Wild, Kuperman
(5034) Cotter, Ferreira
(5035) Caliskan, Milligan, Schotter
(5036) Al-Azary, Reid, Katz
(5037) Lupker, Spinelli, Colombo

Speech Perception (5038–5058)
(5038) Silcox, McDonnell, Strayer, Payne
(5039) Ho, Nusbaum
(5040) Smith, Yi, Kidd, McAuley
(5041) Exton, Newman
(5042) Cheimariou, Kapnoula
(5043) Casserly, Sushon, Siedman
(5044) Nagle, Runkle, Dowd
(5045) Phillips, Myers
(5046) Black, Nozari, Murphy, Holt
(5047) El-Dinary, Gryskevicz, Brouwer, Van Hell, Viswanathan
(5048) Michelini, Nygaard
(5049) Saltzman, Myers

CONDENSED SCHEDULE B

(5050) Strori, Bradlow
(5051) Costanzo, Liu, Zaharchuk, Van Hell
(5052) Banai, Sussan, Lavie
(5053) Clapp, Vaughn, Sumner
(5054) Iqbal, Backer, Bortfeld, Lacanlale, Shahin
(5055) Van Hedger, Batterink
(5056) Hoffmann, Nygaard
(5057) Strand, Villanueva, Farwell, Rogers, Sewell, Zhang, Berry, Hu, Paulig, Brown
(5058) Crinnion, Gaston, Myers

Learning and Instruction II (5059-5083)
(5059) Holohan, Lou, Rapp
(5060) Richardson, Lacroix, Aswad, Robinson, Whittaker
(5062) Taylor, Arnold
(5063) Zepeda, Butler, Rozek, Wede, Boyle
(5064) Ahn, Chan
(5065) Arcos, Storm, Hausman
(5066) Goldstein, Chan, Lohnas, Wahlheim, Szpunar
(5067) Johnson, Whitmer, Marraffino, Namukasa, Carroll, Igwe, Yelencsics, Nash
(5069) Szpunar, Dunnett, Gill, Goldstein
(5070) Dutli, Oberauer, Bartsch
(5072) Fiorella, Jaeger
(5074) Kane, Carpenter, Witherby
(5075) Little, Abraham, Karlin
(5076) Onan, Biwer, Wiradhany, de Bruin
(5077) Prieto, Hausman
(5078) Villalobos, Serra
(5079) Withall, Mensink, Rapp
(5080) Geller, Witherby, Carpenter
(5081) Rea, Wang, Yan
(5082) Yuksel, Green, Vlach
(5083) Chowdhury, Tree

Prospective Memory (5084-5095)
(5084) Vogel, Regier, Smith
(5085) Nuño, Shelton, Pusser, Robinson, Ishak, Everett
(5086) Celaya, Brewer
(5087) Meier, Cottini
(5088) Peper, Ball
(5089) Harrington, Reese-Melancon, Bock
(5090) Félix, Pandeirada, Poirier
(5092) Simonson-Vargo, Hubbell, Bailey
(5093) Dageforde, Parra, Jensen, Brockmole, Radvansky
(5094) Collins, Briggs, Eyma, Goonan, Chauhan, Hai, Tompkins, Tola
(5095) Coverdale

Recall Memory (5096-5121)
(5096) Olsen, Malmberg
(5097) Williams, Kensinger, Ford
(5098) Garcia, Kensinger
(5099) Thiebaut, Bonin, Prokop, Witt, Méot
(5100) Eckardt, Schmidt, Helion, Chen, Murty
(5101) Diachek, Brown-Schmidt
(5102) Quevedo Pütter, Erdfelder
(5103) Tanberg, MacLeod
(5104) Tullis
(5105) Allen, Labuda, Lien, Loth, Loth
(5106) Kemp, Garlitch, Loaiza, Wahlheim
(5107) Arpaci, Kilic
(5108) Laursen, Farrell, Fiacconi
(5109) McDonald, Eakin
(5110) Shull, Villalobos, Kelley, Serra
(5111) Ünal, Benjamin
(5112) Gove, Sanders, Jiang, Cowell
(5113) Mohawk, Werner, Kiley, Parks
(5114) Kindell, Lucas
(5115) Butowska, Zawadzka, Hanczakowski
(5116) Avery, Altarriba
(5117) Glavan, Houpt
(5118) Ni, Saito
(5119) Chang, Brainerd
(5120) Li, Peng, Tullis
(5121) Ortmann, Bixter, Luhmann
(5162) Paff, Kim, Ross, Matthews, Kritikos

Working Memory II (5122-5132)
(5122) Metzger, Peter, Hill, Carr
(5124) Musfeld, Krasnoff, Souza, Oberauer
(5125) Piątkowski, Zawadzka, Hanczakowski
(5126) Labaronne, Plancher
(5127) Saint-Aubin, Poirier, Yearsley, Guitard, Robichaud
(5128) Streitberger, Kuhlmann, Arnold, Meier
(5129) Rosner, Pantoja
(5130) Li, Oberauer, Frischkorn
(5131) Hosseinpour, Padilla
(5132) Bhanap, Oberauer, Rosner

Metacognition (5091, 5133-5149)
(5091) Lee, Pournaghdali, Schwartz
(5133) Barideaux, Ruppel, Travis
(5134) Friski, Frank
(5135) Hong, Son
(5136) Cipollini, Coane, Umanath, Hernandez, Barrett, Levina, Chang
(5137) Miller
(5138) Fletcher, O'Leary
(5139) Hildenbrand, Griffin, Wiley
(5140) Karaca, Geraci, Kurpad, Lithander, Balsis
(5141) Macaluso, Fraundorf
(5142) Wei, Meade, Soderstrom

(5143) Wong, Mills
(5144) Huebert, Carlaw, McNeely-White, Cleary
(5145) McNeely-White, Cleary
(5146) Cormia
(5147) Stevens, Pierce
(5148) Ruppel, Barideaux, Travis
(5149) Biwer, Wiradhany, Oude Egbrink, de Bruin

Vision (5150–5160)
(5150) Hale, Kroeger, Conway
(5151) Patten
(5152) Yang, Lee
(5153) Bernard, Gardony, Taylor
(5154) Pandey, Cave
(5155) Braswell
(5156) Overstreet, Dowell, Hajnal
(5157) Koch
(5158) Marshall, Powell, Diaz, Fajen
(5159) Charbonneau, Blais, Plouffe-Demers, Guérette, Fiset
(5160) Goulet-Pelletier, Cousineau

Statistics and Methodology II (5161)
(5161) Musslick, Ji

SUNDAY, NOVEMBER 20, 2022

8:00 AM–10:00 AM
SPOKEN SESSIONS (238–271)

Psycholinguistics II (238–243), Constitution AB
8:00 AM–8:15 AM Broniatowski, Reyna, Edelson, Birmingham, Koban, Hu
8:20 AM–8:35 AM Potter, Perdomo, James, Watson
8:40 AM–8:55 AM Dempsey, Tsiola, Bosch, Christianson, Stites
9:00 AM–9:15 AM Sehyr, Berger, Goldberg, Caselli, Emmorey
9:20 AM–9:35 AM Liceralde, Watson
9:40 AM–9:55 AM Pissani, Almeida

Attention: Control II (244–250), Republic
8:00 AM–8:15 AM Isham, Wall
8:20 AM–8:35 AM Yanguez, Bediou, Chanal, Bavelier
8:40 AM–8:55 AM Hutchison, Hood, Charbonneau
9:00 AM–9:15 AM Chiu, Nack
9:20 AM–9:35 AM Petley, Brzac, Meyers
9:40 AM–9:55 AM Pfeuffer, Bouhlel, Lang, Ewel
10:00 AM–10:20 AM Engle, Burgoyne, Tsukahara, Mashburn, Draheim, Pak, Coyne, Foroughi, Sibley

Reading (251–255), Back Bay C
8:00 AM–8:15 AM Feldman, Christofalos, Sheridan
8:20 AM–8:35 AM Gaskell, Mak, Curtis, Rodd
8:40 AM–8:55 AM Olkoniemi, Halonen, Pexman, Häikiö
9:20 AM–9:35 AM Liversedge, Wang, Bai, Yan, Zang
9:40 AM–9:55 AM Angele, Cordero, Perea, Marcet

Judgment (256–261), Back Bay D
8:00 AM–8:15 AM Newell, Mason, Szollosi
8:20 AM–8:35 AM Regenwetter, Cavagnaro
8:40 AM–8:55 AM Bø, Sjåstad
9:00 AM–9:15 AM Mandel, Irwin
9:20 AM–9:35 AM Sharps, VIllarama, Rios, Price-Sharps
9:40 AM–9:55 AM Ballard, Lloyd, Evans, Palada, Fletcher, Neal

Learning and Instruction (262–266), Back Bay A
8:00 AM–8:15 AM Finn, Miele, Wigfield
8:20 AM–8:35 AM McDaniel, Cahill, Frey, Limeri, Lemons
8:40 AM–8:55 AM Pelzl
9:00 AM–9:15 AM Kellman, Mettler, Krasne, Burke, Massey
9:20 AM–9:35 AM Motz, Jankowski, McDaniel

Recognition II (267–271), Back Bay B
8:00 AM–8:15 AM Caulfield, Intraub, Gonzalez, Hubeny, Kan
8:20 AM–8:35 AM Gronau, Avital-Cohen
8:40 AM–8:55 AM Boutsen
9:00 AM–9:15 AM Duarte, Geng
9:20 AM–9:35 AM Morcom, Legan

10:00 AM–12:00 PM
SPOKEN SESSIONS (272–303)

Language Production (272–276), Commonwealth
10:00 AM–10:15 AM Rapp, Wiley, Shea, Mccloskey
10:20 AM–10:35 AM Westbury, Anderson
10:40 AM–10:55 AM Atilgan, Chu, Nozari
11:00 AM–11:15 AM Hambric, O'Séaghdha
11:20 AM–11:35 AM Zhang, Diaz

CONDENSED SCHEDULE B

Cognitive and Motor Control of Performance (277–282), Back Bay A
10:00 AM–10:15 AM Orr, Porro
10:20 AM–10:35 AM Eidels, Bennett, Hedley, Love, Houpt, Brown
10:40 AM–10:55 AM Bortfeld, Rahimpour-Jounghani
11:00 AM–11:15 AM Savalia, Cowell, Huber
11:20 AM–11:35 AM Kvam, Sokratous, Fitch
11:40 AM–11:55 AM Sahakyan

Spatial Cognition (283–288), Back Bay B
10:00 AM–10:15 AM Shayman, Finney, Fino, Stefanucci, Creem-Regehr
10:20 AM–10:35 AM He, Boone, Hegarty
10:40 AM–10:55 AM Minear, Sensibaugh, Verheydt, Staben
11:00 AM–11:15 AM Moen, Long, McClure, Johnson
11:20 AM–11:35 AM Hubbard, McCulloch, Zajankauskaite
11:40 AM–11:55 AM Herrera, Prados, Austen, Urcelay, Buckley

Metacognition II (289–293), Constitution AB
10:20 AM–10:35 AM Double, Birney
10:40 AM–10:55 AM Schuetze, Yan
11:00 AM–11:15 AM Pournaghdali, Schwartz, Soto
11:20 AM–11:35 AM Ager, Fulton, Gray, Fregoso, Dirickson
11:40 AM–11:55 AM Lupyan, Uchiyama, Thompson, Casasanto

Prospective Memory (294–298), Back Bay D
10:20 AM–10:35 AM Moore, Arnal
10:40 AM–10:55 AM Scarampi, Kliegel
11:00 AM–11:15 AM Wiemers, Ball
11:20 AM–11:35 AM Hughes, Clawson
11:40 AM–11:55 AM Palma, Vieira, Mata

Working Memory II (299–303), Back Bay C
10:20 AM–10:35 AM Vergauwe, Jeanneret, Hautekiet, Langerock
10:40 AM–10:55 AM Mathy, Vivion, Ftaïta, Banks, Fartoukh, Ramanoël, Guida
11:00 AM–11:15 AM Camos, Barrouillet, Minamoto, Nishiyama, Chooi, Morita, Logie, Saito
11:20 AM–11:35 AM Kowialiewski, Oberauer
11:40 AM–11:55 AM Bartsch, Mizrak

THURSDAY, NOVEMBER 17–SUNDAY, NOVEMBER 20, 2022
VIRTUAL-ONLY POSTERS (V001–V208)

Attention (V001-V007, V209-V210)
(V001) Kim, Morales, Cahn, Mather
(V002) Golan, Lamy
(V003) Parmentier, Gallego, Micucci, Pilar, Alicia, Maybery
(V004) Oyama, Ishikawa, Okubo
(V005) Ishikawa, Oyama, Tanaka, Okubo
(V006) Chao, Hsiao, Huang
(V007) Colombatto, Guo, Scholl, Ristic
(V209) Kuo, Chao, Yeh
(V210) Mercado, Scagel

Concepts and Categories (V008-V010, V211)
(V008) Banks, Connell
(V009) Unger, Anilkumar, Sloutsky
(V010) Dubois, Tandoc, Finn
(V211) Vaughn, Marshall

Decision Making (V011-V018, V140-V143, V203-V204, V212, V251)
(V011) Frame, Rahal, Houpt
(V012) Dennard, Frank
(V013) Mienaltowski, Minton
(V014) Casteel
(V015) Stanley, Wedell
(V016) Stevens, Kleider-Offutt
(V017) Washburn, Rudiman, Agee
(V018) Simonsen, Madan
(V140) Qin, Han, Joslyn, Savelli, Agrawal
(V141) Oehler, Horn, Wendt
(V142) He, Beveridge, Vargas, Salen, Brown
(V143) Ford, Qureshi
(V203) Zilker
(V204) Hayes, Wedell
(V212) Cauble
(V251) Li, Hayes

Cognitive Skill (V019-V021)
(V019) Toth, Ter-Haar
(V020) Zar, Barrera
(V021) Bodet, Hernandez

Bilingualism: Memory (V022-V024)
(V022) Arriagada-Mödinger, Ferreira
(V023) Tsuboi, Francis
(V024) Yeh, Pee

CONDENSED SCHEDULE B

Event Cognition (V025)
(V025) Pitts, Bailey, Campbell

Numerical Cognition (V026, V213)
(V026) Azzarello, Edi, Jameson, Lewis
(V213) Akyol

Bilingualism: Development and Individual Differences (V027)
(V027) Tosun, Filipović

Letter/Word Processing (V028-V035)
(V028) Smith
(V029) Yoshihara, Wewala, Lupker, Nakayama
(V030) Brossette, Lefèvre, Grainger, Lété
(V031) Chung-Fat-Yim, Bartolotti, Marian
(V032) Dickinson, Yates
(V033) Tsutsuse, Stout, Sinnett
(V034) Zhang, Wang
(V035) Fang, Perfetti

Eyewitness Identification (V036)
(V036) Colloff, Mahmood, Roughton

Autobiographical Memory (V037-V042, V214-V215, V241, V244)
(V037) Deffler, Holden, Shedlosky-Shoemaker
(V038) Hosokawa
(V039) Kurtulmuş, Oner
(V040) Gu, Tse
(V041) Zhang, Battista, Thissen, Otgaar, Wang, Jelicic
(V042) Gander, Szita, Falck, Lowe
(V214) Ergen, Gülgöz
(V215) Asolar, Tekcan
(V241) Ay, Gülgöz
(V244) Stedman, Ford, Kensinger

Associative Learning (V043-V052)
(V043) Taniuchi, Suzuki, Zhao
(V044) Tosatto, Fagot, Nemeth, Rey
(V045) Rosca, Dames, Pfeuffer
(V046) Otsuka
(V047) Taraban
(V048) Ibrahim, Geller
(V049) Sitzman, Wolff, Babineau, Tauber
(V050) Kelty-Stephen, Mangalam
(V051) Song, Chen
(V052) Zhou, Shen, Chen

Cognitive Control (V053-V054, V065-V068, V131-V136, V205-V206, V216)
(V053) Núñez-Estupiñan, Gauer, Siegmund
(V054) Musso, Fuentes Cuiñas, Cascallar
(V065) Leclercq, Bonnin
(V066) Fu, Dodd
(V067) Ruiz, Bangert
(V068) Zhou, Privitera
(V131) Hirsch, Koch
(V132) Oliveira, Remondes, Garcia-Marques
(V133) Ackermann, Gouret, Pfeuffer
(V134) Snijder, Steindorf, Rummel
(V135) Mayrand, McCrackin, Ristic
(V136) Niu, Mordkoff, Hollingworth
(V205) Tanaka, Ishikawa, Oyama, Takashima, Okubo
(V206) Kang, Chiu
(V216) Dixon, Decker

Motor Control (V055-V057)
(V055) Slifkin, Blatt, Gyure, Patrick, Kyrkos, May, Venorsky, Raghav, Mediati, Lowry
(V056) Li, Saal
(V057) Rieker, Gajewski, Wascher, Reales, Ballesteros, Getzmann

Performance (V058-V062)
(V058) Basgol, Dayan, Franz
(V059) Blackburn, Ynalvez, San Miguel
(V060) Pontorno, Chesney
(V061) Niimi, Hirano
(V062) Tokita, Ishiguchi

Statistics and Methodology (V063-V064, V202, V217)
(V063) Röhner, Holden, Schütz
(V064) Akrenius
(V202) Modirrousta-Galian, Higham
(V217) Daggett, Hout

Cognitive Aging (V069-V077)
(V069) Chung, Arnell
(V070) Suzuki, Ishikawa, Okubo
(V071) Brazauskiene, Markostamou, Kvavilashvili
(V072) Musich, Costa, Halder, Curtis
(V073) Gorohovsky, Magen
(V074) Baran, Del Tufo
(V075) Faghihi, Vaid
(V076) Hu, Yang, Luo
(V077) FitzGibbon

Judgment (V078-V086, V218)
(V078) Bains, Cassidy, MacLean, Bernstein, Derksen, Connolly, Kantner
(V079) Calvillo
(V080) Kleider-Offutt, Meacham
(V081) Muir, Newman, Schwarz
(V082) Navarro, Price

CONDENSED SCHEDULE B

(V083) He, Zhang, Wang, Bhatia
(V084) Barlas
(V085) Katz, Hampton, Schneider
(V086) Said, Schumacher, Huff
(V218) Noda, Tanabe, Kimura

Music Cognition (V087-V090)
(V087) Tegiacchi, George
(V088) Gauer, Lannig
(V089) Mantell, Johnson, Atwell
(V090) Gryder, Dowling

Language Production/Writing (V091-V094, V219-V220)
(V091) Wong, Ng, Tsang, Chen
(V092) Wang, Cheng, Maurer, Wang, Chen
(V093) Chen, Yang
(V094) Zhai, Feng, Qu, Fischer-Baum
(V219) Knapp, Folk
(V220) Lin, Hsieh

Psycholinguistics (V095-V099, V167-V170)
(V095) Wang, Schiller
(V096) Ha, Yang, Yang
(V097) Park, Dia, Al-Jundi
(V098) Calma-Roddin, Brennan
(V099) Chen, Chang
(V167) Bazzi, Brouwer, Foucart
(V168) Li, Zhang, Liu
(V169) McDonough, McCauley, Yoon
(V170) Lord, Zimmerman, Duff, Brown-Schmidt

Reading (V100-V109, V221-V222, V252)
(V100) Valentini, Vergauwe
(V101) Arnal, Crundall, Bailey, Roca, Tejero
(V102) Techentin
(V103) de Long, Folk
(V104) Deibel, Folk
(V105) Kambara, Lin, Adachi
(V106) lin, Chen, Chen
(V107) Petersen, Almor
(V108) Stoops, Choi, Montag
(V109) Cohen, Altani, Katopodi, Georgiou, Protopapas
(V221) Veldre, Wong, Yu, Reichle, Andrews
(V222) van Viersen, Martinez Cano, de Jong, Georgiou, Parrila, Ziaka, Protopapas
(V252) Atanasov, Liversedge, Degno

False Memory (V110-V114, V223-V224)
(V110) Ulatowska, Wojciechowska
(V111) Mah, Friesen, King-Nyberg, Grannon, Ballesteros
(V112) Wulff, Karanian, Race, Thomas
(V113) Abadie, Camos
(V114) Yang, Chiang
(V223) Yu, Moore, Crozier
(V224) Rindal, McQuinn, Beard

Recognition (V115-V120, V225-V226)
(V115) Santos, Fernandes, Pandeirada
(V116) Tatz, Peynircioglu
(V117) Ramey, Shields
(V118) Bergen, Guevara Pinto, Queen
(V119) Sun, Feuerriegel, Osth
(V120) Guitard, Cowan
(V225) Chen, Heathcote, Sauer, Palmer, Osth
(V226) Whitlock, Lo, Ding, Hubbard, Sahakyan

Metamemory (V121-V124, V245)
(V121) Krasnoff, Overkott
(V122) Kurdoglu-Ersoy, Schwartz, Kapucu
(V123) Luna, Cadavid
(V124) Navarro-Baez, Giebler, Undorf, Bröder
(V245) Agadzhanyan, Zou, Castel

Perception and Action (V125-V126, V248)
(V125) Miles, Wilson, Vu
(V126) Gutzeit, Huestegge, Kürten, Weller
(V248) Saxon, Marshall, Briones, Vaughn, Donet, Borgogna

Technology and Cognition (V127-V130, V227)
(V127) Lowry, Hystad, Lama, Heley, Perna
(V128) Bishop, Chiu, Chein
(V129) Möller, Mayr
(V130) Lanagan-Leitzel
(V227) Pedroli, Bruni, Greci, Cavallo, Riva, Mancuso, Stramba-Badiale, Cipresso

Bilingualism: Comprehension and Production (V137-V139, V228)
(V137) Aldariz, Rodríguez-Gómez, Rivas, Rodríguez-Cuadrado, Foucart, Moreno
(V138) Vermeer, Brouwer, Foucart
(V139) Von Grebmer Zu Wolfsthurn, Pablos Robles, Schiller
(V228) Lee, Faroqi-Shah, Wang

Reasoning/Problem Solving (V144-V150, V229, V247)
(V144) Boissin, Josserand, De Neys, Caparos
(V145) Raoelison, Salvia, Knops, Charron, Fayolle, Debacker, Cuenca-Maia, Cachia, Oppenheim, BorstDe Neys
(V146) Faiciuc
(V147) Ballestero-Arnau, García-Arch, Marín
(V148) Hernando, Tejero, Roca, Lucas-Alba
(V149) Holm, Oden

CONDENSED SCHEDULE B

(V150) Ammalainen, Loginov, Spiridonov, Öllinger
(V229) Hu, Vaid
(V247) Bertram, Ellsäßer, Feduzi, Gyarmathy, Nelson

Emotion and Cognition (V151-V159)
(V151) Simister, Bridgland, Takarangi
(V152) Oh, Yang, Hayes, Wedell, Shinkareva
(V153) Anderson, Clayton-McClure, Boland, Howe, Riggs, Dewhurst
(V154) Santirocchi, Esposito, Spataro, Cestari, Rossi-Arnaud
(V155) Werlen, Kaakinen, Kammerer, Acartürk, Aparicio, Baccino, Ballenghein, Bergamin, Castells, Costa, Falé, Megalakaki, Ruiz-Fernández
(V156) Booth, Karam-Zanders
(V157) Alaifan, Luo, Graf
(V158) Yüvrük, Kapucu
(V159) Briere, Wang, Sehn

Spatial Cognition (V160-V166)
(V160) Park, Watanabe, Burte
(V161) Costa do Nascimento, Kennedy, Yang
(V162) Muffato
(V163) Miola, Meneghetti, Pazzaglia, Van Der Ham
(V165) Blazhenkova, Duman, Deryalar, Umitli, Aydinlar, Togal, Akbas, Kanero, Booth, Pechenkova, Vasilenko
(V166) Kole, Healy, Schneider, Barshi

Speech Perception (V171-V172)
(V171) Cox, Morich, McLennan
(V172) Kapnoula, Samuel

Human Learning and Instruction (V173-V176, V230-V233, V243, V249)
(V173) Kamura, Santiago, Pilegard
(V174) Vaughn, Goddard, Krull
(V175) Zung, Geller
(V176) Wong
(V230) Goodman, Ferrari
(V231) Murphy, Hoover, Castel
(V232) Kortenhoeven
(V233) Chen, Murphy, Brabec, Bjork, Bjork
(V243) Wang, Woodman
(V249) Shumaker, Ciesielski, Hargis

Prospective Memory (V177-V178, V234)
(V177) Morita
(V178) Corpuz, Oriet
(V234) Nesmith, Jones, Moore

Recall (V179-V183)
(V179) Cook, Dodson, Lurie, Westerman
(V180) Bonin, Thiebaut, Méot
(V181) Falben, Sanborn, Chater
(V182) Kroneisen
(V183) Riggenbach, Gronlund, Zoladz

Working Memory (V184-V188, V242)
(V184) Mizrak, Oberauer
(V185) Al-Hadhrami, Oberauer, Bartsch
(V186) Qiu, Möller, Koch, Mayr
(V187) Lilienthal
(V188) McFayden, Faust, McIntosh, Multhaup
(V242) Şengil, Gezici, Çiftçi, Farooqui

Metacognition (V189-V194)
(V189) Eliseev, Marsh
(V190) Geers, Fischer, Lewandowsky, Herzog
(V191) Verma, Whitebread
(V192) Ruel, Rai, Giroux, Dogra, Ackerman, Bernstein
(V193) Jang
(V194) Kelemen, Anstead

Sensation and Perception: Vision (V195-V201)
(V195) Lukashevich, Petrov, Kudryavstev, Utochkin
(V196) Purcell, Stewart
(V197) Cooney, Naraindas
(V198) Micher, Mazenko, Lamy
(V199) Lin, Sun
(V200) Wu
(V201) Okubo, Yokosawa

Neural Mechanisms (V207)
(V207) O'Donnell, Chrysikou

Visual Search (V208, V238-V240)
(V208) Zsido, Bali, Kocsor, Hout
(V238) Troemel, Feller, Hutson, Tighe, Loschky, Magliano
(V239) Hout, Godwin, Polak, Zsido
(V240) Mohite, Mishra

Test Effects (V235)
(V235) DiMarco, Marmurek

Performance and Control (V236)
(V236) Lee, Rheem, Cho, Kim

Cognitive Development (V237, V250)
(V237) Ionescu, Lu, Holyoak, Sandhofer
(V250) Parrish, Sandgren

Learning and Memory: Reward, Motivation, and Emotion (V246)
(V246) Silaj, Alberts, Castel

Symposia and Spoken Abstracts

Welcome/Keynote Address
Thursday, November 17, 2022, 7:30–8:30 PM US EST,
Sheraton Grand Ballroom

Jeremy M. Wolfe, *Brigham and Women's Hospital/Harvard Medical School*

Opening Reception to Immediately Follow the Keynote Address

Attention Capture
Friday, November 18, 2022, 8:00–10:00 AM US EST, Independence

Chaired by Andrew B. Leber, *The Ohio State University*

8:00–8:15 AM (1)

Learned Spatial Suppression Is Not Always Proactive. SEAH CHANG, *The Ohio State University*, BLAIRE DUBE, *The Ohio State University*, JULIE D. GOLOMB, *The Ohio State University*, ANDREW B. LEBER, *The Ohio State University* — Research has shown that locations frequently containing salient distractors are suppressed. There is debate about whether such spatial suppression is proactive or reactive, with recent work favoring a proactive account. However, these studies have had methodological limitations, which the current work sought to overcome, using a new search-probe method. On search trials, participants searched six items for a shape target while ignoring a salient color distractor; this distractor frequently appeared in a "high probability" location. Replicating prior work, we found reduced attentional capture when the salient distractor appeared in the high-probability location compared to elsewhere. Critically, on randomly interleaved probe trials, participants instead discriminated the orientation of a single tilted bar presented briefly at one of the search locations, allowing us to index the spatial distribution of attention at the moment the search would have begun. Strikingly, probe discrimination was more accurate at the high-probability location vs. other locations. These results suggest high-probability locations were initially selected and then suppressed, revealing that learned spatial suppression can be reactive, not proactive.

Email: Seah Chang, chang.2127@osu.edu

8:20–8:35 AM (2)

The Role of Salience in the Suppression of Distracting Stimuli. BRAD T. STILWELL, *Binghamton University SUNY*, HOWARD E. EGETH, *Johns Hopkins University*, NICHOLAS GASPELIN, *Binghamton University SUNY* — Researchers have long debated whether physically salient stimuli—such as color singletons—can automatically "capture" attention. To resolve this debate, the signal suppression hypothesis proposes that salient items do have the power to attract attention but can be suppressed to prevent capture. This account has recently been challenged on the grounds that previous studies may have used singletons that were not sufficiently salient. Problematically, there are no well-established independent measures of "salience," which makes this claim difficult to test. We introduce a new psychophysical technique for estimating the relative bottom-up salience of singleton distractors and relate this metric to ERP indices of attentional suppression. We then review recent event-related potential (ERP) evidence from our lab suggesting that even highly salient distractors can be suppressed. Altogether, the results cast serious doubt on the claim that highly salient singletons cannot be suppressed.

Email: Brad Stilwell, stilwell@binghamton.edu

8:40–8:55 AM (3)

Feature-Blind Attentional Suppression of Salient Distractors. XIAOJIN MA, *Washington University in St. Louis*, RICHARD A. ABRAMS, *Washington University in St. Louis* — Salient task-irrelevant visual distractors can capture attention and disrupt ongoing tasks. Recent research has shown that people can sometimes suppress salient distractors (e.g., color singletons)—but only when specific features of the distractor (e.g., its color) are known in advance. This constraint suggests that attentional suppression is limited to a first-order, feature-specific level. However, all prior studies of suppression presented only a single instance of the target shape in the search array, making participants likely to exploit the uniqueness of the target to perform the task, and consequently prone to capture by a uniquely colored distractor of uncertain color. In the present study we eliminated the uniqueness of the search target by presenting multiple instances of it among the array and found that participants were indeed capable of suppressing salient distractors in an unpredictable color. Experiments with letter probes superimposed on search stimuli confirmed the proactive nature of the suppression. Our finding for the first time reveals a second-order or global-salience based mechanism of attentional suppression.

Email: Xiaojin Ma, xiaojinma@wustl.edu

9:00–9:15 AM (4)

Are Color Singletons Powerful or Powerless? Assessing Attention Capture in the Absence of Suppression. ERIC RUTHRUFF, *University of New Mexico*, MEI-CHING LIEN, *Oregon State University*, CHRISTOPHER HAUCK, *Oregon State University* — Recent studies have argued that color singletons are powerful, generating an "attend-to-me" signal. However, this power might not be apparent in the overall data because participants can learn over time to suppress them. Indeed, response time data often show capture effects early within a session but then (if the singleton's color is fixed) later show the reverse effect – suppression. If the singleton's color then changes, capture emerges once again for the new color. Hence, it has been argued that color singletons capture attention in the absence of suppression. Here, we replicate this important finding but question its interpretation. A novel singleton color might

capture attention not because it is a salient singleton, but rather simply because it is novel. Indeed, we report that novel colors produce capture effects even when they are not salient color singletons. We present the case that color singletons are generally powerless and that suppression does not arise in response to the singleton's power.

Email: Eric Ruthruff, ruthruff@unm.edu

9:20-9:35 AM (5)

On Preventing Capture: Does Greater Salience Cause Greater Suppression? CHRISTOPHER HAUCK, *Oregon State University*, ERIC RUTHRUFF, *University of New Mexico*, MEI-CHING LIEN, *Oregon State University* — It has been proposed that salient color singleton distractors represent a serious threat to target performance, so people proactively suppress them, thereby reducing that threat in the future. Consistent with this hypothesis, Gaspar et al. (2016) reported a larger PD (believed to index suppression) for high-salient than low-salient color singletons. We looked for converging evidence that salience triggers suppression using the capture-probe paradigm. Participants searched for a yellow circle among nine background circles, which sometimes included a singleton distractor with a unique color. Critically, the singleton was either high or low in salience with respect to the background circles. On 33% of trials, probe letters appeared inside colored circles and participants were to report those letters. If high-salient colors are more strongly suppressed, then probe recall accuracy should be lower at locations with the high-salient color. We found no such effect, suggesting that proactive suppression is not caused by salience.

Email: Christopher Hauck, chris.hauck@oregonstate.edu

9:40-9:55 AM (6)

How Does the Priority Map Change Over Time? HAN ZHANG, *University of Michigan*, ADKINS TYLER, *University of Michigan*, TARAZ LEE, *University of Michigan*, JOHN JONIDES, *University of Michigan* — Visual search is thought to be guided by a "priority map" that assigns attentional priorities to items in a display. However, an often-ignored aspect is that the priority map evolves over time--search behavior at different timepoints may be guided by different priorities. To study the temporal dynamics of attentional priority, we employed a novel forced-response method that allows us to exert tight control over the timing of saccade initiation and observe the landing position of initial saccades. Using this method, we examined the temporal dynamics of distractor rejection in several conditions known to reduce the net effect of capture. We found that, while all these conditions promoted distractor rejection, they produced very different temporal evolutions of attentional priority. Importantly, short-latency first saccades distinguished proactive suppression from a disengagement of attention in these conditions. We further applied a computational model to explain distractor ignoring in terms of target up-weighting, distractor down-weighting, or both. We conclude by arguing that studying the temporal dynamics of the priority map is critical to resolving lingering issues of attentional guidance.

Email: Han Zhang, hanzh@umich.edu

Perception and Action
Friday, November 18, 2022, 8:00-10:00 AM US EST, Back Bay B

Chaired by Frank Durgin, *Swarthmore College*

8:00-8:15 AM (7)

Angular Scale Expansion: Large, Stable Distortions in the Perception of Locomotor Space Are Consistent with the Interface Theory of Perception. FRANK DURGIN, *Swarthmore College* — The Interface Theory of Perception (ITP), argues that evolution should favor functional representations at the expense of accurate ones. One version of such a theory would be Proffitt's behavioral potential theory, which has been falsified repeatedly. Here we consider perceptual phenomena with more consistent and substantial quantitative support: The stable, but inaccurate, perception of locomotor space, including the perception of ground distance (underestimated), ground orientation (hill perception: overestimated), and the perception of large vertical and horizontal frontal extents (differently scaled). While investigating the angular expansion hypothesis, my collaborators and I have carefully documented that all these classes of distortion can be consistently predicted in terms of fixed angular expansions of a few crucial angular variables that can be used to control action in locomotor space. These expansions are defined relative to an allocentric reference frame (elevation and azimuth) and appear stable across locomotor contexts. Current evidence suggests that they are linked to the presence of a ground plane and may serve as feedback amplification, designed for more effective locomotor control. This is consistent with ITP.

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8:20-8:35 AM (8)

The Perceptual Fidelity of Affordance Judgments in Real and Virtual Environments. MIRINDA WHITAKER, *University of Utah*, HUNTER C. FINNEY, *University of Utah*, JO ELSTON, *University of Utah*, LUCAS EPPERSON, *University of Utah*, SARAH H. CREEM-REGEHR, *University of Utah*, JEANINE K. STEFANUCCI, *University of Utah* — Virtual reality (VR) applications for training and simulation (e.g., in medicine, architecture) require accurate perception of depth and size. Previously, these applications were limited due to a compression effect in VR, in which VR environments were perceived as smaller than comparable real-world environments. Recently, there have been significant advancements in VR technology (increased field of view, better graphics, lighter immersive displays), which should reduce the compression effect and improve perceptual fidelity–the notion that people will perceive and act in virtual environments as they would in the real world. In the present study, we assessed two perceived affordances–(1) the perceived ability to grasp objects and (2) the perceived ability to reach objects–in both a real and visually matched immersive virtual environment. Participants overestimated reach and underestimated grasp, but no difference was found in either affordance tasks

across type of environment. Our results suggest that with modern VR technology people perceive affordances relating to depth and size in virtual environments similar to real environments.

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8:40–8:55 AM (9)

Creation of Affordance Norms for 3,000 Objects. NICHOLAS MAXWELL, *The University of Southern Mississippi*, ALEN HAJNAL, *The University of Southern Mississippi*, MARK J. HUFF, *The University of Southern Mississippi*, TYLER SURBER, *Pearl River Community College* — Objects can be described in several ways, such as their relations to other objects (e.g., associations, semantic similarity) or based on their physical features (e.g., birds have wings, feathers). Objects can also be described in terms of affordances (i.e., actionable properties), which portray interactive relationships between actors and objects versus physical properties of an object. While several normed datasets have been created to categorize aspects of meaning (e.g., semantic features, associations), affordance norms have not been generated. This is surprising, as affordances have been shown to affect how individuals process objects (e.g., body-object interactions; Pexman et al., 2019). The present study addresses this limitation by developing a set of affordance norms for 3,000 objects. A searchable web portal will also be included, providing access to affordance data for individual objects and the frequency of affordance use. Finally, because our stimuli overlap with other semantic and lexical norm sets (e.g., semantic feature norms; Buchanan et al., 2019; MRC Psycholinguistic Database; Colthart, 1981), researchers will be able to evaluate semantic/lexical variables when generating affordance properties.

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9:00–9:15 AM (10)

Action Does Not Drive Visual Biases in Peri-Tool Space. LAURA E. THOMAS, *North Dakota State University*, ROBERT R. MCMANUS, *Exponent Engineering and Scientific Consulting* — Observers show visual biases within the hands' grasping space to privilege effective action. These biases shift to accommodate newly learned affordances, suggesting that experience-driven plasticity tunes visual cognition to facilitate action. Observers show similar visual biases near the functional ends of handheld tools that may also stem from plasticity in body representations; if tools are temporarily incorporated into the body schema as extensions of the hands, then peri-hand visual biases could also extend to the area surrounding a tool. In a series of experiments, we explored the conditions under which observers experienced facilitation in detecting targets presented near the ends of handheld and remote-controlled tools. We found that acting with a tool was neither necessary, nor sufficient, to introduce visual processing biases in peri-tool space. This work suggests that action alone may not lead observers to incorporate tools into the body schema.

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9:20–9:35 AM (11)

Imagined Walking and Side-Stepping with and without Attention. JARED CHAN, *Queensland University of Technology,* NAOHIDE YAMAMOTO, *Queensland University of Technology* — The duration of imagined walking tends to be underestimated, but this underestimation can be removed by having participants perform an attention-demanding task while imagining walking. The effect of the concurrent task has been explained by postulating that implicit representations of ambulatory bodily motion, which represent action timing accurately, take over the control of imagined walking when participants' attention is shifted away from explicitly conjuring up motor images of walking. To further test this idea, we had participants perform imagined walking with and without concurrent tasks in two modes of walking: forward (i.e., normal) walking and side-stepping. It was hypothesised that the concurrent tasks would remove the underestimation of walking duration only in the forward walking condition because participants would not have been well practised in walking via side steps and therefore they would not have developed implicit representations of imagined side-stepping. Results showed the predicted pattern, suggesting that implicit representations of walking are indeed involved when imagining walking without overt attention.

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9:40–9:55 AM (12)

Interspecific Contagious Yawning in Humans. ANDREW GALLUP, *SUNY Polytechnic Institute*, SABINA WOZNY, *SUNY Polytechnic Institute* — Contagious yawning is well-documented among humans and a number of social vertebrates. While the most common form of yawn contagion occurs between conspecifics, some non-human animals in captivity have been reported to yawn in response to yawns from human handlers/caregivers. The current research examined, for the first time, whether people yawn contagiously in response to yawns from non-human animals. In addition, this study aimed to test whether this response was modulated by phylogenetic relatedness and domestication/social closeness. A total of 296 participants from Amazon Mechanical Turk self-reported on their yawning behavior following exposure to a (1) control (non-yawning) condition or a compilation of yawning stimuli either from (2) fish, (3) amphibians, (4) reptiles, (5) birds, (6) non-primate mammals, (7) apes, or (8) domesticated cats and dogs. The results provide strong support for interspecific yawn contagion. However, neither the propensity to yawn (binary) nor total yawn frequency varied significantly across conditions. Overall, these findings suggest that the mechanisms governing yawn contagion can be activated by varied forms of yawning stimuli, including those from distantly related and unfamiliar species.

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Discourse Processes
Friday, November 18, 2022, 8:00-10:00 AM US EST, Back Bay D

Chaired by Navin Viswanathan, *The Pennsylvania State University*

8:00-8:15 AM (13)

Drawing on Perspective Cues in Pronominal Reference Resolution. TIANA V. SIMOVIC, *University of Toronto Mississauga*, CRAIG CHAMBERS, *University of Toronto Mississauga* — Psycholinguistic accounts of pronoun resolution have tended to emphasize the influence of discourse-level and lexical cues (e.g., order-of-mention biases, coherence relations, implicit causality). Much less work has considered effects of situation-specific pragmatic reasoning. We explore the latter by focusing on communicative perspective-taking. Expt1 used sentences like "Molly [asked Ana if]/[told Ana that] she remembers when Fall classes start" to assess readers' offline judgments for antecedents of ambiguous pronouns. We predicted that a character ASKING about the subordinate clause information should lead readers to interpret the pronoun as co-referring with the main-clause object, whereas TELLING should entail main-clause subject interpretations. This is because we do not tell people what they already know and do not ask people something that we should know that they do not. The results corroborated our predictions: Participants picked the antecedent intuitively expected to be "perspectivally-congruent" 99.8% of the time, with no order-of-mention effect (which would predict stronger effects for TELL, where the antecedent is the first-mentioned character). Expt2 further corroborated the results in a self-paced reading task.

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8:20-8:35 AM (14)

Are Verb Metaphors Processed as Analogies? DANIEL KING, *Northwestern University*, DEDRE GENTNER, *Northwestern University* — Psycholinguistic work on metaphor processing has mainly focused on noun-noun metaphor (e.g., My job is a jail), but metaphorical use of verbs (e.g., The negotiation collapsed; Their friendship blossomed) appears more common (Krennmayr, 2011). In Study 1, we demonstrate that verb metaphoric extension is driven primarily by online adjustments to the verb's meaning rather than by sense selection (King & Gentner, 2022). In Study 2, we show that these extensions follow a pattern of progressive abstraction of the verb's meaning components, resulting in fine-grained adaptations of the verb's meaning to the noun referent. In Study 3, we provide evidence that comprehension involves aligning the verb with an event schema saliently associated with the noun, resulting in an analogy between the two event structures. These findings suggest that verb metaphors, like noun-noun metaphors, are understood as comparisons processed via structure-mapping.

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8:40-8:55 AM (15)

Synergy Not Mimicry: What Mixed Findings of Phonetic Convergence Tell Us. NAVIN VISWANATHAN, *The Pennsylvania State University*, ANNIE OLMSTEAD, *The Pennsylvania State University* — Phonetic convergence is the phenomenon that speakers' productions of segments sometimes grow more alike to the speech of their interlocutors. Current accounts view this phenomenon as strong evidence of perception-production coupling (e.g., Pardo et al., 2013) and even as evidence that speakers simulate their partners' productions to achieve communication success (Pickering & Garrod, 2013). However, past research indicates that the acoustic dimensions of convergence as well as even whether convergence occurs varies across studies. Moreover, the magnitude and likelihood of convergence is affected by several factors. In a pair of studies, we add to this literature by demonstrating that the kind of phonetic changes observed strongly depends on task dynamics as well as interlocutor characteristics. We suggest that phonetic convergence may be better understood within the context of interpersonal phonetic synergy (Olmstead et al., 2021) rather than as a default mechanism linking perception and production.

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9:00-9:15 AM (16)

Conversational Style Differences in the Montclair Map Task Corpus. JENNIFER S. PARDO, *Montclair State University*, BIMASH BUDHA, *Montclair State University*, COURTNEY BELL, *Montclair State University* — Previous studies of the Montclair Map Task Corpus found that same-sex male pairs of talkers produced more words, turns, and turn interruptions than same-sex female and mixed-sex pairs. Moreover, male pairs also differed in the relationship between these attributes of conversational style and task performance. In particular, greater output of male pairs was associated with reduced task performance, while the reverse pattern occurred in pairs with female talkers. Finer-grained analyses of turn interruption rates, question style, and word types further support the finding that conversational style of same-sex male pairs is largely unrelated or negatively related to task performance. While mean task performance levels did not differ across pair types, complex relationships between conversational style and performance indicate that same-sex male pairs of talkers engaged in a distinct strategy to accomplish the task. To facilitate future research, recordings and transcriptions of the Montclair Map Task Corpus are available at https://digitalcommons.montclair.edu/mmt_corpus/.

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9:20-9:35 AM (17)

Self-Reported Mindfulness and Anxiety: How Do They Relate to Aging and Speech Fluency? LORI E. JAMES, *University of Colorado Colorado Springs*, OCTAVIO BUSTOS PENALOZA, *University of Colorado Colorado Springs*, HANNAH LEVITT, *University of Colorado Colorado Springs*, JASMIN PANIQUE, *University of Colorado Colorado Springs* — Tests of

healthy aging effects on speech fluency during discourse have yielded a wide range of conclusions. Some of the variability likely results from methodological differences, but individual speaker characteristics may also contribute to the inconsistent results. This study analyzed a subset of the data from a larger project in which several individual difference variables related to mindfulness and anxiety are assessed for relationships with various measures of speech production. Participants aged 18 – 80 (N = 140) completed a picture description task during a videoconference call, from which we derived measures of speech fluency. Participants also completed self-report measures of age, education, dispositional mindfulness, and state and trait anxiety via Qualtrics. Dispositional mindfulness increased and both state and trait anxiety decreased with age, as expected. Speech rate (one index of speech fluency taken from the description task) also decreased with age, consistent with previous findings. Mindfulness and anxiety measures had limited relationships with speech fluency measures. Explanations for the different patterns of age-related effects on various measures of speech fluency are considered.

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9:40-9:55 AM (18)

Greater Entropy Leads to More Explicit Referential Forms During Language Production. HOSSEIN KARIMI, *Mississippi State University* — Speakers can refer to previously-mentioned words (e.g., the actor) using attenuated referring expressions such as pronouns (he) or elaborated referential forms such as repeating the original word (the actor). Predictability is theorized to influence form of reference during language production: More attenuated forms may be used to refer to more predictable words, presumably because predictable words are already active in memory and therefore require less linguistic signal during subsequent reference. However, the reported results are mixed. The current study examines the effect of entropy, an information-theoretic metric that captures the predictability of all, not just one, referential candidate on the production of referential forms. A meta-analysis combining data from multiple experiments (492 participants, 405 items) revealed that greater entropy leads to more explicit referential forms, suggesting that entropy might intensify the competition between referential candidates during language production, reducing total memory activation.

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Visual Working Memory

Friday, November 18, 2022, 8:00-10:00 AM US EST, Back Bay A

Chaired by Timothy J. Ricker, *University of South Dakota*

8:00-8:15 AM (19)

Feature Identity Drives Representation Format Within Visual Working Memory. TIMOTHY J. RICKER, *University of South Dakota*, ALESSANDRA S. SOUZA, *University of Porto*, EVIE VERGAUWE, *University of Geneva* — Work in the popular delayed estimation paradigm has primarily addressed the causes of capacity limits by assessing which factors limit the number or the precision of items in working memory, without providing information on the nature of working memory representations. Recent modeling work has pointed out that visual representations can contain continuous (fine-grained) and categorical (coarse) information about the stimulus. Yet, how exactly these sources of information are maintained and combined in mind has not been the topic of much investigation. The present work uses computational modeling of delayed estimation responses to refine our understanding of the representations stored in working memory for colors, orientations, and shapes. We find remarkable consistency in the format of mental representations with color and shape representing continuous and categorical information separately and orientation representing continuous and categorical information as a single joint representation. We show that the differing representation formats are driven by the feature identity and not idiosyncrasies of the task or strategy. This work informs our knowledge of what is stored in working memory and how best to model it going forward.

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8:20-8:35 AM (20)

Direct Interactions Between Working Memory and Perception. SIMON KAPLAN, *The George Washington University*, DWIGHT KRAVITZ, *The George Washington University* — If visual working memory (VWM) recruits sensorimotor areas also directly involved in ongoing perception, then there should be a bidirectional influence between the VWM and perception. Here we extend evidence for this bidirectional relationship beyond gabor orientation and color (Teng & Kravitz, 2019) to motion direction and color. As predicted and preregistered, we observed discrimination thresholds that were significantly greater for the middle than side conditions ($p < .001$, Cohens $d = .637$), but only when the direction of motion was the maintained feature. Further, we provide the time course of the interaction over varying ISIs between the encoding and discrimination stimuli over a window of 100-1000ms. These observations ultimately enable a causal study of the involvement of these regions in VWM maintenance. We expect that TMS to Area MT+ during critical periods of the ISI will destabilize the VWM representation, causing its impact on the discrimination thresholds to diminish and the quality of report to drop. If evidence continues to support the joint recruitment of cortical areas by putatively distinct cognitive and perceptual processes, the taxonomy of those distinctions should be revisited.

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8:40-8:55 AM (21)

Does Prior Knowledge in Long-Term Memory Facilitate Refreshing in Working Memory? VANESSA M. LOAIZA, *University of Essex*, HIU WAH CHEUNG, *University of Essex*, DAVID T. GOLDENHAUS-MANNING, *University of Essex* — It is well-known that prior knowledge in long-term memory (LTM) enhances working memory (WM) overall, but there is less agreement

about its effect on refreshing, or using attention to foreground recently presented information. Here, we used the retro-cue paradigm, wherein briefly presented arrays of an individually calibrated number of colored shapes (either concrete or abstract) were followed by a retention interval that either remained blank (no-cue) or presented a cue to guide attention to the to-be-tested shape (retro-cue). Participants recalled the color of the tested shape using a continuous color wheel. When the tested shape was presented in its original location (Experiment 1), there was evidence for an interaction: concrete shapes showed a stronger retro-cue effect than the abstract shapes. However, presenting the tested shape in the center of the screen (Experiment 2) yielded equivalent retro-cue effects for both types of shapes. We discuss the implications for models of WM.

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9:00-9:15 AM (22)

Massive Memory in Space and Time. JEREMY M. WOLFE, *Brigham and Women's Hospital/Harvard Medical School*, WANYI LYU, *Brigham and Women's Hospital* — It is well known that we have massive recognition memory for objects. After viewing hundreds of objects for 2-3 seconds, observers can discriminate old images from new ones with over 80% accuracy. In the real world, however, we don't want to merely remember that we have seen something before. We often want to know when and where we saw it. To assess whether we have spatial and/or temporal massive memory, we presented observers with a series of objects at distinct loci in a rough 7x7 grid. Each of 300 items appeared twice. After each 3-sec presentation, observers labeled the item as new or as a repetition of a previously seen item. If it was repeated, observers clicked on its remembered location and estimated when it first appeared using a timeline. Observers remembered the approximate location of at least 50 to 100 objects. Their temporal estimates averaged within 10% of the actual time of the item's original appearance. Interestingly, these two memories were not well correlated with each other across observers.

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9:20-9:35 AM (23)

Working Memory Reselection for Attended Information: Feature-Specific Working Memory Gates. HUI CHEN, *Zhejiang University*, PING ZHU, *Zhejiang University*, YINGTAO FU, *Zhejiang University*, BRAD WYBLE, *The Pennsylvania State University*, MOWEI SHEN, *Zhejiang University* — Attention is commonly believed to play an obligatory role in opening working memory (WM) gate. However, in most previous studies the attended information was also the to-be-remembered one. Here, we created a novel design separating attending and remembering and found that WM even reselected information that had been fully attended and used to perform a task (Experiments 1-3). More importantly, we demonstrated that such a WM reselection process operated in a feature-specific manner (Experiments 4-7). That is, there exists a specific WM gate for each feature dimension (e.g., the color gate, shape gate), and the reselection could occur between different feature gates, but not within the gate. The brain could be able to selectively open the color gate while close the shape gate at one time, even though both the color and shape were attended. However, once the color gate is open, all attended colors would be selected into WM.

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9:40-9:55 AM (24)

Repulsion and Attraction Between Sequential Representations: From Perception to Working Memory Retrieval. YOSUKE SAKAMOTO, *Kyoto University*, HIROSHI ASHIDA, *Kyoto University*, SHIN'YA NISHIDA, *Kyoto University*, KIYOFUMI MIYOSHI, *Kyoto University* — To investigate sequential dependency among representations of multiple visual stimuli, we asked participants to encode the directions of three dot motion stimuli for a subsequent report. We found that the perceived direction of the third stimulus, measured by immediate perceptual discrimination, was repulsed away from the preceding stimuli. By contrast, the third stimulus was reported to be attracted to the preceding stimuli when the report was made after a time interval for memory retention. The representational dynamics in the process from perception to working memory retrieval may offer a unified account of the repulsive/attractive interactions. We propose that an ecologically adaptive mechanism underlies these interferences such that the perceptual repulsion yields advantages in detecting differences in the external world, whereas the attraction in memory retrieval results from parsimonious allocation of limited brain capacity.

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Recall I

Friday, November 18, 2022, 8:00-9:40 AM US EST, Back Bay C

Chaired by Khena M. Swallow, *Cornell University*

8:00-8:15 AM (25)

Electrophysiological Correlates of Temporal Selection During Episodic Encoding. ADAM W. BROITMAN, *Cornell University*, KHENA M. SWALLOW, *Cornell University* — Attention varies over time, and this affects episodic encoding. Recent work suggests behaviorally relevant moments are prioritized for encoding via mechanisms that briefly, but broadly, facilitate perception and memory (temporal selection). With the Attentional Boost Effect (ABE), responding to a target in a detection task (e.g., a red square) enhances the encoding of other concurrently presented but unrelated items (e.g., the word it appeared with). If the ABE reflects temporal selection, then it should immediately affect neural processing and boost momentary context memory. In an EEG study, we asked participants to perform a target detection task as they memorized and then recalled lists of words. Relative to distractors, targets modulated EEG frequency bands associated with attention and successful encoding, particularly for words that were later recalled. An additional study demonstrated that temporal

selection enhanced relational memory between a word and the stimuli it appeared with, but not its association with other words or its temporal context. The results suggest that target detection during encoding engages neural systems involved in attention and episodic memory and may enhance momentary event representations.

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8:20–8:35 AM (26)

Optimal Policies for Free Recall. QIONG ZHANG, *Rutgers University – New Brunswick*, THOMAS L. GRIFFITHS, *Princeton University*, KENNETH A. NORMAN, *Princeton University* — There is rich structure in the order in which studied material is recalled in a free recall task. Extensive effort has been directed at understanding the processes and representations that give rise to this structure; however, it remains unclear why certain types of recall organization might be favored in the first place. We provide a rational analysis of the free recall task, deriving the optimal policy for recalling items under the internal representations and processes described by the Context Maintenance and Retrieval (CMR) model of memory search (Polyn et al., 2009). Our model, which we call rational-CMR, shows that the optimal policy for free recall is to start from the beginning of the list and then sequentially recall forwards, providing a rational account of the primacy and forward asymmetry effects typically observed in free recall. In addition, when recall is not initiated from the beginning of the list, it is optimal during recall transitions to minimize the amount of forward asymmetry. Predictions from the rational model are confirmed in human behavioral data. We discuss the resemblance of the optimal behavior in free recall to participants' behavior when applying mnemonic techniques such as the method of loci.

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8:40–8:55 AM (27)

MEMCONS: How Contemporaneous Note-Taking Shapes Memory for Conversation. SARAH BROWN-SCHMIDT, *Vanderbilt University,* CHRISTOPHER JAEGER, *Baylor University,* MELISSA J. EVANS, *Vanderbilt University*, AARON BENJAMIN, *University of Illinois Urbana-Champaign* — Written memoranda of conversations, or MEMCONS, provide a near-contemporaneous record of what was said in conversation and offer important historical and political insights into high-profile conversations. We assess the impact of writing a memcon on the writer's memory for conversation. Pairs of participants engaged in conversation and were asked to recall the conversation contents 1 week later. One participant in each pair memorialized the conversation in a memcon shortly after the conversation; the other did not. After a 1-week delay, participants who generated memcons recalled more details of the conversation, but the two groups were equivalently accurate. While most aspects of the prior conversation were forgotten after 1 week, most volunteered information was accurate. Remarkably, < 5% of the details of the conversation were recalled by both partners after 1 week, indicating that shared recall of conversational details is uncommon. Contemporaneous note-taking appears to enhance memory for conversation by increasing the amount of information produced but not its accuracy. Our findings have implications for evaluating the testimony of participants regarding conversations, with major political or legal ramifications.

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9:00–9:15 AM (28)

Is Word Learning Capacity Restored After a Daytime Nap? JAKKE TAMMINEN, *Royal Holloway, University of London*, JESSICA MARCH, *Royal Holloway, University of London*, JESSIE RICKETTS, *Royal Holloway, University of London* — The synaptic homeostasis hypothesis proposes that new learning gradually saturates memory encoding capacity during wake and that slow-wave sleep restores it. While the role of sleep in consolidating newly learned words has been extensively documented, the impact of sleep in restoring the capacity to encode new words and to integrate them in the mental lexicon is unknown. Our participants took a polysomnographically-monitored daytime nap or remained awake prior to learning new spoken words. Shortly after learning, and again the next day, we measured participants' episodic memory for the new words through cued recall as well as the degree to which the new words had been integrated in the mental lexicon. Pre-learning nap did not increase number of correct cued recall responses but did result in more accurate responses. It had no impact on lexical integration. Slow-wave activity during the nap did not predict any subsequent word learning measure. Participants who generated more sleep spindles, however, showed larger increases in lexical integration between the first and second test. We suggest that a pre-learning nap may have some benefits for learning new words, but these are more likely to be mediated by spindles than slow-waves.

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9:20–9:35 AM (29)

Retrieval-Based Learning in a Sample of Special-Needs Students. TOBIAS TEMPEL, *Pädagogische Hochschule Ludwigsburg* — Retrieval-based learning has been investigated in various populations. Mostly, testing is found to be superior to other forms of practice (restudy usually), enhancing memory for tested material more strongly. This benefit of testing appears to be very robust and not to depend much on individual differences. The present study examined whether students at special-needs schools with educational tracks for below-average levels of cognitive abilities would benefit as well. Practice type (testing, restudy) was manipulated within participants. In a first session, participants either received alternating test and study cycles after initial presentation of the item set, or they received repeated study cycles only. A second session then comprised the opposite form of practice for another item set. In both sessions, a final test assessed memory after a short distractor phase. This procedure was applied to two different kinds of item material. For both (images and image-word pairs), a testing effect occurred, i.e., higher recall of tested items. These results document a benefit of retrieval-based learning for students at special-needs schools that typically involve much less experience with being tested than regular schools, if any.

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Event Cognition

Friday, November 18, 2022, 8:00-9:40 AM US EST, Constitution AB

Chaired by Jonathon D. Crystal, *Indiana University*

8:00-8:15 AM (30)

Validation of a Rodent Model of Episodic Memory Replay. JONATHON D. CRYSTAL, *Indiana University*, CASSANDRA SHERIDAN, *Indiana University*, DANIELLE PANOZ-BROWN, *Indiana University* — Vivid episodic memories in people have been characterized as the replay of multiple unique events in sequential order. We recently showed that rats remember multiple unique episodes (Panoz-Brown et al., 2016, Current Biology) and the order in which the events occur by engaging hippocampal-dependent episodic memory replay (Panoz-Brown et al., 2018, Current Biology), a process by which the rat searches its representations in episodic memory in sequential order to find information. To document episodic memory, it is necessary to rule out the hypothesis that rats judged memory trace strength, which covaries with sequentially presented items. Here, we directly manipulated memory trace strength by manipulating the odor intensity of target items in a list of odors and in a subsequent memory assessment. We used Bayesian statistics to document substantial evidence that rats relied on episodic memory replay in conditions in which reliance on memory trace strength is ruled out. We conclude that rats replay episodic memories.

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8:20-8:35 AM (31)

Event Segmentation in Story Listening Using Deep Language Models. MANOJ KUMAR, *Princeton University*, ARIEL GOLDSTEIN, *Princeton University*, SEBASTIAN MICHELMANN, *Princeton University*, JEFFREY M. ZACKS, *Washington University in St. Louis*, KENNETH A. NORMAN, *Princeton University* — Event segmentation theory posits that we segment continuous experience into discrete events and event boundaries occur at large transient increases in prediction error, often related to context changes. Identifying event boundaries a priori has been difficult in naturalistic settings. To overcome this challenge for story listening, we used a deep learning language model (GPT-2) to compute the predicted probability distributions of the next word at each point in the story. For 3 stories, we computed the surprise, the entropy, and the Bayesian surprise. We then asked participants to listen to these stories while marking event boundaries. We used regression models to compare the GPT-2 measures and the human segmentation data. We found that event boundaries are associated with transient increases in Bayesian surprise. This supports the hypothesis that prediction error serves as a control mechanism governing event segmentation and points to important differences between operational definitions of prediction error.

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8:40-8:55 AM (32)

Serial Position Curves for Components of Events: Beginnings Are Recalled First and Better. MAVERICK E. SMITH, *Washington University in St. Louis*, ASHWIN V. SRINIVASAN, *Washington University in St. Louis*, JEFFREY M. ZACKS, *Washington University in St. Louis* — Some models of event encoding predict that the beginnings of events are preferentially encoded in long-term memory (e.g., Zacks et al., 2007, Psychological Bulletin)—a primacy effect. However, people selectively attend to and remember the end of goal-related actions (e.g., Lakusta & Landau, 2012, Cognitive Science), which tend to align with the end of events—suggesting the possibility of a recency effect. To test for primacy and recency in event memory, we reanalyzed data from a paradigm in which participants segmented movies of everyday activities and then recalled them. Each recall protocol was divided based on the viewers' segmentation data, and serial position curves were computed for first mention of micro-actions and overall recall of micro-actions within each event. We found strong evidence of primacy: Participants recalled micro-actions from event beginnings more frequently and were more likely to mention them first within an event. Models of event encoding in which information is gated into event representations at event boundaries provide a natural explanation for this effect.

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9:00-9:15 AM (33)

Evaluating Sources of Error in Temporal Binding Tasks. LAURA SAAD, *Rutgers University*, PERNILLE HEMMER, *Rutgers University*, JULIEN MUSOLINO, *Rutgers University* — Temporal Binding (TB) is the subjective compression between a voluntary action and its associated outcome and is standardly regarded as an implicit measure of the sense of agency (Haggard, 2017), though an underlying mechanism has yet to be agreed upon (Hoerl et al., 2020). We previously reported results from Bayesian generative model simulations of two publicly available datasets (Weller et al., 2020) and proposed a memory process as an alternative explanation for the observed effect (Saad et al., 2022). Here, we extend these findings by implementing a Bayesian inference model to infer parameter values (e.g., prior mean/variance and memory noise) from the data. We also evaluated other possible predictive factors of TB, including anchoring in recall, reaction time, as well as other sources of individual differences that account for the TB effect. Implications of these results for TB and the sense of agency will be discussed.

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9:20-9:35 AM (34)

The Causal Map: Promoting Creativity by Encouraging the Construction of Alternate Problem Representations. YUN YANG, *Teachers College, Columbia University*, JAMES E. CORTER, *Teachers College, Columbia University* — A new technique for promoting creativity in problem solving is described, termed the "Causal Map." This technique is designed to aid the problem-solver in building an elaborate model of the problem situation that can be used to construct alternative problem representations. These alternative problem representations facilitate producing novel solutions to the problem. An online experiment (N=109) was conducted to compare the effectiveness of the Causal Map technique with two previously proposed methods for promoting creativity: individual brainstorming and the Five Whys technique (Ohno, 1998). Participants were presented with the Elevator Problem (Ackoff, 1978) and were asked to generate multiple solutions under one of the three conditions (randomly assigned). The generated solutions were blind-rated on the dimensions of creativity, originality, effectiveness, and feasibility. Ideational fluency was measured by the number of solutions generated. The solutions generated by participants using the Causal Map technique were best on all these measures, significantly better than brainstorming on fluency and feasibility, and significantly better than the Five Whys technique on fluency, creativity, and originality.

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Cognitive Aging

Friday, November 18, 2022, 8:00-9:40 AM US EST, Republic

Chaired by Julia Spaniol, *Toronto Metropolitan University*

8:00-8:15 AM (35)

Motivated Cognition in Younger and Older Adults: A Meta-Analysis. JULIA SPANIOL, *Toronto Metropolitan University,* LIYANA T. SWIRSKY, *Toronto Metropolitan University*, ERIKA P. SPARROW, *University Health Network*, MARGOT D. SULLIVAN, *Toronto Metropolitan University*, SABRINA VALENZANO, *University of Toronto*, SADIA CHOWDHURY, *University of Toronto* — Motivation shapes cognitive engagement and performance across the lifespan, but the extent to which age differences impact the motivation-cognition interface is still unclear. To shed light on this issue, we meta-analyzed cross-sectional studies comparing the effects of motivation on cognition in younger and older adults in the domains of memory (67 cross-sectional comparisons; N=5,209) and cognitive control (27 cross-sectional comparisons; N=1,908). Overall, the interaction of age and motivation on performance was not significant for either of these cognitive domains. However, in the memory domain, subgroup analyses revealed significant moderation by incentive type. Memory performance in older versus younger adults was less sensitive to gain incentives, with no age difference for loss incentives. Furthermore, memory performance in older adults was more sensitive to socioemotional rewards, whereas performance in younger adults was more sensitive to financial rewards. These findings highlight the need for an updated theoretical framework of motivated cognition across the adult lifespan.

Email: Julia Spaniol, jspaniol@ryerson.ca

8:20-8:35 AM (36)

The Effects of Combined Goal and Valence Framing in Appraisal and Memory of Health Communication in Younger and Older Adults. LIXIA YANG, *Toronto Metropolitan University* — Health communication would be most effective if the content is framed in a way that best captures individuals' information processing style. Relative to younger adults, older adults showed a preference and memory advantages for appeals framed to feature emotion goals (e.g., loving or caring) or positive outcomes (e.g., benefits of a health behaviour). This study examined whether combining goal (emotion vs. future) and valence framing (positive vs. negative) could optimize older adults' appraisal (i.e., behaviour intention, informativeness, likeability, and persuasion) and memory of health appeals. Sixty younger (ages 18-29) and 60 older (ages 64-87) adults viewed, rated, and recalled one of the four versions of a health pamphlet, with a unique goal and valence framing combination. Younger adults showed a more favorable appraisal for the future- over emotion-framed pamphlet. Both age groups recalled more content from the emotion- than future-framed pamphlet. Importantly, older adults showed a more favorable appraisal and a weak memory advantage than younger adults only for the positively- and emotion-framed pamphlet. This suggests that combining goal and valence framing could optimize older adults' health communication.

Email: Lixia Yang, lixiay@ryerson.ca

8:40-8:55 AM (37)

"Context Grows Old": Effects of Aging and Cognitive Load on Using Spoken Semantic Context: Evidence from Eye Movements and Pupillometry. BOAZ M. BEN-DAVID, *Reichman University*, TAMI HAREL-ARBELI, *University of Haifa*, YUVAL PALGI, *University of Haifa* — Older adults typically rely on spoken context. As context use is based on cognitive resources that decline with aging, this may pose a conundrum. We tried to elucidate by testing the age-related cost of context. Eye movements were examined as 30 young (18-30 years old) and 30 older adults (60-75 years old) listened to spoken instructions to touch an image on a monitor. The predictability of the target word was manipulated: non-predictive, predictive, or predictive of two images (competition). In tandem, listeners were asked to retain 1 or 4 spoken digits (low or high load) for later recall. Results indicated that: 1) Semantic context facilitated word prediction to the same extent for young and older adults, 2) but older adults were slower and exerted more cognitive resources when processing context. 3) An increase in cognitive load impaired context-based word prediction, indicating the cost of context processing. However, the rate of word recognition was not significantly affected by load. 4) Pupillometry data further suggest the increased cost associated with context processing in older age. In sum, the efficiency of context processing may not be preserved in aging, but older adults can use it to create accurate predictions.

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9:00-9:15 AM (38)

A Longitudinal Study on the Impact of the COVID-19 Pandemic on the Well-Being and Cognitive Functioning of Older Adults. SARAH DE PUE, *KU Leuven*, CÉLINE GILLEBERT, *KU Leuven*, EVA DIERCKX, *Vrije Universiteit Brussel*, EVA VAN DEN BUSSCHE, *KU Leuven* — In earlier research (De Pue et al., 2021), we observed a drastic impact of the first peak of the COVID-19 pandemic on the subjective well-being, sleep, and activity of adults aged 65 years or older in Flanders, Belgium. The impact on subjective cognitive functioning, however, was limited. Since then, periods of lockdown and periods with less strict regulations alternated, but social distancing remained, especially for older adults. To study the longer-term impact of the pandemic on older adults, we reassessed a subsample of older adults from the first measurement moment (N=372) in a second (June-July 2020) and third (December 2020) wave. Results indicated that well-being and activity level increased with decreasing severity of the pandemic, while sleep quality further declined over time. Results for cognitive functioning were mixed. While frequency of cognitive failures increased over time, participants indicated a better general subjective cognitive functioning at the end of the study. Several factors such as biological sex, social network, anxiety and depressive symptoms, and resilience influenced these fluctuations. Our study shows the long-lasting impact of the pandemic on older adults, without full recovery from the first wave.

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9:20-9:35 AM (39)

Modifiable Perceptual Risk Factors Are Associated with Longitudinal Incidents of Falls in Older Adults. ALAN MICHAEL O' DOWD, *Trinity College Dublin & The Irish Longitudinal Study on Ageing*, REBECCA HIRST, *Trinity College Dublin & The Irish Longitudinal Study on Ageing*, ANNALISA SETTI, *University College Cork & The Irish Longitudinal Study on Ageing*, ORNA DONOGHUE, *The Irish Longitudinal Study on Ageing*, ROSE ANNE KENNY, *The Irish Longitudinal Study on Ageing & Mercer's Institute for Successful Ageing at St. James's Hospital*, FIONA N. NEWELL, *Trinity College Dublin* — The precision of temporal multisensory integration declines with age, particularly in older adults with cognitive impairment, reduced mobility, or a history of falls. However, whether long-term patterns of falling and fall risk are associated with temporal audio-visual integration is unclear. Older adults (N = 2,319), drawn from The Irish Longitudinal Study on Ageing (TILDA), were grouped into longitudinal (10-year) trajectories based on self-report fall number (decreasing, stable, increasing) and, separately, fall risk via Timed Up and Go (TUG) performance (stable, declining). Susceptibility to the Sound Induced Flash Illusion (SIFI) was assessed at three stimulus onset asynchronies (70, 150, and 230 ms). Compared to non-fallers, "younger" increasing fallers (53-59 years) showed no difference in illusion susceptibility at 70 ms and 150 ms while the "oldest" increasing fallers (70+ years) showed a larger difference. There was no association between TUG trajectories and SIFI susceptibility. The precision of temporal multisensory integration, which is modifiable, is associated with falls in ageing, possibly linked with visual weighting and inhibition. Our findings shed light on the mechanisms underpinning brain health in older adults.

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Symposium I: Visual Statistical Learning and Attention: A Two-Way Street

Friday, November 18, 2022, 10:00 AM-12:00 PM US EST, Grand Ballroom

Chaired by Louisa Bogaerts, *Ghent University*

Visual stimuli tend to repeatedly appear in the same sequences and spatial configurations. The process by which we detect the statistical regularities in our visual environment is known as "visual statistical learning." While statistical learning has long been described as a type of implicit learning that operates automatically, growing evidence suggests that it not only oftentimes requires attention but can also shape how attention is deployed. This symposium will highlight a series of findings that can help us understand the bidirectional relationship between observers, sensitivity to visual regularities, and the allocation of visual attention. It does this by bringing together speakers from different areas of research: experts on learning and memory who are investigating the modulation of statistical learning performance by attentional allocation on the one hand, and experts on attention who are investigating the ways in which statistical regularities shape attentional biases on the other hand. We end by discussing possible directions for taking an integrative approach to statistical learning and attention forward.

10:05-10:30 AM (SYM1)

Knowledge and Similarity Shape Visual Statistical Learning. TIMOTHY J. VICKERY, *University of Delaware*, LEELAND L. ROGERS, *University of Delaware*, ALYSSA LEVY, *University of Delaware* — When exposed to visual spatiotemporal regularities that are irrelevant to task demands, humans nonetheless often learn them unintentionally. This visual statistical learning (VSL) is typically studied using unfamiliar stimuli such as shapes and patterns in order to minimize the role of prior knowledge of stimuli and their relationships. However, if VSL is ubiquitous in daily life, then it may often occur for familiar objects laden with prior knowledge. How does this shape VSL? We have found that when stimuli belong to two clearly distinct categories, people learn same-category combinations (e.g., two faces) much better than different-category combinations (a face and a scene). This can occur even when the task is unrelated to category and when the category is arbitrary (not linked to similarity) and trained in the lab. It even occurs when category learning happens in a separate phase from exposure to regularities. Similarity also modulates VSL: combinations that are more similar are better learned. We propose that categorical and similarity discontinuities may alter working memory and/or selective attention in a manner that impairs learning of combinations involving items that are more distinct.

10:35-11:00 AM (SYM2)

Learning from Multiple Statistical Sources Over Time. TESS FOREST, *University of Toronto*, NOAM SIEGELMAN, *Haskins Laboratories*, AMY FINN, *University of Toronto* — Our environments are saturated with learnable information, which we can learn quickly and effortlessly. One possibility for how we come to know all of said information so quickly is by learning it all at once. However, we found (Ex. 1-3, N=128) that statistical learning proceeds one structure at a time and that only the learning of one structure can be boosted via effort. Thus, an important question is "What determines which information gets prioritized for limited attentional resources?" Previous studies suggest learners prefer medium complexity information. Here we add that what counts as medium should change as someone learns an input's structure, by testing the hypothesis that attention is directed towards more complicated structures over time. Participants watched 4 simultaneous streams of information that varied in complexity. Reaction times to search trials (Ex. 4, N=75) and eye-tracking (Ex. 5, N=45) indexed where participants attended over time. Using two subject- and trial-specific measures of complexity, we found participants attend to increasingly complex streams over time. Individual differences in learning also predicted attention allocation, hinting the ability to prioritize information relates to learning success.

11:05-11:30 AM (SYM3)

What to Expect When You Are Not Expecting It: How Implicit Regularities Drive Attentional Selection. JAN THEEUWES, *Vrije Universiteit Amsterdam, Institute for Brain and Behavior Amsterdam, & Instituto Superior de Psicologia Aplicada (ISPA) William James Center for Research* — Lingering biases of attentional selection affect the deployment of attention above and beyond top-down and bottom-up control. In this talk I will present an overview of recent studies investigating how statistical learning regarding the distractor determines attentional control. We used the classic additional singleton task in which participants searched for a salient shape singleton while ignoring a color distractor singleton. The distractor singleton was presented more often in one location than in all other locations. Even though observers were not aware of the statistical regularities, we show that the location of the distractor was proactively suppressed relative to all other locations. We show that this learning is highly flexible and adaptive. We argue that selection history modulates the topographical landscape of spatial "priority" maps, such that attention is biased towards locations having a high activation and biased away from locations that are suppressed.

11:35 AM-12:00 PM (SYM4)

Learned Associations for Attentional Guidance and Identity Decisions. JOY GENG, *University of California, Davis*, ZHIHENG ZHOU, *University of California, Davis*, XINGER YU, *University of California, Davis*, PHIL WITKOWSKI, *University of California, Davis* — Models of attention include the concept of a "template" to describe task-relevant information held in memory and used to set attentional priority. During visual search tasks (e.g., looking for a friend in a crowd) information in the template about the target (i.e., the friend) guides attention to potential objects of interest and is then used to decide if the selected object is indeed the target. However, recent work has begun to suggest that the information held in the template is not static, or even unitary. In particular, the initial guidance of attention appears to be highly flexible in response to learned expectations about the sensory environment as well as the actual and associated features of the target, whereas identity decisions are more narrowly bound by defining characteristics. We will discuss behavioral and fMRI experiments looking at the conditions under which attentional guidance and identity decisions use different information and why doing so increases the efficiency of visual search.

Neural Mechanisms of Memory and Cognition
Friday, November 18, 2022, 10:20 AM-12:00 PM US EST, Back Bay A

Chaired by David W. Gow, Jr., *Massachusetts General Hospital/Harvard Medical School*

10:20-10:35 AM (40)

Neural Representation of Abstract Linguistic Variables: Evidence from Integrated Neural Decoding and Effective Connectivity Analyses. DAVID W. GOW, JR., *Massachusetts General Hospital/Harvard Medical School*, ENES AVCU, *Massachusetts General Hospital/Harvard Medical School*, ADRIANA SCHOENHAUT, *Massachusetts General Hospital*, DAVID SORENSEN, *Harvard-MIT Division of Health Sciences and Technology*, SKYLA M. LYNCH, *Massachusetts General Hospital*, SEPPO P. AHLFORS, *Athinoula A. Martinos Center for Biomedical Imaging* — The generativity that allows language users to evaluate or generate novel, well-formed linguistic structures depends on abstract representations (variables). To determine whether there is a neural basis for such abstract representations, we examined whether previously unheard nonsense words evoked localized patterns of activation that support machine learning categorization (i.e., neural decoding) of syllable reduplication and explored potential causal downstream consequences of those localized activations using effective connectivity measures. Our results showed that the within-region activity of a small set of temporal lobe regions known to be associated with the representation of phonetic and phonological structure supported the decoding of syllable reduplication, and decodable signals from these regions causally influenced downstream processes. Control analyses confirmed decoding effects were separable from low-level repetition enhancement or task-specific processing demands. Collectively, the results suggest that the localized activation patterns function as neural representations of a property, i.e., syllable reduplication, which appears to require abstract variable-like representation.

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10:40-10:55 AM (41)

Listening Over Time: Single-Trial Oscillatory EEG Measures of Listening Effort and Listening-Related Fatigue. CYNTHIA R. HUNTER, *University of Kansas* — Listening effort refers to using attentional resources to understand speech in noisy or otherwise adverse conditions. Listening effort leads to subjective fatigue; however, objective measures of listening-related fatigue are lacking. The current study used single-trial analysis to index effects of both listening effort and listening-related fatigue on oscillatory EEG power in the alpha (8-12 Hz) and theta (4-8 Hz) frequency bands. Middle-aged adults (n = 12; age range = 37 - 65 years) listened to spoken sentences in a background of multi-talker babble at a range of signal-to-noise ratios (SNRs) relative to an individualized SNR corresponding to a speech recognition threshold. Increased power at later trials in both frequency bands appeared to track the development of listening-related fatigue. Power changes in both frequency bands also tracked with SNR, such that alpha power decreased for lower (poorer) SNRs, whereas theta power increased at lower SNRs. However, the linear effect of SNR on alpha power emerged only at later trials. Results indicate that alpha and theta power may index listening-related fatigue in addition to listening effort and that the alpha-band index of listening effort is affected by fatigue.

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11:00-11:15 AM (42)

Meta-Analysis of Executive Function Training: fMRI Evidence for Differential Changes in Attentional Networks and Dorsal Striatum. CHANDRAMALLIKA BASAK, *University of Texas at Dallas*, RAHUL RAJESH, *University of Texas at Dallas*, JOHN MOORMAN, *University of Texas at Dallas*, MILAN BASAK-ODISIO, *School for the Talented and Gifted, Dallas, TX*, VAISHNAVI MOTURI, *Centennial High School, Frisco, TX*, FARHAN ALI, *University of Texas at Dallas* — Executive Function Training (EFT) is argued to improve broad cognitive abilities. However, the neural mechanisms of EFT-related improvements are unknown because both increases and decreases in activation have been reported. We examined not only the overall effect of EFT, but also the separate effects of switching, updating, and inhibition subprocesses on changes in fMRI activations in healthy adults. The final data set included 33 publications (20 updating, 6 shifting, 6 inhibition, 1 combination) with a total of 1,321 subjects and 336 foci used for analysis with GingerALE. EFT effects are seen in central executive network (CEN), salience network and dorsal striatum, implicated in cognitive control and learning, with increased activation in CEN and neural efficiency in dorsal striatum and left IFG. Comparison of training vs. transfer tasks suggests that increased activation of the prefrontal cortex could generalize to broad transfer. Age, training duration, and subprocesses differentially impacted patterns of brain activations.

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11:20-11:35 AM (43)

Common Suppressive Effects of Prediction Across the Brain: Links Between Corticospinal and Sensory Attenuation. EVAN J. LIVESEY, *The University of Sydney*, DOMINIC M.D TRAN, *The University of Sydney*, NICOLAS MCNAIR, *The University of Sydney*, ALEXIS WHITTON, *Black Dog Institute*, THOMAS WHITFORD, *UNSW Sydney* — When sensations are predicted by one's actions or external cues, neural activity is suppressed compared to unexpected sensations. A similar effect is observed when stimulating the motor system with transcranial magnetic stimulation (TMS); predictable TMS excites the motor system less effectively than unpredicted TMS. Using combined TMS-EEG, we measured attenuation to motor cortex stimulation using motor-evoked potentials (MEPs) and sensory attenuation to the sound of the TMS coil using the N1 component of the event-related potential. We found MEP attenuation and N1 suppression when the TMS pulse was predicted, relative to unpredictable TMS. Critically, the magnitude of ERP suppression predicted the magnitude of MEP suppression. We also verified that the MEP attenuation effect is caused by predicting motor system stimulation rather than predicting the sensory byproducts of TMS. Our results reveal a close correspondence between attenuation of the sensory and motor systems despite their different origins. The findings reveal commonalities between predictive downweighting across distinct neural systems, suggesting that domain-general mechanisms may be responsible for predictive coding of neural representations throughout the brain.

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11:40-11:55 AM (44)

Neural Correlates of Cognitive Offloading and Directed Forgetting: Similar But Not Identical. SAM GILBERT, *University College London*, PEI-CHUN TSAI, *University College London*, CHIARA SCARAMPI, *University of Geneva*, CHHAVI SACHDEVA, *University College London* — People often choose between storing to-be-remembered information in internal memory or offloading it to an external store, e.g., writing it down. Offloaded information is subsequently less accessible in memory. This suggests that offloading engages similar mechanisms to directed forgetting to dismiss offloaded information from memory. We tested this hypothesis with fMRI. Participants (n=36) repeatedly encoded picture stimuli. After encoding they were cued to A) remember the stimuli for a test, B) forget (there will be no test), or C) offload (a reminder will be available). There was sustained neural representation of stimuli in the remember condition. This was diminished in the forget and offload conditions (which did not differ from each other), providing evidence that the stimulus was removed from memory. Compared with the remember cue, the cues to forget and to offload yielded similar patterns of activation in a predominantly frontoparietal network. A region of inferior parietal cortex was uniquely activated by the forget cue only. Therefore, neural correlates of directed forgetting and cognitive offloading are substantially similar, leading to diminished neural representation of previously-encoded information, but not identical.

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Attention I

Friday, November 18, 2022,
10:20 AM-12:00 PM US EST, Independence

Chaired by Geoffrey Woodman, *Vanderbilt University*

10:20-10:35 AM (45)

Multiple Long-Term Memories Simultaneously Guide Attention. GEOFFREY WOODMAN, *Vanderbilt University*, SISI WANG, *Vanderbilt University* — How do we know what we are looking for in familiar surroundings? One proposal is that working memory buffers a single memory representation that controls attention. Contrary to this view, here we show that human observers rapidly learn the statistical distribution of incidental target features in their environment (i.e., color) and use this information to provide top-down guidance of attention to multiple possible targets at the same time. Next, we ruled out alternative explanations based on priming and other known phenomena. Finally, noninvasive recordings of electrical brain activity showed that the deployment of attention to possible targets occurred simultaneously, and that the faster reactions times to detect targets in highly likely colors were due to the brain making faster decisions about these objects. Thus, our results show that multiple long-term memory representations can simultaneously guide attention toward potential targets, explaining how it is that humans can perform complex tasks such as driving in which we remain vigilant for multiple potential threats or targets at the same time.

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10:40-10:55 AM (46)

Effects of Basic and Superordinate Category Labels on Visual Memory of Objects. SYDNEY SCHABACKER, *California State University San Marcos*, CARRICK C. WILLIAMS, *California State University, San Marcos* — Objects sharing category labels (e.g., several different apples) can interfere in visual memory, but how flexible are those labels? If an apple were labeled "Fruit," would a picture of a banana interfere? In the current study, participants saw critical object picture/label combinations (an apple picture labeled either "Fruit" or "Apple"). Subsequently presented objects could match the critical objects on their basic level (e.g., an apple), superordinate level (e.g., a banana), or neither (e.g., soap). A 2AFC memory test followed. As expected, when objects were referenced by the basic label (e.g., an apple labeled "Apple"), basic category/label matches resulted in retroactive interference; superordinate matched objects (e.g., a banana labeled "Banana"), on the other hand, did not retroactively interfere. In contrast, when objects were labeled with the superordinate category (e.g., an apple labeled "Fruit"), all interference conditions were remembered equally well, indicating a shift in the organization in visual memory with the superordinate label. Referring to objects by their superordinate level may emphasize what makes these objects distinct from the category rather than similar, insulating the visual memories from interference.

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11:00-11:15 AM (47)

Report on NCI's Cognition and Medical Image Perception Think Tank. TODD S. HOROWITZ, *National Cancer Institute*, MELISSA TREVIÑO, *National Institutes of Health*, GEORGE BIRDSONG, *Emory University School of Medicine*, ANN CARRIGAN, *Macquarie University*, PETER CHOYKE, *National Cancer Institute*, TRAFTON DREW, *The University of Utah*, MIGUEL ECKSTEIN, *University of California, Santa Barbara*, ANNA T. FERNANDEZ, *Booz Allen Hamilton*, MARYELLEN GIGER, *University of Chicago*, STEPHEN HEWITT, *Laboratory of Pathology, Center for Cancer Research, National Cancer Institute, National Institutes of Health*, YUHONG JIANG, *University of Minnesota*, BONNIE KUDRICK, *HumanLink LLC*, SUSANA MARTINEZ-CONDE, *SUNY Downstate Medical Center*, STEPHEN MITROFF, *The George Washington University*, LINDA NEBELING, *Behavioral Research Program, National Cancer Institute*, JOEL H. SALTZ, *Stony Brook University*, STEVEN SELTZER, *Brigham and Women's Hospital/Harvard Medical School*, BEHROUZ SHABESTARI, *National Technology Centers Program, National Institute of Biomedical Imaging and Bioengineering*, LALITHA K. SHANKAR, *Clinical Trials Branch, Cancer Imaging Program, National Cancer Institute*, ELIOT SIEGEL, *University of Maryland School of Medicine*, MIKE TILKIN, *American College of Radiology*, JENNIFER S. TRUEBLOOD, *Indiana University*, ALISON VAN DYKE, *National Cancer Institute*, ARADHANA VENKATESAN, *MD Anderson Cancer Center*, DAVID WHITNEY, *University of California, Berkeley*, JEREMY M. WOLFE, *Brigham and Women's Hospital/Harvard Medical School* — New medical imaging modalities, the shift to digital technologies, and the rise of machine learning and artificial intelligence are transforming the way we peer into the human body. However, none of these technologies can reach their potential if they ignore the humans who interpret the images and algorithms. How can we best move the science of medical image perception forward? In September 2019, the National Cancer Institute (NCI) convened a multidisciplinary "Think Tank" to identify actions to advance medical image perception research. In this talk, I will outline the findings from the Think Tank, including key research questions from the clinical perspective, and how cognitive and perception research can address these questions. Advancing medical image perception research requires active multidisciplinary collaboration between clinicians and the cognition and perception research community. Together, we can improve detection and diagnosis of disease while also advancing psychonomic science.

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11:20-11:35 AM (48)

The Subjective Experience of Mind Wandering and the Heuristic Basis of Feelings of Inattention. NICHOLAUS P. BROSOWSKY, *University of Manitoba*, DONG JOO LEE, *University of Manitoba* — Mind wandering is a common experience in which your attention drifts away from a focal task and toward unrelated thoughts. To measure mind wandering in the lab, we typically use experience sampling and retrospective self-reports, which require

participants to make metacognitive judgments about their immediately preceding attentional states. We recently discovered that people rely on two kinds of information to make these mind wandering judgments: explicit memories of their thoughts and subjective feelings of inattention. In this project, we investigated the heuristic basis of those feelings of inattention. We present new experiments exploring how (dis)fluency of processing, expectations, and discrepant (dis)fluency are used to make judgments of mind wandering. We discuss the theoretical implications of (dis)fluency-driven mind wandering experiences, as well as the potential importance of measuring subjective feelings of inattention in future research on mind wandering.

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11:40–11:55 AM (49)

Effects of Task Type on Spontaneous Alternations of Attentional States. RANXIAO FRANCES WANG, *University of Illinois Urbana-Champaign*, MARK WEBER, *University of Illinois Urbana-Champaign*, EMILY CUNNINGHAM, *University of Illinois Urbana-Champaign*, DIANE M. BECK, *University of Illinois Urbana-Champaign*, SEPIDEH SADAGHIANI, *University of Illinois Urbana-Champaign* — Mind wandering is a common occurrence that can have serious consequences. Estimating when mind wandering occurs is a challenging research question. Previous research showed that during a meditation task, people may spontaneously alternate between task focus and mind wandering states without awareness (Zukosky & Wang, 2021). The present study examined the effects of task type on spontaneous alternations between task focus and mind wandering. Besides the meditation task, participants performed RSVP scene categorization task (SC) or a Metacontrast masking target detection task (MCM) while their attentional focus was assessed with self-caught and probe-caught techniques. As in previous research, the proportion of focus response and the attentional focus ratings remained constant throughout the focus-mind wandering episode in the meditation task. However, they showed a significant slope in the SC and MCM tasks. These findings support the hypothesis that spontaneous alternations of attentional states without self-awareness occur during tasks emphasizing internally oriented attention.

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Bilingualism: Developmental Processes

Friday, November 18, 2022,
10:20 AM–12:00 PM US EST, Back Bay B

Chaired by Catherine L. Caldwell-Harris, *Boston University*

10:20–10:35 AM (50)

Understanding the Nature of Bilingualism: Multimodal Network Approaches Reveal Dynamic Effects of Bilingualism for Language and Cognition. ELEONORA ROSSI, *University of Florida*, DAVID CAÑARTE, *University of Florida*, REINADO CABRERA PEREZ, *University of Florida*, ESTER NAVARRO, *Tufts University Center for Applied Brain and Cognitive Sciences* — Recent research has attempted to describe the variability of the bilingual experience through measures to characterize individual differences in bi/multilinguals and its multifaceted social use. In turn, little is known about how the characteristics of the speaker's personal social network can reveal variability in the linguistic and cognitive profile of the speakers themselves. In a series of studies, we apply personal social network methodology and psychometric modeling to understand how characteristics of one's personal social network can shape the individual's language and cognitive experience across different stages of life. Preliminary results reveal that characteristics of language use in the personal social network moderate performance in a number of cognitive tasks and variability in language use for the speaker. These data support the use of social network tools to measure variability in language experience, overall suggesting that bilingualism is influenced by a multiplicity of factors that varies within and across individuals.

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10:40–10:55 AM (51)

Effects of Bilingualism and DLD on How Children Learn and Process Words. TAMAR DEGANI, *University of Haifa*, LARA BARAK, *University of Haifa*, RAMA NOVOGRODSKY, *University of Haifa* — Bilingual children may experience difficulty in lexical retrieval due to reduced frequency of use or to competition from the other language they know. To examine these mechanisms, the same children performed a lexical-retrieval task and a novel word learning task, as the latter eliminates frequency differences between monolinguals and bilinguals. Further, learning words with an unfamiliar referent, to which children do not have a name in their known languages, reduces competition. Preschoolers (N = 101) in four groups (Hebrew monolinguals or Russian-Hebrew bilinguals, with developmental language disorder or typical language development) performed a Hebrew object naming task and learned 12 novel words (6 with a familiar referent and 6 with a novel referent). Language disorder negatively affected both learning and lexical retrieval. Critically, bilingualism did not affect learning or interact with referent type, but bilinguals named objects less accurately than monolinguals. Thus, when baseline frequency differences were eliminated during learning, no bilingualism effect emerged, irrespective of potential competition from known words, highlighting the role of reduced frequency of exposure in explaining bilingual performance.

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11:00–11:15 AM (52)

Examining Language Aptitude in Autistic Adults: A Bimodal Distribution of Ability. CATHERINE L. CALDWELL-HARRIS, *Boston University*, FRANCES WENRICH, *Boston University*, JACOB WELCH, *Boston University* — Persons on the autism spectrum may show hypo- or hyper-sensitivity in diverse psychological domains, not just sensory sensitivities. As part of a broad survey of foreign language learning outcomes and experiences, we assessed the

language aptitude abilities of 114 autistic adults, recruited from social media sites. They were compared to 112 neurotypical adults. Autistic participants reported learning on average 2.7 foreign languages compared to 1.4 languages reported by neurotypical respondents, a statistically reliable difference. Autism Quotient scores correlated positively with Parts of Speech and Sound it Out tests. Autistic learners reported using self-study methods, whereas more neurotypicals learned via formal education. Pertinent to the hypo/hyper ability question, the neurotypical sample had a standard normal distribution for all aptitude tests, but distributions of scores for the autistic individuals had two modes, indicating respondents either had low or high language aptitude. This is consistent with language being a special interest and domain of achievement for some autistic persons, while language learning and use pose challenges for others.

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11:20-11:35 AM (53)

Higher L2 Proficiency Is Associated with Greater Sensitivity to Distant Connections and Community Structure in the Phonological Lexicon. CYNTHIA SQ SIEW, *National University of Singapore*, NICHOL CASTRO, *University at Buffalo, SUNY*, JAZTON CHERN, *National University of Singapore* — The phonological similarity network of English words has both small-world structure and community structure. In this study we investigated whether L2 speakers of English are sensitive to the overall similarity structure of the phonological lexicon, and whether this sensitivity is affected by the level of proficiency in their L2. Participants with diverse L1s (with English as their L2) were recruited to complete a phonological similarity rating task where they listened to pairs of English words and provided similarity judgments for word pairs of varying path lengths and community membership. Path length in the phonological network represented the number of steps needed to traverse from one word to another word in the network. Word pairs were either from the same phonological community or different communities. English proficiency was assessed using LexTALE (Lemhöfer & Broersma, 2012). Results indicated that participants with higher LexTALE scores showed greater sensitivity to both community membership of word pairs as well as phonological distance between words at shorter path lengths. The findings have implications for understanding how large-scale structure of the phonological network develops with increasing L2 proficiency.

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11:40-11:55 AM (54)

Modeling the Bilingual Advantage: Do Results Differ Between Fixed and Mixed-Effects Analyses? ADAM J. PRIVITERA, *Wenzhou-Kean University*, MOHAMMAD MOMENIAN, *The Hong Kong Polytechnic University*, BRENDAN S. WEEKES, *The University of Hong Kong* — Whether bilingualism results in improved executive function remains controversial. One recurring argument is that previously reported bilingual advantages can be better explained by differences in non-linguistic variables including socioeconomic status, culture, and education. While studies have addressed these concerns by recruiting carefully matched samples, the standard fixed effect analysis methods used ignore additional non-trivial individual differences in task performance. Does the use of mixed-effects models, which take differences in task performance across participants into account, influence the emergence of bilingual advantages? To investigate this question, Simon task data from Mandarin-English-speaking Chinese adolescents were analyzed using separate fixed and mixed-effects models. While results from both models support improved inhibitory control associated with higher English proficiency, a number of significant linguistic variable main effects reported in the exclusively fixed-effects model became non-significant after individual differences in task performance were accounted for. Implications for future investigations of the bilingual advantage are discussed.

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Test Effects

Friday, November 18, 2022, 10:00 AM-12:00 PM US EST, Constitution AB

Chaired by Neil Mulligan, *University of North Carolina at Chapel Hill*

10:00-10:15 AM (55)

The Testing Effect with Free Recall: Organization, Attention, and Order Effects. NEIL MULLIGAN, *University of North Carolina at Chapel Hill*, ZACH BUCHIN, *Union College*, JOHN T. WEST, *University of North Carolina at Chapel Hill* — Memory retrieval not only reveals but can also change memory as shown by direct and indirect (e.g., forward) testing effects. Two experiments examined the testing effect with free recall, with respect to attention, organization, and forward testing effects. In Experiment 1, participants learned two categorized word lists, one followed by repeated retrieval practice and the other followed by repeated restudy; memory for both lists was assessed on a final free recall test 2 days later. Final recall was significantly diminished by divided attention in the restudy but not retrieval condition, indicating that the testing effect is relatively resistant to distraction. However, a negative testing effect was found on final recall. Experiment 2 implemented a between-subjects design in which both learning blocks were in the retrieval or restudy condition. Final recall now exhibited a positive testing effect. Analyses of the order of learning blocks revealed strong forward-testing effects in which the study list following the retrieval block produced superior final recall, a benefit accruing to the restudy condition in the within-subject design and to the retrieval condition in the between-subjects design.

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10:20-10:35 AM (56)

Just What the Doctor Ordered: Prescribing Retrieval Practice Improves Memory and Metamemory for Important Medication-Related Information. ROBERT ARIEL, *Virginia Wesleyan University*, S. UMA TAUBER, *Texas Christian University* — A major barrier to effective medication adherence is that people often forget most information about their treatment regimens immediately after talking with their physicians. The current experiments investigated the efficacy of using retrieval practice to aid in remembering important medication-related information. Subjects learned about the uses, side effects, drug interactions, and directions for administering six medications by either (1) reading and copying the facts from each medication's drug label or (2) retrieving the drug labels' contents from memory. Subjects who simply read and wrote down the medication facts were more overconfident in their memory for medication-related information than subjects who practiced retrieval. Most important, retrieval practice enhanced memory for medication-related information on both an immediate test (Experiment 1) and a 2-day delayed test (Experiment 2). These data indicate prescribing retrieval practice can aid in remembering important medication-related information and reduce overconfidence in memory to help one safely adhere to their treatment regimen.

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10:40-10:55 AM (57)

Transfer-Appropriate Retrieval Practice. ANDREW C. BUTLER, *Washington University in St. Louis*, LISI WANG, *The University of Texas at Austin*, RACHEL SMITH-PEIRCE, *Washington University in St. Louis*, NATHANIEL WOODWARD, *The University of Texas at Austin* — The concept of transfer-appropriate processing is potentially useful for explaining the mnemonic benefits of retrieval practice, but relatively few studies have empirically tested this theoretical idea. In two experiments, we manipulated the type of practice task (retrieval practice versus restudy), the type of processing induced during practice (item-specific versus relational processing), and the type of processing required by the criterial test (item-specific versus relational processing). The results of the two experiments showed a consistent benefit of retrieval practice relative to restudy when the type of processing was matched across practice tasks and criterial test. When processing was mismatched, this benefit was often eliminated or reversed. These findings were qualified by a failure to observe the expected cross-over interaction between the two processing types within each practice task condition, which suggests difficulty with experimentally isolating each type of processing. Although this study provides support for the utility of transfer-appropriate processing as an explanatory concept, it also demonstrates important limits for informing theory and guiding the use of retrieval practice in education.

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11:00-11:15 AM (58)

A Neurocomputational Model of the Testing Effect and Consequences of Retrieval for Nonretrieved Items. CHARAN RANGANATH, *University of California, Davis*, XIAONAN L. LIU, *The Chinese University of Hong Kong*, RANDALL O'REILLY, *University of California, Davis* — Episodic memory retrieval improves retention relative to repeated study (the testing effect), and it can impair or facilitate retention of nonretrieved information (retrieval induced forgetting/facilitation). These effects pose challenges for traditional models based on Hebbian learning, which predict that, if anything, restudy should result in better retention than retrieval practice. To address these questions, we introduce TEACH (TEsting Activated Cortico-Hippocampal interactions), a new biologically based computational model of retrieval practice effects. TEACH assumes: (1) the hippocampus binds item and context information during learning, (2) retrieval practice results in error-driven learning in the hippocampus, and (3) it enables the hippocampus to effectively drive learning in the neocortex. Simulations show how these principles explain the different ways that testing and restudy impact retention of practiced as well as non-target items. The full range of effects could not be explained by a traditional model assuming that episodic memory is solely supported by Hebbian learning in the hippocampus. We will describe new predictions generated by the model to guide future behavioral and cognitive neuroscience research.

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11:20-11:35 AM (59)

The Benefits and Problems of Multiple-Choice Quizzing with Related Questions. PHILIP HIGHAM, *University of Southampton*, AESHAH ALAMRI, *King Saud University* — Practice answering a multiple-choice (MC) question can benefit performance on a later cued-recall test if an MC lure is the correct answer on the later test. However, if the later test is in MC format and the corrective feedback on the first MC test is included amongst the response options, performance is often impaired. That is, the potential benefit of retrieving lure information during practice is overshadowed by the presence of the feedback (which is now incorrect) on the second MC test. Here, we present experiments that elaborate on the nature of this impairment and explore the boundary conditions. The results indicate that warning people prior to the second test that related-but-different questions never have the same answer had little effect, largely because people falsely believe the second question is repeated, thereby warranting matching answers. However, when students answer the MC questions in a genuine educational environment, benefits are observed that are similar to cued recall. Moreover, if the difference between the MC questions is emphasized by placing the related MC questions back-to-back in a single test, the benefits are enhanced. Both the applied and theoretical implications of these results are discussed.

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11:40-11:55 AM (60)

Do Upfront Reading Assignments Aid Learning Beyond Practice with Feedback? PAULO CARVALHO, *Carnegie Mellon University*, FARIA SANA, *Athabasca University*, KEN KOEDINGER, *Carnegie Mellon University* — Teachers at all levels of education assign textbook materials and papers for students to read. There is plenty of evidence that complementing reading passages with pre- or post-passage practice activities improves learning outcomes. But how does passage reading along with practice activities compare with just completing practice activities? Across three online studies (N = 578, 590, and 584) we demonstrate that completing only practice questions with feedback results in better and more efficient learning (more learning per unit of time spent in instruction) than instruction that complements a passage with either pre (Experiment 1 and 2) or post-passage practice (Experiment 2). This effect holds for both memorization of facts (Experiments 1 and 2) and when learning concepts (Experiment 3). We propose that if feedback is presented during practice, practice will constitute a more powerful instructional event than equivalent passive processing of a text passage. Reactive reading of the feedback after trying to respond increases attention and processing compared to passively reading passages, resulting in more efficient and robust learning.

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Speech Perception I
Friday, November 18, 2022, 10:00 AM-12:00 PM US EST, Back Bay C

Chaired by Ann R. Bradlow, *Northwestern University*

10:00-10:15 AM (61)

Intelligibility-Dependent Cross-Talker Perceptual Adaptation to Second-Language (L2) Speech. ANN R. BRADLOW, *Northwestern University*, ADRIANNA M. BASSARD, *Northwestern University*, KEN A. PALLER, *Northwestern University* — Recent work suggests that cross-talker generalization of perceptual adaptation to L2 speech depends on specific training-test talker combinations rather than on high-variability exposure (Xie, Liu, Jaeger, 2021, J. Exp. Psych: Gen). We explored this proposal with a multi-talker test of L2 English sentence recognition (100 L1 English listeners). Test sentences (15/talker) were produced by 4 L2 English talkers from different L1 backgrounds: Farsi (A), Spanish (B), Portuguese (C), and Turkish (D). Pre-test training involved 8 between-listener conditions: 4 single-talker (ST) (A, B, C, or D) and 4 multiple-talker (MT) (ABC, ABD, ACD, or BCD). Seven of the 8 training conditions resulted in generalized adaptation to L2 English. Critically, ST training with the lowest intelligibility talker (D) provided no benefit over untrained controls for any talker in the multi-talker test including the trained talker (D). Moreover, inclusion of the lowest intelligibility talker in MT conditions (ABD, ACD, and BCD) did not inhibit cross-talker generalization in the test. Thus, by mitigating the inhibitory influence of a low intelligibility talker, high-variability training promoted generalized perceptual adaptation to L2 speech.

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10:20-10:35 AM (62)

Exploring the Onset of Phonetic Drift in Perception. JACKSON KELLOGG, *Boston University*, CHARLES B. CHANG, *Boston University* — Recent exposure to a second language (L2) can influence production and/or perception in the first language (L1), a phenomenon referred to as phonetic drift. The smallest amount of L2 exposure shown to affect drift in perception is 1.5 hours. The present study examined L1 perception at earlier timepoints of L2 exposure to determine whether the phonetic system is able to resist L2 influence at an incipient stage. In a longitudinal pre-test/post-test design, L1 English listeners were exposed to L2 Tagalog under different conditions varying in attention to the voice onset time (VOT) plosive contrast in the L2; they then completed an identification task on L1 tokens from 12-step VOT continua. In every condition there was a decrease in the number of tokens identified as voiceless, which reached significance after 10–30 minutes of L2 exposure. This change indicates a shift towards a longer-lag VOT crossover point between "voiced" and "voiceless" consistent with dissimilatory drift in perception. Listeners in a control condition, however, displayed a similar, albeit smaller, shift in L1 judgments, suggesting the change arose partially from a task effect. We conclude with directions for future research on phonetic drift in perception.

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10:40-10:55 AM (63)

Conflict Monitoring Occurs Across Intelligibility Levels During Speech Recognition in Noise. SUSAN TEUBNER-RHODES, PH.D., *Auburn University*, ANDREW LUU, *Auburn University*, REBECCA DUNTERMAN, *Auburn University* — According to conflict monitoring theory, people increase cognitive control in the service of goal-directed behaviors following conflict, thereby improving subsequent performance. We previously found that conflict improves subsequent speech recognition in noise in an experiment that eliminated stimulus contingencies and repetitions that often account for sequential performance changes. It is unclear how listening demands affect such conflict monitoring. The present study examined how signal-to-noise ratio (SNR) affects conflict monitoring during speech recognition in noise. Participants (N=82) listened to and repeated spoken words presented at +4, +6, or +8 dB SNR in multitalker babble. A congruent ("bat"-bat) or incongruent ("scars"-scarf) picture was presented with each word. Word recognition on incongruent trials improved with increasing SNR, but SNR did not affect conflict monitoring: accuracy on incongruent trials improved significantly (13%-17%) after conflict regardless of SNR. These results suggest that conflict monitoring benefits speech recognition in noise across a range of difficult listening conditions. Our findings join evidence that cognitive control may be instrumental in understanding speech in noisy environments.

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11:00–11:15 AM (64)

The Effect of Transcranial Direct Current Stimulation (tDCS) on Speech Perception in Noise. LEAH FOSTICK, *Ariel University*, RIKI TAITELBEUM-SWEAD, *Ariel University*, ADI LIFSHITZ-BEN-BASAT, *Ariel University* — Speech perception in noise is a challenge to daily auditory functioning. The effect of Transcranial Direct Current Stimulation (tDCS) to improve speech perception in noise was tested stimulating Wernicke's as compared to Broca's area. Stimulation to Wernicke's area included 13 participants, and to Broca's 15. Speech perception was measured using CVC words, two-syllable words, and sentences, accompanied with white noise. Performance was measured four times: at baseline, two sessions of stimulation (one Active, one Sham, randomized though half of the participants received active stimulation first), and at two-weeks follow-up. In both areas, a small learning effect was found, with lower scores in baseline than in other sessions. In Wernicke's area only, higher scores in CVC words and sentences were observed for Active stimulation than Sham when the Active was performed in the later session. tDCS improves speech perception, but only with stimulation to Wernicke's area and combined with sufficient learning.

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11:20–11:35 AM (65)

"Split Listening": Insight into the Tug of War Between Sensory Input and Cognition in Challenging Listening Conditions. SVEN MATTYS, *University of York*, SARAH KNIGHT, *University of York* — An understanding of how listeners can track two talkers simultaneously requires modelling the interaction between bottom-up and top-down processes. The former primarily concern "energetic masking" – interference between simultaneous talkers at the acoustic, sensory-input level. The latter involve cognitive control of attention between talkers. We manipulated: (1) Degree of energetic masking between two talkers – high (voices unfiltered) vs. low (voices in non-overlapping frequency bands); (2) Spatial separation between the talkers, from co-located (diotic) to maximally separated (dichotic). When the voices were unfiltered, transcription performance improved monotonically from diotic to dichotic, indicating a reduction in energetic masking via spatial separation. When the voices were energetically non-overlapping, the benefit of spatial separation disappeared, with transcription performance actually dropping in the dichotic condition. The results indicate that bottom-up processes are dominant during divided-attention listening, but that the challenges of cognitive control can be observed when energetic masking is reduced.

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11:40–11:55 AM (66)

Do Manual Beat Gestures Recalibrate the Perception of Lexical Stress? RONNY BUJOK, *Max Planck Institute for Psycholinguistics*, DAVID PEETERS, *Tilburg University*, ANTJE MEYER, *Max Planck Institute for Psycholinguistics*, HANS RUTGER BOSKER, *Max Planck Institute for Psycholinguistics* — Seeing a talker speak can recalibrate people's perception of segmental speech sounds. That is, repeatedly hearing an ambiguous sound in between /b/ and /d/ while seeing a talker produce /b/ biases perception of a following auditory /b-d/ continuum towards /b/. Here we tested whether this recalibration also occurs for lexical stress driven by manual beat gestures. Two groups of Dutch participants were repeatedly exposed to ambiguously stressed words (audio; in between "CAnon - kaNON"), disambiguated by a manual beat gesture either aligned to the first (Group 1) or second syllable (Group 2). Then both groups were presented with an auditory "CAnon - kaNON" continuum and asked to indicate what word they heard. Group 1 gave more initial stress responses for the same audio-only continuum than Group 2. This suggests that beat gesture alignment in the exposure phase recalibrated participants' perception of lexical stress. Ongoing work investigates whether this recalibration effect generalizes across words by using a different word in exposure. In conclusion, visual cues that are not intrinsically tied to articulation can also reshape the perception of speech.

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False Belief: Memory and Judgment Processes

Friday, November 18, 2022,
10:00 AM–12:00 PM US EST, Republic

Chaired by Lisa Fazio, *Vanderbilt University*

10:00–10:15 AM (67)

Fluent Processing or Convergent Validity: Comparing Two Explanations for Why Repetition Increases Belief. RAUNAK PILLAI, *Vanderbilt University*, LISA FAZIO, *Vanderbilt University* — Repetition increases belief in statements. This illusory truth effect is typically shown using verbatim repetition of statements without a specific source. However, in real life, ideas are repeated with different wordings and come from identifiable people. There are multiple theories for why repetition increases belief. One is that repeated statements feel more true because they are more fluently processed. By this account, verbatim repetition would more greatly increase processing fluency and belief than paraphrased repetition, and the number of sources should not matter. However, repetition may also increase belief by increasing perceived convergent validity—the sense that an idea is believed by many others. Thus, varying the wording and/or source of repeated claims may increase convergent validity, and thereby belief. In Exp 1, participants rated the truth of real-world news headlines after earlier seeing three identical headlines, three paraphrased headlines, or zero headlines of the event. Repetition increased belief, but there was no difference between verbatim and paraphrased repetitions. In a planned Exp 2, we will compare how belief is affected by repetition of headlines from one source or from different sources.

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10:20-10:35 AM (68)

Timing Matters When Correcting Fake News. NADIA M. BRASHIER, *Purdue University*, GORDON PENNYCOOK, *University of Regina*, ADAM J. BERINSKY, *Massachusetts Institute of Technology*, DAVID G. RAND, *Massachusetts Institute of Technology* — One proposed solution to the misinformation crisis involves flagging misleading content. But people often continue to rely on falsehoods, even after receiving explicit corrections. Previously, we mitigated this continued influence effect by providing fact-checks immediately after people judged the accuracy of headlines, rather than before or during accuracy judgments. We recently replicated this finding in a follow-up study involving a more naturalistic task at exposure. Participants (N = 1215) read true and false headlines taken from social media and indicated how willing they would be to share each story. In the treatment conditions, "true" and "false" tags appeared before, during, or after participants read each headline. In a control condition, participants received no information about veracity. One week later, all participants rated the same headlines' accuracy. Providing fact-checks after headlines improved subsequent truth discernment more than providing the same information before or during exposure. The timing of corrective messages matters even when people do not have an explicit accuracy focus initially, a finding that informs both the cognitive science of belief revision and social media platform design.

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10:40-10:55 AM (69)

On the Relationship Between Recognition Judgments and Judgments of Truth: A Memory-States Analysis of the Recognition-Based Truth Effect. LENA NADAREVIC, *University of Mannheim*, EDGAR ERDFELDER, *University of Mannheim* — The truth effect is the phenomenon that repeatedly encountered statements are more likely judged to be true than novel statements. A similar effect is evident when truth judgments are compared as a function of participants' "old" versus "new" recognition judgments. However, it is unclear to what extent this recognition-based truth effect depends on the memory states underlying recognition judgments. We investigated this question by extending the two-high-threshold model of recognition memory with parameters for truth judgments. Our model-based analyses showed that judged truth varies as a function of participants' recognition judgments and the memory states underlying these judgments. More specifically, the truth effect tended to be larger in the state of memory certainty than in the state of memory uncertainty. We further replicated this pattern of results conceptually by analyzing truth judgments as a function of participants' subjective ratings of memory states.

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11:00-11:15 AM (70)

Deep Distortion. CHARLES J. BRAINERD, *Cornell University*, DANIEL M. BIALER, *Cornell University*, MINYU CHANG, *Cornell University*, XINYA LIU, *Cornell University*, VALERIE F. REYNA, *Cornell University* — Fuzzy-trace theory (FTT) supplies process interpretations of quantum cognition models that allow novel effects to be predicted rather than only explained post hoc. The key quantum property--that behavioral probabilities are non-compensatory--falls out of FTT's non-compensatory gist memories. That interpretation predicts a class of gist-driven memory illusions known as deep distortions, which violate classical probability axioms such as additivity, countable additivity, and boundedness. Extensive evidence of three deep distortions has accumulated in conjoint recognition experiments: (a) overdistribution, in which the sum of the probabilities of remembering that an item belongs to each of two incompatible states exceeds the probability of remembering that it belongs to either state; (b) non-additivity, in which the probabilities of remembering that an item belongs to each of a series of mutually exclusive states exceed unity; and (b) impossible conjunctions, in which people remember an item as belonging to two logically incompatible states.

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11:20-11:35 AM (71)

How Does Feedback About a Lineup Identification Influence Susceptibility to Misinformation? KRIS-ANN S. ANDERSON, *University of Louisiana at Lafayette*, ROBERT B. MICHAEL, *University of Louisiana at Lafayette* — When people are given feedback that they correctly identified the suspect in a lineup, their confidence skyrockets. But does the influence of feedback extend beyond meta-cognitive judgments to other behaviors, like how susceptible people are to misinformation? Drawing from related literature, we hypothesized that positive feedback about a lineup identification might encourage people to process post-event information more carefully, reducing susceptibility to misinformation. We tested this idea across three experiments in which participants witnessed an event, made a lineup identification, received misleading post-event information, then took a memory test. Our results show that feedback can potentially increase memory accuracy generally but does not seem to affect susceptibility to misinformation specifically. These findings could have implications for our understanding of memory accuracy in certain eyewitness contexts.

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11:40-11:55 AM (72)

Psychological Inoculation Improves Resilience Against Misinformation on Social Media. SANDER VAN DER LINDEN, *University of Cambridge*, STEPHAN LEWANDOWSKY, *University of Bristol*, JON ROOZENBEEK, *University of Cambridge*, STEVE RATHJE, *University of Cambridge*, BETH GOLDBERG, *Google Jigsaw* — Online misinformation continues to have adverse consequences for society. Although inoculation theory has been put forward as a way to reduce susceptibility to misinformation by teaching people about how they might be misinformed, its scalability has been elusive both at a theoretical and practical level. We developed five short videos that inoculate people against manipulation techniques commonly used in misinformation: emotionally

manipulative language, incoherence, false dichotomies, scapegoating, and ad hominem attacks. In seven preregistered studies —- six randomized controlled studies (n = 6,464) and an ecologically valid field study on YouTube (n = 22,632) –- we find that these videos improve manipulation technique recognition, boost confidence in spotting these techniques, increase people's ability to discern trustworthy from untrustworthy content, and improve the quality of their sharing decisions. These effects are robust across the political spectrum and a wide variety of covariates. We show that psychological inoculation campaigns on social media are effective at improving misinformation resilience at scale.

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Symposium II: Bridging the Gap Between Spoken and Written Language Research

Friday, November 18, 2022, 1:30-3:30 PM US EST, Sheraton Grand Ballroom

Chaired by Kristi Hendrickson, *University of Iowa*

Language relies on intricate relationships between several cognitive processes and multiple sensory modalities. For most individuals, language is accessed across two sensory modalities: auditory (spoken language) and visual (written language). While there is a rich history of literature documenting the cognitive mechanisms underlying each language system, historically these literatures have been somewhat disparate. In the current symposium, we illustrate how research that examines spoken and written language in tandem can: 1) highlight the distinct sensory and cognitive challenges each language system faces; 2) identify a set of core mechanisms of each system in a common set of computational principles; and 3) delineate how each language system is shaped by the other at multiple time scales (from the millisecond unfolding of processing in real-time to the time scale of behavior over years). The talks in this symposium highlight state-of-the-art methods for assessing language abilities and cut across several levels of language processing and production. Finally, an open-forum Q&A at the conclusion of the symposium will provide an opportunity to discuss how to further bridge the gap between these literatures.

1:35-1:50 PM (SYM5)

The Profile of Real-Time Competition in Spoken and Written Word Recognition: More Similar Than Different. KRISTI HENDRICKSON, *University of Iowa*, JINA KIM, *University of Iowa*, HANNAH O'DONNELL, *University of Iowa*, BOB MCMURRAY, *University of Iowa* — Word recognition is a fundamental component of spoken and written language. While spoken and written word recognition face unique challenges, they are both described as a competition process by which multiple lexical candidates compete for recognition. While there is a consensus regarding this competition process during spoken word recognition, there is less consensus for written word recognition. Here, we use a novel version of the Visual World Paradigm to examine real-time spoken and written word recognition. For both spoken and written words, we found evidence for activation of onset competitors (cohorts, e.g., cat, cap) and words that contain the same sounds or letters in reverse order (anadromes, e.g., cat, tack), but not for rhymes (e.g., cat, hat). However, for spoken words, cohorts were more active than anadromes, whereas for written words activation was similar. These results suggest a common characterization of lexical similarity across spoken and written words: temporal order (spoken) or spatial order (written) is coarsely coded, and word onsets receive more weight. However, for spoken words, the signal unfolds over time, which creates temporary ambiguity that gives word onsets an additional boost in activation.

1:55-2:15 PM (SYM6)

The Development of Spoken- and Written-Word Recognition Across Early School-Age Years. KEITH APFELBAUM, *University of Iowa*, JAMIE KLEIN-PACKARD, *University of Iowa*, BOB MCMURRAY, *University of Iowa* — The early school years tax children's developing language skills. School introduces a diversity of new talkers and novel content, as well as the onset of reading education. This causes rapid development in both spoken- and written-word recognition during these years. These developments occur at similar ages, but it is unclear how closely they interact: does spoken-word recognition drive how written-word recognition develops? Previous studies found commonalities across modalities in adults, but less consistency in cross-sectional studies of children. We present results from the first two years of an ongoing longitudinal study that annually measures the spoken- and written-word recognition abilities of 245 elementary-school children, along with high-level language and reading ability, cognitive control, and the home language environment. The data from these first two time points highlight aspects of development specific to language and more general cognitive development. Development of written- and spoken-word recognition shows complex interrelations between these various skills. Additionally, we identify hypotheses for ongoing interactions between these developments in future years of data collection.

2:20-2:40 PM (SYM7)

Linking Speech Perception and Phonology to Reading Disability Via Neural Phase Locking to Speech. MARC F. JOANISSE, *The University of Western Ontario*, CHRISTINE MOREAU, *The University of Western Ontario*, CHRISTINA M. VAN DEN BOSCH DER NEDERLANDEN, *University of Toronto Mississauga* — Language and reading development are intimately linked thanks to the role that phonology plays in spoken and written language. Phonological deficits likewise play a central role in developmental dyslexia. Here we examine how neural entrainment to speech, measured with electroencephalography (EEG), can provide novel insights into this relationship. We examined how EEG responses to speech relate to variability in reading and language scores, within a dataset of 713 children ages 5-18. Cerebro-acoustic phase coherence was used to quantify how well children's EEG activity aligns to the speech contained in a 2.7 minute video. We found that neural tracking in the alpha band significantly predicted children's reading ability, especially as it relates to nonword decoding in reading

and phonological short-term memory. In contrast, theta-band entrainment correlated with a separate set of oral language measures including vocabulary and grammatical development. The findings show that different levels of information in the acoustic signal support learning different types of language and reading representations. Just as importantly, they suggest a way forward in understanding the link between language and reading disorders.

2:45–3:05 PM (SYM8)

Articulation Rate and Cognitive Demands in Serial Naming and Reading. ATHANASSIOS PROTOPAPAS, *University of Oslo*, KATERINA KATOPODI, *University of Athens,* ANGELIKI ALTANI, *University of Oslo*, LAOURA ZIAKA, *University of Oslo*, GEORGE K. GEORGIOU, *University of Alberta* — Serial rapid naming is a strong concurrent and longitudinal predictor of word reading fluency, a crucial index of reading development. In serial naming and reading tasks, simultaneous availability of multiple stimuli affords parallelization while also presenting challenges due to interference from adjacent items. The effect of interference on the efficiency of parallelization may depend on the cognitive demands of the task. Here we focus on articulatory slowdown as an index of cognitive load. Children in Grades 1, 3, and 5 were tested in discrete and serial naming of digits, number words, dice, words, and objects using controlled materials. Spoken and silent intervals were marked in the recorded responses. Articulation times were longer for serial than discrete naming in less automatized tasks and longer for serial dice than serial digits and number words (the exact same words). This suggests that the cognitive demands of serial naming far exceed discrete naming and that some stimuli are inherently more demanding to name than others. Studying these differences in naming tasks provides insights for understanding the cognitive implications of multiple words being simultaneously available when fluently reading sentences.

Statistics and Methodology

Friday, November 18, 2022, 1:30–3:30 PM US EST, Independence

Chaired by Joseph W. Houpt, *The University of Texas at San Antonio*

1:30–1:45 PM (73)

Nonparametric Measurement of Choice and Response Time When Relying on Multiple Information Sources. JOSEPH W. HOUPT, *The University of Texas at San Antonio*, CARA KNEELAND, *U.S. Navy* — Understanding how human performance changes as the amount of information available varies is of particular interest across many basic and applied research topics in psychology. One approach to quantifying these changes is with the assessment functions. The assessment functions are non-parametric measures that compare observed performance to a baseline derived from a model predicting how changes in information influence the system. Critically, the assessment functions account for response-time and accuracy, and hence are applicable in conditions in which speed-accuracy trade-offs can vary. Two potential hindrances to the wider use of the assessment functions are the specific assumptions needed to derive the baseline model and the lack of associated inferential statistics. In this talk, we demonstrate how a fixed accumulator model with a random threshold (i.e., Grice model) representation of the choice/RT data can be leveraged to derive generalized assessment functions and for deriving inferential statistical tests.

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1:50–2:05 PM (74)

Models of Unforced Choice. VICTOR H. CERVANTES, *University of Illinois Urbana-Champaign*, AARON BENJAMIN, *University of Illinois Urbana-Champaign* — Unforced choice tasks are ones in which the responder has the option of selecting from a limited array of choices or rejecting the entire set. Such tasks are common in perceptual and cognitive research, but models of decision-making for unforced choice are sparse in the literature and lack a unifying mathematical framework. Such tasks are important for theoretical development because they contain elements of relative, criterion-independent decision making and also criterion-dependent decision making. We provide a generic signal-detection multivariate framework for developing models of unforced choice. Within this framework, standard unidimensional signal-detection models and forced-choice models are limiting cases. We show how this framework can accommodate all extant models of unforced choice that have been applied to the specific case of lineup memory tasks for eyewitnesses. Exact derivations are provided for each model in both an unrestricted form--in which variances and covariances are relatively free to vary across signal and noise--and in various restricted forms. This framework will aid in the testing of current models and in the development of new models of lineup memory and other tasks involving unforced choice.

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2:10–2:25 PM (75)

Data Quality of Platforms and Panels for Online Behavioral Research. DAVID ROTHSCHILD, *Microsoft Research*, ANDREW GORDON, *Prolific*, EYAL PE'ER, *The Hebrew University of Jerusalem*, EKATERINA DAMER, *Prolific*, ZAK EVERNDEN, *Prolific* — We examined key aspects of data quality for online behavioral research between selected platforms (Amazon Mechanical Turk, CloudResearch, and Prolific) and panels (Qualtrics and Dynata). We first engaged with the behavioral research community to discover which aspects are most critical to researchers and found that these include attention, comprehension, honesty, and reliability. We then explored differences in these data quality aspects in two pre-registered studies (N ~ 4000), with or without data quality filters. We found significant differences between the sites. In Study 1 (without filters), we found that only Prolific provided high data quality on all measures. In Study 2 (with filters), we found high data quality among CloudResearch and Prolific. MTurk showed alarmingly low data quality even with data quality filters. We also found that while reputation did not predict data quality, frequency and purpose of usage did,

especially on MTurk. These results hold important implications for all researchers who are using online samples and provide a framework for future investigation into the ever-changing nature of data quality in online research.

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2:30–2:45 PM (76)

The EPIC Psychology Project: Researcher Perceptions of Participant Engagement in Cognitive Psychology Tasks. JONATHAN WILBIKS, *University of New Brunswick Saint John*, REBECCA HIRST, *Open Science Tools/University of Nottingham* — In cognitive psychology, many experimental trials are required for accurate measurement. This impacts participant engagement, leading to attrition and limited data quality. The EPIC Psych Project is an effort to evaluate the scope of this issue and create a library of adapted tasks to aid engagement. In an exploratory evaluation phase, 121 researchers completed a survey on their experience with participant engagement on a range of tasks. Most researchers agreed that participant engagement was important for high quality data and that participant engagement was a problem in many cognitive tasks. When asked to rate interest in tasks they had experienced, perceptual tasks (e.g., sensory adaptation) yielded the lowest ratings. When asked about approaches to maintain engagement, researchers indicated that "regular breaks" and "rewards at end of the task" are important for adult participants and "story framing" and "verbal encouragement" for children. These findings help pinpoint the types of tasks where participant engagement is problematic and lay out potential solutions suggested from the research community. The next steps will involve the active involvement of children in testing and shaping how we adapt tasks in cognitive psychology.

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2:50–3:05 PM (77)

Building Experiments in R. FELIX HENNINGER, *Ludwig-Maximilians-Universität München* — Over the past decade, the R environment for statistical computing has firmly established itself as the standard for data processing in psychology and many social sciences. It provides a multitude of data handling and analysis capabilities and is now routinely taught to students early on. Despite the widespread familiarity of researchers with R, building experiments has heretofore often required picking up an entirely new programming language and skill set. We present a versatile, high-performance package for constructing and running experiments in R and demonstrate its timing capabilities. The package builds upon the powerful functionality present in the R ecosystem, allowing for direct integration of data collection and processing and more advanced designs such as adaptive experiments. With it, researchers at every career stage can now apply their knowledge of R to the construction of experiments. More information is available at https://felixhenninger.com/2022/experiments-in-r.

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3:10–3:25 PM (78)

Locus of Slack: Determining Order of Mental Processes by Selectively Influencing Them. RICHARD SCHWEICKERT, *Purdue University* — In some models of cognitive tasks, mental processes are a mixture of those which must be executed in order (sequential) and those which need not be (concurrent). An example is the response selection bottleneck model of dual tasks. We use reaction time to learn whether a pair of processes is sequential or concurrent by using experimental factors to manipulate them. If they are sequential, we do not directly learn their execution order. However, by combining information from multiple experiments about which pairs of processes are sequential and which are concurrent, we can construct an order. More than one order may be possible. If two processes are sequential, we can learn the value of the longest amount of time by which one may be prolonged without making the other start late, the slack between them. If slacks are compatible with one order, they are compatible with all possible orders. Slacks do not resolve order ambiguities.

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Recognition I

Friday, November 18, 2022, 1:30–3:30 PM US EST, Republic

Chaired by Gregory E. Cox, *University at Albany, SUNY*

1:30–1:45 PM (79)

A Dynamic Approach to Serial Position in Recognition Memory: Integrating Associative Encoding and Temporal Context. GREGORY E. COX, *University at Albany, SUNY* — Recognition memory shows effects of recency and primacy, which are typically explained using different mechanisms. I propose an integrative account using the same mechanisms that explain the dynamics of encoding and recognition of items and associations (Cox & Criss, 2020; Cox & Shiffrin, 2017). Items and their temporal contexts are both stored as memory traces; item traces contain features specific to the item, temporal context traces contain a mixture of features from previous items, and the two types of traces share associative features when they are encoded at the same time. The model accounts for accuracy, response time, and speed-accuracy tradeoff across list lengths and serial positions as well as facilitation when study order is preserved at test. Recency and facilitation occur because the associative features formed between the test item and the prevailing temporal context are a strong match to the associative features formed at study. Primacy occurs because temporal context traces tend to contain more features from early versus later items.

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1:50–2:05 PM (80)

What Conditions Optimize Memory and Why? Reconciling the Conflicting Effects of Similarity and Correlated Noise. MARIA ROBINSON, *University of California, San Diego*, JOHN WIXTED, *University of California, San Diego*, TIMOTHY BRADY, *University of California, San Diego* — Memory research across domains has revealed two conflicting phenomena. Computational and behavioral work on eyewitness memory suggests that correlations between memory signals enhance memory, whereas research on visual memory for simple features, such as color, indicates that similarity between memory signals hurts memory. In the current work, we propose a simple integrative framework that reconciles these conflicting effects of correlated noise and similarity. Using basic principles from signal detection theory, we show formally that memory performance will always be optimized when similarity between memory signals is minimized, but only if specific ordinal constraints are met. We examine the generality of this framework across a range of memory tasks and stimuli. Together, we outline basic principles that can be used to predict when similar items being present at test may hurt or facilitate detection and discrimination performance in memory tasks. We also discuss how these principles can be used in the development of ecological models of memory that formally incorporate the latent similarity structure of stimuli spaces.

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2:10–2:25 PM (81)

A Signal-Detection Model Predicting Recognition Memory Performance for Particular Target-Foil Combinations. IGOR UTOCHKIN, *National Research University Higher School of Economics (HSE University)*, DANIIL GRIGOREV, *National Research University Higher School of Economics (HSE University)*, VARVARA MIKHALISHCHINA, *National Research University Higher School of Economics (HSE University)* — There is growing evidence that how likely people would remember or forget a given stimulus is consistent across individuals, which is termed memorability. While memorability is typically measured for each individual stimulus shown separately (yes-no task), recognition often requires a choice among multiple alternatives (n-AFC task), so the interactions between these alternatives are important. Here, we develop and test a signal-detection model that quantitatively predicts the probability of correct recognition of individual items and false alarms in complex recognition (4-AFC) based on a more simple one (2-AFC). 300 observers memorized the same set of 120 object pictures and tested in a 2-AFC task, so that each target was shown with one of three predefined foils per observer. We then calculated discriminability (d') for each target-foil pair and used d'-s for three pairs associated with the same target to predict how often observers would choose each item in a 4-AFC task. 100 new observers were tested on the 4-AFC. We found a strong prediction-data correlation (.85) for hits across the target-foil combinations. The model also correctly predicted differential false alarm rates to specific foils as a function of individual 2-AFC d'.

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2:30–2:45 PM (82)

Stop Using d′ and Start Using da: Evidence from Empirical Data on How to Measure Sensitivity in Recognition Memory. YONATAN GOSHEN-GOTTSTEIN, *Tel-Aviv University*, ADVA LEVI, *Tel-Aviv University*, CAREN ROTELLO, *University of Massachusetts Amherst* — In Psychonomics 2019, we presented simulation data suggesting that all old-new recognition studies that used d′ or H-F to establish changes in sensitivity between two conditions reached conclusions not supported by the data analysis. Those simulations revealed high Type I error rates between two iso-sensitive recognition-memory conditions that only differed in bias. In contrast, the simulations revealed da to be a bias-free measure of sensitivity. Critically, simulations make assumptions that may not be true of empirical data. For example, simulations test a finite set of data-generating models, specifically Gaussian unequal variance, and if these are not true (e.g., Rouder & Pratt, 2010) then the da would fail to distinguish between bias and sensitivity. Also, while the values of confidence judgments were sampled independently in our simulations, empirical confidence ratings show sequential dependencies (Kantner et al., 2018). To estimate the Type I error rate for da, we ran 20 identical experiments (N = 960) in which only bias was manipulated between conditions. Type I error rates were comparable to those found in our simulations. We campaign for the use of da in binary tasks such as recognition.

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2:50–3:05 PM (83)

The Interaction Between Filler Similarity and Lineup Size on Discriminability. JOHN WIXTED, *University of California, San Diego*, KYROS SHEN, *University of California, San Diego*, JIAQI HUANG, *University of California, San Diego*, ALLAN LAM, *University of California, San Diego* — Presenting a photo of a suspect (innocent or guilty) to a witness is called a showup. Presenting a photo of a suspect surrounded by photos of fillers is called a lineup. In a fair lineup, fillers are matched to the suspect on features like age, race, gender, and hair color/style. Viable models of eyewitness identification predict that the ability to discriminate innocent from guilty suspects should be higher for lineups compared to showups, but they differ in their predictions of whether increasing the number of fillers beyond 1 (i.e., beyond a lineup size of 2) will further enhance discriminability. To date, research shows a reliable increase in discriminability from 0 fillers to 1 filler (showup vs. lineup size of 2) but no further increase in discriminability using lineup sizes greater than 2. We manipulated filler similarity to the suspect and found that, when the fillers were highly similar, increasing lineup size actually impaired discriminability, but when the fillers were highly dissimilar, increasing lineup size enhanced discriminability (with no effect of lineup size for intermediate levels of filler similarity). No current model of eyewitness identification has a mechanism that can accommodate this outcome.

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3:10–3:25 PM (84)

Hybrid-Similarity Exemplar Model for Predicting Individual-Item Recognition in a High-Dimensional Category Domain. ROBERT NOSOFSKY, *Indiana University*, BRIAN MEAGHER, *Indiana University* — Participants learned to classify a set of rock images into geologically-defined science categories. We then investigated the nature of their category-based memory representations by collecting old-new recognition data in a subsequent transfer phase. An exemplar model provided better qualitative accounts of the old-new recognition data than did a prototype or clustering model. However, to account for the variability in recognition probabilities among the old training items themselves, a hybrid-similarity exemplar model was needed that took account of distinctive features present in the items. The study is among the first to use computational psychological models for making detailed quantitative predictions of old-new recognition probabilities for individual items embedded in complex, high-dimensional similarity spaces.

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Decision Making I
Friday, November 18, 2022, 1:30–3:30 PM US EST, Back Bay C

Chaired by David Pascual-Ezama, *Universidad Complutense de Madrid*

1:30–1:45 PM (85)

Why Does James Bond Always Need to Be Smart? DAVID PASCUAL-EZAMA, *Universidad Complutense de Madrid*, DRAZEN PRELEC, *Massachusetts Institute of Technology*, ADRIÁN MUÑOZ, *Universidad Autónoma de Madrid* — Recently, it has been possible to classify honest and dishonest people into different typologies according to their behavior and decision-making. These results have shown people who prefer to lie, people who choose to cheat and not lie, and people who are radical in their dishonest behavior and take their reward without doing the assigned work. The next logical step is to understand what differences there are between the different profiles. Some research has already been done on gender differences with exciting results. In this study, we have analyzed whether intelligence is a fundamental factor in (dis) honest decision-making. We run an experiment with 345 people using the die-under-the-cup paradigm to measure (dis)honesty and CRT and Raven to measure intelligence. The results obtained are fascinating, especially when we examine the behavior of those people who are more intelligent.

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1:50–2:05 PM (86)

An Integrated Theory of Decision-Making, Motor Preparation, and Motor Execution. MATHIEU SERVANT, *Université Bourgogne Franche-Comté*, GORDON D. LOGAN, *Vanderbilt University*, THIBAULT GAJDOS, *Aix-Marseille University*, NATHAN EVANS, *The University of Queensland* — Most of our decisions are communicated to the world, and this communication requires an interplay between decision and motor processes. A traditional view in psychology is that the motor system is engaged when the decision-maker has committed to an internal choice. A growing body of electrophysiological data challenges this view and suggests an involvement of the motor system in decision formation. I will introduce an integrated theory of decision-making, motor preparation, and motor execution that combines theoretical elements from the dual-threshold diffusion model (Servant et al., 2021, JEP General) and the leaky integrated threshold model (Verdonck et al., 2020, Psych Rev). Model fits to behavioral and electromyographic data from choice response time tasks that tap into different cognitive domains provide evidence for the theory.

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2:10–2:25 PM (87)

Brief Verbal Descriptions Accurately Convey Domain Knowledge. MARK STEYVERS, *University of California, Irvine*, ALEX BOWER, *University of California, Irvine*, NICOLE X. HAN, *University of California, Santa Barbara*, MIGUEL ECKSTEIN, *University of California, Santa Barbara* — How much can a few words reveal about someone's knowledge? We address this question by having one group of people ("informants") complete a trivia question task and describe various images relating to a category (e.g., cartoons, Japanese cuisine). A second group of people ("evaluators") then decide who is more knowledgeable across pairs of informants based on their image descriptions. Strikingly, evaluators generally perform above chance at identifying the most knowledgeable informants (65% with only one description available; seven words on average). The most knowledgeable informants produce the most specific facts, while the most knowledgeable evaluators are the most adept at identifying false information. Less knowledgeable evaluators tend to treat correct and incorrect statements interchangeably, though there was a low base rate of incorrect statements overall. Together, these findings demonstrate the power a few words hold when inferring others' domain knowledge.

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2:30–2:45 PM (88)

Evidence-Based Scientific Thinking and Decision-Making in Everyday Life. CAITLIN DAWSON, *University of Helsinki*, HANNA JULKU, *University of Helsinki*, MILLA R. PIHLAJAMÄKI, *University of Helsinki*, JOHANNA K. KAAKINEN, *University of Turku*, JONATHAN SCHOOLER, *University of California, Santa Barbara*, JAANA SIMOLA, *University of Helsinki* — In today's knowledge economy, it is critical to make decisions based on high quality evidence. Science-related decision-making is thought to rely on a complex interplay of reasoning skills, cognitive styles, and attitudes and motivations toward information. First, we use a data-driven exploratory approach to identify latent factors in a large

set of cognitive skills and epistemic attitudes related to decision-making. Preliminary results suggest that key factors include reasoning skills, active openmindedness toward new information, and emotional resilience to threats toward one's epistemic viewpoint. Second, we investigate whether these factors predict behaviour in a naturalistic decision-making task. In the task, participants are introduced to a real science-related petition and are asked to read six online articles related to the petition, which vary in scientific quality, while deciding how to vote. Participants evaluate the credibility, reliability, and shareability of each source and their familiarity, interest, and curiosity about the topic. By identifying the skills and attitudes related to evidence-based decision-making behaviour, we can better understand how people engage with scientific information in everyday life.

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2:50-3:05 PM (89)

Individual Differences in the Number of Examples That Come to Mind in Probability Estimation. ANDREW CHANG, *National Taiwan University*, JOAKIM SUNDH, *Uppsala University*, JIAN-QIAO ZHU, *University of Warwick*, NICHOLAS CHATER, *University of Warwick*, ADAM SANBORN, *University of Warwick* — Despite the fruitfulness of Bayesian cognition science, it struggles to explain why human probability judgments are systematically biased. In response to the conundrum, the Bayesian sampler model postulates that the brain does not represent probabilities but approximates Bayesian inference by a sampling process. The aim of this study was to link the sample size parameter in the model, retrieved from fitting probability estimates into a novel sample size estimation method, with the long-standing literatures of individual differences in cognitive ability and strategy measures. We found that the number of mental samples generated per second was correlated with the rate of correct scores in a reasoning matrices task. As the constructs of the two measures are similar in terms of measuring participants' cognitive processing speed, under the assumption that participants were using mental samples in both tasks, our result suggests that the Bayesian sampler model can capture people's cognitive processing speed in probability estimation tasks .

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3:10-3:25 PM (90)

How Perceived Privacy Risk Determines People's Willingness to Use Online Fashion Technologies. JOSEPH TEAL, *London South Bank University*, PETKO KUSEV, *London South Bank University*, DAVID PEEBLES, *The University of Huddersfield*, SIANA VUKADINOVA, *Sofia University St. Kliment Ohridski*, MICHELE BUONTEMPO, *The University of Huddersfield*, ROSE MARTIN, *Surrey Business School, University of Surrey*, BELLA TRANG NGO, *Brarista Ltd* — The subjective perception of Risk, Security, and Privacy in using online platforms and technologies determines to a large extent customers' behaviours on these platforms. Accordingly, in this applied research project we have empirically explored how procedural anonymity and privacy influence customers' willingness to use an online fitting application for fashion. Moreover, we have developed a psychometric tool that captures the psychological variables (e.g., trust, perceived privacy risk, perceived privacy control, and online self-disclosure behaviour) of using online fashion technology. Furthermore, we will report the psychological factors that predict customers' willingness to use online technology for fashion (e.g., online fitting application).

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Attention: Control I

Friday, November 18, 2022, 1:30-3:30 PM US EST, Back Bay B

Chaired by Daniel H. Weissman, *University of Michigan Ann Arbor*

1:30-1:45 PM (91)

Conflict Adaptation Is Independent of Conflict. DANIEL H. WEISSMAN, *University of Michigan Ann Arbor*, MATT JONES, *University of Colorado Boulder*, KATIE A. SMITH, *University of Auckland*, CHRISTOPHER D. ERB, *University of Auckland* — During Stroop-like tasks, people experience less interference from conflicting distractors in the current trial (trial N) if the previous trial (trial N-1) was incongruent relative to congruent. It remains unclear, however, what triggers adaptive control to produce such "conflict adaptation." Recent data suggest that control is triggered by conflict-independent processes that vary with objective trial congruency rather than by greater conflict in incongruent (vs. congruent) trials. But these data come from unusual tasks that minimize conditional differences in conflict. In two experiments (N=80) designed to address this limitation, we observed the typical conflict adaptation effect. Critically, interference did not vary whether conditional differences in conflict in trial N-1 were (a) relatively large (because trial N-2 was congruent) or (b) relatively small (because trial N-2 was incongruent). Instead, interference varied with trial N-1 congruency independent of trial N-1 conflict (indexed by trial N-1 RT) but not (usually) vice versa, and computational modeling showed this pattern is unique to congruency-based control. These data favor congruency-based accounts of "conflict adaptation" over conflict-based accounts.

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1:50-2:05 PM (92)

Task-Irrelevant Features Drive Both General and Specific Post-Inhibition Performance Effects. SAMONI NAG, *The George Washington University*, PATRICK COX, *Intelligence Community Postdoctoral Research Fellowship Program*, STEPHEN MITROFF, *The George Washington University*, DWIGHT KRAVITZ, *The George Washington University* — Suppressing a prepotent motor response (i.e., response inhibition) often triggers behavioral changes that hinder subsequent performance. There is debate about whether these post-inhibition deficits are general (applying to all responses) or specific to the features of the inhibited stimulus.

Here, in a single paradigm, we show both general post-inhibition deficits and their modulation by the specific inhibited features even when those features are task-irrelevant. Participants recruited online were presented with colored and oriented Gabor patches and were instructed to respond to the orientation, rendering the color task-irrelevant. A single inhibition trial was presented, and the task-irrelevant color on the immediately following trial was manipulated between participants to be either 0º or 72º away from the color of the inhibition trial. While both groups demonstrated post-inhibition deficits, response time on the probe trial was slower when the task-irrelevant feature matched (0º) than when it differed (72º). Experiment 2 replicated the results with orientation as the task-irrelevant feature. These findings suggest that post-inhibition deficits are both general and specific, incorporating even task-irrelevant features.

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2:10–2:25 PM (93)

Controlled Distractor Ignoring: Insights from the EZ Diffusion Model. NANCY CARLISLE, *Lehigh University* — Cognitive control can be used to guide attention toward target items, and recent evidence suggests we can also use negative attentional templates to guide attention away from known distractor features. Both positive and negative color cues lead to RT benefits compared to a neutral uninformative cue, but negative templates are reliably less beneficial than positive templates. It remains unclear which attentional processes differ between the two forms of attentional control. To address this issue, I applied the EZ diffusion model positive, negative, and neutral attentional control data, making the simplifying assumption that the entire search process can be modeled as a single decision. I found a main effect of control type on drift rate, with the slowest drift rate for neutral, followed by negative and then positive. The positive template boundary was significantly larger than the negative or neutral boundaries. Finally, the positive template non-decision time was significantly shorter than the negative or neutral non-decision time. These results suggest negative cues lead to benefits mainly through a shift in drift rate, while positive cues lead to benefits due to a combination of drift rate and reduced non-decision time.

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2:30–2:45 PM (94)

Both Negative and Positive Task-Irrelevant Stimuli Contract Attentional Breadth in Individuals with High Levels of Negative Affect. STEPHANIE C. GOODHEW, *The Australian National University*, MARK EDWARDS, *The Australian National University* — Emotionally-salient stimuli can capture attention to their spatial location, even when task-irrelevant. Here we tested whether they can influence the spatial breadth of attention. Experiment 1 tested whether small task-irrelevant emotionally-salient stimuli contracted attention when the task required a broad focus, while Experiment 2 tested whether large task-irrelevant emotionally-salient stimuli expanded attention when the task required a narrow focus. Both experiments compared the effect of negative and positive emotionally-salient images against neutral and examined the role of participants' self-reported negative affect. Experiment 1 demonstrated an interaction between accuracy and negative affect, such that individuals with high levels of negative affect were less accurate at identifying global targets following both negative and positive small images, but not following neutral small images. This suggests that these small task-irrelevant emotionally-salient images contracted attentional breadth. Experiment 2 suggested that large task-irrelevant emotionally-salient images did not expand attentional breadth. We discuss how these results cannot be explained by existing models of emotion-based effects on attention.

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2:50–3:05 PM (95)

The Effect of Non-Invasive Brain Stimulation on Semantic Control Functioning: A Meta-Analysis. MARIA MONTEFINESE, *San Camillo IRCCS Research Hospital*, SILVIA BENAVIDES-VARELA, *University of Padova, Padova, Italy*, ETTORE AMBROSINI, *University of Padova, Padova, Italy* — The efficient use of knowledge requires control processes to retrieve information in a task-appropriate way. Neuroimaging studies showed that while the anterior temporal lobe (ATL) is involved in the storage of information, both inferior frontal gyrus (IFG) and middle temporal gyrus (MTG) exert top-down control over the activation of information within semantic storage. Previous studies showed that control processes are selectively impaired in patients with semantic aphasia, who have difficulties in manipulating weakly activated information or handling competing information within the semantic store. Transcranial magnetic stimulation (TMS) is used to induce a "virtual lesion" in neurologically intact participants to simulate this deficit. The aim of this meta-analysis is to evaluate the effect of the TMS-generated virtual lesion over the ATL, IFG, and MTG on the ability to use control processes. Frequentist and Bayesian analyses on the effect sizes of interest showed that TMS effects are significant, but there is no evidence for a difference in the effect across brain regions. Several analyses also showed that a publication bias exists, but the effect sizes of the effects of interest remain significant after controlling for it.

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3:10–3:25 PM (96)

Investigating the Sequential Effects of Task Conflict in Task Switching. LUCA MORETTI, *Rheinisch-Westfälische Technische Hochschule Aachen University*, IRING KOCH, *Rheinisch-Westfälische Technische Hochschule Aachen University*, MARCO STEINHAUSER, *Catholic University of Eichstätt-Ingolstadt*, STEFANIE SCHUCH, *Rheinisch-Westfälische Technische Hochschule Aachen University* — According to the popular conflict monitoring theory of cognitive control, top-down processes are instantiated upon conflict detection so to keep our behavior goal-directed. An important feature of this theory is that cognitive control upregulation is thought to persist beyond the single trial, reducing the influence of conflict on subsequent performance. Such proactive recruitment of control

has been widely demonstrated in response-conflict tasks, where congruency effects have been found to be reduced both following incongruent trials and in blocks where incongruent trials are frequent. In two task switching experiments we investigated whether similar proactive mechanisms are recruited to deal with task conflict, which was operationalized as the difference in performance between bivalent congruent trials (task-conflict trials) and univalent trials (no task-conflict trials). We found the bivalency effect to be reduced both following bivalent trials and in blocks employing 75% bivalent trials, suggesting that proactive control is recruited to attenuate task conflict.

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Numerical Cognition
Friday, November 18, 2022, 1:30–3:30 PM US EST, Constitution AB

Chaired by Adam J. Reeves, *Northeastern University*

1:30–1:45 PM (97)

Numerosity Perception and Illusion Explained by Contrast Energy. ADAM J. REEVES, *Northeastern University*, QUAN LEI, PHD, *Wichita State University* — The rapid impression of large-set numerosity has attracted the notion of a "number sense" for displays of items too numerous to count. But what could inform such a sense? One notion is that numerosity relies on a single metric, the total contrast energy (CE), or sum of the squared contrasts of all N stimuli. Increasing N increases CE, providing a "textural" cue to numerosity. Since increasing contrast by itself does not increase numerosity, we assume that sqrt (CE) is normalized by the peak-trough luminance difference, obviating contrast while retaining the dependence on N. If so, judged numerosity must increase with sqrt (N), as we show here for isolated displays with from 20 to 80 stimuli. The curious "numerosity illusion" arises when displays of different contrasts are intermingled: the more salient stimuli (white or black) are underestimated compared to the less salient (grey). We theorize that CE depends on the luminance difference between adjacent illumination levels, which explains both the magnitude of the illusion and the fact that judgements of intermingled displays also follow the sqrt (N) law.

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1:50–2:05 PM (98)

Humans Can Sense the Number of Objects in a Box by Touch Alone. ILJA FRISSEN, *McGill University*, ALANA LEVENE, *Bentley University*, TEJA KAIPA, *Bentley University*, MOUNIA ZIAT, *Bentley University* — Humans use active touch to gain information about contained objects, such as when shaking a milk carton or rattling a box of cereal. Although such interaction with containers is most common, its perceptual basis remains largely unexplored. In this study, we investigated how accurately fifteen participants could tell, by touch alone, how many objects were contained in a small, opaque cardboard box. Objects were marble balls that could vary in number (1-5) and in weight (0.8, 1.6, and 3.25 grams), for a total of 15 combinations, each tested seven times in a randomized order. Participants were handed one box at a time and told to wield it as they pleased. They could not see the box and wore headphones playing a masking sound. Overall, the results demonstrated that participants were quite accurate at estimating the number of objects for the two heavier weights but tended to underestimate the number for the lightest of the three weights. This study demonstrates another one of the human haptic system's impressive repertoire of capabilities including weight estimation and numerosity.

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2:10–2:25 PM (99)

Fostering Recoding Through Arithmetic Problem Solving for Enhancing Adaptive Learning. EMMANUEL SANDER, *University of Geneva*, KATARINA GVOZDIC, *University of Geneva*, CALLISTE SCHEIBLING-SÈVE, *University of Geneva* — Students' informal solving strategies are a basis for developing formal mathematics knowledge. Informal knowledge might lead to an encoding of the problem favorable for finding the solution but also to costly solving strategies and inaccurate answers. Putting aside informal strategies when they are inefficient is a key educational issue. This study investigated the benefits of a pedagogical intervention designed to lead students to recode an initial representation into another one that makes the problem's deep mathematical structure salient. We compared the performance and strategies of 5 experimental first-grade classes to 5 business as usual classes. Half of the 12 presented arithmetic word problems (from 6 different semantic categories) could be easily solved with informal solving strategies, whereas the cost would be high for the other half. Students from the experimental classes had better performance on high-cost problems than the control group and used formal solving strategies significantly more. There was no difference between the groups on the control tasks. Our findings illustrate a promising path for how semantic recoding can contribute to adaptive learning.

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2:30–2:45 PM (100)

Honey Bees Represent Quantities from Left to Right. CATHERINE THEVENOT, *University of Lausanne*, ROSA RUGANI, *University of Padova*, MARTIN GIURFA, *University of Toulouse* — It was already known that bees can differentiate non-symbolic numerosities. In this study we show further that they represent small quantities on the left of the space and larger quantities on the right. We reached this conclusion by adapting the paradigm used by Rugani in chicks. Bees were familiarized with a specific quantity of elements, and they were then presented with two panels representing another quantity. One of the panels was placed at their right, the other at their left. When the new quantity was higher than the initial quantity, to which bees were habituated, they preferentially selected the panel on their right and it was the reverse when the new quantity was lower than the initial one.

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2:50–3:05 PM (101)

Testing the Independence of Encoding and Calculation in Mental Addition: A Confirmatory Bayesian Analysis. THOMAS J. FAULKENBERRY, *Tarleton State University*, BRYANNA SCHEULER, *Tarleton State University* — A current debate concerns the independence of encoding and calculation in mental arithmetic. One way to test this independence is to manipulate both size and format of presented problems. Independence would be reflected by an additive model (Dehaene, 1992) and predict no interaction between size and format. On the other hand, an interactive model (Campbell & Fugelsang, 2001) would predict a larger size effect for problems in word format compared to those in digit format. To test these predictions, we presented 185 participants with a series of addition verification problems and measured response times while manipulating size and format. We then used Bayesian analysis of variance (Rouder et al., 2012) to compare five possible models stemming from a 2x2 factorial design. We found that the observed data were approximately 19 times more likely under an interactive model than under an additive model. Bayesian model averaging indicated that the data were approximately 75 times more likely when including the interaction term, compared to all models not including the interaction. Overall, these data lend support to an interactive model of mental arithmetic where the surface format of a problem directly impacts calculation processes.

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3:10–3:25 PM (102)

"Groupitizing": A Key Factor in Math Learning Disabilities. MICHAL WOLK, *University of Haifa*, BAT SHEVA HADAD, *University of Haifa*, ORLY RUBINSTEN, *University of Haifa* — The visuospatial perception system process that allows us to decompose and recompose small quantities into a whole is often called "groupitizing." Previous studies have found that adults use groupitizing processes in quantity estimation tasks and link this ability of subgroups recognition to arithmetic proficiency. This study examined if adults with math difficulties benefit from visuospatial grouping cues when asked to estimate the quantity of a given set. We manipulated number range (small vs. large quantities) and grouping cues (non, different quantities-different patterns, same quantities-different pattern, same quantities-same pattern). As predicted, adults with math difficulties showed significantly low quantity estimation performance compared to a control group. However, when given grouping cues, adults with math difficulties narrowed the performance gap and improved their ability to estimate quantities in the small number range but not in the large quantity range. Conclusion: impaired perceptual groupitizing abilities may be a characteristic of low arithmetic abilities.

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Working Memory I

Friday, November 18, 2022, 1:30–3:30 PM US EST, Back Bay A

Chaired by Nathan Rose, *University of Notre Dame*

1:30–1:45 PM (103)

Are Latent Working Memory Items Retrieved from Long-Term Memory? NATHAN ROSE, *University of Notre Dame*, CHANG-MAO CHAO, *University of Notre Dame*, CHENLINGXI XU, *University of Notre Dame*, VANESSA M. LOAIZA, *University of Essex* — Switching attention between items in working memory (WM) is critical for cognition, but the mechanisms by which this is accomplished are unclear. Some models suggest that passively retaining a "latent" item outside of focal attention and returning it to the focus involves episodic long-term memory (LTM) retrieval processes even for delays of only a few seconds. We tested this hypothesis in a preregistered study (osf.io/z9cgq/) by examining performance on both a two-item, double-retrocue WM task that oriented participants' attention to the item that was tested first and second on each trial and subsequent LTM tests for these items. Performance was compared between older adults (a population with LTM deficits) and young adults with either full (Exp. 1) or divided (Exp. 2) attention during the WM delays. Retrocueing, aging, and divided attention all had significant effects on WM performance but did not systematically affect subsequent LTM performance for item, location, or associative memory judgments made with high or low confidence. These dissociations suggest that retaining and reactivating latent WM does not involve LTM retrieval processes; rather, the results are consistent with the Dynamic Processing Model of WM (Rose, 2020).

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1:50–2:05 PM (104)

Working Memory Selects from a Spectrum of Compression: A Deep Learning Approach. BRAD WYBLE, *The Pennsylvania State University*, SHEKOOFEH P. HEDAYATI, *The Pennsylvania State University*, RYAN E. O'DONNELL, *The Pennsylvania State University* — Working memory (WM) has always been construed as being integrated with long-term memory. For example, with chunking, memory capitalizes on pre-learned patterns to rapidly store familiar information. To understand how this might work, we have developed a computational model that uses deep learning to mimic how the visual system creates a hierarchy of maps (or latent spaces) that represent familiar information with compact neural codes. Then, a binding pool stores patterns from these maps into tokens as active representations with varying detail depending on which map is used. For example, a handwritten digit "4" can be stored as visual elements, a semi-prototypical shape, or as a categorical representation that lacks visual detail. This model allows us to explore the tradeoffs between levels of compression. In experiments, observers tuned their memory encoding to store levels of detail according to task demands. However, with no advanced preparation or instructions, they stored

memories at a detailed level, enabling fine grained discrimination on even the first trial. Models using latent spaces show how memory can encode information from learned representations that exist along a spectrum of compression based on long-term memory.

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2:10–2:25 PM (105)

Asymmetry Between Processing and Storage in Working Memory. PIERRE BARROUILLET, *University of Geneva*, VALÉRIE CAMOS, *Université de Fribourg*, JULIEN BEAUDET, *Université Clermont Auvergne*, PABLO CROIZET, *Université Clermont Auvergne*, JULIE POUGEON, *Université Clermont Auvergne*, CLEMENT BELLETIER, *Université Clermont Auvergne* — Working memory is a cognitive system that has evolved for maintaining accessible the relevant information for the time necessary for its processing. This study investigated how the cognitive resources needed by storage are balanced in the face of demanding processing. Using a complex span task, we examined in three experiments the residual performance in memory and processing of individuals who performed at their best in the other component. Reciprocal dual-task costs pointed toward a resource sharing between the two functions. However, whereas prioritizing processing almost abolished participants' memory performance, more than 60% of their processing capacities were preserved while maintaining memory performance at span. We argue that this asymmetry might be adaptive in nature. Working memory might have evolved as an action-oriented system in which short-term memory capacity is structurally limited to spare the resources needed for processing the information it holds.

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2:30–2:45 PM (106)

Toward Theoretical Integration Between Free Recall and Serial Recall: Start and End Sequences and Error Transposition Gradients. GEOFF WARD, *University of Essex* — Immediate serial recall (ISR) and immediate free recall (IFR) are often explained by primacy-dominated theories of working memory and recency-dominated theories of episodic memory, respectively. However, theoretical integration appears more likely when recalls are reanalysed into start-sequences, end-sequences, and residual recalls. Such reanalysis also circumvents a potential barrier to theoretical integration: Transposition error gradients in ISR have been argued to demonstrate item-position association, not commonly assumed in theories of IFR. Reanalysing published ISR datasets from open and closed sets of items, the current work shows that if participants recall known sequences of start and/or end items of different lengths, then classic transposition error gradients arise even when residual items (for which there is otherwise no order information) are distributed randomly. The work suggests that error gradients in ISR can be obtained from more IFR-like output sequences, obviating the need for item-position associations and providing a step closer toward theoretical integration of the two tasks.

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2:50–3:05 PM (107)

Differential Age-Related Decline Across Tasks Is Compatible with Domain Specific and Domain General Working Memory. ROBERT H. LOGIE, *University of Edinburgh*, ALICIA FORSBERG, *University of Sheffield*, JASON DOHERTY, *University of Missouri-St. Louis*, NELSON COWAN, *University of Missouri*, VALÉRIE CAMOS, *Université de Fribourg*, MOSHE NAVEH-BENJAMIN, *University of Missouri*, PIERRE BARROUILLET, *University of Geneva*, CLEMENT BELLETIER, *Université Clermont Auvergne*, AGNIESZKA GRAHAM, *Queen's University Belfast*, STEPHEN RHODES, *University Hospitals Cleveland Medical Center* — Age-related decline in working memory tasks has been argued to reflect the impact of age on overall cognitive ability that supports both memory and processing tasks. In contrast, differential rates of decline across different tasks offer evidence for different cognitive functions that are differentially sensitive to age. We explored age-related differences in 525 participants aged 18 to 84 years who completed online tasks of immediate recall, running memory span, visual processing, simple and choice RT, verbal complex span, and verbal memory with visual processing during a 10s retention interval. Memory and processing tasks shared 10% of variance. Visual processing and choice RT declined across all age groups. Complex span showed decline only in the oldest group. Other measures showed initial decline in 35-44 year olds, but declined further only above 74 years. Dual-task performance showed some decline in 35-54 year olds, but then no further decline across the remaining age groups. Results are consistent with previous studies showing differential rates of decline but also are consistent with an overall age-related decline in cognition. Debates may be driven by which tasks and measures are used and which age groups are compared.

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3:10–3:25 PM (108)

Time and Cognitive Load in Simple and Complex Span Tasks. KLAUS OBERAUER, *University of Zurich* — Time is beneficial for immediate serial recall. In simple span tasks, slower presentation leads to better recall. In complex span tasks, lower cognitive load leads to better recall. Cognitive load is the ratio of the time demand for distractor processing to the available time for processing. Hence, extending the time between items while holding the processing requirement constant reduces cognitive load. Here I investigate whether these effects of time in simple and complex span can be subsumed under a common explanation. In three experiments I varied the free time between list items over seven levels in both simple and complex span. In complex but not simple span, participants also had to process distractors between items. For both span tasks, performance increased with longer free time according to approximately the same function: A decelerating time-accuracy function, which translates into a linear decline of performance with higher cognitive load. Therefore, cognitive load in complex span might be a special case of a more general phenomenon, contrary to current explanations of the cognitive-load effect, which are specific to complex span.

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Symposium III: Facilitating Belonging, Inclusion, and Equity in STEM (Special Symposium)

Friday, November 18, 2022, 3:45-5:45 PM US EST, Sheraton Grand Ballroom

Chaired by Timothy J. Nokes Malach, *University of Pittsburgh,* **and Mary A. Peterson,** *University of Iowa*

The speakers in this symposium investigate the topics of belonging, inclusion, and equity with an emphasis on identity, mindsets, and equity in STEM. Their perspectives – from social psychology and education – differ from, but are related to, the cognitive perspectives typically represented at the annual Psychonomic Society meeting. The speakers will cover challenges to creating an inclusive and equitable STEM community and will suggest approaches to addressing them. Our goals are to inspire attendees to work toward inclusion and equity within the cognitive psychology community and to provide effective tools for this effort.

3:55-4:20 PM (SYM9)

Creating Contexts That Foster Equity and Belonging in College STEM Courses: An Ecological-Belonging Approach. KEVIN R. BINNING, *University of Pittsburgh* — Disciplinary norms and stereotypes can powerfully shape students' experiences of belonging in different academic disciplines. Fortunately, research has shown that social norms are malleable: targeted, timely interventions can reconstruct social norms in ways that foster equity and belonging in diverse classroom contexts. This talk will discuss a program of research designed to understand and foster ecological belonging in large-lecture college STEM courses. The mixed-methods approach involves quantitative analysis to identify courses for intervention; focus groups to identify norms and sources of belonging uncertainty in those courses; and a timely, instructor-led classroom intervention that uses a collective class discussion to change norms around belonging and foster equity in course outcomes. Results have shown the approach can positively affect students' course performance, particularly among minoritized students. Students who receive the intervention have also shown higher levels of peer collaboration, higher attendance in the targeted course, and higher one-year college retention compared to control students. We argue the ecological-belonging approach can construct classroom norms in ways that help all students thrive.

4:20-4:45 PM (SYM10)

Creating Cultures of Inclusion. MARY C. MURPHY, *Indiana University* — Equity and inclusion are the results of person-by-context interactions. In this talk, I will highlight four contextual cues that intensify or diminish identity threat and belonging among people from underrepresented backgrounds in STEM. Drawing on our recent work, I will show how numeric underrepresentation, bureaucratic hassles, Cultures of Genius, and the broader culture of scientific discussions can create contexts of identity threat for people from structurally disadvantaged groups—with downstream consequences for interest, persistence, and performance. I will show how these cues can be restructured to reduce threat and bolster inclusion, motivation, and performance and will end with thoughts about what individuals and institutions can do to build and maintain environments that support diversity in science.

4:45-5:10 PM (SYM11)

Leveraging Counternarratives and Counterspaces to Facilitate the Physics Identity Development of Women. ZHARA HAZARI, *Florida International University* — In the US, nearly half of students taking physics in high school are women, but women represent only a fifth of the students interested in physics majors in college. This issue has persisted over decades despite numerous studies and programs focused on addressing the underrepresentation of women in physics. Given that patterns of participation are consequences of cultural issues driven by the historically androcentric construction of physics as a field, it is necessary to understand and disrupt dominant narratives and practices that marginalize women and other minoritized groups. Two strategies that have been used to resist marginalizing narratives and practices in physics are counternarratives and counterspaces. This talk will present some of the theory and research evidence regarding how these strategies support women's physics identity development and future physics intentions. Furthermore, it will describe how these evidence-based strategies are being used by physics educators as part of the STEP UP project, a national campaign which has grown to include a network of more than three thousand physics teachers, faculty, students, and community members, to inspire a new generation of women physicists. (Supported by the National Science Foundation under Grant No. 1720810, 1720869, 1720917, and 1721021.)

5:10-5:35 PM (SYM12)

Making Hidden Knowledge Visible in Minority Serving College Contexts. GERARDO RAMIREZ, *Ball State University* — Students draw on the wealth of their knowledge base (i.e. procedural skills, content knowledge, cultural experiences) to make sense of their academic struggles. Unfortunately, classrooms and university systems can often stymie students' academic potential by failing to adequately provide user-friendly and engaging knowledge and skills for how to succeed in college (what is referred to as "cultural capital"). And when university systems do attempt to teach cultural capital, there is often no mention of how cultural differences shape student resources attainment. As universities serve growing numbers of minority students (e.g., low-income, first-generation, students of color), research exploring what kind of college transition stories best support a diversity of experiences is essential. I will present intervention work in which students are presented with brief, engaging and user-friendly lessons that teach students cultural capital through a lens that empowers students to develop an adaptive understanding of how culture and background inform their challenges in higher education. Compared to a no-treatment control group, I find that treatment students show enhanced GPA and reduced dropout rates. My work highlights the importance of universities making visible this privileged cultural knowledge and why this matters for institutions that serve more economically and racially diverse students.

Decision Making: Motivation and Reward
Saturday, November 19, 2022, 7:40–9:40 AM US EST, Back Bay A

Chaired by Janet Metcalfe, *Columbia University*

7:40–7:55 AM (109)

Delayed Gratification: A Grey Parrot (Psittacus erithacus) Will Wait for More Tokens. IRENE M. PEPPERBERG, *The Alex Foundation*, VIRGINIA A. ROSENBERGER, *Massachusetts Institute of Technology* — Delay of gratification, the ability to forgo an immediate reward and wait for a reward better in quality or quantity, has been used as a metric for temporal discounting, self-control, and the ability to plan for the future in both humans (particularly children) and nonhumans. Several avian species wait for a better quality reward for up to 15 min, but none seem able to wait for a better quantity reward for any significant time period. Using a token system (where each wooden heart represents 1 nut piece), we demonstrated that a Grey parrot—who had previously waited up to 15 min for better quality—would now wait for better quantity, again for up to 15 min. Thus, symbolic distancing—that is, removal of the immediate presence of the hedonic item—enabled him to perform at levels comparable with young children on the classic test and might be a viable method for training executive function.

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8:00–8:15 AM (110)

Curiosity1 and the "Need for Agency": Wait, Wait... JANET METCALFE, *Columbia University*, TREVA KENNEDY-PYERS, *University of Sussex*, WILLIAM JAMES JACOBS, *University of Arizona*, MATTI VUORRE, *University of Oxford* — We propose that curiosity is composed of two distinct constructs: Curiosity1 and Curiosity2. Curiosity2 is aligned with exploratory playfulness heedless of proximal goals. Curiosity1 occurs when people are challenged with a specific answerable question. It is characterized by eager goal/answer/reward pursuit and increases in a goal-gradient manner that is consistent with reinforcement learning (RL) models. We present evidence that although people do seek the answer/reward, they want to actively get it themselves rather than having it given to them, in contrast to RL views. RL views hold that, because time-delay depreciates value, the answer's reward value is greatest with no delay and people should opt to receive the answer as soon as possible. The "need for self-agency" view holds that in order to potentially attain the answer by their own efforts, people may well wait. Three experiments showed that even when the answer could be revealed at any time, people spontaneously waited longer when curious. They also asked for hints rather than the entire answer--a finding consistent with the "need for agency" view.

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8:20–8:35 AM (111)

Coping with Uncertainty Once Certainty Has Been Removed. SHARON MOREIN-ZAMIR, *Anglia Ruskin University* — Coping with uncertainty can involve goal-directed actions to increase knowledge about the environment. This study investigated the tendency to seek out cues which no longer conveyed information about uncertainty in the environment. Using a free-operant observing task, participants learned that they could earn rewards on two buttons. However, at any one time only one button was active. Pressing a third button yielded an observing (certainty) cue informing them which button is currently active though incurring a cost. Observing was relatively stable across time in a sample of 82 participants. After six minutes, unbeknownst to participants, observing was extinguished. Assessing the data in two-minute bins demonstrated that 45% of participants continued to seek certainty even 6-8 minutes after extinction despite this being detrimental to their goal. Observing during extinction, but not prior, was a significant predictor of self-reported levels of obsessive-compulsive checking. Results indicate that maladaptive checking does not serve to increase certainty.

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8:40–8:55 AM (112)

Effort Aversion: Is It Worth This Risk? ALICE MASON, *University of Warwick*, CHRISTOPHER R. MADAN, *University of Nottingham*, NICK SIMONSEN, *University of Nottingham*, MARCIA SPETCH, *University of Alberta*, ELLIOT LUDVIG, *University of Warwick* — Choices are often framed around how rewarding the outcome will be. The effort required to obtain the outcome, however, is also important. Research on risky choice has focused primarily on the trade-off between risk and reward, whereas research on effort has focused on the trade-off between effort and reward. Here we bridge this gap and examine how risk and effort interact to influence choice. We presented people with the same sets of described decision problems and separately elicited their risk preferences for outcomes and for effort levels. The options varied in terms of risk (rare or common) and effort level. There were substantial individual differences in effort preferences, with some people showing a preference for the harder options. Those people who had a preference for harder effort showed the fourfold risk pattern, consistent with them treating effort as gain. In contrast, people who had a preference for the easy effort showed a "flipped" fourfold risk pattern, consistent with effort as a loss. These paradoxical effects of effort map directly onto risk preferences with reverse risk preferences for hard- and easy-effort choosers.

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9:00–9:15 AM (113)

Temporal Discounting in Amnesia When Outcomes Are Experienced in the Moment. VIRGINIE PATT, *Boston VA Healthcare System/Boston University*, RENEE HUNSBERGER, *University of Massachusetts Lowell*, DOMINOE JONES, *VA Boston Healthcare System*, MIEKE VERFAELLIE, *Boston University* — Temporal Discounting (TD) is the mental devaluation of rewards

delivered after a delay. Involvement of the hippocampus in TD remains unclear: whereas animals with discrete hippocampal lesions display impaired TD, human subjects with similar lesions show intact performance on classic TD tasks. A candidate explanation for this discrepancy is that delays and rewards are experienced in the moment in animal studies but tend to be hypothetical in human studies. We tested this thesis by comparing the TD indifference curves of amnesic patients (N=7) and healthy control subjects (N=14) on a classic TD task and on a novel experiential TD task that uses occluded photographs as rewards (Patt et al., 2021, PLoS One, 16(5): e0251480). Using a logistic function fit, results revealed patterns of choices that differed across groups in the experiential task but not in the classic TD task. In the experiential task, although area under the curve was similar across groups, amnesic patients displayed choices that were less reliable than those of controls and a TD curve with a less steep logistic slope. These results suggest hippocampal involvement in constructing precise representations of delay-reward tradeoffs in experiential TD.

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9:20–9:35 AM (114)

The Role of Epistemic Emotions in Mapping the Epistemic Landscape. STANKA A. FITNEVA, *Queen's University*, MICHAEL SLINGER, *Dalhousie University* — Creating a representation of our epistemic landscape – who believes what – has implications for social affiliation and learning. The epistemic emotions (e.g., surprise, curiosity) triggered by a situation and the individual tendencies to experience curiosity have been shown to affect the in-depth exploration of a topic. The present research examined the contribution of situationally triggered epistemic emotions and trait-level curiosity to the gathering of information about how widely a belief is held in the population. After answering a trivia question and indicating their certainty, participants in two studies (n = 284) were shown an answer submitted by another participant, reported their surprise and curiosity, and were given the option of seeing up to three responses from different participants. They also completed Litman's Interest/Deprivation curiosity scale. Epistemic emotions and I-type curiosity predicted the number of sources explored. Unlike prior findings, high-certainty errors did not result in stronger emotions or more exploration. Thus, epistemic emotions and intrinsically, discovery driven curiosity propel exploration of the epistemic landscape.

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Cognition and Emotion I

Saturday, November 19, 2022, 8:00–9:40 AM US EST, Republic

Chaired by Michael K. McBeath, *Arizona State University*

8:00–8:15 AM (115)

Did Phonemics Originally Evolve to Discriminate Emotions? Gleam-Glum and Wham-Womb Effects Are Robustly Confirmed When Naming Emotional Cartoons with Pseudowords. MICHAEL K. MCBEATH, *Arizona State University*, CHRISTINE S.-P YU, *Arizona State University*, YE LI, *Arizona State University*, TATUM M. ZAPP, *Arizona State University*, VIRIDIANA L. BENITEZ, *Arizona State University* — Our work supports that phonemes can convey embodied emotional facial musculature. The same facial musculature associated with visually-recognizable emotional expressions (like happy and sad) appears to also favor production of parallel auditorily-recognizable sounds. Our previous work verified this using words in English and Mandarin, as well as swear words. The current study produced nearly an order of magnitude larger effects when observers name emotional cartoons by choosing one of two vocalized monosyllabic pseudowords. We tested 218 participants and confirmed both the Gleam-Glum Effect (bias to name positive cartoons with [i]-words and negative ones with [Λ]-words on 77% of trials, d=6.9) and the Wham-Womb Effect (bias to name high energy cartoons with [æ]-words and low energy ones with [u]-words on 73% of trials, d=2.7). This methodology has great promise for testing generalizability to children and in other languages. The phoneme-emotion relationship provides a strong, functional explanation for why humans originally evolved the ability to so finely discriminate phonemes. The acoustic phonemic characteristics upon which language is built may initially have served as adaptive acoustic emotion-detection features.

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8:20–8:35 AM (116)

Of Two Hearts, Of Two Minds: Differences in Concreteness, Imageability, and Context Availability Measures in English and Polish Emotion Terms. HALSZKA BĄK, *Adam Mickiewicz University*, JEANETTE ALTARRIBA, PHD, *University at Albany, SUNY* — In two parallel studies we collected measures of concreteness, imageability, and context availability for words denoting basic emotions from self-identified male and female native speakers of English and Polish. The words were all synonyms of the six basic emotion terms (anger, fear, sadness, disgust, surprise, joy) in noun, verb, and adjective forms. Analyses indicated that basic emotions are conceptualized in language-specific ways. The strongest correlations between the measures for English were between imageability and context availability, for Polish between imageability and concreteness. In English, anger was scored significantly lower than other emotions across all measures. In Polish, joy and surprise scored significantly higher than other emotions on concreteness, while disgust scored significantly lower than others on imageability. Part-of-speech effects were significant across all measures in English, but only for concreteness in Polish. Finally, male speakers in English scored emotion words higher than female speakers on concreteness and imageability, but the gender effect was reversed in Polish. The implications of these psychometric differences for psycholinguistic research methodology will be discussed.

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8:40–8:55 AM (117)

What Are the Necessary Precursors to Relief? AIDAN FEENEY, *Queen's University Belfast*, SARA LORIMER, *Queen's University Belfast*, AGNIESZKA GRAHAM, *Queen's University Belfast*, TERESA MCCORMACK, *Queen's University Belfast*, CHRISTOPH HOERL, *University of Warwick*, MATTHEW JOHNSTON, *Queen's University Belfast*, SARAH BECK, *University of Birmingham* — Relief can be experienced under two very different circumstances: when an unpleasant experience has ended (temporal relief) or because an unpleasant experience has been avoided (counterfactual relief). We examined whether, as claimed by at least one account, the ending of a period of anxiety is a necessary precondition for counterfactual relief. Two survey studies (N = 485) showed that although participants' spontaneously generated descriptions of counterfactual relief experiences tend to have a temporal component of this kind, the vast majority could describe a counterfactual relief experience which did not rely on a preceding period of anxiety ending. Two carefully controlled vignette experiments (N = 136) found that although people attribute higher levels of relief in cases with temporal and counterfactual precursors, nonetheless, they also attribute high levels of relief in purely counterfactual cases. These results are problematic for accounts of relief claiming that relief experiences always have a temporal component.

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9:20–9:35 AM (119)

Black Characters Matter: Can Reading Fictional Stories Reduce Prejudice? DEENA WEISBERG, *Villanova University*, LAURA HARDNER, *Villanova University* — Reading fictional stories about characters from minoritized groups has been shown to decrease prejudice toward those groups (Johnson et al., 2014). However, this work has only used stories in which racism is a focal plot point. This study tests whether reading fiction can reduce prejudice by using a story that does not mention race. Participants read a story featuring either a white or Black main character (n=54 and 60, respectively), read an expository text (n=50), or read nothing (n=60). They were then post-tested with measures of prejudice (Color-Blind Racial Attitudes Scale; Neville et al., 2000) and empathy (Interpersonal Reactivity Index; Davis, 1980). Across conditions, we found a marginally significant difference in prejudice ($F(3, 220) = 2.28$, $p = .08$) and a significant difference in empathy ($F(3, 220) = 2.75$, $p = .04$). Post-hoc tests revealed that, contrary to our predictions, participants had the highest empathy scores and the lowest prejudice scores when they read the story with the white protagonist -- potentially because our mostly white participants may have found it easier to relate to a white protagonist. Although more work is needed, these results suggest that stories can increase empathy and reduce prejudice.

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Attention: Automatic Processing
Saturday, November 19, 2022, 8:00–9:40 AM US EST, Back Bay C

Chaired by Hanna Haponenko, *McMaster University*

8:00–8:15 AM (120)

Inhibition of Return in a 3D Scene Depends on the Direction of Depth Switch from Cue to Target and Object Membership. HANNA HAPONENKO, *McMaster University*, NOAH BRITT, *McMaster University*, HONG-JIN SUN, *McMaster University* — Inhibition of Return (IOR) is a phenomenon that reflects slower target detection when the target appears at a previously cued rather than uncued location. We investigated IOR in computer-simulated 3D environments with monocular depth cues. Peripheral cues and targets appeared within 3D rectangular boxes placed on the surface of a textured ground plane and positioned separately on the left or right side of the central fixation. One condition involved two different boxes separated in depth, and another condition involved one box extended across multiple depths. When the target appeared at a farther location than the cue, the magnitude of the lateral IOR effect remained similar regardless of whether the cue and target appeared at different depths (i.e., IOR was depth-blind). When the target appeared at a nearer location than the cue, the magnitude of the lateral IOR effect was significantly attenuated compared to the same-depth condition (i.e., IOR was depth-specific), but only when the cue and target appeared in different boxes, not the same box, while all other spatial properties remained the same. These results suggest object membership can override the depth-specific property of the IOR effect in 3D environments.

Email: Hanna Haponenko, haponeh@mcmaster.ca

8:20–8:35 AM (121)

Global Context Guides Early Attentional Selection Independent of Item Identity in Visual Search: Evidence from Lateralized Event-Related Potentials.. ARTYOM ZINCHENKO, *Ludwig-Maximilians-Universität München*, MARKUS CONCI, *Ludwig-Maximilians-Universität München*, HERMANN MÜLLER, *Ludwig-Maximilians-Universität München*, THOMAS GEYER, *Ludwig-Maximilians-Universität München* — Stable spatial arrangement of items can efficiently guide attentional selection and facilitate visual search over time, a phenomenon known as contextual cuing. On the other hand, updating of already formed long-term context memories in the relocation is rigid. In the current work, we explored whether global context regularities can guide and misguide early attentional selection in the absence of individual item identities. We used lateralized event-related electroencephalogram potentials and presented a group of participants (N = 16) with repeated and non-repeated displays that were preceded by a spatial mask for 500 ms. The mask contained placeholders of search items that didn't reveal the identity of the search items. We found a reliable contextual cuing during the initial learning phase, which was

associated with an early N1pc ERP component: negativity that peaks ~150 ms after stimulus onset. Contextual cuing was effectively abolished in the relocation phase, and the N1pc was reversed in polarity, which is indicative of persistent misguidance of attention to the original target location. Repeated layouts proactively interfere with contextual relearning after target relocation, even in the absence of stimulus identities.

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8:40–8:55 AM (122)

The Fate of the Unattended Revisited: Can Irrelevant Speech Prime the Non-Dominant Interpretation of Homophones? KATHLEEN CAMERON MCCULLOCH, *University of Central Lancashire*, BETH H. RICHARDSON, *University of Central Lancashire*, JOHN E. MARSH, *University of Central Lancashire*, LINDEN J. BALL, *University of Central Lancashire* — Whether the semantic properties of task-irrelevant speech are processed has been a source of debate. The present research offers a resolution by examining whether semantic processing of task-irrelevant speech occurs despite explicit instructions to ignore it. During a visual-verbal serial recall paradigm, participants were auditorily presented with non-dominant homophones with or without their close associates and asked to ignore this irrelevant speech. We assessed whether the spelling of homophones was influenced by content in the earlier phase. We found evidence of semantic priming in conditions wherein the homophone was present, as well as conditions wherein only associates of the homophone were present. Results suggest that semantic processing of irrelevant speech occurs regardless of an explicit direction to ignore it as homophones were spelt in accordance with their non-dominant meaning across conditions. Furthermore, this semantic processing did not have a disruptive effect on serial recall performance.

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9:00–9:15 AM (123)

The Emotional Attentional Blink Relies on "Pop Out," But Is Weak Compared to the Goal-Driven Attentional Blink. LINDSAY A. SANTACROCE, *University of Houston*, APURVA L. SWAMI, *University of Houston*, BENJAMIN J. TAMBER-ROSENAU, *University of Houston* — In the emotional attentional blink (EAB), attentional capture by a task-irrelevant emotional distractor hinders report of a subsequent rapid serial visual presentation (RSVP) target. Recent studies have questioned whether emotional salience alone is sufficient to capture attention, or if the emotional stimulus must already be attended in order for its valence to affect target report. Here, EAB tasks were manipulated based on (1) the emotional distractors' similarity to the surrounding RSVP stimuli (visually similar or visually distinct) and (2) the target-defining feature (a surface-level perceptual feature or item semantic content), resulting in four experiments. Only experiments in which distractors were visually distinct from the RSVP streams yielded EABs. The target-defining feature (and associated processing strategy) had no effect on the EAB. These results suggest that the EAB relies on the emotional distractor's visual distinctiveness to "pop out" from the surrounding RSVP stimuli before the emotional distractor can engage emotional processing that may further magnify the blink. In matching attentional blink conditions, the AB exceeded the EAB; thus, goal-driven control is greater than stimulus-driven control in RSVP tasks.

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9:20–9:35 AM (124)

Statistical Learning Improves Non-Spatial Target Selection, But Not Distractor Suppression. DANIEL PEARSON, *University of New South Wales*, MIKE LE PELLEY, *University of New South Wales* — The deployment of spatial attention is influenced by learning about the location in which targets and distractors are likely to appear. For example, responses are faster to targets appearing in high-probability locations versus low-probability locations, suggesting spatially-specific attentional enhancement. Similarly, distractors appearing in high-probability locations are less likely to capture attention versus when they appear in low-probability locations, suggesting spatially-specific attentional suppression. In a series of experiments, we investigated whether learned statistical regularities influence the deployment of non-spatial attention. Participants completed a rapid serial visual presentation (RSVP) task in which they searched for a target image while ignoring a salient distractor. The target and/or distractor was presented more often in one (temporal) position within the stream than in all other positions. We provide evidence to suggest that statistical learning can improve non-spatial target selection but has no effect on non-spatial attentional capture by physically salient distractors. These findings suggest that the inhibitory influence of statistical learning may be restricted to spatial attentional priority.

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Cultural/Social Influences on Cognition

Saturday, November 19, 2022, 8:00–9:40 AM US EST, Back Bay D

Chaired by Catalina Iricinschi, *Franklin & Marshall College*

8:00–8:15 AM (125)

Social Cognition of Belonging: Attitudes Towards Real and Virtual Group Membership. CATALINA IRICINSCHI, *Franklin & Marshall College*, KACIE ARMSTRONG, PH.D., *Bowdoin College* — The current global mobility resulted in large populations negotiating a sense of belonging in unfamiliar cultural environments. Simultaneously, belonging to social media platforms challenges memberships to real/physical social environments. The current study revises the existing definition for belonging (acceptance/rejection dichotomy) and proposes complex heuristics that describe belonging as a dynamic cognitive and social system. Our questionnaire data measure three variables: citizenship (belonging to a country), language (belonging via shared language), and social media (belonging

to virtual communities). The citizenship questionnaire, for instance, contains items about immigrants forced to leave their country (Ukrainians currently in Romania) as well as immigrants who chose to emigrate, thus measuring attitudes in relation to global and local media and individual bias-based heuristics. Additional items elicit participants' (Eastern and Western Europeans, U.S. citizens) opinions about whether or not governments/policy makers should consider immigrants as belonging to the host country. (Masked) priming and participant eye tracking implicitly measure attitudes towards self/other belonging in real and technology-assisted social environments.

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8:20–8:35 AM (126)

Depolarization by Inoculation. ALMOG SIMCHON, *University of Bristol*, FINTAN SMITH, *University of Bristol*, DAWN HOLFORD, *University of Bristol*, STEPHAN LEWANDOWSKY, *University of Bristol* — Misinformation pollutes our online environments and contributes to growing polarization in many western democracies. However, discerning fake news and trustworthy news takes time, resources, and motivation that people often lack. One way to reduce the spread of misinformation is by boosting people's skills to use cues that correlate with news veracity. We analyzed more than 160,000 news articles and found a negative relationship between the extent of polarizing language (quantified by computational text analysis) and the trustworthiness of news sources (NewsGuard score). We then show in experimental settings that inoculating partisan social media users on both sides of a polarizing issue (Brexit Leavers or Remainers) against polarized content reduces the likelihood of them sharing it by 37%, $F(1,709) = 8.12$, $p = .005$, $\eta p2 = 0.01$. By applying such low-cost interventions, we could potentially curtail the polarizing nature of our online environments while reducing the volume of misinformation.

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8:40–8:55 AM (127)

Social Media Sharing of Low-Quality News Sources by Political Elites: An Asymmetric U.S.-American Exceptionalism. JANA LASSER, *Graz University of Technology*, SEGUN AROYEHUN, *Graz University of Technology*, ALMOG SIMCHON, *University of Bristol*, FABIO CARRELLA, *University of Bristol*, DAVID GARCIA, *Graz University of Technology*, STEPHAN LEWANDOWSKY, *University of Bristol* — Information disseminated by political elites is known to shape citizen and media discourse. Therefore, it is particularly important to examine the quality of information shared by them. We investigate the quality of information (NewsGuard score) shared by members of the U.S. Congress and the German and British parliaments between 2016 and 2022 on Twitter. In all three countries, conservative politicians share information of lower quality than liberals. This difference is greater in the U.S., where Republicans overall shared links to untrustworthy websites 9 times more often than Democrats, than in the UK (4.7) and Germany (6). Overall, American politicians shared more untrustworthy links than their counterparts in Europe. Even Democrats share more untrustworthy content than their conservative European colleagues. Superimposed on those absolute differences is a temporal trend of increasingly greater divergence between Republicans and Democrats in the U.S. Whereas information quality shared by Democrats has remained stable, the proportion of untrustworthy sites shared by Republicans doubled between 2016-18 and 2020-22. This growing asymmetry between the two parties is unique to the U.S.

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9:00–9:15 AM (118)

Affective Polarization and Analytic Thinking Predict Persistence of Corrected Misinformation in Judgments of Political Candidates. MICHAEL COHEN, *University of Pennsylvania*, VICTORIA HALEWICZ, *Brown University*, ECE YILDIRIM, *University of Pennsylvania*, JOSEPH KABLE, *University of Pennsylvania* — We examine how misinformation influences subsequent judgments and decisions, following prior work on Continued Influence Effects (CIEs). We developed a set of novel political candidate stimuli with accusations and refutations based on true stories. We observe robust within-participant CIEs: candidates targeted by corrected accusations evoke lower feeling thermometer ratings and are chosen less often in a mock vote choice than candidates not targeted by accusations. Measures of analytic thinking (CRT-2, digital literacy, less intuitive epistemology) were associated with both reduced CIEs and better headline discernment. Affective polarization is also associated with worse CIEs, regardless of participant political orientation or perceived political orientation of targeted candidates, while participant political orientation is unrelated to CIEs. This latter result contrasts with findings that conservative political orientation, but not affective polarization, predicts poorer headline discernment. Affective polarization reflects a non-partisan vulnerability that could interact with partisan media spreading negative and/or false information to exacerbate extreme polarization.

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9:20–9:35 AM (128)

Pupil Dilation Widens the Perceived Cone of Direct Gaze. SARAH D. MCCRACKIN, *McGill University*, CLARA COLOMBATTO, *Yale University/University College London*, VICTORIA FRATINO, *McGill University*, BRIAN J. SCHOLL, *Yale University*, JELENA RISTIC, *McGill University* — One of the most important social cues in our environment is the direction in which another person is looking — especially when they are looking directly at us. Perhaps as a result we perceive a range of eye-gaze deviations as directed towards instead of away from us — a range known as the Cone of Direct Gaze (CoDG). Here we asked whether the width of the CoDG was affected by another salient property of others' eyes — how dilated their pupils are. Pupil size is often a cue to heightened attentional and/or emotional states but has typically been explored independently such as in experiments involving pupillometry. Here, for the first time, we combined pupil size and the CoDG. Participants

viewed faces with constricted, normal, or dilated pupils that were looking left, right, or directly at the participant with varying eccentricities. Faces were perceived as gazing directly at participants more often when they had dilated (compared to normal) pupils. In other words, dilated pupils effectively widened the CoDG, potentially due to the perception of enhanced attention from the eyes of others.

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Aging and Memory
Saturday, November 19, 2022, 8:00-10:00 AM US EST, Back Bay B

Chaired by Andrea R. Halpern, *Bucknell University*

8:00-8:15 AM (129)

Auditory Imagery Scanning in Younger and Older Adults. ANDREA R. HALPERN, *Bucknell University*, L. ROBERT SLEVC, *University of Maryland, College Park* — Mental imagery is in some ways cognitively expensive, as it requires conscious awareness and is hard to inhibit. However, it is cognitively inexpensive because it draws on perceptual representation. Thus, this process is interesting to study in older adults given the usual decline in fluid processing skills but not basic perceptual processing. However, little work in this area and nearly none in auditory imagery exist. We presented a validated auditory mental scanning task (mental pitch comparison of lyrics in familiar songs) to younger and older adults along with baseline cognitive tasks. Consistent with prior work, older adults were slower in the task but showed similar timing patterns to younger adults' slower response times to compare lyrics farther apart in the tune and when the first lyric was farther from the tune's beginning. In a novel finding, the slopes of both of those functions correlated with a self-report measure of auditory imagery vividness in the younger adults. However, we did not see this relationship in older adults (due possibly to smaller sample size). This provides preliminary evidence of quantitative but not qualitative changes in how older adults use mental imagery to solve novel problems.

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8:20-8:35 AM (130)

Age-Deficits in Ventral Visual Neural Discriminability and Recapitulation Associated with False Memories. JORDAN CHAMBERLAIN, *The Pennsylvania State University*, NANCY DENNIS, *The Pennsylvania State University*, CAITLIN BOWMAN, *University of Wisconsin-Milwaukee* — The ability to discriminate between target and lure items is critical for memory success. Inherent to this discrimination process is also the ability to recapitulate encoded information to be used during retrieval discrimination. Age deficits in both processes are related to increases in false memories in older adults. To investigate this, we utilized multivariate classification and encoding-retrieval similarity (ERS) analyses within younger and older adults who completed a memory task including lures that were either perceptually or thematically related to encoded items. An age-related increase in false memory rates was accompanied by age-related reductions in the classification of targets and perceptual lures in portions of the visual cortex. Such reductions differentially predicted behavioral discriminability. Additionally, we observed age-related reductions in single-item ERS associated with targets and lures throughout much of the ventral visual stream. These results suggest that the recapitulation of imprecise visual information underscores memory errors in older adults.

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8:40-8:55 AM (131)

Event Tagging: A Novel Technique to Remediate Age Differences in Event Memory. KAREN L. CAMPBELL, *Brock University*, SARAH HENDERSON, *Brock University*, EMILY E. DAVIS, *Brock University* — A long line of work suggests that event boundaries trigger attentional mechanisms that update one's mental representation of the current situation or context. This process allows for ongoing experience to be stored in long-term memory as a series of discrete events, with details from an event better recalled when a cue is taken from within the same event than across an event boundary. What happens to these discrete event memories when attentional processes break down, for instance with advancing age? In this talk, I will present some of our recent work suggesting that older adults (particularly, those with poor attentional control) form associations across event boundaries (or seem to "hyper-bind" over time) and this relates to self-reported memory deficits in everyday life. I will also share some recent data from a novel "tagging" intervention we are developing to help improve event memory with age.

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9:00-9:15 AM (132)

Changes in Specific and Gist Representations of Episodic Associations Across Time. NATHANIEL R. GREENE, *University of Missouri*, MOSHE NAVEH-BENJAMIN, *University of Missouri* — Using a novel continuous associative recognition paradigm, we trace changes in specific and gist representations for complex episodic associations from working memory (WM) to long-term memory (LTM). The paradigm is applied to data from healthy older adults, whose deficits in specific representations in LTM are well-documented. We show that some of these age-related deficits appear immediately after encoding, within the confines of WM. These results address a long-standing debate as to whether older adults fail to encode or retrieve specific representations. We also employ the paradigm to contrast two competing theoretical mechanisms that have been proposed to explain how dividing attention (DA) disrupts episodic memory specificity. Results show a rapid disintegration of specific and gist representations under DA that occurs in a seemingly parallel fashion, as opposed to a slower rate of gist degradation in young adults whose attention is not divided during encoding.

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9:20–9:35 AM (133)

Dissociable Age Effects on Direct and Generative Autobiographical Memory Retrieval. IOANNA MARKOSTAMOU, *University of Hertfordshire*, LIA KVAVILASHVILI, *University of Hertfordshire* — We examined the retrieval characteristics and the phenomenological qualities of effortless (i.e., direct) and effortful (i.e., generative) autobiographical memory (AM) in younger and older adults. Participants recalled AMs in response to word-cues and reported whether each of their memories was retrieved directly or generatively and provided ratings for several retrieval and phenomenological characteristics. Overall, directly retrieved AMs were recalled faster and with less effort and were more recent, more frequently rehearsed, more vivid, and more emotionally positive than generatively retrieved AMs. Importantly, while younger adults recalled a higher number of generatively retrieved AMs, there were no age effects on the number of directly retrieved AMs. The results provide novel insights on the effects of retrieval mode and aging on AM and support the spontaneous retrieval deficit hypothesis (Kvavilashvili, Niedźwieńska, Gilbert, & Markostamou, 2020), which suggests that stimulus-dependent spontaneous retrieval processes are particularly impaired by pathological, but not typical, aging.

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9:40–9:55 AM (134)

Strong Stereotypical Views in People Across the Lifespan on Everyday Memory and Aging: An Online Survey. LIA KVAVILASHVILI, *University of Hertfordshire*, BRIGITA BRAZAUSKIENE, *University of Hertfordshire*, IOANNA MARKOSTAMOU, *University of Hertfordshire* — Recent diary studies of everyday memory have shown that while young adults record higher number of prospective memory errors, no effects of age are obtained for retrospective memory and absent-minded errors, suggesting that negative effects of aging are less pronounced in daily life. Nevertheless, adults of all ages hold strong beliefs that memory deteriorates with increased age. The aim of the present study was to investigate stereotypical views that the general public may hold in relation to everyday memory failures (EMFs) across the adult lifespan. A total of 695 participants completed a newly developed survey of EMFs and rated how often they expected people in their 20s, 40s, 60s, and 80s to experience prospective, retrospective, and absent-minded errors. Participants were divided into five age groups: 212 young adults aged 18-39, 93 middle-aged adults aged 40-49, 143 young-old adults aged 60-69, 193 old-old adults aged 70-79, and 54 very old adults aged 80-92. Results demonstrated strong stereotypical views towards memory and aging in both directions, with younger adults generally believing in stark memory decline with aging, while older adults believing in almost perfect memory in young adults.

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Bilingualism: Cognitive Control
Saturday, November 19, 2022, 8:00–10:00 AM US EST, Constitution AB

Chaired by Arturo E. Hernandez, *University of Houston*

8:00–8:15 AM (135)

What Would Kuhn Say? The Bilingual Advantage, EF, and the Structure of Scientific Revolutions. ARTURO E. HERNANDEZ, *University of Houston* — In the past twenty years, a heated debate has emerged with regard to the link between bilingual experience and performance on cognitive control tasks. More recently, research has begun to look at variability in bilingualism and on the nature of the control tasks used. To date, however, very few studies have focused on the models used to conceptualize cognitive control. In this talk, the views of Kuhn on scientific revolutions are brought to bear on this question. In particular, an alternative to the current models will be presented that is centered on reinforcement learning (RL) and interactive specialization (IS). RL suggests that the interactions between the basal ganglia and the prefrontal cortex are at the core of cognitive control. This view also takes into account neurotransmitters such as dopamine. IS focuses on emergent modularization across development. A natural question that arises is whether a synthesis of RL and IS represents what Kuhn might consider a paradigm shift. The presentation will end by emphasizing the implications of a potential paradigm shift on current views on the impact of bilingualism on the cognitive system and the role of development in this process.

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8:20–8:35 AM (136)

Experience-Based Individual Differences in Bilingualism Modify Brain Signal Complexity and Neural Efficiency. JOHN G. GRUNDY, *Iowa State University*, ASLI YURTSEVER, *Iowa State University* — Several studies have shown that second-language acquisition requires domain-general cognition and as a result, bilinguals often outperform monolinguals on executive function tasks. However, this is not always replicated. Part of the reason for this discrepancy is likely that bilingualism is complex and no two bilingual experiences are the same. In the present study, we collected EEG data while young adult participants completed a context-dependent Stroop task and show that different bilingual experiences lead to different behavioral and electrophysiological outcomes. Of particular note, second-language usage, proficiency, and frequency switching between languages predicted brain signal complexity, behavior, and neural efficiency. We conclude with a discussion on how the field should progress moving forward.

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8:40–8:55 AM (137)

45 Key Assertions Relevant to the Bilingual Advantage in EF Hypothesis. KENNETH PAAP, *San Francisco State University* — Paap (2023) concludes that the effect of bilingualism on executive functioning (EF) is trivially small and that the necessary and sufficient conditions for producing consistent and more robust advantages are undetermined and likely to remain so. However, the research on the relationship between bilingual control and cognition has yielded rich results that enable one to formulate at least 45 key assertions that have shaped the current debate. I will present those assertions at a rate of three per minute. For example: (1) When bilinguals switch languages voluntarily, switch costs are greatly reduced or eliminated. Switching languages in natural environments is not inherently effortful. (2) Seven recent meta-analyses converge on the conclusion that effect sizes (bilingual advantages) for all components of EF are very small and not distinguishable from zero when corrected for publication bias. Age is not a mediator. (3) Failure to reject the null is not grounds for accepting the null when using NHST, but substantial evidence for the null can be obtained when using Bayes Factors. Almost all tests of the bilingual advantage in EF hypothesis reporting, Bayes Factors have reported substantial evidence for the null.

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9:00–9:15 AM (138)

Is There a Language Switch Cost in Comprehension? Manipulation of Intentional ("Top-Down") Language Selection in Visual Word Categorisation. BRONTË GRAHAM, *University of Exeter*, STEPHEN MONSELL, *University of Exeter*, HEIKE ELCHLEPP, *University of Exeter*, AURELIU LAVRIC, *University of Exeter* — Bilinguals rarely need to select the language in which they read, because most words are language-specific. Indeed, some studies found no language switch costs in visual comprehension. We manipulated between-subjects the opportunity and need for endogenous selection of language in a semantic categorisation task by (1) cuing the language of the word (French/English) and (2) including interlingual homographs on 20% of trials (e.g., "four" means 4 in English and "oven" in French). Performance on non-homographs was compared across three conditions: (1) with language cues and interspersed interlingual homographs, (2) with language cues but without interlingual homographs, and (3) without cues or interlingual homographs. Switch costs were observed in all three conditions. Interspersing interlingual homographs more than doubled the switch cost. Language cuing alone had little effect on the switch cost. In contrast with some studies, these results provide evidence for language switch costs in bilingual comprehension, even when there is no need or opportunity for top-down selection. Intentional control of language selection can be induced by the inclusion of language-ambiguous words, increasing the switch cost for language-specific words.

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9:20–9:35 AM (139)

Language-Switch Costs from Comprehension to Production Might Just Be Task-Switch Costs. CHUCHU LI, *University of California, San Diego*, TAMAR GOLLAN, *University of California, San Diego* — Spanish-English bilinguals switched between naming pictures in one language and either reading aloud or semantically classifying written words in both languages. When switching between reading aloud and picture naming, bilinguals exhibited no language switch costs in picture naming even though they produced overt language switches in speech. However, when switching between semantic classification and picture naming, bilinguals, especially unbalanced bilinguals, exhibited switch costs in the dominant language and switch facilitation in the nondominant language even though they never switched languages overtly. These results reveal language switching across comprehension and production can be cost-free when the intention remains the same. Assuming switch costs at least partially reflect inhibition of the nontarget language, this implies such language control mechanisms are recruited only under demanding task conditions, especially for unbalanced bilinguals. These results provide a striking demonstration of adaptive control mechanisms and call into question previous claims that language switch costs necessarily transfer from comprehension to production.

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9:40–9:55 AM (140)

The Role of Orthographic Similarity in Language Switching. TANJA C. ROEMBKE, *Rheinisch-Westfälische Technische Hochschule Aachen University*, IRING KOCH, *Rheinisch-Westfälische Technische Hochschule Aachen University*, ANDREA M. PHILIPP, *Rheinisch-Westfälische Technische Hochschule Aachen University* — The role of orthographic overlap in language switching is not clear, partly because language switching has been primarily investigated while speaking and not while writing. Therefore, across two experiments, we manipulated the extent of orthographic overlap of translation-equivalent words, so that stimuli were either very similar orthographically (e.g., TIGER [English/German]) or not (e.g., DRESS/KLEID [English/German]). Unbalanced German-English bilinguals completed a cued language switching task where they had to name pictures in their more dominant language and secondary language by typing. Reaction times as well as error rate were analyzed. While switch costs were present when translation-equivalent concepts did not overlap orthographically, they disappeared when stimuli overlapped completely in how they are written. These results suggest that overlap in orthography can strongly facilitate language switching when writing. Thus, the role of orthographic similarly should be considered more thoroughly in models of bilingual language production.

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Speech Perception II
Saturday, November 19, 2022, 8:00-10:00 AM US EST, Independence

Chaired by Sara Incera, *Eastern Kentucky University*

8:00–8:15 AM (304)

Contribution of Visual Speech Rhythm to Speech Recognition in Noise. J. DEVIN MCAULEY, *Michigan State University,* ANUSHA MAMIDIPAKA, *Michigan State University,* SHEN YI, *University of Washington,* TONI SMITH, *Michigan State University,* GARY KIDD, *Indiana University* — This talk describes two experiments that examined the use of visual speech information in speech recognition in "zoom-like" listening environments. Individuals listened to one of four speakers produce five-word sentences of the form (Name, Verb, Adjective, Number, Noun) embedded in multi-talker babble and reported what they heard for different signal-to-noise ratios. Experiment 1 compared recognition for an auditory-only condition accompanied by a static image of the talker to an auditory-visual congruent condition where the audio was paired with a video of the same talker producing the same target sentence and an auditory-visual incongruent condition where the audio was paired with the video of the same talker producing a different target sentence. Experiment 2 simulated "glitches" by systematically modulating the visual speech rhythm by temporally compressing and expanding the videos. Results reveal a large benefit of visual speech information to speech recognition, especially for more difficult SNRs. In addition, the benefit of visual speech information is significantly reduced when the visual speech rhythm is disrupted.

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8:20–8:35 AM (141)

How Active Are Sublexical and Lexical Representations 12 Hours After They Have Been Used to Understand Speech? ARTHUR SAMUEL, *Stony Brook University, Basque Center on Cognition, Brain and Language, & Ikerbasque*, NICOLAS DUMAY, *University of Exeter* — During speech comprehension, listeners activate both lexical and sublexical representations. Sumner and Samuel (JEP:LMC, 2007) demonstrated that 15-20 minutes after such activation, perception of a nonword was facilitated by having heard a similar nonword (e.g., "jub" → "jup"), but was inhibited by having heard a similar word (e.g., "job" → "jop"). This pattern demonstrates enduring activation of both lexical and sublexical information for 15-20 minutes. We find that after a much longer delay (12 hours), during which time people were awake and doing their normal activities, lexical interference remains but sublexical facilitation is gone. We will report on the fate of lexical and sublexical activation when the 12-hour delay instead includes a night's sleep, testing whether sleep differentially maintains or resets the activation levels of lexical or sublexical representations.

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8:40–8:55 AM (142)

Task-Optimized Deep Learning Models Reveal Computational Pressures for the Specialization of Lexical Representation. ENES AVCU, *Massachusetts General Hospital/Harvard Medical School*, MICHAEL HWANG, *Harvard University*, KEVIN BROWN, *Oregon State University*, DAVID W. GOW, JR., *Massachusetts General Hospital/Harvard Medical School* — Converging evidence from pathology, neuroimaging, and behavioral research suggests the existence of parallel wordform representations mediating the mapping between acoustic-phonetic input and dorsal versus ventral stream processing. We hypothesize that this separation arose in part because of fundamental differences in the computational requirements of these mappings. We tested this hypothesis by training two LSTM networks (one on sparse arbitrary vectors and the other on sparse vectors based on patterns of lexical co-occurrence as a surrogate for semantic representation) to recognize cochleagrams of multiple tokens of different spoken words. Both models achieved high levels of accuracy. Secondary analyses showed a double dissociation in classification based on hidden node activation patterns, with dorsal model patterns supporting superior (untrained) phoneme classification and ventral patterns supporting superior (untrained) grammatical class categorization. These findings suggest that the development of parallel lexica in the dorsal and ventral pathways arose from computational pressures for optimizing the primary mapping functions that support lexically organized processes in the dorsal and ventral processing streams.

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9:00–9:15 AM (143)

When Does First Language Support Second Language Speech Perception? The Acoustic-Attentional-Contextual Hypothesis.. WILLIAM CHOI, *The University of Hong Kong* — Can second language learners outperform natives on speech perception? In a recent study, Cantonese listeners discriminated English stress more accurately than did English listeners. The present study investigates whether this previous finding generalizes to various pitch accent and vowel reduction contexts. Sixty Cantonese and English listeners completed the English stress discrimination task in various pitch accent and vowel reduction contexts. In the falling pitch accent context without vowel reduction, the Cantonese listeners outdid the English listeners on English stress discrimination. With either rising pitch accent pattern or vowel reduction, the Cantonese advantage disappeared. In the rising pitch accent pattern context with vowel reduction, the Cantonese listeners even performed poorer than the English listeners. The results suggest two constraints of the Cantonese advantage in English stress discrimination—rising pitch accent pattern and vowel reduction. The Acoustic-Attentional-Contextual hypothesis is proposed to conceptualize non-native advantage in speech perception.

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9:20–9:35 AM (144)

Cognitive Ease: How Native Speakers Drive Interactions in Foreign Accents Research. SARA INCERA, *Eastern Kentucky University*, ANGIE MARROQUIN, *Eastern Kentucky University*, HALEIGH A. HAMILTON, *Eastern Kentucky University*, JENNA SHOEMAKER, *Eastern Kentucky University*, MONTSERRAT CRUZ, *Eastern Kentucky University* — Research on accents often focuses on whether context influences listeners' perception. It is possible that "challenging contexts" make it more difficult to process foreign speech or that "conducive contexts" make it particularly easy to process native speech. We examined whether the way a speaker looks influences listeners' ratings of accentedness. In particular, whether foreign speakers who look foreign are rated as more foreign (negative bias) or whether native speakers who look native are rated as more native (cognitive ease). In the video condition (where the effect of appearance played a role) participants rated the speakers who looked and sounded native as more native. Surprisingly, appearance did not influence the ratings of the foreign-accented speakers. These results support the Cognitive Ease Hypothesis: speakers who look and sound familiar are particularly easy to process. Difficulties with foreign accents might be due to our inability to predict what comes next.

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9:40–10:00 AM (145)

The Role of Pitch and Pause on Rhythm Perception. MICHAEL WAGNER, *McGill University* — Intensity and duration are well known to affect the perception of rhythm in sound sequences: alternating loud and soft sounds tend to be perceived as trochees, and alternating long and short sounds as iambs (Bolton 1894, Hay & Diehl 2007). Similar effects have been reported for pitch, often also based on tasks that ask about perceived foot type. But pitch effects are much more variable. Woodrow (1911) , e.g., concluded that pitch has "neither a group-ending nor a group-beginning effect." This paper reports on an experiment on the perception of syllable sequences showing that pitch does have a systematic effect on perceived grouping, but only if its trajectory is compatible with resulting from a boundary tone. If it looks like the reflex of a pitch accent, grouping decisions will be closer to chance, while prominence decisions will be above chance. Pause, on the other hand, reliably cues grouping, but the presence of a pause affects whether listeners hear groups with initial or final prominence. Overall, the results show that rhythm perception can only be fully understood if the task is such that both grouping and prominence perception are established, but just a single dimension such as grouping, prominence, or perceived foot.

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Symposium IV: Age-Related Patterns for Memories and Future Projections During the COVID-19 Pandemic

Saturday, November 19, 2022, 10:00 AM–12:00 PM US EST, Sheraton Grand Ballroom

Chaired by Lauren L. Richmond, *Stony Brook University*

Although the COVID-19 pandemic was a collectively experienced event, memories from the COVID-19 pandemic period may be varied, particularly as a function of age. Moreover, memories and future projections are known to be tightly related to one another; therefore, understanding features of memories formed during the COVID-19 period, such as valence, is expected to provide insights into how people will think about the future in moving forward from this period. Older adults are at greater health risk under COVID-19 and may therefore have different memories and future projections than younger-aged adults that may be more negative in nature. At the same time, older adults are known to possess better emotion regulation skills and to remember information more positively than younger-aged cohorts, suggesting a potential benefit to emotional memory associated with being older during the COVID-19 pandemic. Finally, due to the stressful nature of the COVID-19 period, emotion-focused processing may impact memory accuracy for emotional information that is unrelated to COVID-19 as well as information related to the COVID-19 pandemic itself.

10:00–10:20 AM (SYM13)

Memories and Future Thinking Under COVID-19: Durability of Age-Related Patterns Up to 10-Year Future Projections. LAUREN L. RICHMOND, *Stony Brook University*, TORI PEÑA, *Stony Brook University*, LOIS K. BURNETT, *Stony Brook University*, SUPARNA RAJARAM, *Stony Brook University* — People are more positive about the future than the past, more positive in the personal than the national domain, and exhibit more positivity at older ages. We have previously reported that during the COVID-19 pandemic people expressed more positivity for future events than past events. To characterize future projections over longer timelines during this period, we asked participants to rate their excitement and worry for their personal future and the national future over varying timelines. We tested the effects of age group (young, middle-aged, older), domain (personal, national), and timeline (one week, one year, 5-10 years) separately for excitement and worry. Younger-aged groups were more excited for their personal future than the national future, whereas older adults exhibited similar levels of excitement across domains. All age groups expressed more worry for the national future than their personal future, with smaller differences at longer timelines. Young adults were both the most excited and the most worried at longer timelines. Results are largely consistent with past work regarding personal versus national future thinking and age-related positivity, suggesting the durability of these effects under COVID-19.

10:20-10:40 AM (SYM14)

The Impact of Covid-19 Related Stress on Emotional Reactivity and Memory Across the Adult Lifespan. AUDREY DUARTE, *The University of Texas at Austin*, KYOUNGEUN LEE, *The University of Texas at Austin* — The Covid-19 pandemic has threatened not only physical health, but also psychological well-being. However, it is unclear how Covid-19 related stress influences processing and remembering of emotional events. Here, we investigated the impact of perceived Covid-19 related stress on emotional experience and subsequent memory for emotional events. As age is predictive of greater emotion regulation ability, we also examined whether age moderates the impact of Covid-19 related stress on emotional experience and memory. The current study was conducted on a large, online sample with varying levels of Covid-19 related stress. Participants completed an emotional episodic memory task in addition to numerous questionnaires. People who reported higher levels of Covid-19 related stress, above and beyond general stress, showed a higher level of experienced arousal for emotional stimuli, regardless of valence. In addition, Covid-19 related stress predicted greater negative memory preference effects benefits. Covid-19 related emotional arousal and memory effects were similar across the adult lifespan. Collectively, these results showed that Covid-19 related stress may intensify reactivity and memory for emotional stimuli across the adult lifespan.

10:40-11:00 AM (SYM15)

Differences in Remembering the Panic Memories: Findings from 15 Countries. SEZIN OÑER, *Kadir Has University* — As part of an international collaborative project (https://osf.io/m46nq/), we asked over 4,000 individuals from 15 countries to report the three most remarkable events that happened since the outbreak of the pandemic and three events that they expected to occur in the future. Individuals indicated the events at a global and national level. First, we examined the valence of reported events and demonstrated a positivity bias for future events. Then, we investigated the role of age in the observed differences as the COVID-19 constituted a more intense threat for the elderly. We found that while elderly reported more negative past events for the pandemic, age differences disappear for the future events. Results will be discussed from a functional perspective in relation with the severity of the pandemic in each country.

11:00-11:20 AM (SYM16)

Pandemic Memories: Differences Across the Generations and Suggestions of Inter-Generational Transfer. ELIZABETH A. KENSINGER, *Boston College*, TONY CUNNINGHAM, *Boston College*, ERIC FIELDS, *Westminster College*, JACLYN H. FORD, *Boston College*, SANDRY M. GARCIA, *Boston College*, HANNAH YOON, *Boston College* — In summer and fall 2020, older age was associated with greater tendency to recall positive aspects or silver linings of the first wave of the pandemic (Ford et al., 2021). Here, we examined whether these age-related differences persisted (Study 1) and whether they transferred to young adults who had extensive contact with older adults (Study 2). In Study 1, conducted in summer 2021 with 257 of the participants (ages 18-89, M=40.14) who completed the earlier memory surveys, older age again was associated with increased focus on positive aspects in memory ($p<.001$), and unlike at earlier time-points, was also associated with reduced focus on negative aspects ($p=.03$, age x time interaction, $p=.01$). In Study 2, conducted in fall 2021, we compared memories of college students who had no contact (N=25) or substantial contact (N=26) with older adults. The latter group focused marginally less on the negative aspects ($p=.06$) and had significantly lower subjective negativity for picture-cued memories ($p=.03$) of the pandemic. The results reveal that older adults reduce the negative focus of memories as they gain distance from events, and intriguingly suggest that this ability may transfer to young adults with whom they have extensive contact.

11:20-11:40 AM (SYM17)

Empathy and Memory During the COVID-19 Pandemic and Effects of Aging. ISU CHO, *Brandeis University*, RYAN T. DALEY, *Psychology and Neuroscience, Boston College*, TONY J. CUNNINGHAM, *Psychology and Neuroscience, Boston College; Psychiatry, Harvard Medical School; Psychiatry, Beth Israel Deaconess Medical Center*, ELIZABETH A. KENSINGER, *Boston College*, ANGELA GUTCHESS, *Brandeis University* — Empathy influences one's behavior especially in times of challenge. Studying how empathy is related to one's memory during the COVID-19 pandemic can delineate the dynamics between emotion and cognition in daily lives. Do individuals with greater empathy show more accurate memory for the number of COVID cases due to their motivation to empathize with others? Does this relationship change with age, as empathic ability changes? The current study examined these questions with 393 U.S. participants (aged 18-89) from the Boston College COVID-19 study who completed surveys on dispositional empathy and memory for COVID cases in the USA and their state. The results showed that affective empathy, but not cognitive empathy, was significantly associated with memory for the confirmed cases early in the pandemic. Specifically, individuals with higher affective empathy reported greater memory accuracy for COVID cases, regardless of one's perceived stress levels and personal experience relevant to COVID. This association, however, was neither influenced by age nor found at a later stage in the pandemic. The pattern suggests individual differences in memories from the pandemic and fluctuations of emotion-memory interactions over time.

11:40 AM-12:00 PM (SYM18)

Thinking Beyond COVID-19: Thinking About the Personal Past and Future During the Pandemic. DONNA ROSE ADDIS, *Baycrest Health Sciences & University of Toronto*, SAMUEL GYNES-CLINTON, *Baycrest Health Sciences*, ZIMING CHENG, *Baycrest Health Sciences & University of Toronto*, RIYA TRIKHA, *Baycrest Health Sciences & York University*, AUDREY LI-CHAY-CHUNG, *Baycrest Health Sciences & York University* — The coronavirus pandemic has had widespread effects, ranging from social disconnection to loss of income and loss of life, with severe

consequences for mental health. Together with the monotony of daily life and prolonged uncertainty, these factors have impacted the way in which we think about the past and future. We have explored autobiographical thinking during the pandemic in a global online study, the Thinking Beyond COVID-19 Study, collecting data from participants in 6 geographical regions over 11 time-points since May 2020. In this talk, I will focus on findings from two autobiographical tasks that probe past and future thinking: the sentence completion task and an event description task. I will discuss how age and mental health relate to the episodic specificity of past and future thoughts, as well as the content and affective tone of autobiographical responses. Our results suggest that depression is related to the specificity and affective tone of past thoughts, while future thoughts are marked by a strong optimism bias, particularly in older adults.

Bilingualism: Cognitive Processes
Saturday, November 19, 2022, 10:20 AM-12:00 PM US EST, Constitution AB

Chaired by Debra Titone, *McGill University*

10:20-10:35 AM (146)

What Drives Figurative Meaning Interpretation During L1 and L2 Idiom Reading: Direct Retrieval or Compositional Assembly? DEBRA TITONE, *McGill University*, MARCO SILVIO GIUSEPPE SENALDI, *McGill University* — When idioms are first encountered with no prior context, past work suggests that L1 readers directly retrieve idiom forms (e.g., spill the beans), whereas L2 readers process idioms more literally/compositionally. However, unclear is whether idioms are interpreted figuratively, and how this varies when idioms follow figuratively or literally biased contexts (i.e., when meaning selection is viable on the first pass). We tested this in an eye-tracking study where 40 L1-English and 35 L2-English adults (French L1) read English sentences containing idioms that had figurative, literal, or neutral prior contexts. Linear mixed-effects models revealed an overall L1 preference to interpret idioms literally for early measures (idiom FPGD). At the disambiguation region, however, L1 readers showed evidence of interpreting idioms figuratively as familiarity increased, suggesting an L1 reliance on direct retrieval. In contrast, L2 readers showed evidence of interpreting idioms figuratively as verb-decomposability increased, suggesting an L2 reliance on bottom-up compositional assembly of figurative interpretations. Collectively, these data cohere with hybrid models of idiom processing and past work examining neutral prior contexts exclusively.

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10:40-10:55 AM (147)

Bilingual Lexical Access Is Driven by Semantic Diversity, Not Word Frequency. PHILLIP HAMRICK, *Kent State University*, NICK B. PANDŽA, *Applied Research Laboratory for Intelligence & Security, University of Maryland* — Recent studies have shown that corpus-derived metrics that take into account the likely need of a word across different semantic contexts (e.g., semantic diversity) outperform standard word frequency metrics in predicting native speaker lexical access (Jones et al., 2012). However, similar studies with bilinguals have yielded somewhat mixed findings. We analyzed the separate and joint influences of semantic diversity and word frequency on reaction times in a lexical decision task on over 760 words across 80 bilingual participants. Semantic diversity significantly outperformed word frequency in predicting reaction times, and when considered jointly, the word frequency effect was eliminated, consistent with findings in monolinguals. These results add to the growing evidence that the mental lexicon is underpinned by basic principles of declarative memory as outlined in Anderson's rational analysis of memory (Anderson & Milson, 1989).

Email: Phillip Hamrick, philliphamrick@gmail.com

11:00-11:15 AM (148)

More Proficient Writers Use Fewer Cognates in L2: A Computational Approach. ANAT PRIOR, *Education, University of Haifa*, LIAT NATIV, *University of Haifa*, YUVAL NOV, *Statistics, University of Haifa*, NOAM ORDAN, *Israeli Association of Human Language Technologies*, SHULY WINTNER, *Computer Science, University of Haifa* — Bilinguals often show evidence of cross language influences (CLI), such as facilitation in processing cognates. Here we use computational methods for analyzing spontaneous texts written by hundreds of speakers of different L1s, at different levels of English proficiency, to investigate writers' preference for using cognates over alternative word choices. We focus on English, since a majority of its lexicon is either of Romance or Germanic origin, allowing an investigation of the preference of speakers of Germanic and Romance L1s for cognates between their L1 and English. Results show that L2 writers tend to prefer English cognates, and that this tendency is weaker as English proficiency level increases, suggesting diminishing effects of CLI. However, a comparison of the L2 writers with native English writers shows general overuse of cognates only for the Germanic, but not the Romance, L1 speakers, most likely due to the register of argumentative writing.

Email: Anat Prior, aprior@edu.haifa.ac.il

11:40-11:55 AM (150)

Visuospatial Serial Order Recall in Bilinguals vs. Monolinguals vs. Chimpanzees. NADINE CHARANEK, *Carleton University*, OLESSIA JOURAVLEV, *Carleton University*, PANOS ATHANASOPOULOS, *Lancaster University* — Chimpanzees have been shown to outperform humans in visuospatial serial order recall (Matsuzawa, 2003). According to the cognitive tradeoff hypothesis (Matsuzawa, 2007), chimps are superior to humans in this task because humans sacrificed the robust working memory system to accommodate the complex system of language. Based on the cognitive tradeoff hypothesis, we hypothesized that acquiring multiple languages might be associated with additional costs in the visuospatial working memory that bilinguals incur. To test this hypothesis, we compared performance of monolinguals vs. bilinguals (and vs. data

from chimpanzees reported in Matsuzawa, 2003) as they engaged in a limited-hold masking task. In this task, visual stimuli (numerals or nonverbal pictures) are briefly displayed on the screen before being masked by white boxes. Participants memorized the location of the stimuli in the order of their appearance. Consistent with prior research, we found that chimpanzees outperformed humans. Further, there were indications that bilinguals with a particular language background history (balanced; need to use 2 languages on daily basis) differed from monolinguals in their performance in the visuospatial serial order recall.

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Concepts and Categorization
Saturday, November 19, 2022, 10:20 AM-12:00 PM US EST, Back Bay D

Chaired by Fabian A. Soto, *Florida International University*

10:20-10:35 AM (151)

Categorization Training Does Not Create New Dimensions: Enhancement of Existing Representations Explains Dimension Differentiation Effects. FABIAN A. SOTO, *Florida International University*, JASON A. HAYS, *Florida International University* — Learning to categorize objects along a novel morphing dimension increases its discriminability and invariance. A common interpretation of these results is that categorization creates novel dimensions rather than simply enhancing already-existing representations. Here, we trained participants to categorize faces that varied along a task-relevant and a task-irrelevant morphing dimension. Three experiments using face adaptation aftereffects and traditional morphing suggested that categorization enhances the already-existing norm-based coding of face identity rather than creating novel representations. To more precisely test this hypothesis, we directly manipulated three-dimensional face models to generate novel dimensions in shape space. We implemented a neurobiologically-plausible face encoding model in the same shape space and simulated candidate mechanisms of encoding change as a result of categorization. We linked each mechanism to a potential change in psychophysical thresholds along the category-relevant dimension. In a new study, we observed threshold changes that again suggested enhancement of already-existing representations. We show through simulation how this mechanism can explain prior results in the literature.

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10:40-10:55 AM (152)

Sorry, I Can't Talk Right Now: Category Learning on the Go. ANTHONY CRUZ, *University of Western Ontario*, JOHN PAUL MINDA, *University of Western Ontario* — Humans learn to make a wide range of category judgments and these judgments tend to be acquired in short, temporally distinct (distributed) learning experiences in varying contexts. Distributed learning benefits procedural skills including keyboarding, grammar acquisition, and EKG diagnosis; this well-documented effect is known as the spacing effect. The spacing effect may play a role in the acquisition of natural categories, as well. We examined how the distribution of learning experiences over time impacts information-integration category learning. Participants were randomly assigned to one of two learning conditions and completed six category learning blocks on their smartphone preceded and followed by similarity judgment tasks. Participants in the massed condition completed all category learning trials in one session while those in the distributed conditions underwent 6 learning sessions spaced 6-18 hours apart. We found support for a spacing effect, suggesting that distributed study is more effective than massed study for category induction. Future research should examine this paradigm's effectiveness at instructing real-world category induction tasks, such as melanoma diagnosis or mushroom classification.

Email: Anthony Cruz, acruz27@uwo.ca

11:00-11:15 AM (153)

Category Learning with Point-Based Feedback. CASEY L. ROARK, *University of Pittsburgh*, BHARATH CHANDRASEKARAN, *University of Pittsburgh* — During category learning in the lab, learners are often presented with simple, deterministic feedback about whether their categorization response was right or wrong. In the real world, we receive more nuanced information about the goodness of category exemplars. In this study, we varied the information provided to learners about underlying category structures during rule-based auditory category learning. In addition to corrective feedback, participants received points if they were correct and saw how many points they missed if they were incorrect. Across five conditions, we varied the reward randomly or based on the distance from the boundary (positive or negative correlation) or distance from the category prototypes (positive or negative correlation). Learning performance was similar across conditions. However, in tasks completed after learning to assess how the reward information affected learners' decisions, we found that learners overvalued stimuli close to the category boundaries, regardless of which reward contingencies they were trained on. Overall, these results demonstrate that point-based feedback interacts with overall category structure to guide category learning.

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11:20-11:35 AM (154)

Implicitly Learned Information Affects Explicitly Learned Category Judgements. PRIYA KALRA, *The University of Western Ontario*, JOHN PAUL MINDA, *University of Western Ontario* — Humans can learn categories using implicit or explicit mechanisms. Previous findings suggest that these mechanisms may compete or interfere with one another during learning. In the current study, we explore the effects of simultaneous implicit and explicit category learning. Participants were explicitly instructed to use a completely diagnostic, shape-based rule to classify exemplars and received feedback after each trial. However, unknown to participants, the categories

also differed probabilistically in their color distributions. Results suggest that participants used both color (implicitly learned information) and shape (explicitly learned information) to make category judgements: participants were quicker to correctly classify exemplars when the test stimuli were congruent with the training color distributions than when they were incongruent (Mcongruent = 2.98s, Mincongruent = 3.28s, t = 3.16, p = .004). However, participants were not aware of the color differences. Either implicitly and explicitly learned information contributes to a common representation or forms of learning contribute to decision-making. These results suggest less encapsulation between learning mechanisms than has been previously thought.

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11:40-11:55 AM (155)

Exception Learning as a Window to Cognitive and Neural Mechanism. MICHAEL MACK, *University of Toronto*, EMILY HEFFERNAN, *University of Toronto*, YONGZHEN XIE, *University of Toronto*, MATEJA PEROVIC, *University of Toronto*, MELISA GUMUS, *University of Toronto*, MARGARET L. SCHLICHTING, *University of Toronto* — Meaningful learning comes from moments of contention in which the current experience conflicts with prior knowledge. Such moments can arise in rule-plus exception learning tasks, in which learners must reconcile rare exceptions to a categorization rule with their knowledge of rule-confirming items in support of flexible generalization. Yet the factors and mechanisms that promote exception learning are poorly understood. Here, we review several studies that characterize exception learning at the behavioural, computational, and neural levels. We find that learning of exceptions 1) is strengthened when they are introduced later in learning; 2) is supported by differentiation and hierarchically organized representations; and 3) is likely subserved by the hippocampus (HPC), as evidenced by simulations from an HPC neural network model and relationship with HPC white matter integrity. We further find that 4) exception learning is uniquely impacted by variability in estrogen, a hormonal modifier of HPC function, throughout the menstrual cycle. Collectively, these findings suggest that exception learning offers an important empirical tool to characterize the key cognitive and neural mechanisms that underlie complex human learning.

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Learning and Instruction I

Saturday, November 19, 2022, 10:20 AM-12:00 PM US EST, Back Bay B

Chaired by Doug Markant, *University of North Carolina at Charlotte*

10:20-10:35 AM (156)

When Do Data Visualizations Persuade? Effects of Existing Attitudes on Belief Updating About Correlations. DOUG MARKANT, *University of North Carolina at Charlotte*, MILAD ROGHA, *University of North Carolina at Charlotte*, ALIREZA KARDUNI, *Northwestern University*, RYAN WESSLEN, *Explosion*, WENWEN DOU, *University of North Carolina at Charlotte* — Data visualizations play an increasingly important role in communicating scientific evidence to the public, yet little is known about when and why data visualizations are persuasive, leading to changes in attitudes or behavior. The Covid-19 pandemic has shown that data visualizations can be powerful decision making aids for some people, while being ignored or discounted by others when they clash with existing beliefs. This study examined the effects of preexisting attitudes on how people learn about statistical relationships when interacting with visualizations of real-world data related to polarizing topics (e.g., Covid-19 vaccination). We measured changes in beliefs about bivariate correlations (e.g., between vaccination rate and infection rate) after interacting with visualizations with different representations of statistical uncertainty. The results showed that strong preexisting attitudes were associated with less belief updating when faced with statistical evidence that conflicted with prior beliefs. These findings are a step toward a formal account of persuasive visualization rooted in cognitive and motivational mechanisms, including how they interact to preserve existing views in the face of contradicting evidence.

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10:40-10:55 AM (157)

Patterns of Visual Attention in Massed and Interleaved Learning. MELINA KNABE, *University of Wisconsin-Madison*, EZGI M. YUKSEL, *University of Wisconsin-Madison*, BENJAMIN BARMORE, *University of Wisconsin-Madison*, HALEY VLACH, *University of Wisconsin-Madison* — Interleaving -- as opposed to massing -- information improves learning of categories, such as artists' painting styles (Kornell & Bjork, 2008). The aim of the present study was to replicate this finding and to assess whether massed and interleaved schedules result in different patterns of visual attention during learning. For this purpose, 82 participants (Mean age: 19.98 years, SD = 1.68) studied paintings from 12 different artists on either a massed or interleaved schedule. Participants then identified the artists for a series of new paintings. The results replicated prior research: Participants were significantly better at learning the painting styles for artists whose paintings were presented on an interleaved schedule. Furthermore, the distribution of visual attention to the stimuli differed between the two presentation schedules; participants scanned the screen more on interleaved presentations. Future studies will assess how individual differences in attention, working memory, and prior knowledge impact the magnitude of the interleaving effect.

Email: Melina Knabe, mknabe@wisc.edu

11:00-11:15 AM (158)

The Effects of Note-Taking on Mind-Wandering and Learning: A Comparison of Four Note-Taking Methods. AKIRA MIYAKE, *University of Colorado Boulder*, REBEKAH BENJAMIN-POLLAK, *University of Colorado Boulder*, HAYDEN KINDSCHI, *University of Colorado Boulder*, HAN ZHANG, *University*

of Michigan, MICHAEL J. KANE, *University of North Carolina at Greensboro* — In this laboratory study, ~270 students watched a video lecture on introductory statistics, during which they were occasionally interrupted with thought probes and asked to report what they were thinking right before each probe. During the lecture, students took notes in one of four ways: (a) freehand note-taking; (b) taking notes on the printouts of full slides; (c) taking notes on partial slides where some key information was missing; and (d) taking no notes. After the lecture, students took posttests, first without reviewing the notes and then after reviewing them (the no-notes group reflected on the lecture content). Results indicated that, compared to the no-notes control, taking notes in any form reduced mind-wandering, but this effect was the most substantial for the two groups taking notes on printed slides (full or partial). Such attentional benefits of taking notes, however, did not translate into better posttest scores right away (i.e., no direct encoding benefit), but reviewing notes substantially improved posttest scores. These results point to potential benefits of making lecture slides available to students in advance and letting them take notes on the printouts of those slides in class.

Email: Akira Miyake, akira.miyake@colorado.edu

11:20–11:35 AM (159)

Embodied Learning Online: Seeing the Professor Leads to Better Learning Outcomes Than Hearing a PowerPoint Read. JACLYNN V. SULLIVAN, *Mount Mercy University* — The goal of this experiment was to extend in-person findings and determine if the style of online lectures (voiced-over PowerPoint versus full video demonstration) impacted learning of a brief lecture on biological hierarchies. 233 participants were randomly assigned to the PowerPoint (n = 119) or video (n = 114) condition and then asked recall, recognition, and application questions. An independent-samples t-test revealed that the students in the video condition (M= 25.39, SD= 4.03) performed significantly better than those in the PowerPoint condition (M= 23.27, SD= 5.27). This was indicated by a medium and significant difference between groups, t(220) = 3.45, p= <.001, d= 0.45. Evidence suggests that online lectures vary in their effectiveness. Students' learning is impacted by the presentation being active and embodied such that professors should consider recording lectures as full video demonstrations where possible.

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11:40–11:55 AM (160)

What Matters When Lectures Move Online? Measuring the Impact of Fluency, Modality, and Feedback on Students' Metacognitive Judgments and Learning. NAYANTARA KURPAD, *St. Mary's College of Maryland*, MIKO M. WILFORD, *University of Massachusetts Lowell* — Due to the COVID-19 pandemic, many courses were forced to shift online. Recent data on student learning indicate that student engagement suffers when courses are delivered virtually. This could be due to students' involvement in other activities while they "attend" online lectures (e.g., doing dishes, folding laundry). In two experiments, we evaluated the impact of various factors that could be influencing online learning in consecutive learning sessions (over different topics)—specifically, we manipulated lecturer fluency, information modality, and feedback. Overall, participants reduced their judgments of learning and improved their learning performance on the second learning session relative to the first. Lecturer fluency increased JOLs and learning performance (replicating Wilford et al., 2020). The effects of modality on JOLs and learning performance were mixed, and feedback appeared to be ineffective. We conclude that online instructors should incorporate multiple learning and testing sessions and provide individualized feedback to encourage student engagement and maximize learning performance.

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Visual Perception
Saturday, November 19, 2022, 10:00 AM–12:00 PM US EST, Back Bay A

Chaired by Cathleen M. Moore, *University of Iowa*

10:00–10:15 AM (161)

Limits of Perceptual Organization in Near-Peripheral Vision: Surface Completion Fails to Reduce Visual Crowding (Uncrowding). CATHLEEN M. MOORE, *University of Iowa*, QINGZI ZHENG, *University of Iowa* — Visual acuity is worse for stimuli in the periphery than near fixation. Peripheral targets that are easily identifiable in isolation, however, and thus are well within acuity limits can be rendered unidentifiable by the addition of clutter (visual crowding). A question is whether perceptual organization processes, such as grouping, can protect a stimulus from crowding, or whether crowding is caused by sensory interference that occurs before mid-level structure has been abstracted from the image. Reduced crowding (uncrowding) occurs in displays designed to support grouping of a target away from cluttering flankers. We adapted these displays so that they would support perceptual grouping only if perceptual completion of surfaces behind occluding surfaces also occurred. This allowed us to match the image-level information across conditions more closely than previous studies. We found substantial uncrowding when perceptual completion was unnecessary, but no uncrowding when it was necessary. This reveals a limit to how perceptual organization alleviates crowding and is consistent with the hypothesis that uncrowding is in part attributable a reduction of image-level interference rather than mid-level perceptual organization.

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10:20–10:35 AM (162)

Gestalt Formation Promotes Awareness of Suppressed Visual Stimuli During Binocular Rivalry. DAVID HUBER, *University of Massachusetts Amherst*, MAR NIKIFOROVA, *University of Massachusetts Amherst*, ROSEMARY A. COWELL, *University of Massachusetts Amherst* — Continuous flash suppression leverages binocular rivalry to render observers unaware of a static

image for several seconds. To achieve this effect, rapidly flashing noise masks are presented to the dominant eye while a static stimulus is presented to the non-dominant eye. Eventually "breakthrough" occurs, wherein attention/awareness shifts to the static image shown to the non-dominant eye. We tested the hypothesis that high-level Gestalt formation can promote breakthrough. In two experiments, we presented several pacman-shaped objects that might or might not align to form illusory contours. In this way, low-level aspects of the display were the same in all conditions, which differed only in terms of high-level illusory contours. To measure the inception of breakthrough, observers were instructed to press a key as soon as they became aware of something, at a point of partial breakthrough. Breakthrough was faster when there was an illusory contour. After participants pressed the key to indicate partial breakthrough, they reported how many pacmen they had seen and where they were located. Supporting the Gestalt hypothesis, observers were more likely to report both pacmen if they were connected by an illusory contour.

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10:40–10:55 AM (163)

Eastern and Western Paintings: An Aesthetic Study. ZHE LI, *Bentley University*, CLAUS-CHRISTIAN CARBON, *University of Bamberg*, MOUNIA ZIAT, *Bentley University* — Many contemporary aesthetic studies are utilizing Western paintings; essentially limiting any generalization. We expanded a commonly used artworks database (JenAesthetic) that originally comprises 1,625 Western paintings by adding the same number of Eastern paintings. In order to provide a flexibly usable scientific art stimulus database, we collected preliminary data from 75 participants, each evaluating ten randomly assigned paintings from the database on the basis of the Aesthetic Emotions Scale (AETHEMOS), capturing aesthetic experiences and aesthetic displeasure. Additional questions related to art interest (personal importance), art experience, art knowledge, and personality of the participants were also collected. Participants were separated into two groups: Eastern participants and Western participants based on their country of origin. Paired t-tests showed significantly higher overall aesthetic ratings for Western paintings compared to Eastern paintings for both Eastern participants ($t(20) = 2.74$, $p = 0.01$) and Western participants ($t(20) = 4.23$, $p < 0.001$). There was no significant difference in ratings between the two groups, illustrating that different cultures might share a high degree of aesthetic assessment.

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11:00–11:15 AM (164)

A Replication Study of Two Classic Texture Segmentation Tasks. MARIA KON, *Purdue University*, GREGORY FRANCIS, *Purdue University* — Beck (1966) created a simple experiment to investigate properties of grouping and texture segmentation. The observer reported the boundary between regions of common elements (e.g., backward Ls, upright Ts, slanted Ts) that most naturally divided the pattern in two. By using different elements, he concluded that groupings were based on common orientation and not on element similarity. Beck (1983) used a similar task except participants rated the strength of segmentation of top and bottom regions that consisted of patterns of Us. While influential, these findings were based on small sample sizes (n=16,19), so we replicated these two experiments with much larger samples (n=49,99). Beck's (1966) results only partly replicated (correlation across conditions is r=0.6), but the (1983) results replicated very well (r=0.9). Two difficulties with replicating Beck (1966) are: the stimuli in the original paper are not well described, and example stimuli are incompatible with the provided textual description.

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11:20–11:35 AM (165)

A Novel Generalization Between Verbal Judgments and Perceptual Discrimination of 3D Space. PRACHI MAHABLESHWARKAR, *The George Washington University*, LINDSAY HOUCK, *Bates College*, DWIGHT KRAVITZ, *The George Washington University*, JOHN PHILBECK, *The George Washington University* — Visual spatial perception depends on integrating multiple sources of information over time, making it difficult to understand the contribution of individual cues. Here, we leverage natural scene image databases paired with a novel approach to crowd-sourced data collection in a series of preregistered studies, revealing a remarkable level of systematicity and generalization of spatial perception across tasks (verbal estimates [VE], discrimination) and stimulus durations (250, 500, 750, 1000ms). In VE, participants showed a strong overall sensitivity to target depth with significant and reliable differences across individual scenes beyond the general effect of depth ($R2 \sim .56$, $p \sim 10\text{-}35$). Moreover, these scene-specific deviations predicted discrimination performance in an independent group of participants for particular scene pairs ($R2 = .57$, $p < 10\text{-}14$). This generalization across tasks and participants indicates that image cues are consistently driving 3D spatial perception, allowing for in-depth examinations of individual cue contributions (e.g., familiar size, ground plane).

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11:40–11:55 AM (166)

No Sensory Visual Imagery in Aphantasia? GAËN PLANCHER, *Cognitive Mechanisms Research Laboratory, Université Lumière Lyon 2*, RUDY PURKART, *University of Montreal*, REMY VERSACE, *University of Lyon*, EDDY CAVALLI, *University of Lyon* — For some people the experience of visual imagery without direct external stimulus is lacking, a condition recently referred to as aphantasia. So far, most of the studies on aphantasia rely on subjective reports. In the present study, the formation of mental images was estimated in individuals with aphantasia without explicitly asking them to generate mental images. Participants performed an implicit priming task where a probe is assumed to automatically reactivate a mental image. An explicit priming task, where participants were explicitly required to form a mental image after a probe, served as a control task. While control participants showed a priming effect

for the implicit and the explicit tasks, participants with aphantasia did not show any priming effects. These results may suggest that aphantasia relies on a genuine inability to generate mental images rather than a deficit in accessing these images. Interestingly, when we put all the participants together and considered the score on the Vividness of Visual Imagery Questionnaire as a continuous variable, it correlated with the size of the implicit priming effect but not with the explicit one, suggesting that our implicit measure might be relevant to screen aphantasia.

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Cognitive Development
Saturday, November 19, 2022, 10:00 AM-12:00 PM US EST, Back Bay C

Chaired by Thomas St. Pierre, *University of Toronto Mississauga*

10:00-10:15 AM (167)

What Goes Up Might Come Down: The Development of Language Biases Across Childhood. THOMAS ST. PIERRE, *University of Toronto Mississauga*, KAITLYN HARRIS, *University of Toronto Mississauga*, ELIZABETH K. JOHNSON, *University of Toronto Mississauga* — Historically, children's media has tended to disproportionately portray villains with foreign and non-standard accents (Lippi-Green, 1997). This study investigated the extent to which children actually associate foreign accents with villains and how that changes across development. We asked children between the ages of 5 and 14 (N = 205) and adults (N = 77) to watch cartoons of foreign- and native-accented voice actors each portraying a hero and a villain and decide which of the two characters they thought each voice was better suited for. Results show that by 7 years old, children are more likely to associate non-native accents with villains, and this bias only increases with age. Ongoing work (to be completed by November) is investigating whether the tendency to associate foreign accents with villains can be mitigated through positive exposure to foreign accents. This work is important for understanding the development of linguistic discrimination and how to combat it.

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10:20-10:35 AM (168)

Developmental Changes in the Grapheme–Color Association of Kanji Characters Observed in Japanese Elementary School Children. EIKO MATSUDA, *The University of Tokyo*, YOSHIHIRO OKAZAKI, *Okayama University*, MICHIKO ASANO, *The University of Tokyo*, KAZUHIKO YOKOSAWA, *Tsukuba Gakuin University* — Grapheme–color associations are observed in the general adult population (Simner et al., 2005; Nagai et al., 2015). When asked to choose "the most suitable color" for graphemes, people's temporal consistency varies, while their average consistency tends to be higher than chance. In this research, we studied developmental changes in the grapheme–color association among Japanese children to determine whether it exists at the beginning of grapheme acquisition or is formed by learning and development. We focused on kanji characters, as students learn their new pronunciations by school grades and they can therefore reveal the effect of learning on grapheme–color associations. We conducted a paper-based questionnaire in which we asked 161 children (9–12 years old) to choose the most suitable color for 40 kanji characters. The survey was repeated twice with a one-week interval to ensure consistency. A one-way ANOVA revealed no significant difference in test-retest consistency across school grades, while the average consistency was significantly higher than chance. This suggests that consistency was not affected by learning or development and that the grapheme–color association exists at the beginning of grapheme acquisition.

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10:40-10:55 AM (169)

Differentiation of Related Events in the Hippocampus Is Associated with Successful Memory Reinstatement in Development. NICOLE VARGA, *The University of Texas at Austin*, HANNAH E. ROOME, *Newcastle University*, ROBERT MOLITOR, *Microsoft*, LUCIA MARTINEZ, *The University of Texas at Austin*, ELIZABETH HIPSKIND, *The University of Texas at Austin*, MICHAEL MACK, *University of Toronto*, ALISON PRESTON, *The University of Texas at Austin*, MARGARET L. SCHLICHTING, *University of Toronto* — We often experience related events featuring the same people or places. Memories for such events can be both connected (integrated) and repelled (differentiated) in adults. Both types of representations can also serve to bind rich neocortical traces evoked during initial perception, enabling high-fidelity reinstatement of individual event features at retrieval. Yet how children represent related events is unknown. Here, children (7-10 years) and adults learned that several objects were paired with a shared face or scene that they later recalled during fMRI scanning. We measured and compared the pattern of fMRI activation for objects that were related through a common face or scene with those that were unrelated. Both age groups showed differentiation in the hippocampus, such that related events were stored as less similar than unrelated events. Moreover, such hippocampal differentiation was related to higher-fidelity reinstatement of the associated face or scene in the neocortex among children. Only adults showed evidence of integration—greater similarity for related memories—in the medial prefrontal cortex. Together, the findings provide fundamental insight into what representational capacities are in place to support memory early in life.

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11:00-11:15 AM (170)

Learning Strategy Differentially Impacts Memory Connections in Children and Adults. MARGARET L. SCHLICHTING, *University of Toronto*, ZAHRA ABOLGHASEM, *University of Toronto*, TIFFANY TENG, *University of Toronto*, ELIDA NEXHA, *University of Toronto*, CHERRIE ZHU, *University of Toronto*,

CINDY S. JEAN, *University of Toronto*, MARIANA CASTRILLON, *University of Toronto*, ERIC CHE, *University of Toronto*, EVA DI NALLO, *University of Toronto* — Children struggle to use their memories flexibly, as in to support new inferences. It remains unknown whether such developmental differences in flexibility are due to (a) a fundamental limitation on children's learning mechanisms or (b) suboptimal strategy use. Here, children (7-9 years) and young adults formed strong memories for initial AB pairs and then engaged in one of three learning strategies while viewing overlapping BC pairs. We found that being told to integrate—combine ABC during learning—both improved children's ability to explicitly infer the AC relationship and reduced forgetting. Surprisingly, adults and children both exhibited A-C links prior to inference—yet for children, such links emerged when they were told to simply encode BC, not integrate. Moreover, adults accessed implicit links to make explicit inferences, but children only did so for well-learned AB pairs not requiring inference. These results suggest that while a lack of integration strategy may explain a large share of the developmental differences in explicit inference, children and adults also differ in both the circumstances under which they connect interrelated memories and their ability to later leverage those links to inform flexible behaviors.

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11:20-11:35 AM (171)

Listen Up, Kids! How Distraction and Mind Wandering Affect Memory Recall in Primary Schoolers. AGNIESZKA GRAHAM, *Queen's University Belfast*, JESSICA CHERRY, *Queen's University Belfast*, TERESA MCCORMACK, *Queen's University Belfast* — Mind wandering occurs when attention becomes disengaged from the here and now and directed toward internally generated thoughts; this is often associated with poorer performance on educationally significant tasks. In this study, 8-9-year-old children listened to audio stories embedded with intermittent thought probes which were used to determine if participants' thoughts were on- or off-task. The key aim was to explore, for the first time, the impact of probe-caught mind wandering on immediate and delayed memory recall in primary schoolers. Children reported being off-task ~25% of the time. Most inattention episodes were classified as task-unrelated thoughts or attentional failures due to external distractions. Higher frequency of off-task thoughts was associated with poorer memory recall, and mind wandering strongly predicted how well children remembered components of the story both immediately after the task and after a one-week delay. Results indicate that exploring the causes and consequences of mind wandering in the foundational years of schooling could provide the necessary empirical foundation for the development of practical interventions geared toward detecting and refocusing lapses of attention in educational contexts.

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11:40-11:55 AM (172)

The Relations Between Parent–Educator Communication, the Home Environment, and Preschoolers' Numeracy, Literacy, Executive Function, and Vocabulary Skills. TANYA M. PAES, *Purdue University*, JOYCE LIN, *California State University, Fullerton*, ROBERT J. DUNCAN, *Purdue University*, DAVID J. PURPURA, *Purdue University*, SARA A. SCHMITT, *Purdue University* — This study examines the relations between parent–educator communication and preschoolers' numeracy, literacy, executive function (EF), and vocabulary, and explores if these relations work through the home numeracy environment (HNE) and the home literacy environment (HLE). Children (N = 558, 48.92% female) were either enrolled in a state-funded prekindergarten program or in another community-based preschool program. Analyses revealed a significant relation only between parent–educator communication and numeracy skills ($\beta = -.14$, $p = < .001$), where increased parent–educator communication was related to lower numeracy skills. Although there were no significant direct effects between parent–educator communication and the preschoolers' outcomes, we wanted to examine if there were any significant indirect effects. The results demonstrated that the indirect effects for the HNE and HLE were not significant for all four outcomes. The findings suggest that there may be increased communication when the children are performing lower on their numeracy skills than their peers. Consequently, it may be beneficial for educators to engage with families early in the academic year to support the development of children's numeracy skills.

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Language: Cognitive Control
Saturday, November 19, 2022, 10:00 AM-12:00 PM US EST, Republic

Chaired by Tamar Gollan, *University of California, San Diego*

10:00-10:15 AM (173)

What Is Conflict Adaptation? Incongruent Flankers Acceleran un Switch to English but Delay a Switch to Español. DALIA L. LOPEZ GARCIA, *San Diego State University/University of California, San Diego Joint Doctoral Program in Language & Communicative Disorders*, TAMAR GOLLAN, *University of California, San Diego* — Although language skills can develop separately from other cognitive abilities, some processing is shared across domains. Prior studies provided striking demonstrations of cross-talk such that mixing languages sped responses to incongruent (< < > < <) but not congruent flanker trials (< < < < <), but these effects were small, restricted to errors, or significant only in ERPs. To better reveal the critical point of shared processing across domains, we measured conflict adaptation on spoken language switches. If incongruent flankers automatically disengage bilinguals from the recently used language, all language switches should have been facilitated. However, incongruent flankers sped switches to the dominant language but slowed switches to the non-dominant language. We suggest

that incongruent flankers downregulated global inhibitory control of the dominant language as needed to maximize performance, in this case, releasing inhibition trial-to-trial following incongruent flankers. This suggests that detection, rather than resolution, of conflict involves shared cognitive mechanisms across linguistic and nonlinguistic domains.

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10:20–10:35 AM (174)

Cognitive-Control Engagement Increases Children's Reliance on Reliable Cues During Sentence Processing. ZOE OVANS, *University of Maryland, College Park*, YI TING HUANG, *University of Maryland, College Park*, JARED M. NOVICK, *University of Maryland, College Park* — Children interpret language input as it unfolds and often fail to revise incorrect sentence parsing decisions. This pattern has been ascribed to their immature cognitive control. Yet there is mixed support for this view, which focuses on individual differences in a cognitive control "trait" that is assumed to be stable across time. Here, we experimentally manipulate the "state" of cognitive control to test the hypothesis that its upregulation increases children's reliance on reliable cues to structure. Five-year-olds heard ambiguous sentences like "VERB the elephant with the carrot" with either [I]nstrument- (e.g., "poke") or [M]odifier-biased (e.g., "choose") verbs. Flanker trials preceded sentences to modulate the state of cognitive control within children. Eye movements to referents in a scene measured ongoing parsing preferences. For sentences with I-verbs, we observed increased looks to likely instruments (e.g., a carrot) after incongruent vs. congruent flankers. For sentences with M-verbs, looks to likely instruments decreased after incongruent vs. congruent flankers. These findings suggest that upregulated cognitive control, induced by incongruent Flanker, boosts children's use of reliable cues to guide parsing decisions.

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10:40–10:55 AM (175)

Cognitive Control in Thematic Role Assignment: Evidence from Neural Oscillations. TAL NESS, *University of Maryland, College Park*, VALERIE J. LANGLOIS, *University of Colorado Boulder*, WING-YEE CHOW, *University College London*, COLIN PHILLIPS, *University of Maryland, College Park*, JARED M. NOVICK, *University of Maryland, College Park*, ALBERT E. KIM, *University of Colorado Boulder* — Language comprehension involves determining who did what to whom, i.e., thematic role assignment. This process is influenced by semantic and syntactic cues, which sometimes support conflicting interpretations. Prior research shows that such conflict engages cognitive control, but the time course of its involvement remains unknown. We ask whether theta-band (4-8Hz) oscillatory EEG activity can provide a real-time index of cognitive-control engagement during language processing. We reanalyzed EEG data from Chow et al. (2016), examining two types of implausible sentences: Role Reversal sentences, in which conflict arises between role assignment supported by world knowledge and that signaled by sentence structure (e.g., "...which waitress the customer had served…"); and Argument Substitution sentences without conflicting cues (e.g., "...which realtor the landlord had evicted..."). Role Reversals increased theta-band power compared to control, 500-950ms after verb onset. No theta-band activity increase was observed in Argument Substitution sentences versus control. These results indicate rapid recruitment of cognitive control during sentence processing, exclusively when conflict arises, manifesting in EEG as increased theta-band activity.

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11:00–11:15 AM (176)

Apple, Pomme, or Manzana? Language Interference and Inhibition During Trilingual Production. ANGELA DE BRUIN, *University of York*, LIV J. HOVERSTEN, *University of California, Santa Cruz*, CLARA D. MARTIN, *Basque Center on Cognition, Brain and Language (BCBL) & Ikerbasque* — Most research on multilingual language control has focused on a bilingual's first (L1) and second (L2) languages. Studies looking at third language (L3) acquisition suggest that, even though the L1 is more proficient, L3 learners experience more interference from the L2 than from the L1. However, little is known about the way a trilingual's L2 and L3 interact after initial stages of language learning. Furthermore, it is unclear how potential interference might relate to language inhibition. In this study, 30 Spanish-Basque-English (Experiment 1) and 50 English-French-Spanish trilinguals (Experiment 2) completed a speeded naming task. We assessed cross-language intrusions (e.g., using the Spanish "manzana" instead of the French "pomme"). Both groups of trilinguals made more L3 than L1 intrusions during L2 naming. Furthermore, two different tasks showed that trilinguals inhibited their L1 more strongly than their L3. In Experiment 2, this inhibition was related to the relative number of intrusions. Together, this suggests that a trilingual's non-native language might experience more interference from another non-native language than from their L1 because trilinguals apply more inhibition over their L1.

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11:20–11:35 AM (177)

Reversed Language Dominance: The Tip of the Iceberg of Inhibitory Control. MATTHEW GOLDRICK, *Northwestern University*, TAMAR H. GOLLAN, *University of California, San Diego* — Theories of speech production have proposed that in mixed-language contexts, bilinguals inhibit the dominant language to balance the relative accessibility of their two languages. This process often overshoots this target, leading to better performance in the nondominant vs. dominant language or reversed language dominance effects. This striking phenomenon is diagnostic of inhibitory mechanisms; no alternative account has been able to successfully explain it. In support of this phenomenon, we reanalyze data from a recent meta-analysis of experimental studies of language switching (Gade et al., 2021). Inspection of the data revealed errors in 10/41 sets of data. After correcting these errors, we find that dominance effects were

reduced in the vast majority (78%) of studies when comparing mixed- versus single-language contexts. Across studies, the most common degree of dominance reduction was slightly larger than strictly required to equalize accessibility of the two languages – yielding a reversal of dominance effects. These results show that, contra Gade et al., there is strong support for theories incorporating inhibition as part of the cognitive toolkit that enables bilingual language control.

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11:40-11:55 AM (178)

Understanding the Dynamics of Language Regulation and Domain General Cognitive Control. JORGE R. VALDÉS KROFF, *University of Florida*, JUDITH F. KROLL, *University of California, Irvine* — A key discovery in bilingualism research is the robust evidence for non-selectivity in production and in comprehension, even when staying in one language. This discovery creates an apparent problem that bilinguals solve: How is the intended language used without interference? Past research has focused on inhibition and/or attention as domain-general cognitive processes that might be engaged to provide a solution to the control problem. However, recent studies also show that language experience itself plays a critical role in how bilinguals achieve language regulation, beyond proficiency or age of acquisition. By including experiential factors such as immersion context, language entropy, and code-switching habits, we can begin to understand how the regulation of the two languages may draw on aspects of domain general cognitive control. We review these effects and discuss how such effects modulate language regulation. Our review calls for a more holistic framework that couples language use with bilingual language control.

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Symposium V: Co-Registration of Eye Movements and EEG (Leading Edge Workshop)

Saturday, November 19, 2022, 1:30-3:30 PM US EST, Sheraton Grand Ballroom

Chaired by Elizabeth R. Schotter, *University of South Florida,* **and Brennan R. Payne,** *University of Utah*

Visual attention is critical for many real-world cognitive tasks that have important consequences for our daily lives (e.g., reading, visual search, object perception). Recent technological innovations have allowed for the simultaneous study of behavioral and neural measures of visual and cognitive processes in naturalistic free-viewing scenarios, moving beyond the constraints of traditional laboratory paradigms (e.g., through co-registration of EEG while people freely move their eyes). Because much of the prior eye movement and EEG research on visual attention has been developed in largely independent research areas, each with their own theories, foci, and best practices, rapid progress in answering these questions requires integrating these long-siloed domains through collaborative cross-talk, which was the topic of the 2022 Psychonomic Society Leading Edge Workshop on EEG and eye movement co-registration. This symposium highlights a broad overview of the workshop and features some of the latest empirical, theoretical, and methodological work on eye movement and EEG co-registration in cognitive science.

1:35-1:55 PM (SYM19)

Eye Movements Are Not Automatically Preceded by the N2pc Component. NICHOLAS GASPELIN, *Binghamton University SUNY*, TRAVIS N. TALCOTT, *Binghamton University SUNY* — In vision, researchers distinguish between two mechanisms of attentional selection: overt and covert attention. A common assumption is that covert attention mandatorily precedes overt eye movements. However, this assumption has been largely unexplored using electrophysiological indices of covert attention, such as the N2pc component. The current study bridged this gap by concurrently measuring shifts of covert attention (via the N2pc component) and eye movements (via eye tracking). Participants searched for a lateralized target and were allowed to generate overt eye movements. At analysis, event-related potentials were timelocked to the first eye movement, and the preceding waveform was evaluated for the N2pc component. The results indicated that eye movements were not preceded by an N2pc component, despite strong guidance of eye movements toward the target stimulus. Control experiments confirmed that our task was sensitive to detect an N2pc, and the presaccadic N2pc could be observed under artificial conditions that promoted covert shifts of attention before eye movements. Implications for understanding the relationship between covert and overt attention will be discussed.

1:55-2:15 PM (SYM20)

The Role of Prediction and Extrafoveal Preview in Naturalistic Visual Perception. DAVID MELCHER, *New York University Abu Dhabi*, CHRISTOPH HUBER-HUBER, *Donders Institute for Brain, Cognition and Behavior*, ANTIMO BUONOCORE, *Suor Orsola Benincasa University of Naples*, XIAOYI LIU, *New York University Abu Dhabi* — Saccades are typically used to bring objects, glimpsed with extrafoveal vision, into the fovea for further processing. Although most studies in vision science have used static eye fixation and suddenly onsetting and offsetting stimuli, in natural viewing most objects are actually present on the retina, outside of the fovea, prior to foveation. This raises the question of whether this extrafoveal preview influences visual object processing. In the case of face stimuli, we have found that a predictable preview leads to faster and better face recognition judgments and dramatically reduced face-related evoked potentials. For more simple stimuli, there is also a preview effect and, for both faces and gratings, information about the preview is present in the EEG/MEG signal prior to saccade onset and integrated with the post-saccadic information. These effects are modulated by the predictability and visibility of the preview. Overall, these studies suggest that visual perception during natural viewing is influenced by the extrafoveal preview, and prediction more generally. Studying behavioral and EEG/MEG responses under more natural viewing conditions may be necessary to understand how visual processing typically works.

2:15–2:35 PM (SYM21)

Effects of Stimulus Quality and Word Frequency During Sentence Reading. SIMON P. LIVERSEDGE, *University of Central Lancashire*, FEDERICA DEGNO, *Bournemouth University*, FRUZSINA SOLTÉSZ, *University of Southampton*, PIRIL HEPSOMALI, *University of Roehampton*, NICK DONNELLY, *Liverpool Hope University* — Consistent evidence in both the eye movement (EM) and event-related potential literatures has demonstrated that the quality of the stimulus in the fovea is essential for efficient reading. Much more limited is the evidence for an effect of quality while the stimulus is in the parafovea. In addition, while EM studies report robust foveal effects of word frequency, these effects are not observed when fixation-related potentials (FRPs) are recorded during sentence reading. In the present experiment, we simultaneously recorded participants' EMs and FRPs while they read sentences for comprehension. A target word was embedded in each sentence and manipulated for parafoveal stimulus quality (degraded vs. non-degraded preview) and foveal word frequency (high vs. low frequency target word). Initial analyses on first-pass reading times and amplitudes of FRP components showed effects of parafoveal and foveal stimulus quality in both the EM and FRP data, with foveal effects of word frequency in the EM data only. Deconvolution analyses of these data are currently underway, and these analyses will disentangle FRP effects uniquely associated with specific, separate fixations on the pre-target and target words.

2:35–2:55 PM (SYM22)

The Eye as a Window to the Brain and Mind: Co-Registration of Pupillometry and Cognitive ERPs. BRENNAN PAYNE, *University of Utah*, JACK SILCOX, *University of Utah* — The co-registration of event-related brain potentials (ERPs) and pupillometry offers critical insights into the physiological correlates of cognition that outweigh the benefits of using either method independently. Here, we review recent experiments from our lab in which such co-registration has provided novel findings into the functional significance of both the cognitive pupil dilation response (PDR) and specific ERP components. First, using an oddball paradigm, we show that the P3b component and the PDR are functionally independent, but that each contributes to decision response time. Then, in a speech perception in noise task, we show that the PDR measures noise-induced listening effort and predicts single-trial variation in both N400 sentence context effects and subsequent speech memory performance. Finally, in an RSVP reading paradigm, we show that semantic animacy violations that elicit a P600 potential also elicit a robust PDR response. However, morphosyntactic violations, which elicit a similar P600 response, do not elicit a concomitant PDR response, suggesting that these two P600 effects are functionally distinct. Collectively, these studies show that the simultaneous recording and analysis of pupillometry and ERPs provide insights into human cognition beyond the sum of their parts.

2:55–3:15 PM (SYM23)

Reading Fluency Deficits in Schizophrenia: Evidence from Computational Modeling and Fixation-Related Potentials. HEATHER SHERIDAN, *University at Albany, SUNY*, ELISA C. DIAS, *Nathan S. Kline Institute for Psychiatric Research/New York University School of Medicine*, DANIEL C. JAVITT, *Nathan S. Kline Institute for Psychiatric Research/Columbia University/New York State Psychiatric Institute* — Fixation-related potentials (FRPs) can reveal the cognitive and neural mechanisms underlying individual differences during reading. We will discuss an ongoing line of work that combines FRPs with computational modeling to investigate reading fluency in readers with and without Schizophrenia. Relative to readers in the control group, readers with Schizophrenia show dramatic reductions in reading rate, reduced fixation-P1 amplitudes, longer fixation durations, decreased word skipping rates, and increased numbers of saccades (Dias et al., 2021, Schizophrenia Bulletin). Simulations using the E-Z Reader model of eye movement control during reading indicate that reading deficits in Schizophrenia reflect both higher-level lexical processing deficits and lower-level oculomotor and perceptual processing deficits. Our talk will illustrate the potential for co-registration research to advance our understanding of individual differences during reading by revealing the relative contributions of high- and low-level processing and by providing new empirical constraints to support the development of future models of individual differences and eye movement control during reading.

Letter Word Processing
Saturday, November 19, 2022, 1:30–3:10 PM US EST, Back Bay D

Chaired by Erin M. Buchanan, *Harrisburg University of Science and Technology*

1:30–1:45 PM (179)

Is Priming Consistent Across Languages? Preliminary Findings from the SPAML: Semantic Priming Across Many Languages. ERIN M. BUCHANAN, *Harrisburg University of Science and Technology*, PSYCHOLOGICAL SCIENCE ACCELERATOR, *Psychological Science Accelerator* — Semantic priming has been examined across many experimental manipulations, languages, and frameworks for the last fifty years. Priming studies elucidate word processing and the nature of semantic representations, and thus, are widely used in cognitive and psycholinguistic studies. While semantic priming is often a robust finding, studies have been criticized for small samples and a lack of diversity in linguistic representation. In the Semantic Priming Across Many Languages study, we present a large-scale semantic priming study using a lexical decision task across a variety of languages matched on target words. Adaptive sampling was used to improve sample sizes for variability in response latencies for targets, and multiple languages were investigated within the study instead of within multi-linguistic individuals. We will

present preliminary results from the study examining the strength of the priming effect for all languages and report on the heterogeneity of priming effects across languages.

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1:50–2:05 PM (180)

Baselines in Standard and Sandwich Masked Priming. SACHIKO KINOSHITA, *Macquarie University*, LUKE MILLS, *Macquarie University* — In Forster and Davis' (1984) masked priming procedure, it has been repeatedly observed that the identity priming effect assessed relative to an all-letter-different (ALD) control prime (e.g., #####-house-HOUSE vs. #####-fight-HOUSE) remains constant across the quantiles (e.g., Gomez et al., 2013). This has been interpreted within the diffusion model framework as evidence that the identity priming effect originates in the stimulus encoding stage that precedes the lexical decision process. Here we used a non-letter "neutral" prime (+++++) and found that relative to the neutral prime, the facilitatory effect of identity prime increases and the interfering effect of ALD control prime decreases across the quantiles. In contrast, in the "sandwich priming" procedure (Lupker & Davis, 2009) that presents the target as a "pre-prime" (e.g., #####-HOUSE-fight-HOUSE), both the small facilitatory effect and the large interfering effect remain constant across the quantiles. The implication of the results for models of word recognition will be considered.

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2:10–2:25 PM (181)

Understanding Empirical Inconsistencies in Repeated Letter Effects in Orthographic Processing. JAMES S. ADELMAN, *University of Warwick*, ILIYANA V. TRIFONOVA, *University of East Anglia* — Efforts to understand orthographic processing often involve the construction of pairs of stimulus strings that differ in some critical way. Such pairs are used in experiments in roles such as prime and target in priming paradigms; foil and target in forced-choice identification; and (nonword) target and (unpresented) baseword in lexical decision. Comparing results across different tasks and stimulus types can, however, pose challenges when the critical difference in the pair is asymmetrical. For instance, is a briefly presented identification target that is longer than its foil analogous to a briefly presented prime that is longer than its target? Or is it analogous to a target that is longer than its prime? Such considerations would be moot if the effects were the same. However, in experimental comparisons of (non-adjacent) repeated and unique letters, we have often found that only one of insertions (longer) or deletions (shorter) shows a repetition effect. We consider whether, in light of the ambiguity between insertions and deletions, these results can be considered consistent or inconsistent across paradigms and designs, and the implications for interpretation and modelling of orthographic processing results more generally.

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2:30–2:45 PM (182)

Sleep Supports the Word-Superiority Effect by Enhancing Perceptual Details of Newly Learnt Letter Strings. NICOLAS DUMAY, *University of Exeter* — This study used a Reicher-Wheeler paradigm to determine whether sleep supports perceptual learning of orthographic information. Seventy-two participants learnt pairs of new orthographic neighbors (e.g., "alarchy"/"afarchy") for two sets of English hermit words. Whereas the PM-group learnt Set 1 of pairs of neighbors at 20:00 and Set 2 at 08:00 the next day, the AM-group learnt Set 1 at 08:00 and Set 2 at 20:00 on the same day. At a 12-hr test (immediately after learning Set 2), the PM-group showed signs of enhanced perceptual learning for Set 1, which they had slept on, compared to Set 2, whereas the AM-group showed the opposite. The benefit of sleep was confirmed at a 36-hr retest: The PM-group having slept twice on Set 1 showed an even stronger word superiority effect compared to Set 2, whereas the AM-group having now slept once on both sets showed equal discriminability. Clearly, sleep supports the word-superiority effect by enhancing perceptual details of newly learnt letter strings.

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2:50–3:05 PM (183)

Spelling-to-Sound Translation for English Disyllables: Use of Long and Short Vowels Before Single Medial Consonants. REBECCA TREIMAN, *Washington University in St. Louis*, BRETT KESSLER, *Washington University in St. Louis* — Most studies of word reading in English involve single-syllable items. Here we examined disyllables with medial VCV (V = vowel, C = consonant) sequences, focusing on whether the first vowel is pronounced as long (as in "even") or short (as in "ever"). In such words, the long pronunciation is typically described as regular and the short one as exceptional. But are there regularities among the exceptions? In a study of 2,049 English disyllabic words with medial VCVs, we found that pronunciation of the first vowel is systematically affected by the vowel letter itself, the nature of the medial consonant, and the identity of the word-final sequence. The results of four experiments using a nonword pronunciation task showed that university students are sensitive to most of the patterns documented in the vocabulary analysis. People seem to have picked up these patterns on their own, for they are not explicitly taught as a part of reading instruction. However, participants used fewer long vowels than expected on the basis of our vocabulary statistics, a finding that we followed up in study analyzing previously collected data. We also compared participants' pronunciations to those produced by two models of spelling-to-sound translation.

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Cultural/Social Influences on Cognition II
Saturday, November 19, 2022, 1:30–3:10 PM US EST, Back Bay C

Chaired by Ian M. McDonough, *The University of Alabama*

1:30–1:45 PM (184)

Resilience Resources May Buffer Some Middle-Aged and Older Black Americans from Memory Decline Despite Experiencing Discrimination. IAN M. MCDONOUGH, *The University of Alabama*, DEANNAH BYRD, *Arizona State University*, SHINAE CHOI, *The University of Alabama* — Discrimination has been associated with poorer episodic memory in Black Americans. However, resilience resources at multiple levels (individual, social, endowed) may act as a buffer to protect future memory decline, especially in the face of discrimination. Using longitudinal data from the Health and Retirement Study (N = 1,862), we tested whether Black Americans aged 50 and older would show different trajectories of episodic memory depending on their reported discrimination (everyday and major lifetime) and resilience resources. Joint latent cluster mixed resulted in three memory classes that differentiated baseline from longitudinal memory performance: "High Decliners," "Low Decliners," and "Low Stable." Two independent patterns of discrimination and resilience resources occurred between the classes. First, compared with High Decliners, the two lower baseline memory classes (Low Decliners and Low Stable) reported more everyday discrimination and lower individual and endowed resilience resources. Second, although the Low Stable class did not report different levels of discrimination, they had more social resilience resources (greater social support and more social contact) than both declining classes.

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1:50–2:05 PM (185)

Different Conceptions of Honesty: A Computational Analysis of Public Discourse by Members of the U.S. Congress. STEPHAN LEWANDOWSKY, *University of Bristol*, JANA LASSER, *Graz University of Technology*, FABIO CARRELLA, *University of Bristol*, SEGUN AROYEHUN, *Graz University of Technology*, ALMOG SIMCHON, *University of Bristol*, DAVID GARCIA, *Graz University of Technology* — In today's polarized world partisans find it increasingly difficult to agree on a shared body of facts. Here we argue that even the very notions of honesty and truth have fractured into two distinct constructs: one focusing on authenticity and belief speaking, and one focused on evidence and truth seeking. We analyze tweets by all members of both houses of Congress from 2012 onward to examine the prevalence of belief speaking and truth seeking. We find a robust and strong correlation between a higher share of belief speaking and tweets with links to low-quality information sites, especially among members of the Republican party. We find some evidence for a weaker correlation between a high share of truth-seeking tweets and links to high-quality information sites. We find that the content posted on the linked sites themselves reproduces the correlation between a high proportion of belief-speaking words and low information quality. We suggest that the increasing prevalence of misinformation is in part driven by a new ontology of truth that prioritizes belief speaking over truth seeking and is fuelled by public-facing speech of elected officials.

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2:10–2:25 PM (186)

Decoding Complex Emotions and Humanization Show Related Face Processing Effects. BRITTANY CASSIDY, *University of North Carolina at Greensboro*, ROBERT WILEY, *University of North Carolina at Greensboro*, MATTEA SIM, *Indiana University Bloomington*, KURT HUGENBERG, *Indiana University Bloomington* — Inferring others' complex emotions is central to ascribing humanness to others. However, little research has investigated the perceptual processes linking the inference of complex emotions to judging others' humanness. Here, we disrupted the low-level perceptual processes typically employed in face processing via face inversion. Of interest was whether the inversion-driven deficits in complex emotion judgments and in humanness judgments were related. Across three experiments, disrupting efficient face processing via face inversion undermined the accurate decoding of complex emotions from the eyes and triggered more dehumanized evaluations of target eye regions and faces. Critically, these inversion effects on emotion decoding and dehumanization were positively correlated. People who showed stronger inversion effects on the accuracy of decoding complex emotions also showed stronger inversion effects on dehumanizing evaluations. Taken together, these findings provide novel evidence that sensitivity to complex emotions and (de)humanization are related through a shared perceptual basis in efficient face processing.

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2:30–2:45 PM (187)

Remembering the Forest or the Trees: Psychological Distance at Encoding Affects Memory Specificity. KYUNGMI KIM, *Wesleyan University*, AUGUSTA CLAIRE BURHANS, *Wesleyan University*, NINA S. EYRES, *Wesleyan University*, STEPHEN C. PHILIPPS, *Wesleyan University*, ALEX E. RAMSDEN, *Wesleyan University*, XIANGQING ZHANG, *Wesleyan University* — Psychological distance (i.e., the perceived gap between a stimulus and a person's direct experience) is suggested to alter the way people construe a stimulus, with a more detail-oriented, concrete construal for a more psychologically proximal stimulus. Given that a stimulus can be remembered based on its verbatim details or gist meaning, the present study examined how psychological distance affects the specificity with which information is remembered. Psychological distance of stimuli was manipulated either at encoding (Expt. 1) or after encoding but prior to retrieval (Expt. 2). Participants' memory for stimuli was probed in a recognition test in which they had to indicate whether given stimuli were the same as the ones they had seen before, similar, or new. When manipulated at encoding, psychological distance

affected memory specificity by producing a verbatim vs. gist memory advantage for psychologically proximal vs. distal stimuli, respectively. When manipulated after encoding, psychological distance did not significantly affect memory specificity. Our findings suggest that the effects of psychological distance on memory operate at encoding, affecting what aspect of information is preferentially attended to and retained.

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2:50–3:05 PM (188)

Cross-Cultural Differences in Movement-Induced Self-Referential Memory Advantage. SERGE ONYPER, *St. Lawrence University*, MARK OAKES, *St. Lawrence University* — Movement toward oneself produces a memory advantage for stimuli that are either moved toward one's physical body or its virtual representation, such as a selfie or one's phone, or displayed concurrently with self-referential physical movement. This effect has so far been established with U.S. participants. Presently, we compared an American and a Vietnamese sample on a task where participants pressed keys on the computer keyboard to categorize adjectives by moving them either toward one's selfie, a selfie of a close other, or a selfie of a stranger. In a surprise memory task that followed, we measured their item and source recognition memory. American participants were more accurate recognizing stimuli that they categorized by moving toward their selfie compared to the selfie of a close other or a stranger; a similar trend emerged for source memory – the memory for the referent associated with a particular stimulus. For Vietnamese participants, no difference between the three referents emerged in either item or source recognition. These findings suggest that mnemonic advantage of self-referential processing is culture-bound. Self-processing does not appear to be privileged in cultures with interdependent self-construal.

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Eyewitness Identification

Saturday, November 19, 2022, 1:30–3:10 PM US EST, Independence

Chaired by Ira E. Hyman, Jr., *Western Washington University*

1:30–1:45 PM (189)

Confidence in Identifications of Culprits, Foils, and Innocent Bystanders. IRA E. HYMAN, JR., *Western Washington University* — People will often make erroneous identifications of innocent people when presented with lineups. Confidence has been proposed as a potential tool for distinguishing between accurate and erroneous identifications. Most research investigating confidence has compared confidence in culprit identifications with confidence in identifications of unrelated foils. In contrast, studies of unconscious transference typically investigate the conditions that lead to erroneous identifications of innocent people but do not evaluate confidence. In this paper, confidence will be compared for culprit, innocent bystander, and foil identifications. Collapsing across multiple studies, we investigated if confidence can be a useful indication of the difference between accurate identifications and identifications of innocent bystanders. Although confidence may be a reliable indication of correct identifications compared to unrelated foils, confidence is less indicative of accuracy when considering innocent bystanders.

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1:50–2:05 PM (190)

A Complete Guide to Assessing Discriminability with ROCs, Even for Complex Tasks Like Eyewitness Lineups. JEFFREY J. STARNS, *University of Massachusetts Amherst*, MICHAEL D. TUTTLE, *University of Massachusetts Amherst*, ANDREW COHEN, *University of Massachusetts Amherst* — The receiver operating characteristic (ROC) is a popular tool for analyzing choice tasks, often with the goal of measuring the ability to discriminate targets and lures (e.g., guilty and innocent suspects) independently of decision biases. Meeting this goal is straightforward in some applications, but the link between ROCs and discriminability can be difficult to specify for complex tasks, such as eyewitness lineups. We assess (and, we claim, resolve) various contentious issues surrounding ROC use in lineups and other complex tasks. These issues include connecting ROC points with straight lines versus a theoretical function, ordering ROC points by strength versus diagnosticity ratios, and analyzing full versus partial ROCs.

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2:10–2:25 PM (191)

Does the Act of Making a Mistaken Identification Impair Eyewitness Memory? LAURA SMALARZ, *Arizona State University*, ANDREW M. SMITH, *Iowa State University* — Witnesses who make a mistaken identification from an initial lineup perform more poorly on a subsequent lineup compared to witnesses who reject an initial culprit-absent lineup (Smalarz et al., 2019). Is this impaired memory performance attributable to poor memory alone, or does the act of making a mistaken identification impair memory? Witnesses (N = 2655) viewed a mock-crime and were randomly assigned to view no initial lineup or an initial culprit-absent lineup. Witnesses who viewed the initial culprit-absent lineup either made a mistaken identification or rejected the lineup, and half of the witnesses who rejected the lineup were subsequently forced to make an identification ("You selected 'Not Present.' Now, please identify who you believe is most likely to be the person who planted the bomb."). All witnesses then viewed a culprit-present or culprit-absent lineup with fillers who were not present in the initial lineup. We present final memory performance data for the four groups of witnesses (no initial lineup, initial rejectors, initial voluntary choosers, initial forced choosers) to assess whether making an initial mistaken identification impairs eyewitness memory.

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2:30–2:45 PM (192)

The Rule Out Procedure: A Signal-Detection-Informed Approach to the Collection of Eyewitness Identification Evidence. ANDREW M. SMITH, *Iowa State University*, NYDIA T. AYALA, *Iowa State University*, REBECCA C. YING, *Iowa State University* — Eyewitness lineups are more useful for detecting culprit-presence than culprit-absence. The equal-variance signal detection model with a MAX decision rule predicts this asymmetry—a global confidence rating that none of the lineup members is the culprit has low diagnostic value because it does not measure match-to-memory for the suspect. Hence, the MAX model makes the controversial prediction that a one-person showup ought to have better discriminability than a six-person lineup. A large-scale experiment (N = 3281) confirmed this prediction; however, a modified lineup in which participants assigned confidence ratings to each lineup member had better discriminability than both the showup and lineup. Furthermore, whereas global confidence for lineup rejections was a weak indicator of accuracy, confidence that a specific person was innocent was more strongly related to accuracy. Past failures to detect culprit absence from lineups should be attributed to design flaw, not to limitations of visual recognition memory.

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2:50–3:05 PM (193)

Model-Based Full Lineup ROCs. ANDREW COHEN, *University of Massachusetts Amherst*, MICHAEL D. TUTTLE, *University of Massachusetts Amherst*, JEFFREY J. STARNS, *University of Massachusetts Amherst* — Application of the Receiver Operating Characteristic (ROC) to complex recognition tasks, such as the eyewitness lineup, requires a new examination of the principles of ROC construction and interpretation. For example, creating ROCs based on diagnosticity ratios (DRs) provides a general method for tasks that are not amendable to traditional ROC analysis. Parameter recovery simulations, however, show that creating lineup ROCs with observed-sample DRs leads to biased performance measures. We propose a new ROC method to correct for this bias, whereby the observed data are fit with a decision model and ROCs are constructed based on the DRs from the model.

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Decision Making II
Saturday, November 19, 2022, 1:30–3:30 PM US EST, Republic

Chaired by Brett K. Hayes, *University of New South Wales*

1:30–1:45 PM (194)

Demand Avoidance in Risky Value-Based Decision-Making. KEVIN DA SILVA CASTANHEIRA, *McGill University*, ROSS OTTO, *McGill University* — Prominent theories of choice assume that decision-makers use simplifying heuristics to avoid effort expenditure. Yet while previous studies have shown that participants avoid demanding cognitive control tasks, it remains unclear whether individuals also systematically avoid demanding risky choices. We conducted two experiments to understand 1) what makes a choice demanding and 2) whether people avoid demanding choices. In the first study, we asked participants (N=33) to complete a risky decision-making task and rate subjective feelings of demand. Critically, we manipulated choice difficulty by decreasing the difference in expected value between options while equating overall expected value across difficulty levels. Both RTs and subjective ratings suggest that participants found difficult—versus easy—choices to be more demanding. In a second study, we asked participants (N=80) to complete a demand selection task where they were asked to choose between two stimuli either with high- or low-demand choices pairs rated in the first study. We found participants reliably avoided high-demand choices, suggesting that effort in value-based choice is experienced as costly.

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1:50–2:05 PM (195)

Dual-Process and Fuzzy-Trace Theory Predictions for COVID-19 Risk Taking. VALERIE F. REYNA, *Cornell University*, SARAH EDELSON, *Cornell University*, BRIDGET HAYES, *Cornell University*, DAVID GARAVITO, *U.S. Department of Veterans Affairs* — We test well-motivated but contrasting predictions about COVID-19 risky decisions grounded in dual-systems models and fuzzy-trace theory. Participants self-reported behaviors, such as mask wearing and social distancing prior to availability of vaccines, and emotions associated with these decisions. They also made choices between safe versus risky options in everyday scenarios involving COVID-19 varying in risk and reward (and whether choices were mandatory or voluntary) and in social scenarios predicted to amplify risk-taking. To understand mechanisms underlying risky behaviors and choices, we assessed sensation seeking, impulsivity, categorical gist thinking, and agreement with gist principles of social responsibility. Risky behaviors were emotional, and both behaviors and choices in decision problems were consistently predicted by gist measures of fuzzy-trace theory, controlling for sensation seeking and impulsivity. The latter were also significant predictors under the most emotionally charged scenarios. Thus, explaining and predicting risky decisions requires going beyond dual-systems assumptions to encompass gist-based thinking.

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2:10–2:25 PM (196)

Overcoming Learning Traps with Summative Feedback. BRETT K. HAYES, *University of New South Wales*, JAIMIE LEE, *University of New South Wales*, AMY X. LI, *University of New South Wales* — Learning traps arise when early experience leads to false beliefs about the reward structure of the environment and subsequent avoidance of rewarding options. The current work examined the role

of "summative" feedback, which signals that a current decision rule is suboptimal, in reducing the prevalence of such traps. Participants learned to predict which category exemplars should be approached to obtain a reward and which should be avoided to prevent a loss. Those in a contingent-feedback condition received outcome feedback only on trials where they approached an exemplar. In summative feedback conditions, this was supplemented with information about the gap between current rewards earned and optimal rewards. A large proportion of those receiving only contingent feedback learned an incomplete categorization rule that led to suboptimal rewards (a learning trap). Similar results were obtained when infrequent summative feedback was provided. However, when summative feedback was presented frequently during learning, trap formation was attenuated (i.e., more learners used an optimal decision rule). Our results represent one of the first successful interventions for reducing the prevalence of learning traps.

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2:30-2:45 PM (197)

Judging Uncertain Futures: Effects of Surprise, Probability, and Plausibility on Estimating Outcomes of Causally Simple and Complex Scenarios. MANDEEP K. DHAMI, *Middlesex University London*, JAMES DERBYSHIRE, *Middlesex University London*, IAN BELTON, *Middlesex University London*, DILEK ONKAL, *Northumbria University* — When judging the likelihood of possible futures, people may have expectations about the potential extremity of the future based on past occurrence and presently available information. In a mixed design, participants (N = 264) estimated "surprising," "plausible," and "probable" high and low outcome values for causally simple or complex scenarios. These scenarios referred to Covid-19 deaths and median house prices. For both scenarios, there was a significant main effect of uncertainty expression, such that surprising estimates had significantly wider ranges and ranges with higher mid-points than either plausible or probable estimates. The main effects of causal complexity were non-significant. Thus, focusing on surprise can help stretch consideration of the full potential extremity of the future beyond the bounds implied by past occurrence and presently available information. These findings have implications for techniques such as scenario planning that are used to guide expert judgment of future outcomes.

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2:50-3:05 PM (198)

Understanding Jury Instructions: Why Is It So Difficult? RUTH S. DAY, *Duke University*, JONATHAN VICTOR, *Weill Cornell Medical College* — Judges instruct jurors about what criteria to use in deciding whether a defendant is guilty or not guilty. Our previous research showed that even when jury instructions are very brief, performance is poor – accuracy in deciding court case scenarios was only 66% correct. Follow-up experiments replicated this finding and ruled out many possible explanations. The current research examined two new factors that might affect juror accuracy. We varied Crime Severity (murder, theft) and Type of Defense (insanity, medication, self-defense) in a 2x3 design. Participants read a brief jury instruction (a single sentence) and used it to decide a series of court case scenarios. The overall results were surprising – accuracy was again poor but confidence in decisions was high, both for correct and incorrect decisions. Additional analyses suggest that there may be a fundamental problem with jury service – a priori assumptions about guilt and innocence.

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3:10-3:25 PM (199)

A U-Shaped Function of Delay Discounting Across the Lifespan. XT (XIAOTIAN) WANG, *The Chinese University of Hong Kong, Shenzhen*, JUNSONG LU, *The Chinese University of Hong Kong, Shenzhen* — How do people make intertemporal tradeoffs between smaller-sooner and larger-later rewards across the lifespan? Relevant theories provide contradictory predictions. Previous empirical studies have not reached a consensus. We compared and evaluated these theories based on meta-analyses of 172 effect sizes extracted from 102 articles that examined age differences in delay discounting. Overall, delay discounting decreased progressively with advancing age (z = -.061). However, this linear trend masked a U-shaped relationship. We developed a new calculus method to convert effect sizes to derivatives and recovered a nonlinear function. Delay discounting was a decreasing function in early life but an increasing one in late life. Delay discounting was lowest around age 50. After passing this turning point, people gradually become more present-oriented. The U-shaped function was steeper for samples with a shorter expected lifespan. A short lifespan promotes a fast life-history strategy. Supporting evolutionary modeling and predictions from a life-history theory perspective, the delay discounting rate varies as a function of reproductive opportunities and the expectancy of the remaining years in life.

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Autobiographical Memory
Saturday, November 19, 2022, 1:30-3:30 PM US EST, Constitution AB

Chaired by Gabriel Radvansky, *University of Notre Dame*

1:30-1:45 PM (200)

Memory from Nonsense Syllables to Novels. GABRIEL RADVANSKY, *University of Notre Dame*, DANI PARRA, *University of Notre Dame*, ABIGAIL DOOLEN, *University of Notre Dame* — Memory has been the subject of scientific study for nearly 150 years. We are at a point where we can assess how effective memory is for a range of materials from very simple nonsense syllables to complex and extended sets of materials, such as novels. Moreover, we can assess memory effectiveness anywhere from a few seconds to decades later. Our primary aim here is to assess the factors that contribute to the patterns of retention and forgetting under various circumstances.

This is done by taking a meta-analytic approach across a wide range of studies. We assessed memory performance across 256 papers, involving 916 data sets (e.g., experiments and conditions). The result of this analysis revealed that exponential-power, logarithmic, and linear functions captured the widest range of data compared to power and hyperbolic-power functions. The poor performance of the power function, in particular, is surprising given the literature on this topic. These findings bring us closer to the ability to model and predict the amount of information retained in memory. In addition, our analyses provide a foundation for expanding behavioral and neuroimaging research to better target areas of study that can better inform the effectiveness of memory.

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1:50–2:05 PM (201)

The COVID Bump: How the COVID-19 Onset Affected the Temporal Distribution of Memorable Personal Events. NORMAN R. BROWN, *University of Alberta*, EAMIN Z. HEANOY, *Psychology, University of Alberta*, ANA SCHWARTZ, *The University of Texas at El Paso*, FRED CONRAD, *ISR, University of Michigan*, STEPHANIE A. MORALES, *University of Michigan* — Major life transitions spawn memorable personal events (Brown et al., 2016; Shi & Brown, 2016). It follows that people should remember more events from March 2020 – the transitional onset of the COVID-19 pandemic – than from surrounding months. To test this prediction, we collected two waves of data: W1 was conducted in early 2021; W2 in early 2022. During both waves, 1st-year undergrads at the University of Alberta recalled 12 "memorable, interesting or important" autobiographical memories from the previous calendar year – 2020 for W1; 2021 for W2. As predicted (Brown, 2021), W1 participants displayed a COVID Bump, recalling a higher percent of events from March 2020 (9.2%) than from February 2020 (4.6%) or April 2020 (6.1%). Also as predicted, event memories were less common in March 2021 (5.6%) than March 2020. This pattern was replicated in samples from the Universities of Michigan and Texas at El Paso. These findings indicate that: (a) it was the transitional impact of the pandemic rather than some other feature of the month of March that produced the spike in March 2020, indicating that this pattern was in fact a COVID Bump and (b) the effect was generalized across regions and local cultural differences.

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2:10–2:25 PM (202)

Shape of the Past: Revealing How Details Are Reconstructed Over Time to Form Memories of Personal Life Events. AUBREY KNOFF, *VA Boston Healthcare System*, JEREMY WILSON, *University of Arizona and Banner Health*, JESSICA ANDREWS-HANNA, *University of Arizona*, MATTHEW GRILLI, *University of Arizona* — Remembering personal events results in "temporal arcs" that represent the rise and fall of details both specific to the event and those that provide context. Temporal arcs can reveal fundamental properties of memory reconstruction and the impact of healthy aging on how we remember past events. From seven studies, 235 healthy young, middle-aged, and older adults described memories aloud that were scored for event-specific and semantic details summed within five segments based on word count. Mixed modeling revealed that semantic/contextual information was most prevalent initially, whereas event-specific details peaked mid-reconstruction. Scene details, a subtype of event-specific details, tended to be underutilized early in older adult memories. Notably, memories from older participants with greater initial semantic details demonstrated a flattening of event-specific details across reconstruction. These novel temporal arcs reveal a transition in the timing of how details come together and provide evidence for an older-age specific issue with semantic frontloading.

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2:30–2:45 PM (203)

Social Mobility, Well-Being, and Emotion Regulation in Older Adulthood: Evidence from the Cognitive and Social Well-Being (CoSoWELL) Project. AKI-JUHANI KYRÖLÄINEN, *University of Turku*, VICTOR KUPERMAN, *McMaster University* — Social isolation and loneliness adversely affect psychological and emotional well-being in older adulthood, especially during the global pandemic. Yet, joint and relative contributions of loneliness and social isolation to the impact on well-being are rarely examined. Here, we use a data-driven method (a Latent Class Model based on 22 variables) to construct social mobility profiles in older adulthood. The data came from the CoSoWELL project that contains an extensive survey administered for over 2,000 older adults (55+ y.o.) in eight testing sessions before (1) and during (7) the pandemic. The model recovered four highly distinct social mobility clusters (classification accuracy = 93%). Further analyses demonstrated that the number of the individual's social connections and their frequency of use were the features that discriminated between the profiles the most; loneliness contributed much less. Importantly, profiles featuring high loneliness and impoverished social ties correlated with reduced scores on well-being and emotion regulation scales. We also demonstrate how social mobility profiles affected CoSoWELL written productions by members of those clusters, revealing linguistic markers of social isolation and loneliness.

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2:50–3:05 PM (204)

Blind Implantation: A New Method to Implant False Autobiographical Events. HENRY OTGAAR, *Maastricht University*, MARK L. HOWE, *City, University of London* — A heated debate exists surrounding the topic of therapy-induced false memories and the existence of repressed memory. Because of this debate, memory scholars have devised several ways to create false memories. In this presentation, a new method to implant false autobiographical events will be described. Participants received several autobiographical events including a critical false event and had to state whether they ever experienced these events. After 1 week, participants who did not experience the false

event received a second survey suggesting that they actually did experience the false event. False memory rates were similar as in related false memory tasks. Furthermore, we will discuss the role of plausibility and event frequency in the formation of blind implanted false memories.

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3:10-3:25 PM (205)

Memories of Coming Out and Their Relationship with Gay and Bisexual Men's Identities and Well-Being. BURCU KAYA KIZILÖZ, *Eastern Mediterranean University*, İBRAHIM RAY, *Eastern Mediterranean University*, SHENEL HUSNU, *Eastern Mediterranean University* — How we create meaning for the self from our experiences relates to our identity and well-being (Merill et al., 2015). Coming out, a challenging and sensitive experience for lesbians, gays, and bisexuals (LGB), has been found to correlate with mental health and well-being. To our knowledge, there is no research on coming out memories and their relations with identity and mental health and well-being. We asked 109 gay and bisexual men their most negative and positive coming out experiences and to fill out Centrality of Event, LGB identity, well-being, and depression scales. We found that only valence of negative memories was related to well-being scores, whereas valence of negative memories and a negative LGB identity was predictive of higher depressive symptomology. These findings suggest that the way we remember our memories and how they are integrated to our identities affect our well-being and mental health.

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Visual Search

Saturday, November 19, 2022, 3:50-5:30 PM US EST, Back Bay A

Chaired by Brian A. Anderson, *Texas A&M University*

3:50-4:05 PM (206)

Visual Search as Effortful Work. BRIAN A. ANDERSON, *Texas A&M University*, DAVID S. LEE, *Texas A&M University* — Tasks requiring more information to be maintained in working memory or more frequent task switches are perceived to be more mentally effortful. Visual search is sometimes characterized as "difficult" or "easy" in the literature on the basis of search slope, but whether such variability in performance is related to mental effort is unclear. In the present study, across three experiments, participants could reduce the number of items they needed to search through by applying force to a hand dynamometer. We found that canonical measures of search difficulty—set size and non-target heterogeneity at the group level and search slope at the individual level—predicted willingness to exert physical effort to make search "easier." A control experiment ruled out a desire to finish the experiment faster as an explanation for the physical effort exerted. Our results are consistent with the idea that visual search constitutes effortful work that can trade off with the performance of a physically effortful task, which has broad implications for theories of visual information processing. The methodological approach we developed is flexible and could be adapted to address a variety of other fundamental questions concerning mental effort.

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4:10-4:25 PM (207)

Spatial-Based Attention Deficit in Encoding Memory Binding in Alzheimer's Disease. MARIANA R. MANIGLIA, *University of São Paulo*, CESAR A. GALERA, *University of São Paulo* — Alzheimer's disease presents impairment in conjunctive memory binding that is not reported in aging or other pathologies. The mechanisms underlying memory binding are still unclear. The present study investigated spatial-based attention to assess the binding of color and shape in Alzheimer's disease. We used the cueing paradigm of pre-cue and retro-cue to investigate the effect on encoding and retrieving. The performance of Alzheimer's patients (n= 15) was compared with healthy old adults (n= 23). The experiment consisted of three blocks (control, precue, and retrocue) of a short-term memory recognition task of shapes, colors, or shape-color binding. The results point to a deficit in spatial-based attention for binding in patients with Alzheimer's during encoding (pre-cue). There was no difference between old adults and Alzheimer's patient group in retro-cue condition. This study suggests that the impairment of memory binding in Alzheimer's may come from the attention mediated by the spatial orientation system.

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4:30-4:45 PM (208)

Take a Pause! Scene Construction Is Not Instantaneous. HELENE INTRAUB, *University of Delaware*, ANTHONY PHILLIPS, *University of Delaware*, GINA CANTATORE, *University of Delaware*, WILLA LANE, *University of Delaware*, BANJIT SINGH, *University of Delaware* — Bainbridge and Baker (2020) proposed that boundary extension (BE) does not reflect constructive, inferential processes: BE (memory beyond the view) and boundary contraction (BC: loss of peripheral content) are points on a continuum mediated solely by scene properties (e.g., distance). Their task (250-ms scene, 250-ms masked off-time, then a boundary memory test) may have probed memory too soon to capture scene construction across their image set. In our five experiments, scene presentation (250 ms) and test were unchanged, but masked off-time varied (250 ms vs. 8 s). In one experiment (n=217), we presented their most extreme "BE" and "BC" images. The BE/BC pattern occurred for the 250-ms mask, but not the 8-s mask, where errors reflected the pattern associated with scene construction: BE for their close-ups, but no directional error for their distant "BC" images. In our other Exps, using two different picture sets (single-object vs. multi-object views), BE occurred after 8 s mask for the same images that did not elicit BE after 250 ms. Although sometimes very rapid, scene construction time likely varies across views. Identification time and normalization may account for BE/BC when scene construction is rapidly disrupted.

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4:50–5:05 PM (209)

Violating Expectations: Pitting Prior Knowledge vs. Immediate Previous Experience in Search. KAROLINA J. KRZYŚ, *Queen's University*, CARMEL AVITZUR, *Queen's University*, CARRICK C. WILLIAMS, *California State University, San Marcos*, MONICA S. CASTELHANO, *Queen's University* — Many recent studies have shown that previous experience plays a significant role in attentional guidance. When searching in scenes, previous experience takes on two forms: prior knowledge about the expected location of target objects and performance in prior trials. Here, we examine how prior knowledge and prior trials change influence over time. Participants searched for target objects that had varied spatial associations with scenes (Fixed: shoes on the floor; Variable: cats are everywhere). Also, targets could be placed in expected or unexpected locations. Not surprisingly, when in expected locations, Fixed targets were found faster than Variable, but in unexpected locations, performance was more adversely affected for Fixed ones. Interestingly, when we examined performance over time, we found no evidence that participants were altering their use of prior knowledge. However, when examining trial-to-trial influences, we found whether the target was in an expected position in the previous trial had a significant effect: violating expectations led to ignoring prior knowledge subsequently. While prior knowledge had a strong influence overall, immediate previous experience played an unexpected role.

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5:10–5:25 PM (210)

Perceptual Grouping of Social Interactions: From Dyads to Triads. JELENA RISTIC, *McGill University*, CLARA COLOMBATTO, *Yale University/University College London*, VICTORIA FRATINO, *McGill University* — Detecting social interactions is crucial in everyday life. Accordingly, our visual system seems well-tuned to detect not just the presence of other people but also the social relationships between them. For example, recent work has shown that dyads (or groups of two) are found faster when the two individuals are facing towards vs. away from one another. Here we examined whether similar perceptual sensitivity extended to larger interactive groups like triads, or groups of three. Participants searched for facing triads in arrays of non-facing triads or for non-facing triads in arrays of facing triads. Experiment 1 found that facing triads were detected faster relative to non-facing triads. Experiment 2 further indicated that the search advantage for facing triads was not driven by prioritization of facing dyads within triads, as the effect vanished when triads were reduced to dyads by singling out one individual. Thus, human perception appears to be specialized for detecting social interactions among larger groups as well.

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Reasoning and Problem Solving

Saturday, November 19, 2022, 3:50–5:30 PM US EST, Constitution AB

Chaired by Steven M. Smith, *Texas A&M University*

3:50–4:05 PM (211)

Hint Blindness as a Function of Mental Set Strength. STEVEN M. SMITH, *Texas A&M University,* SHIVANI MANSHARAMANI, *Texas A&M University* — The benefits of taking breaks when problem solving becomes fixated have been attributed to serendipitous hints encountered during those breaks, and some have even reported effects of "subliminal" hints (e.g., Hattori et al., 2013). The present experiments examined the effectiveness of pictorial hints (i.e., pictures of objects whose names were solutions) in triggering resolution of initially unsolved RAT problems. When a problem was initially unsolved, an extra 10-sec of work on the problem continued with a usually irrelevant photo in the background and a letter maze that usually contained the solution. On critical trials, however, mazes did not contain solutions, but background photos depicted solutions; attention to mazes on such trials functioned as a mental set, preventing participants from using good photo hints in plain sight. Although photo hints helped participants resolve about 70% of problems in a control condition where no mental set was present (i.e., no letter mazes were shown), there was nearly no benefit of hints in the mental set condition, a hint blindness effect. Three experiments examined the effect of mental set strength on hint blindness.

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4:10–4:25 PM (212)

Creativity Does Not Come Easy: Cognitive Conflict in Divergent Thinking. MORITZ REIS, *Julius-Maximilians-Universität of Würzburg*, ROLAND PFISTER, *Julius-Maximilians-Universität of Würzburg* — The investigation of creative behavior has attracted scholars for hundreds of years. The cognitive foundations of creative thought and behavior, however, are still mainly unexplored. In two experiments, we adapted the alternative uses task to a response dynamics paradigm (i.e., mouse-tracking) from rule-violation research. We tracked mouse movements while participants selected either the traditional or the creative use for a given item. Participants were prompted to select a specific use (Experiment 1) or could freely decide between both options (Experiment 2). In both studies, selecting the creative compared to the traditional use required more time, and response trajectories were more curved (towards the non-chosen option) when participants chose the creative instead of the traditional use. The present experiments provide first evidence that creative behavior creates substantial cognitive conflict for the responsible agent, and these results open the opportunity to investigate creativity out of a rule-violation perspective.

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4:30–4:45 PM (213)

The Role of Claims, Reasons, and Rebuttal in Arguments About Vaccination and Other Topics. CHRISTOPHER R. WOLFE, *Miami University*, GRACE E. TIRZMALIS, *Miami University*, JOSSELYN E. MARROQUIN, *Miami University*, WYLIE BRACE, *Miami University* — An argument is, at minimum, a claim supported by a reason. Given the political polarization of vaccination, we conducted three studies on how arguments about vaccines and other topics are processed. Study 1 replicated research on the weight of claims and reasons in agreement and judgments of argument strength or quality. Participants read 8 sets of four arguments unrelated to vaccination, two with pro claims and two with the opposite con claim, crossed with two supporting reasons similar in ideology or other factors and two that were dissimilar. Replicating earlier research for arguments about a variety of topics, claims had significantly more weight in influencing agreement, but reasons had significantly more weight in judgments of strength or quality. However, when applying this procedure to arguments about vaccination in Study 2, claims were significantly more influential than reasons for both agreement and quality judgments. In Study 3, participants rated their agreement with and quality of anti-vaccination arguments before and after rebuttal. Rebuttal did not change agreement, and controlling for pre-rebuttal ratings changed quality ratings only for liberal participants. We discuss practical and theoretical implications.

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4:50–5:05 PM (214)

An Investigation of Individual and Developmental Differences in Rationality and Intelligence. ANDREW CONWAY, *New Mexico State University*, LISE ABRAMS, *Pomona College*, SARA GORING, *Claremont Graduate University*, CHRISTOPHER SCHMANK, *Claremont Graduate University*, KACIE BAUER, *New Mexico State University*, VANESSA PALLENTIN, *Heidelberg University* — According to bounded rationality theory, people strive to be rational but often fall short due to cognitive biases and limitations. Consistent with this view, Stanovich and colleagues recently demonstrated stable individual differences in "rationality," such that some people tend to make more rational decisions than others, across a variety of tasks and situations. They developed a battery of reasoning and decision-making tasks, the Comprehensive Assessment of Rational Thinking (CART), and found that CART scores are correlated with, but distinct from, measures of fluid intelligence (Gf) and crystallized intelligence (Gc). Here we further examine construct validity of the CART and investigate individual and developmental differences in rationality. Young and older adults completed a battery of Gf, Gc, and CART tasks. Results showed that rationality was strongly correlated with both Gf and Gc, and older adults outperformed young adults, but on Gc tasks only, suggesting that rationality involves more than knowledge.

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5:10–5:25 PM (215)

Testing Associations Between Mindfulness Training, Psychological Threat, and Perceptions of Confidence, Difficulty, and Anxiety During Problem Solving. AVITAL PELAKH, *University of Pittsburgh*, MELANIE GOOD, *University of Pittsburgh*, ERIC KUO, *University of Illinois Urbana-Champaign*, MICHAEL J. TUMMINIA, *University of Pittsburgh*, SARA JAHANIAN, *University of Pittsburgh*, TIMOTHY NOKES-MALACH, *University of Pittsburgh*, BRIAN GALLA, *University of Pittsburgh* — The aim of this research is to test the effect of mindfulness training to reduce psychological threat and affect perceptions of confidence, difficulty, and anxiety during problem solving. 149 undergraduates enrolled in introductory physics and who reported feeling psychological threat in their course were randomly assigned to receive either a 5-day mindfulness training intervention or no training (control). Both groups completed a physics problem-solving task before the intervention (baseline; day 1) and directly after the final training session (posttest; day 5) during which perceptions of confidence, difficulty, and anxiety were measured. Psychological threat was measured via self-report survey before the baseline physics task and twice per day on days 2 to 4 using experience sampling methods. We report our analysis in three parts. First, we tested the baseline associations between psychological threat and item-level perceptions during problem solving. Next, we tested the effects of mindfulness training on item-level perceptions measured at posttest. Finally, we tested whether psychological threat, measured using experience sampling, mediates the relationship between mindfulness training and item-level perceptions at posttest.

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Recall II

Saturday, November 19, 2022, 3:50–5:30 PM US EST, Republic

Chaired by Christopher N. Wahlheim, *University of North Carolina at Greensboro*

3:50–4:05 PM (216)

Cued Retrieval of Fake News Promotes Memory Updating for Real News Corrections. CHRISTOPHER N. WAHLHEIM, *University of North Carolina at Greensboro*, PAIGE L. KEMP, *University of North Carolina at Greensboro*, ALYSSA H. SINCLAIR, *Duke University*, R. ALISON ADCOCK, *Duke University* — Reminders of fake news can improve memory for real news. We examined the role of reminder-cued retrieval in this effect. In Phase 1, participants studied real and fake news headlines from the internet. In Phase 2, participants saw reminders of the Phase 1 headlines before studying real news headlines that corrected the fake news or reaffirmed real news. Reminders either included all the details (complete reminder) or omitted the misinformation that would be corrected (partial reminder). Participants attempted recognition for complete reminders and recall for partial reminders. In Phase 3, a cued recall

test, subsequent recall of both the fake news detail and the real news that corrected it was better following complete compared to partial reminders, whereas the opposite was observed for real news affirmations. These results suggest that, rather than only promoting conflict salience, reminder success enabled integrative encoding that updates memory for real news corrections of fake news.

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4:10–4:25 PM (217)

Episodic Memory and Associative Learning Intertwined: Another Challenge to the Multiple Memory System Taxonomy. CHRISTOPHER R. R. MADAN, *University of Nottingham* — It has been decades since the taxonomic structure of memory that we still follow was proposed. The distinction between episodic and semantic memory systems has been challenged in recent years, based on evidence implicating that they are tightly intertwined. Here I propose that episodic memory and associative learning are also closely intertwined, drawing from two lines of experimental studies. One line of work is based on strong evidence of memory biases in a decision-from-experience risky choice procedure. The other draws from evaluative conditioning occurring following an emotional association-memory paradigm. Taken together, these results, as well as those from the episodic-semantic continuum, challenge our current understanding of multiple memory systems and require that we re-evaluate the definition of episodic memory and of the organisation of memory taxonomy more broadly.

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4:30–4:45 PM (218)

Do Item-Dependent Context Representations Underlie Serial Order in Cognition? ADAM OSTH, *The University of Melbourne*, MARK HURLSTONE, *Lancaster University* — Logan (2021) presented a unification of serial order tasks including whole report, typing, and serial recall in the context retrieval and updating (CRU) model. Despite the breadth of CRU's coverage, its reliance on context representations that consist of the previous items may prevent it from being able to address a number of benchmark findings in the serial order literature that have constrained existing theories. In this work, we highlight three challenges that motivated the development of a rival class of models of serial order, namely positional models. These challenges include mixed-list phonological similarity effects, the protrusion effect, and interposition errors. CRU can address the mixed-list phonological similarity effect if phonological confusions can occur during its output stage, suggesting that the serial position curves from this paradigm do not rule out models that rely on inter-item associations, as has been previously suggested. The other two challenges are more consequential for the model's representations, and simulations indicated the model was not able to provide a complete account of them. We discuss how revisions to CRU's representations or retrieval mechanisms can address these phenomena.

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4:50–5:05 PM (219)

Multinomial Processing Tree Models of Cognition: Aggregation Invariance Properties. EDGAR ERDFELDER, *University of Mannheim*, JULIAN QUEVEDO PÜTTER, *University of Mannheim*, MARTIN SCHNUERCH, *University of Mannheim* — Multinomial Processing Tree (MPT) models are frequently used tools to model and measure cognitive processes underlying responses in many experimental paradigms. Although MPT models typically refer to cognitive processes within single individuals, they have often been applied to group data aggregated across individuals. We investigate the conditions under which MPT analyses of aggregate data make sense. After introducing the notions of (a) structural aggregation invariance and (b) empirical aggregation invariance of MPT models, we show that any MPT model that holds at the level of individuals must also hold at the aggregate level when it is both structurally and empirically aggregation invariant. Moreover, group-level parameters of aggregation-invariant MPT models represent means of the corresponding individual parameters. To assess the robustness of aggregate results when one or both invariance conditions are violated, we additionally performed a series of simulation studies using a prototypical MPT model for free recall data as an example. Overall, our results show that aggregate MPT parameter estimates are trustworthy under rather general conditions if a few precautions are taken.

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5:10–5:25 PM (220)

What Are the Causes of Forgetting? Is Inhibition a Significant Cause? RICHARD M. SHIFFRIN, *Indiana University*, ASHLEIGH MAXCEY, *Vanderbilt University*, ROBERT NOSOFSKY, *Indiana University*, COLIN M. MACLEOD, *University of Waterloo*, REBECCA CUTLER, *The University of Texas at Austin*, ZARA JOYKUTTY, *Vanderbilt University* — What are the chief causes of forgetting? Several causes are well established: For short-term memory, limited capacity is a cause of forgetting. Long-term memories are generally thought not to suffer from a similar capacity limitation and are assumed to be more or less permanent if undisturbed. Nonetheless, those traces may exhibit forgetting due to failures of retrieval. Accepted causes of retrieval failure are competition (aka interference, cue overload), context change, and addition to traces that occur when they are retrieved. Bjork, Bjork, and Anderson (1994) highlighted another possible cause of long-term forgetting in a cued recall paradigm that exhibited Retrieval Induced Forgetting (RIF). They argued that RIF was due to inhibition causing a reduction in strength of a trace that is retrieved but that is not the desired one. Maxcey and colleagues published several papers using a design like that of Bjork et al., but using recognition testing. They also found RIF and also interpreted that as due to inhibition. We report two tests of inhibition, one in the recognition paradigm and one in the cued recall paradigm. Finding no RIF in either, we suggest that inhibition is at most a minor contributor to forgetting.

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Psycholinguistics I

Saturday, November 19, 2022, 3:30–5:30 PM US EST, Back Bay D

Chaired by Laura M. Morett, *The University of Alabama*

3:30–3:45 PM (221)

The Effects of Motor and Visual Input and Sign Iconicity on Acquisition of ASL Signs by Hearing Learners. LAURA M. MORETT, *The University of Alabama*, MATHEW CIESLA, *The University of Alabama*, SARAH S. HUGHES-BERHEIM, *The University of Alabama*, KAREN EMMOREY, *San Diego State University* — This study examined the effects of motor (somatosensory) and visual input on acquisition of signs in American Sign Language (ASL) by hearing learners. In an internet-based experiment, 34 hearing adult English speakers learned 80 ASL signs varying in iconicity by either closing their eyes and reproducing them (+ motor, - visual input) or by observing them an additional time while remaining motionless (- motor, + visual input). Subsequently, their knowledge of signs was tested via production in response to English translations, both immediately and one week after learning. We observed no significant main effect of input modality and no interactions between input modality and test-time or iconicity, indicating that signs were learned equally well with motor input and visual input. However, we observed main effects of test-time and iconicity, as well as a significant interaction between these two factors, indicating that more iconic signs were more likely to be produced correctly than less iconic signs, particularly one week after learning. Taken together, these findings provide evidence that motor input and visual input each contribute to sign learning and that iconicity facilitates learning, particularly following a delay.

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3:50–4:05 PM (222)

Why Children's Books? The Role of Structure and Predictability Within Language in Engaging Early Vocabulary Learning. KIRSTEN READ, *Santa Clara University* — One rich support for children's early vocabulary building is shared book reading. Within this context, this talk will present evidence from several studies that have incrementally tested our theory for why common structural features of children's books such as rhyme may be especially useful for fast-mapping new vocabulary. We posit that (1) structured rhyme invites children to make lexical predictions of upcoming words as they listen to a book read aloud, and (2) predicting upcoming words draws extra attention to them making new words more memorable. In studies that employ rhyme and pauses before target words, children reliably make spontaneous verbal and nonverbal signs of anticipation of what word they expect to complete a phrase (Read et al., 2014; 2019; 2020), and making lexical predictions, regardless of whether they are correct or incorrect, correlates with better memory for those words (Read et al., 2021). Ongoing and future work meant to further unpack remaining questions about the connection between lexical prediction and later retention will also be discussed.

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4:10–4:25 PM (223)

What Explains Individual Differences in Segmenting Perceptually Ambiguous Spoken Words? MARK PITT, *The Ohio State University*, ABIGAIL BENECKE, *The Ohio State University*, DAHEE KIM, *The Ohio State University* — Casually produced speech can result in weak acoustic cues to word boundaries. We explored a boundary condition in which there are few such cues, hoping to identify what knowledge is recruited to parse the sequence as intended by the talker. Listeners had to segment pairs of spoken words. Across tasks and replications, listeners exhibited large differences in their ability to parse the two-word sequences correctly. Individual performance is closely associated with word-pair frequency, with most segmenting high-frequency pairs and only a few low-frequency pairs, raising the possibility that exposure frequency informs word segmentation.

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4:30–4:45 PM (224)

How Do We Produce Novel Words? The Negative Feedback Cycle Hypothesis. VSEVOLOD KAPATSINSKI, *University of Oregon* — This paper is framed within a parallel distributed architecture of the language production system, in which distributed semantic representations activate competing form chunks in parallel. This architecture provides a mechanistic explanation for the diachronic processes of semantic extension and morphological paradigm leveling. However, it also raises the question of how errors of leveling and overextension are avoided. A negative feedback cycle is proposed to be responsible. The cycle suppresses activated form chunks with unintended semantics and allows the speaker to decide when to begin speaking. The negative feedback cycle provides the only available psycholinguistic account for how parts of words sometimes gain independence, separating from their hosts. It also explains away much of the evidence for the use of paradigmatic mappings in morphology and syntax, allowing more of the mental grammar to be described with direct form-meaning associations. However, there also remains an important residue of cases for which paradigmatic mappings are necessary. I show that these cases can be accounted for by spreading activation down paradigmatic associations as the source of the activation is being inhibited by negative feedback.

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4:50–5:05 PM (225)

Using Visual Context to Test the Structural Prediction Account of Non-Literal Representation. DOUGLAS J. GETTY, *University of Pittsburgh*, SCOTT H. FRAUNDORF, *University of Pittsburgh* — Implausible sentences like (1) "The man gave the ball the girl" are frequently interpreted non-literally. This non-literal interpretation is reflected in the comprehenders' syntactic

representations (Cai et al., 2022). One proposed account of this is that comprehenders make structural predictions incrementally, and highly plausible predictions linger—even if disconfirmed by the observed input—influencing both the final structural representation and interpretation. In this study, we probe whether prediction can account for non-literal structural representation using a structural priming task and comprehension questions. We manipulate participants' predictions with images that modify the plausibility of primes like (1): in one condition, participants see a literal interpretation supporting image (a man in fact giving a girl to a ball) preceding the primes. In another condition, a non-literal supporting image precedes the primes (a man giving a ball to a girl). These will be compared to conditions where images follow the primes and thus cannot alter prediction. Results will be discussed with respect to the structural prediction account and other models that allow for computing non-literal representation.

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5:10–5:25 PM (226)

Revealing Semantic and Emotional Structure of Suicide Notes with Cognitive Network Science. MASSIMO STELLA, *University of Exeter* — Understanding how people who end their lives perceive their cognitive states and emotions represents an important open scientific challenge. We build upon cognitive network science, psycholinguistics and semantic frame theory to introduce a network representation of suicidal ideation as expressed in 139 suicide notes. By reconstructing the knowledge structure of such notes, we reveal interconnections between the ideas and emotional states of people who ended their lives through an analysis of emotional balance motivated by structural balance theory, semantic prominence, and emotional profiling. Our results indicate that connections between positively- and negatively-valenced terms give rise to a degree of balance that is significantly higher than in a null model where the affective structure is randomized and in a linguistic baseline model capturing mind-wandering in absence of suicidal ideation. We show that suicide notes are affectively compartmentalized such that positive concepts tend to cluster together and dominate the overall network structure. This positive clustering diverges from perceptions of self, which are found to be dominated by negative, sad conceptual associations -- more than in reference free association data.

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Metacognition I

Saturday, November 19, 2022, 3:30–5:30 PM US EST, Back Bay C

Chaired by Timothy Dunn, *Naval Health Research Center*

3:30–3:45 PM (227)

Complexity of Sea Floor and Target Prevalence Diminishes Metacognitive Accuracy and Performance During Simulated Mine Hunting Under Sleep Deprivation. TIMOTHY DUNN, *Naval Health Research Center*, AMELIA KRACINOVICH, *Naval Information Warfare Center Pacific*, MICHAEL WALKER, *Naval Information Warfare Center Pacific*, BRANDON SCHROM, *Naval Health Research Center*, JACOB VAN DEHY, *Naval Health Research Center*, JAMIE LUKOS, *Naval Information Warfare Center Pacific*, RACHEL MARKWALD, *Naval Health Research Center* — Sleep deprivation is known to cause decrements on basic cognitive tasks. Such tasks, however, lack ecological validity and generalizability to real-world scenarios. Here, we aimed at better understanding the effects of sleep deprivation in simulated operational conditions using a military mine hunting task. Trained sailors were tasked with identifying mines in sonar data and providing confidence ratings in their decisions. Participants were kept awake for 24 hours and completed four sessions of the task under varying sea floor complexity (low/high) and target prevalence (low/high) conditions. We found that performance (hit rate) was not affected by sleep deprivation but was worse in low complexity environments. Furthermore, false alarm rates got better as time awake increased but were overall worse in low target prevalence environments. Sleep deprivation did show a negative effect on metacognitive accuracy (AUC) in high target prevalence environments. These results demonstrate that basic task performance is relatively preserved under sleep deprivation in trained individuals, though the ability of confidence judgments to distinguish true hits can suffer.

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3:50–4:05 PM (228)

Subjective Confidence Tracks the Replicability of a Choice. ASHER KORIAT, *University of Haifa* — According to the Self-Consistency Model (Koriat, 2012), confidence in the response to a binary-choice item tracks the reliability of the response across the cues consulted in making that response. Because people sample their cues largely from the same population of cues, subjective confidence should predict the replicability of the response across individuals and occasions. Indeed, in comparing the two responses made by different individuals to the same item, the response endorsed with greater confidence was the more likely to be made by other participants. This was so for 9 tasks, including those for which the response has a truth-value (general knowledge, perceptual judgments) and those for which it does not (beliefs, attitudes), and for the former tasks, this was true whether confidence was diagnostic or counterdiagnostic of accuracy. Similar results were found for response speed. Confidence and speed also predicted within-person replicability. The results demonstrate a hindsight benefit, as confirmed by a simulation experiment. The results call for an extended notion of the wisdom of crowds that includes not only people's actual responses but also the collective pool of cues on which these responses are based.

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4:10–4:25 PM (229)

Subjective Assessments Are More Important Than Content When Updating Knowledge. AYANNA K. THOMAS, *Tufts University*, RENEE DECARO, *VA Boston Healthcare System*,

MCKINZEY TORRANCE, *Tufts University* — We examined how confidence in and popular discussion of misconceptions influenced knowledge updating. In two experiments, participants took a TRUE/FALSE test of misconceptions, rated their confidence, and were given immediate corrective feedback consisting of the correct answer and an explanation of the correct answer. Individuals were retested after a delay of one week to assess stability of knowledge updating. We tested whether misconceptions related to current events would be less resistant to updating as compared to commonly held misconceptions not in the current popular conversation. Therefore, we compared knowledge updating for misconceptions related to structural racism (current event) and those related to psychology. People were similarly likely to update misconceptions about the two topics and both statement framing (e.g., "false") and initial confidence influenced updating. Our results suggest that success of knowledge updating is primarily determined by subjective assessments and not by knowledge content.

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4:30–4:45 PM (230)

Why Do Judgments of Learning Modify Memory? Evidence from Identical Pairs and Relatedness Judgments. VERED HALAMISH, *Bar-Ilan University*, MONIKA UNDORF, *University of Mannheim* — Research suggests that making judgments of learning (JOLs) while learning word pairs improves memory for related but not for unrelated word pairs. To explain these results, theories assume that people process cue-target relatedness more when making JOLs than they spontaneously do otherwise. We directly tested this relatedness-processing assumption with unrelated and related word pairs as well as with hitherto unexamined materials: identical word pairs. In three experiments, participants studied word pairs while either making or not making JOLs. Results revealed that making JOLs improved memory for related and identical word pairs but not for unrelated word pairs. Importantly, participants were further asked to judge at test whether each cue appeared with an unrelated, related, or identical target before attempting to recall it. Results revealed that making JOLs improved the accuracy of these relatedness judgments independently from its effect on recall. These findings provide direct evidence for the relatedness-processing assumption, contribute to the understanding of JOL reactivity and, more broadly, suggest that instructions to monitor learning can direct people's attention to information that is not or less processed otherwise.

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4:50–5:05 PM (231)

Where Are Thoughts Located? AUSAF A. FAROOQUI, *Bilkent University*, BERFIN GÜRCAN, *Bilkent University*, YAKUP CATALKAYA, *Bilkent University* — Emotions generate feelings that are typically localized somewhere in the conscious body schema (e.g., an aching heart). Here we investigated if people localize non-emotional thoughts within their bodies and if different kinds of thoughts get localized at different loci. We made subjects (n = 50) think different kinds of thoughts with their eyes closed: imageries (e.g., imagine seeing city lights in the valley below), mental arithmetic (e.g., 13x12), abstract thought (e.g., "Is there meaning to life?"). We asked them to take note if and where within them were these thoughts/images present and depict the loci in coronal and sagittal line drawings of the body. We found that all participants located their thoughts/images somewhere within their body, typically within their head. The actual locus varied both within and across participants for different kinds of thoughts, e.g., visual imageries were typically localized anteriorly in the head compared to abstract thought. (Supported by TUBITAK grant no. 121K902.)

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5:10–5:25 PM (232)

Exploring the Mechanisms of Output Interference During Cued Recall Using Metamemory Judgments. TAYLOR CURLEY, *Air Force Research Laboratory* — Output interference (OI), or the gradual decline in memory accuracy as a function of an item's position in a testing sequence, is unique among memory interference effects. Rates of memory failures, but not intrusions, increase across trials, suggesting that the effects of OI are more closely related to suppression of the target than semantic competition. The present study used metamemory judgments to better understand the mechanisms underlying OI during cued recall. Participants studied 40 word pairs and provided metamemory judgments during cued recall and a subsequent recognition memory test. For half of the participants, cue words were exemplars sampled from the same taxonomic category and presented in blocks during recall, while for the other half of the participants, word pairs were completely unrelated. For those experiencing OI, self-reported recollection decreased across trials, while rates of familiarity and feelings of no memory did not change across trials. Similarly, feelings-of-knowing (FOKs) decreased in magnitude during OI but did not reliably predict future recognition. The results provide mixed support for retrieval suppression vs. competition accounts of OI.

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Cognition and Emotion II

Saturday, November 19, 2022, 3:30–5:30 PM US EST, Independence

Chaired by Marcus L. Leppanen, *University of Mary Washington*

3:30–3:45 PM (233)

Emotional Context Change Impairs Memory for Prior Remembering. MARCUS L. LEPPANEN, *University of Mary Washington*, OLIVIA SIEGAL, *National Institute of Mental Health*, KYUNGMI KIM, *Wesleyan University*, CHARLES A. SANISLOW, *Wesleyan University* — Recovered memories are an act of memory retrieval for information previously believed to have not been retrieved before. Such experiences may occur for mundane events

(e.g., your birthday party) or for traumatic experiences (e.g., childhood sexual abuse). Attempts to explain recovered memory experiences have focused on the context of retrieval. Laboratory research on memory for prior remembering suggests that semantic context change across instances of memory retrieval can increase forgetting of prior remembering, but the role of emotional context is less understood. In two experiments, we investigated whether the emotional context in which target words were retrieved could impact the accuracy of memory for prior remembering. Emotional vs. neutral contexts were established with pictures of target words (e.g., a barn on fire vs. in a field). Target words learned in each context were tested twice, either with the same or different retrieval context. Memory for prior remembering was worse when words were first learned in an emotional context, then tested in a neutral context, and later tested in the original emotional context. Findings are considered in terms of their impact on therapeutic approaches to traumatic memory experiences.

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3:50–4:05 PM (234)

(When) Are Emotional Sources Remembered Better? NIKOLETTA SYMEONIDOU, *University of Mannheim*, BEATRICE G. KUHLMANN, *University of Mannheim* — In three experiments, we comprehensively investigated whether source memory (i.e., memory for the context of information) is enhanced for inherently emotional sources by using normed emotional stimuli. Instructing intentional item and incidental source learning in Experiment 1 (N=172), we did not find beneficial effects of source valence (i.e., positive or negative sources) and source arousal (i.e., high-arousing sources) on source memory. In contrast, in Experiment 2 (N=68), we found enhanced source memory for emotional (i.e., positive and negative) compared to neutral sources when using an affective, item-focused orienting task (OT; i.e., pleasantness ratings) during encoding. Clarifying these inconsistent findings, Experiment 3 (N=216) unveiled that EEM effects in source memory only occur with an affective OT (as in Experiment 2) but do not occur with an integrative OT (item-source-fit judgments), a purely item-focused OT (living-non-living judgments), or with intentional (vs. incidental) item (vs. source) learning (replicating Exp. 1). Thus, our research overall suggests that emotional sources per se are not remembered better. Rather, an affective item processing is necessary for establishing EEM effects in source memory.

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4:10–4:25 PM (235)

Changing Affective States of Memories Through Reconsolidation. MARK L. HOWE, *City, University of London*, LAUREN KNOTT, *City, University of London*, CASSANDRA BLAND, *City, University of London* — This study is one of the first to examine the effect of negative mood induction on memory reconsolidation and subsequent associations of negativity of the original event. Reconsolidation research tends to focus on the explicit content of memories retrieved. This study, however, proposes that affective changes to an existing memory can also occur through a process of reconsolidation and association formation. Participants were exposed to either neutral or negative mood inductions immediately after completing a recognition test for previously learned nonsense stimuli. After a 24-hour delay, participants filled in a surprise questionnaire consisting of affective ratings for the stimuli. Affective ratings for nonsense words were lower in the negative mood induction condition compared to the neutral induction condition, but only for items correctly recognised as old in the intermediate recognition test. The results support theories of reconsolidation and memory updating, as well as associative network theories of memory and emotion.

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4:30–4:45 PM (236)

Predicting a Reader's Emotion When Reading Short Stories. ANGELA BRUNSTEIN, *Gulf University for Science and Technology*, JOERG BRUNSTEIN, *University of East London*, MARTIN ROSENSTOCK, *Gulf University for Science and Technology* — Stories can be understood as an invitation to experience own emotions in a simulated, not-own scenario. It is obvious that we can only understand stories well that we can relate to. At the same time, there is impact of the story: Sad stories evoke sad emotions, happy stories evoke happy emotions. This study investigated how much a participant's emotion when reading a story can be predicted by all other participants reading the same story; how much by the same participant's emotions reading related stories; and how much by the participant's attitude toward this topic. 40 participants read 21 very short stories with 3 stories per topic, like holiday, work, family etc., with their skin conductance and eye movements recorded. A participant's emotion for, let's say a Christmas story, was much more associated with that participant's emotion for other Christmas stories than other participants' emotion for this story and not at all by the participant's attitude toward Christmas. This makes sense because it provides the reader with the best estimate of what might happen next in that story given what has happened already and what they know about this kind of story.

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5:10–5:25 PM (237)

Helping or Harming? A Trigger Warning Meta-Analysis. VICTORIA BRIDGLAND, *Flinders University*, BENJAMIN BELLET, *Harvard University*, PAYTON JONES, *Harvard University* — Trigger warnings are alerts about upcoming content that may contain themes related to past negative experiences. Advocates claim that warnings help people to emotionally prepare for or completely avoid distressing material. Critics argue that trigger warnings both contribute to a culture of avoidance at odds with evidence-based treatment practices and instill fear about upcoming content. However, current evidence for trigger warnings efficacy is mixed, suggesting they may be helpful, harmful, or inert. Therefore, here we present the results of a meta-analysis of all empirical trigger warning studies to date. We report the standardized mean differences of the effect

of trigger warnings on (1) anticipatory anxiety, (2) anxiety response to presented content, (3) the probability of avoiding warned-of content, and (4) educational outcomes (e.g., comprehension). Overall, we found that trigger warnings appear to have a null or trivial effect on response anxiety towards negative material and on educational outcomes. However, trigger warnings reliably increase anticipatory anxiety and may increase engagement with negative material. Limitations and implications for policy and therapeutic practice will be discussed.

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Psycholinguistics II

Sunday, November 20, 2022, 8:00-10:00 AM US EST, Constitution AB

Chaired by David Broniatowski, *The George Washington University*

8:00-8:15 AM (238)

Can Machines Summarize the Gist of Social Media Messages About COVID-19? Automated Versus Human Diagnostics of Topic Models. DAVID BRONIATOWSKI, *The George Washington University*, VALERIE F. REYNA, *Cornell University*, SARAH EDELSON, *Cornell University*, MEGAN BIRMINGHAM, *Cornell University*, DONALD KOBAN, *The George Washington University*, DIAN HU, *Mayo Clinic* — Automated techniques have been developed to summarize large quantities of natural-language text. Although often inspired by psycholinguistic constructs, such as gist, automated metrics have not been systematically evaluated with reliable human data. We evaluated two large Latent Dirichlet Allocation topic models fit to millions of social media messages about COVID-19 and derived model diagnostics. We recruited 365 subjects randomly assigned to evaluate one of two sets of 25 Facebook topics or 50 Twitter topics: Half evaluated meaningful coherence of the top 10 words representing each topic, and half evaluated the top 10 example posts/tweets. We conducted Principal Component Analyses to test whether human ratings of the gist of model outputs would align with machine diagnostics. Three orthogonal dimensions were extracted accounting for 70%-74% of variance. Human ratings loaded on similar dimensions across platforms and words/examples, aligning with machine diagnostics such as effective number of words, uniform distribution, and word length.

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8:20-8:35 AM (239)

Understanding the Link Between Digital Media and Grammatical Processing. ANSLEY POTTER, *Vanderbilt University*, MICHELLE PERDOMO, *Vanderbilt University*, ARIEL JAMES, *Macalester College*, DUANE WATSON, *Vanderbilt University* — Decades of sentence processing research suggest that readers are sensitive to the statistics of the language they read and rely on this information to predict which syntactic structures are likely to occur. A prediction of such experience-based accounts of language processing is that individual differences in syntactic processing should reflect individual differences in experience with language. We investigated how experience with different types of texts predicts individual differences in sentence processing by having participants (N=200) complete a survey-based assessment of their preferred reading materials and a self-paced reading task. In the reading task, subjects read sentences with subject and object relative clauses, which are known to elicit different reading times. Hours spent reading significantly predicted self-paced reading of relative clauses. We now present the results of a computational linguistic analysis of the relationship between the qualities of texts most often read and syntactic processing.

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8:40-8:55 AM (240)

A Psycholinguistic Analysis of Eye-Movement Patterns While Troubleshooting Python Source Code. JACK DEMPSEY, *University of Illinois Urbana-Champaign*, ANNA TSIOLA, *University of Illinois Chicago*, NIGEL BOSCH, *University of Illinois Urbana-Champaign*, KIEL CHRISTIANSON, *University of Illinois Urbana-Champaign*, MALLORY STITES, *Sandia National Laboratories* — Unlike text reading, the eye-movement behaviors associated with reading Python, a computer programming language, are largely understudied through a psycholinguistic lens. A general understanding of the eye-movements involved in reading while troubleshooting Python, and how these behaviors compare to proofreading text, is critical for developing educational interventions and better tools for helping programmers debug their code. To this end, we recorded experienced programmers' eye-movements while they determined whether 21 different Python functions would produce the desired output, an incorrect output, or an error. Some reading behaviors seem to mirror those found in text reading (e.g., effects of stimulus length and complexity), while others may be specific to reading code. For example, erroneous code elicited longer first-pass reading times while not necessarily triggering rereading of previous regions. The findings are framed to invigorate discussion and further exploration into psycholinguistic studies of human source code processing.

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9:00-9:15 AM (241)

The Semantic Structure of American Sign Language: Evidence from Free Sign Associations. ZED SEHYR, *San Diego State University*, LAUREN BERGER, *Boston University*, ARIEL GOLDBERG, *Tufts University*, NAOMI CASELLI, *Boston University*, KAREN EMMOREY, *San Diego State University* — We used a free-association task in American Sign Language (ASL) to investigate how ASL signers semantically organize their mental lexicons. Deaf signers saw ~2,000 cue signs (e.g., CAT) and produced three signs that came to mind for each cue sign (e.g., DOG, MOUSE, MILK). The dataset currently includes 110,477 sign associations for 2,665 cue signs from 48 participants. Semantic neighborhood

density (SND) was calculated based on the number of associates. SND weakly correlated with sign frequency, phonological neighborhood density, and iconicity. Similar to spoken languages, the structure of the ASL semantic network is a small-world network—sparse connectivity but many sub-clusters that are closely connected, suggesting that these network properties are language-general. We identified several semantic neighborhoods (hubs) that hold outsized importance in the network; some well-represented semantic fields in ASL included foods, animals, and mental states. The study uncovers the semantic structure of a signed language lexicon.

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9:20–9:35 AM (242)

Typical Psycholinguistic Experiments Require More Items to Detect Reliable Individual Differences in Focal Linguistic Effects. VAN RYNALD LICERALDE, *Vanderbilt University*, DUANE WATSON, *Vanderbilt University* — This project examines how well typical psycholinguistic experimental designs can reveal reliable individual differences in language processing. We simulated data with individual differences around typical effect sizes in psycholinguistic experiments. Analyses of these data show that the typical numbers of critical items in psycholinguistic experiments yield poor reliability for person-specific estimates of focal linguistic effects. Consistent with psychometric principles, increasing the number of critical observations per person increased the reliability of person-specific effect estimates. Beyond the need for more subjects to detect interactions that show individual differences in language processing, the current results point to a comparable need for more items to ensure that these interactions are reliable. However, increasing the number of items strains the feasibility of an experiment. Thus, researchers would have to weigh potentially conflicting considerations to arrive at designs that can reveal reliable individual differences in language processing.

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9:40–9:55 AM (243)

Is the Night Owl on the Hunt? The Metaphor Awakening Effect. LAURA PISSANI, *Concordia University*, ROBERTO G DE ALMEIDA, *Concordia University* — Conventional metaphors such as "night owl" or "broken heart" are interpreted rather fast and efficiently, for they may be lexicalized, supposedly bypassing the composition of a literal interpretation. We examined whether the literal meaning of a conventional metaphor could be "awakened" by a subsequent cue. In Experiment 1, participants read sentences word-by-word (e.g., "John is an early bird so he can…") and were presented with a two-word choice in a maze task. Participants took longer and were less accurate when the correct continuation ("attend") was paired with a literally-related distractor ("fly") rather than an unrelated matched control ("cry"). In Experiment 2, we examined whether this effect would hold when there was a medium (6–8 words) and a large (11–13 words) surface distance between metaphor and word junction in the maze. Our results suggest that the literal meaning of a conventional metaphor is not circumvented, nor that metaphors simply involve lexical-conceptual retrieval. Further, they indicate that the awakening effect persists but decreases significantly as word distance increases, suggesting that the literal meaning is still available downstream, although it fades rapidly.

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Attention: Control II

Sunday, November 20, 2022, 8:00–10:20 AM US EST, Republic

Chaired by Yu-Chin Chiu, *Purdue University*

8:00–8:15 AM (244)

Differentiating the Reported Timing of Intent (W) and Timing of Action (M) on the Basis of Temporal Binding Behaviors and Confidence Ratings. EVE A. ISHAM, *University of Arizona*, TIFFANY WALL, *University of California, Davis* — The perceived timing of intent (W) and timing of action (M) have been used as indices of consciousness during simple voluntary actions. However, it is unclear whether W is exclusively inferred from M. Past studies have suggested that W is inferred from M by demonstrating that W varies when judged in conjunction with M. The current study offers counterevidence by showing that W is independent of M under some circumstances related to temporal binding. Participants performed a voluntary keypress that elicited a briefly delayed tone. Subsequently, they reported W or M and indicated the confidence of their report. Binding strength was measured as the extent to which the W and M reports gravitated toward the time of the tone. For W, binding strength increased over time, but being informed of the tone manipulation did not affect W's binding behaviors. In contrast, M's binding behaviors did not change over time, but being informed of the tone manipulation released M from binding. The corresponding confidence ratings associated with W were uniform, whereas those associated with M fluctuated over time. The results suggest that binding behaviors associated with W and M differ and that W is not simply derived from M.

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8:20–8:35 AM (245)

When Cognitive Modeling Meets Latent Variable Methods: Impact of RT, Accuracy, or Drift Rate in Measurement Models of Executive Functions' Structure. MARC YANGUEZ, *University of Geneva*, BENOIT BEDIOU, *University of Geneva*, JULIEN CHANAL, *University of Geneva*, DAPHNE BAVELIER, *University of Geneva* — Latent variable methods (LVM), such as confirmatory factor analysis (CFA), have proven to be powerful tools to characterize the underlying structure of executive functions (EF). Although LVM avoid the pitfall of equating theoretical cognitive constructs with their measures, they are remarkably sensitive to the choice of task operationalization. Using bootstrapped data from 182 children (8-12 years old) and nine EF tasks,

we show that single tasks' scores (e.g., incongruent trials, Flanker task) allow greater convergence and better model fits compared to difference scores (e.g., incongruent minus congruent trials, Flanker task). Second, drift rate – a well-known indicator in decision making models – shows better psychometric properties for CFA modeling of EF structure than more common indicators, such as reaction time and accuracy. Finally, this work highlights the potential of combining cognitive modeling with LVM to further advance our understanding of EF and their underlying structure.

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8:40–8:55 AM (246)

Goal Reminders Provide Long-Lasting and Cumulative Benefits for Lower Working Memory Capacity Individuals. KEITH A. HUTCHISON, *Montana State University*, AUDREY V.B. HOOD, *Montana State University*, BROOKE CHARBONNEAU, *Montana State University* — Lower working memory capacity (WMC) individuals show larger Stroop effects, especially with lists of mostly congruent items. Although the predominant explanation for this relationship involves goal-maintenance, some research has challenged whether list-wide effects themselves truly reflect goal-maintenance abilities. The current studies tested this explanation by having participants periodically recite goal reminder statements ("the goal is to name the color, not the word") versus non-goal statements ("this is part of my intro to psychology class") periodically throughout the task. We also used both within-subject and between-subject manipulations of goal reminder and modified the task across experiments to increase opportunities for goal neglect. In between-subject conditions, goal reminders eliminated the relationship between WMC and Stroop effects, whereas this relationship remained robust following non-goal statements or standard conditions. The benefit of receiving goal reminders lasted for at least 24 trials and accumulated across the course of the experiment. These data suggest goal reminders can be a useful intervention for those suffering from lapses in controlled attention.

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9:00–9:15 AM (247)

Performance Noncontingent Rewards Promote Cognitive Flexibility. YU-CHIN CHIU, *Purdue University*, COREY NACK, *Purdue University* — Success in dynamic environments requires cognitive flexibility. As a means to increase flexibility, Dreisbach & Fröber (2019) propose triggering exploratory behavior by performance noncontingent or "random" rewards. As these rewards have not been accounted for, one explores possible causes, in part, by getting ready to switch to new task representations. Therefore, we hypothesize that random rewards should increase switch readiness. In two task-switching experiments, we index switch readiness using switch costs. In Experiment 1 (N=155), switch costs were reduced following random rewards. Experiment 2 (N=159) contrasted random rewards with performance contingent rewards. While random rewards reduced switch costs, performance contingent rewards did not. Moreover, this switch cost reduction was not confounded by affect. Across the two conditions, participants reported similar valance and arousal. Therefore, contingency per se likely determines the impact of rewards on flexibility. These preliminary findings extend the evidence for a mechanism of increasing flexibility by performance noncontingent rewards.

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9:20–9:35 AM (248)

Validating a Novel Auditory Flanker Task. LAUREN PETLEY, *Clarkson University*, JULIA R. BRZAC, *Clarkson University*, LAUREN MEYERS, *Clarkson University* — Tasks that are implemented in more than one sensory modality are invaluable tools for identifying supramodal and sensory-specific neural operations. Nevertheless, the study of cognitive control has predominantly been carried out using visual tasks. Some conflict tasks, such as Stroop and Simon tasks, lend themselves well to implementation as auditory paradigms. By contrast, the need to induce conflict between two different stimuli in flanker tasks produces challenges in the auditory modality, where simultaneous delivery might additionally lead to perceptual masking. Separating target and flanker stimuli in space or time can reduce or eliminate the potential for masking, but co-located and simultaneous delivery can be necessary for some applications. The purpose of this study is to explore whether masking can fully account for the interference that occurs in such a task. By employing speech that induces different levels of informational masking (phonological or semantic) as well as a conflicting word (incorrect response direction) as flankers, this study provides evidence that auditory flanker tasks with co-located talkers can indeed index cognitive control.

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9:40–9:55 AM (249)

Action Intention and Effect Monitoring: On Anticipatory Saccades Towards the Consequences of Active and Passive Movements. CHRISTINA U. PFEUFFER, *Catholic University of Eichstätt-Ingolstadt*, DANIEL BOUHLEL, *Albert-Ludwigs-Universität Freiburg*, VINCENT LANG, *Albert-Ludwigs-Universität Freiburg*, HANNA EWEL, *Albert-Ludwigs-Universität Freiburg* — Based on prior learning experiences, we anticipatorily look towards our actions' predictable effects. Such anticipatory saccades reflect proactive effect monitoring which supports the subsequent comparison of expected and actual effect. Prior experiments demonstrated that the latencies of anticipatory saccades and effect-generating actions are coupled. Here, we assessed the role action intention (irrespective of movement) plays for proactive effect monitoring. We compared the impact of active and passively-induced, effect-generating movements performed immediately (early) versus delayed until a go signal (late). Participants performed fewer anticipatory saccades when movements were passively-induced. Most importantly, differences in anticipatory saccade latencies between early and late movements were more pronounced for active than passive movements. This was the case even though cue-effect delays were fixed, the timing of passive movements

was highly predictable, and the timing of early/late active and passive movements was matched. These findings demonstrate that action intentions crucially influence anticipatory saccades towards the future effects of one's actions, that is, underlying proactive effect monitoring processes.

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10:00-10:20 AM (250)

Attention Control: Transition from Theory to Application. RANDALL W. ENGLE, *Georgia Institute of Technology*, ALEXANDER P. BURGOYNE, *Georgia Institute of Technology*, JASON S. TSUKAHARA, *Georgia Institute of Technology*, CODY A. MASHBURN, *Georgia Institute of Technology*, CHRISTOPHER DRAHEIM, *Lawrence University*, RICHARD PAK, *Clemson University*, JOE COYNE, *US Naval Research Laboratory*, CYRUS FOROUGHI, *US Naval Research Laboratory*, CIARA SIBLEY, *US Naval Research Laboratory* — We have argued that individual differences in ability to control attention is crucial to both maintain information in working memory and to disengage information from working memory. However, measurement of attention control has suffered from the use of difference scores between reaction times for congruent and incongruent conditions. We will present work showing that, once attention control is measured properly, the measures are important at the construct level to a wide range of real-world tasks. Specifically, we will show that measures of attention control predict performance of Navy personnel in schools for air traffic controllers and pilots. In some cases, measures of attention control account for variance substantially beyond the variance accounted for by much longer and more culturally-derived tests currently used by the military.

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Reading

Sunday, November 20, 2022, 8:00-10:00 AM US EST, Back Bay C

Chaired by Laurie B. Feldman, *University at Albany, SUNY*

8:00-8:15 AM (251)

Memory for Emojified Text: A Comparison of Emojis with Semantically Redundant Versus Inferential Functions. LAURIE B. FELDMAN, *University at Albany, SUNY,* ANDRIANA L. CHRISTOFALOS, *University at Albany, SUNY*, HEATHER SHERIDAN, *University at Albany, SUNY* — Emojis can assume different relations with the sentence context in which they occur. While emotional reaction and emoji-word redundancy are frequently investigated in laboratory experiments, the role of emojis in inferential processes has received much less attention. Here, we used an online rating task and a recognition memory task to investigate whether differences in emoji function within a passage impact judgments of emoji-text coherence and subsequent recognition accuracy. Participants saw passages containing three types of emojis: emojis related to an inference in the passage (inference emojis), emojis that were redundant with target words in the passage (synonym emojis), or emojis that were incongruent with the passage (unrelated). Participants rated both inference and synonym emojis as better fitting with a passage (more coherent) than an incongruent emoji. In a later recognition test, emojis consistent with the semantic content of a passage (synonym and inference emojis) were better recognized than incongruent emojis. Discussion will focus on conditions under which the contributions of synonym and inference emojis to text understanding differ.

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8:20-8:35 AM (252)

How Do You Use a Word? Building Up Lexical-Usage Statistics 24/7. GARETH GASKELL, *University of York*, MATTHEW MAK, *University of York*, ADAM CURTIS, *University of York*, JENNIFER RODD, *University College London* — Familiar words come with a wealth of associated knowledge about their variety of usage, accumulated over a lifetime. How do we track and adjust this knowledge as new instances of a word are encountered? A recent study (Gaskell, Cairney & Rodd, 2019, Cognition) found that, for homonyms, sleep-associated consolidation facilitates the updating of meaning dominance. Here, we tested the generality of this finding by exposing participants to (Experiment 1) non-homonyms (e.g., balloon) in sentences that biased their meanings towards specific interpretations (e.g., balloon-helium vs. balloon-float), and (Experiment 2) morphosyntactically flexible words (e.g., loan) in sentences where the words were used in their dispreferred word class (e.g., "He loaned me $100"). Both experiments showed that the prior experience influenced later judgements about the words more after a night's sleep than a day awake. We interpret these results in relation to an episodic-context account of language comprehension in which new episodic memories are formed every time a sentence is comprehended, and these memories contribute to lexical processing every time a word is recognized.

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8:40-8:55 AM (253)

Children's Processing of Written Irony: An Eye-Tracking Study. HENRI OLKONIEMI, *University of Oulu*, SOHVI HALONEN, *University of Turku*, PENNY M. PEXMAN, *University of Calgary*, TUOMO HÄIKIÖ, *University of Turku* — Ironic language is challenging for many to understand, e.g., for children. Comprehending irony is considered a major milestone in the development of children's social cognition, as it requires inferring intentions of the person being ironic. However, theories of irony comprehension turn a blind eye to developmental changes. We examined how children process and comprehend written irony in comparison to adults. In the experiment, seventy participants (35 10-year-old children and 35 young adults) read ironic and literal phrases embedded in story contexts while their eye movements were recorded. They also responded to a text memory and an inference question after each story, and their level of reading skill was controlled. Results showed

that comprehending irony was harder for both age groups in comparison to literal, but the effect was larger for children. Both adults and children showed longer reading times for ironic than literal stories in the beginning of the experiment, but the effect wore off towards the end. However, they differed in respect of rereading times of the ironic in comparison to literal target phrases. The results have implications for the current theories of figurative language comprehension.

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9:20–9:35 AM (254)

Foveal and Parafoveal Processing of Chinese Four-Character Idioms and Phrases in Reading: Evidence for Multi-Constituent Unit Processing. SIMON P. LIVERSEDGE, *University of Central Lancashire*, SHUANGSHUANG WANG, *Tianjin Normal University*, XUEJUN BAI, *Tianjin Normal University*, GUOLI YAN, *Tianjin Normal University*, CHUANLI ZANG, *University of Central Lancashire* — Research has demonstrated that Chinese three-character idioms are represented and processed foveally and parafoveally as Multi-Constituent Units (MCUs; see Zang et al., 2021). Chinese four-character idioms and phrases extend further into the parafovea during reading. Are they also processed as MCUs? Using the boundary paradigm (Rayner, 1975), we manipulated the preview of the first and the second two-character constituents of four-character idioms (Experiment 1), frequently used phrases (predominantly judged as single four-character words, Experiment 2), and equi-biased ambiguous strings (judged equally often as four-character words/two two-character words, Experiment 3) and compared how they were processed with effects for matched unambiguous multi-word strings. In all experiments we found greater preview benefit for the second constituent when the first was an identity preview; however, preview effects were more pronounced for the former than the latter two target strings, demonstrating that four-character idioms and frequently used phrases are processed as MCUs.

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9:40–9:55 AM (255)

Reading, With and Without Commas. BERNHARD ANGELE, *Bournemouth University*, ISMAEL GUTIÉRREZ CORDERO, *University of Málaga*, MANUEL PEREA, *Universitat de València*, ANA MARCET, *Universitat de València* — Many orthographies mandate the use of commas to separate clauses and list items. However, casual writers routinely omit these mandatory commas. Even though the usage of commas (and their omission) is ubiquitous, there has been little research done on its effect on eye movements, apart from studies by Hirotani and colleagues (Hirotani, 2004; Hirotani et al., 2006), which found that using non-mandatory commas seemed to facilitate overall reading compared to omitting commas, although there were higher dwell times ahead of the commas. However, there was no evidence for longer global sentence reading times when mandatory commas were omitted. We present an eye-tracking experiment investigating the effect of omitting mandatory commas in five types of grammatical constructions in Spanish: concessive, adversative, listing, connective, and parenthetical. Sentences were presented either with or without mandatory commas while readers' eye movements were recorded. We found that there was no evidence for shorter global reading times due to comma presence. We observed differences in reading times for the pre-comma, post-comma, and subsequent regions, but there was no clear pattern suggesting a major advantage of comma presence.

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Judgment

Sunday, November 20, 2022, 8:00–10:00 AM US EST, Back Bay D

Chaired by Michel Regenwetter, *University of Illinois Urbana-Champaign*

8:00–8:15 AM (256)

Learning the Lie of the Land: How People Construct (Mental) Representations of Distributions. BEN NEWELL, *University of New South Wales*, ALICE MASON, *University of Warwick*, ABA SZOLLOSI, *University of Edinburgh* — An unexamined assumption in the majority of studies of learning and decision making is that people learn underlying probability distributions. For example, the selection of a utility-maximizing option in an experience-based choice task is often attributed to (implicit) knowledge of the generating probability distribution. However, the acquisition of distributional knowledge is rarely the focus of investigations. We report five experiments that provide this focus and highlight the factors that impact people's ability to accurately learn and reproduce underlying distributions. We find that accurate distributional-learning occurs only when either the environmental signal is strong (i.e., non-noisy discrete bimodal distributions) or sufficient cues are provided to aid construction of mental representations (e.g., items from the modes in a noisy bimodal distribution are presented in different colors). Together the results challenge strong assumptions about the role of probability distribution-knowledge in explanations of learning and decision making.

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8:20–8:35 AM (257)

Probabilistic Choice Induced by Strength of Preference. MICHEL REGENWETTER, *University of Illinois Urbana-Champaign*, DANIEL CAVAGNARO, *California State University, Fullerton* — Just as we formulate detailed theories of utility or preference, so too should we theorize carefully about strength of preference. Likewise, because behavior is inherently uncertain, we need a theoretical framework for understanding choice probabilities. This talk fleshes out the simple premise that more strongly preferred options are more likely to be chosen. The resulting distribution-free Fechnerian models (DFMs) eschew convenience assumptions underlying popular models like the logit and probit, revealing which aspects of a core decision theory do or do not remain invariant across different ways of constructing strengths of preference, as well as across

different monotonic links between those strengths of preference and choice probabilities. We formulate DFMs in a unifying geometric space that provides a nuanced perspective on theoretical parsimony. DFMs offer a multi-layered quantitative approach to the identifiability of hypothetical constructs and protect the researcher against mistaken conclusions caused by overspecified models.

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8:40-8:55 AM (258)

Lying Like There's No Tomorrow? The Effect of Future Thinking on Honesty. SIMEN BØ, *Norwegian School of Economics*, HALLGEIR SJÅSTAD, *Norwegian School of Economics* — Honesty is a fundamental building block for cooperation. However, the individual may still stand to gain on dishonest behavior. We aim to understand how individuals may choose to be honest by testing whether future thinking promotes honesty in two pre-registered, high-powered experiments. Participants will be randomly assigned to consider either the future (future focused-condition) or present consequences of their actions (present focused-condition). To measure honesty, we will use the mind-game paradigm, where dishonest behavior is economically incentivized but impossible to detect at the individual level. We present results from this experiment along with plans for a follow-up experiment examining whether the effect is stronger for episodic future thinking than semantic future thinking. The results will have implications for our understanding of the motivation to choose to behave honestly, and thus also for how we can influence people to be more honest.

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9:00-9:15 AM (259)

An Interactive Effect of Frame and Probability Level on Magnitude Estimation: Testing the Implicit . DAVID R. MANDEL, *Defence Research and Development Canada*, DANIEL IRWIN, *Department of National Defence, Canada* — Prior research has shown that framing effects on risky choice may be due to the lower bounding of quantifiers (treating values as at least that much). In two experiments (Ns = 902 and 439) that manipulated probability level (low, high) and frame (half survive, half die), the mean estimated number of lives saved by condition varied as would be expected on the basis of lower bounding. That is, mean estimates of lives saved were (a) above "half" if it was likely for half to survive or unlikely for half to die and (b) below "half" if it was unlikely for half to survive or likely for half to die. This pattern of results did not depend on whether probabilities were stated verbally (e.g., likely) or numerically (e.g., 60%-90% chance). The findings extend recent work on the linguistic basis of framing effects to magnitude estimation.

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9:20-9:35 AM (260)

Contextual and Individual Factors in the Determination of Guilt or Innocence in Forensic Cognitive Science. MATTHEW SHARPS, *California State University, Fresno*, KYLE VILLARAMA, *Sierra Education and Research Institute*, FRANKIE RIOS, *Sierra Education and Research Institute*, JANA L. PRICE-SHARPS, *Walden University* — Field theory emphasizes the importance of individual characteristics and context in the understanding of behavior. In this paper, we examine this approach to the attribution of guilt in realistic criminal justice situations. A crime scene was described, identical except for the severity of its consequences (theft, assault, or murder). Respondents judged the degree to which the perpetrator or victim bore responsibility for this crime. Respondents also completed the Dissociative Experiences Scale. Level of violence and dissociative tendencies both significantly influenced judgment. The perpetrator was generally seen as more responsible for the crime than the victim. However, in the single nonviolent context (theft), respondents overall attributed significant blame to the victim for the crime. Higher levels of dissociation were associated with lower perpetrator guilt ratings and greater blame for the victim in the case of murder. These results demonstrate the utility of specific field theory concepts in modern forensic cognitive science.

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9:40-9:55 AM (261)

Goal-Directed Decision-Making in Dynamic and Uncertain Environments. TIMOTHY BALLARD, *The University of Queensland*, ERIN LLOYD, *The University of Queensland*, NATHAN EVANS, *The University of Queensland*, HECTOR PALADA, *The University of Queensland*, KINGSLEY FLETCHER, *Defence Science and Technology Group, Australia*, ANDREW NEAL, *The University of Queensland* — Although there is a growing body of research examining how people make decisions that require the prioritisation of competing goals, this research tends to focus on situations in which decision-makers operate in static environments. We, therefore, know relatively little about how decision-makers make goal-directed decisions in more dynamic environments that change as the individual deliberates. In this research, we develop and test a model of goal-directed decision-making that can be applied to such environments. We report empirical results from a paradigm in which two team members make decisions that allow them to progress toward competing goals while also managing the resources that enable such progress. We use computational modeling to understand the underlying mechanisms necessary to account for the observed decisions. We believe this research provides a useful foundation for exploring more complex decision processes that more closely resemble those encountered in practical settings.

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Learning and Instruction II
Sunday, November 20, 2022, 8:00-9:40 AM US EST, Back Bay A

Chaired by Bridgid Finn, *Educational Testing Service*

8:00-8:15 AM (262)

The Impact of Experiences of Remembered Success on Children's Memory, Motivation, and Future Math Task Performance. BRIDGID FINN, *Educational Testing Service*, DAVID B. MIELE, *Boston College*, ALLAN WIGFIELD, *University of Maryland* — The "remembered success effect" (Finn, 2010) refers to the finding that adults prefer challenging academic tasks that start or end with extra opportunities compared to challenging tasks that do not include these opportunities. The present studies extend this work to children and adolescents to see when the effect emerges. In two studies we examined whether remembered success experiences impacted future activity choices and motivational beliefs and values of elementary, middle, and high-school children. Students completed two challenging math tasks: a short task of all difficult problems and a longer, "extended" task that had the same number of difficult problems plus a smaller set of less difficult problems. We found that children preferred a challenging task that included experiences of relative success over a shorter task that did not, and that experiences of remembered success impacted students' expectancy beliefs and values and their confidence in their performance on a subsequent task.

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8:20-8:35 AM (263)

Individual Differences in Students' Concept-Learning Approaches Predict Transfer on Biology Exams. MARK A. MCDANIEL, *Washington University in St. Louis*, MICHAEL CAHILL, *Washington University in St. Louis*, REGINA F. FREY, *University of Utah*, LISA LIMERI, *Texas Tech University*, PAULA P. LEMONS, *University of Georgia* — Previous studies have found that students' concept-learning approaches, identified a priori with a laboratory concept-learning task, are associated with student exam performances in chemistry classes. We extended these findings to introductory biology courses, courses in which active learning techniques were used to try to foster deep conceptual learning. Exams were constructed to contain both transfer and retention questions. Abstraction learners demonstrated better performance than exemplar learners on the transfer questions but not on the retention questions. These results were not moderated by indices of crystallized or fluid intelligence. Our central interpretation is that students identified as abstraction learners appear to construct a deep understanding of the concepts (presumably based on abstract underpinnings), thereby enabling them to apply and generalize the concepts to scenarios not seen during instruction (transfer questions). By contrast, other students appear to base their representations on memorized instructed examples, leading to good performance on retention questions but not transfer questions.

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8:40-8:55 AM (264)

High Variability Orthographic Training: Learning Words in a Morphosyllabic Script Through Training with Multiple Fonts. ERIC PELZL, *The Pennsylvania State University* — Variability is thought to play a key role in how people learn new categories. Chinese has thousands of unique written words (characters). Could variability in the font used to present words improve learning? Subjects (n=188) with no previous Chinese learning experience learned 24 Chinese words. Subjects were randomly assigned to two training groups. In the single font group (SFG), they were trained using only 1 of 3 different Chinese fonts; in the variable font group (VFG), they were trained using all 3 fonts. During training, each word was presented 6 times across blocks; subjects typed an English meaning and then saw the correct answer. After training, participants were tested on their ability to provide definitions for the words and their speed/accuracy in choosing the learned words over visually similar distractors. At test, half of the words were presented in a familiar font, half in a novel font (not seen during training). Results showed significant interactions based on training: SFG was fastest/most accurate for the familiar font trials, slowest/least accurate for novel fonts; the difference between font conditions was twice as large for SFG compared to VFG. Font variability aids generalization in Chinese word learning.

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9:00-9:15 AM (265)

Enhancing Adaptive Learning Systems Using Signal Detection Theory Concepts: Adaptive Perceptual Learning in Skin Cancer Classification. PHILIP J. KELLMAN, *University of California, Los Angeles*, EVERETT METTLER, *University of California, Los Angeles*, SALLY KRASNE, *David Geffen School of Medicine at University of California, Los Angeles*, TIMOTHY BURKE, *University of California, Los Angeles*, CHRISTINE M. MASSEY, *University of California, Los Angeles* — Virtually all adaptive learning systems have relied on simple accuracy data. In some contexts, such as multi-category perceptual classifications, accurate responding to exemplars of a given category may occur from either competence or bias. We investigated whether adaptive perceptual learning in dermatologic screening can be enhanced by incorporating signal detection theory (SDT) methods that separate true sensitivity from criterion or bias. A perceptual adaptive learning module (PALM) was designed to train classification of 10 cancerous and non-cancerous skin lesion types. Four adaptive conditions varied either the type of adaptive spacing (standard vs. SDT) or retirement criteria (standard vs. SDT). A non-adaptive control condition presented information in video form. All adaptive conditions robustly outperformed the control. Initial results indicate that adding SDT procedures to adaptive learning enhances PL in skin cancer discrimination, resulting in more efficient learning than standard adaptive and non-adaptive methods, including enhancements to sensitivity and learning speed.

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9:20–9:35 AM (266)

Terracotta: A Tool for Conducting Experimental Research in Classrooms on Student Learning. BENJAMIN MOTZ, *Indiana University*, HARMONY JANKOWSKI, *Indiana University*, MARK A. MCDANIEL, *Washington University in St. Louis* — To test whether an instructional practice exerts a causal influence on a learning outcome, the most compelling research method is to conduct an experiment. However, experimentation is increasingly rare in education research, and to date, many researchers have argued it is prohibitively expensive and difficult to conduct experiments in classrooms at scale. To reverse these trends, and to increase the quality of evidence on practices for improving student outcomes, we have developed Terracotta, a tool that enables experimental research on what teachers assign in their learning management system course sites. Specifically, with Terracotta, a researcher can assign, at random, some students to one version of an assignment and others to another version of the same assignment (or more complex designs, e.g., within-subjects), and then assess differences in student performance on later class assessments (exams, final grade, etc.). Terracotta also enables protections for student participants, such as informed consent and automatic removal of student identifiers from data exports. We will showcase Terracotta and present examples of pilot studies that demonstrate the scope of its functionality.

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Recognition II

Sunday, November 20, 2022, 8:00–9:40 AM US EST, Back Bay B

Chaired by Meghan D. Caulfield, *Marist College*

8:00–8:15 AM (267)

Reduced Boundary Extension in People with Behaviorally Inhibited Temperament. MEGHAN D. CAULFIELD, *Marist College*, HELENE INTRAUB, *University of Delaware*, ALEXA S. GONZALEZ, *Villanova University*, TYLER J. HUBENY, *Villanova University*, IRENE P. KAN, *Villanova University* — Boundary extension (BE) occurs when people incorrectly recall perceiving beyond the edges of a studied scene. Factors contributing to individual differences in BE are not well known. Recent research has found that participants with high behavioral inhibition (BI), a temperament related to risk for anxiety, have better discrimination of highly similar stimuli (Caulfield et al., 2021). Here, we examined whether people with high BI are less susceptible to making the BE error. 42 participants self-reported BI and then studied 20 scenes for 15s each. Participants were then presented with 20 test pictures, half with an identical perspective and half with a different perspective from the initial image (either a closer-up or wider-angle view). For the identical images, we found a significant BE effect across all participants, where participants reported the test images as being "closer" than the initial images, suggesting that they remembered the initial images as having extended boundaries. In examining individual differences, we found that high BI scores are associated with a reduced BE effect. Overall, this study provides preliminary evidence that some individual differences in BE may be related to temperamental factors.

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8:20–8:35 AM (268)

The Fidelity of Visual LTM Strongly Depends on Meaning: The Case of Color. NURIT GRONAU, *The Open University of Israel*, ROTEM AVITAL-COHEN, *The Open University of Israel* — Previous findings demonstrated extremely high memory rates for the visual appearance of hundreds of objects, implying a massive LTM capacity for perceptual detail (Brady et al., 2008). We tested memory for objects' color, yet despite a low encoding load and a high perceptual distinctiveness among items in a 2AFC recognition test (N=61), memory performance was relatively poor (=67%). However, object colors were determined arbitrarily and were likely perceived as artificial and unnatural. In a follow-up study we thus used only highly plausible, realistic colors, while additionally manipulating colors' meaning (N=60). We hypothesized that improved detail (i.e., color) memory would be observed when colors are diagnostic of an object's nature (e.g., red vs. white wine), relative to when colors are arbitrary/superficial (red vs. white balloon). Results showed overall higher memory rates than the ones obtained in the previous experiment, and indeed, meaningful object colors yielded significantly better performance than meaningless ones. These findings are in accord with accumulating findings in our lab, as well as others', stressing the importance of conceptual information in mediating high-fidelity visual LTM.

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8:40–8:55 AM (269)

Recognition Memory for Faces with Anomalous Features. LUC BOUTSEN, *Aston University* — Face recognition memory relies on the formation of a holistic perceptual representation in which relational information among features is represented. On this account, the presence of anomalous features, e.g., a disfigurement, would disrupt holistic encoding, preserving featural but not relational information. However, the impact of anomalous features on face recognition is unclear. To address this question, I investigated in three studies old-new recognition memory for unfamiliar White faces containing a simulated disfigurement or a matched occluding feature. Recognition was measured after incidental or intentional encoding, and changes in feature presence between study and test allowed to assess the impact on encoding and retrieval. Across studies the disfiguring feature impaired recognition more than the occluding feature. This is consistent with differential encoding of these features in that the disfiguring (but not the occluding) feature is encoded as part of the face. In support, intentional encoding improved memory for unaltered and occluded faces but not for disfigured faces. The implications of these results for understanding first impression formation from faces with anomalous features are discussed.

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9:00–9:15 AM (270)

Recollection of Object-Identity Is Enhanced by Multisensory Events. SHEA DUARTE, *University of California, Davis*, JOY GENG, *University of California, Davis* — Visual objects that appear with a congruent sound (a dog and a bark) are more likely to be recognized via recollection (Duarte, Ghetti, & Geng, under review). This recollection-based recognition includes episodic information about the specific sound during encoding, suggesting that multisensory objects form unique episodic events. It is unclear, however, whether recollection advantage during encoding is limited to features of the multisensory object or if it includes nearby objects. In Experiment 1, participants were shown two objects on each trial paired with a sound that was congruent to one item or a meaningless control sound. Multisensory audiovisual items, but not nearby visual items, were recollected better on a surprise recollection/familiarity memory test. Experiment 2 tested the visual specificity of multisensory object recollection and found that memory for specific perceptual details did not differ based on sound congruence. These studies suggest that multisensory encoding enhances episodic memory for the identity of an object (e.g., dog) but not for specific perceptual details or other nearby objects in the encoding context.

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9:20–9:35 AM (271)

Scene Cues Improve Source Memory for Objects and Words: Evidence for Holistic Recollection. ALEXA MORCOM, *University of Sussex*, BEN LEGAN, *University of Sussex* — Episodic memories encode disparate elements of complex past events, but it is unclear whether these elements are always remembered together (holistically). While multiple elements are often recalled together, external cues may only enhance memory for the cued element. We examined cross-element cueing in 3 experiments. In Experiment 1 (N=33) participants studied object names (visual, auditory) with scenes, then memory was probed with object images. External cues were either a scene image or scene name. Confident source memory (seen/heard) was better when cued with the image or name of the studied scene than when cued with a different scene or uninformative cue. In Experiments 2a-b (N=23, N=33) participants studied object images and words with scenes, and memory was probed with the words. Confident source memory (living/non-living object) was better when cued with the same scene than with no external cue. These results show that scene cues, at least, can cue recall of other elements, consistent with holistic recollection.

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Language Production

Sunday, November 20, 2022, 10:00–11:40 AM US EST, Commonwealth

Chaired by Chris Westbury, *University of Alberta*

10:00–10:15 AM (272)

When Spellings Don't Stick Around: Highly Selective Difficulties in Learning Word Spellings in Developmental Spelling Dysgraphia. BRENDA RAPP, *Johns Hopkins University*, ROBERT WILEY, *University of North Carolina at Greensboro*, JENNIFER SHEA, *Johns Hopkins University*, MICHAEL MCCLOSKEY, *Johns Hopkins University* — The lexical orthographic knowledge used in spelling is largely learned through reading experience. However, we report on two children (ages 10 and 11) with developmental spelling dysgraphia who exhibited severe spelling difficulties despite normal or superior reading ability and normal knowledge of sound-spelling correspondences. Dysgraphic and control participants completed language and cognitive testing including two novel paradigms that examined spoken and written pseudoword learning over multiple weekly sessions and with different time delays between trials (including immediate recall and filled delays of 500 msec, 10-30 secs, 3 minutes, 10-20 minutes, and one week). We found that the learning of whole-word spellings was impaired in the face of intact learning of spoken word forms. Further, the orthographic learning difficulty was observed at all delays, even in immediate recall. The results provide new understandings of the relationship between reading and spelling during orthographic learning.

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10:20–10:35 AM (273)

He Said, She Said: The Principal Components of Gender. CHRIS WESTBURY, *University of Alberta*, KRIS M. ANDERSON, *University of Alberta* — The difference between males and females is a well-researched topic in psychology, and much work has focused on differences in language acquisition and use. We present a new approach by comparing corpora composed of over 1.4 billion words written by self-identified male or female Redditors. As well as replicating earlier work on frequency differences (Ciot et al., 2011; Evans, 2016; Ikae & Savoy, 2021), we will discuss the differences in the principal components of two word-embedding matrices constructed from each of the two corpora. The early PCs 1-3 are very strongly correlated ($r > 0.9$ over 41,349 words) and largely explicable in terms of self-reference (see Westbury & Wurm, 2022). Later PCs 4-10 are less strongly correlated, with correlations ranging between 0.57 and 0.80. We have modelled the PC differences using as predictors a variety of category-defining vectors (CDVs), the average of the vectors of words from the same syntactic or semantic category. This has enabled us to characterize differences in male vs. female PCs both in broad terms (differences in word class use or affective force) and in the focal topics that underlie those differences.

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10:40–10:55 AM (274)

Statistical Learning in Language Production: Studying Orthotactic Constraints Through Typing. NILSU ATILGAN, *Carnegie Mellon University*, ELIZABETH CHU, *Carnegie Mellon University*, NAZBANOU NOZARI, *Carnegie Mellon University* — Phonotactic and orthotactic constraints determine possible spoken and written sequences of a language. While phonotactic constraints have been widely studied, little attention has been paid to learning orthotactic constraints. The current study addresses this gap through three experiments by using a typing-to-dictation task. Examination of typing errors in Experiments 1 and 2 showed that, similar to spoken production, adults quickly learn the first-order constraints (e.g., "s" is always an onset), whereas learning of second-order rules (e.g., "s" is an onset but only if the vowel is "a") only happens on the second day of training. Experiment 3 showed that learning of a first-order constraint is not affected by having a phonologically opposite constraint, suggesting the true orthotactic nature of the effect. Collectively, these data support strong parallels between the statistical learning of orthotactic and phonotactic constraints in language production, despite the differences between spoken and typed modalities of production.

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11:00–11:15 AM (275)

Integrating Memory and Language Production Accounts of Semantic Interference. CHANNING E. HAMBRIC, *Lehigh University*, PÁDRAIG O'SÉAGHDHA, *Lehigh University* — The parallel incremental learning accounts of semantic interference found in the retrieval-induced forgetting (RIF) and the language production literatures invite integration. In two multi-phase experiments, we implemented a typical cued stem-completion memory retrieval phase for a subset of items and then assessed the long-term effects of this retrieval experience in a structured continuous picture-naming phase. Latencies as well as errors were recorded for both phases. During the memory retrieval phase, we observed the cumulative interference usually reported in language production studies (but not typically examined in the RIF literature). This interference carried forward to picture-naming: Ungenerated members of the previously activated categories were named more slowly (and more erroneously) than never activated controls (an RIF effect). We also observed additional cumulative interference during picture-naming. These findings suggest that the goal of bringing together the memory and language production accounts of semantic interference is feasible.

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11:20–11:35 AM (276)

Resting State Network Segregation Modulates Age-Related Differences in Language Production: A Lifespan Sample. HAOYUN ZHANG, *University of Macau*, MICHELE DIAZ, *The Pennsylvania State University* — Older adults exhibit decline in language production, while the underlying neural bases are not clear. In this study, we focused on resting state functional connectivity and investigated how network segregation in the language network and the whole brain would relate to language production across the adult lifespan. We hypothesized that language production, functional connectivity, and their relationship would differ as a function of age. As predicted, we found that older adults showed worse performance in language production tasks. Neurally, we found that overall, increased age was associated with reduced overall whole brain network segregation. Interestingly, network segregation within the left hemisphere language network was maintained in adults of all ages. Moreover, for both network segregation within the left-hemisphere language network and whole-brain network segregation, there were significant interactions with age, such that for younger and middle-aged adults, increases in network segregation were associated with better language production abilities while there was no significant relationship between network segregation and language production in older adults. These results support the dedifferentiation account of aging.

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Cognitive and Motor Control of Performance

Sunday, November 20, 2022, 10:00 AM–12:00 PM US EST, Back Bay A

Chaired by Joseph M. Orr, *Texas A&M University*

10:00–10:15 AM (277)

Reward Expectancy and Prediction Error Influence Voluntary Task Selection. JOSEPH M. ORR, *Texas A&M University*, DANIELA PORRO, *Texas A&M University* — Much is still unknown about how motivation and reward guide processes of task selection. Recent work has suggested that trial-to-trial transitions in reward availability influence the choice of whether to switch or repeat tasks; however, this work has not examined the effects of prior reward outcomes. This is especially important when considering the effects of probabilistic reward where cues of reward availability are not always valid. Therefore, we examined the interactions of prior reward outcomes and current reward availability during voluntary task selection under conditions of deterministic and probabilistic reward. Data from 353 participants were analyzed with a generalized linear mixed effects model. Under deterministic reward, participants were most likely to switch tasks when reward increased or decreased from the previous trial and most likely to repeat when reward remained high. Under probabilistic reward, they were most likely to switch after receiving a worse than expected reward (i.e., a low reward on a high reward trial) and repeat after a better than expected reward. These findings suggest that reward expectancy and prediction error play a critical role in adaptive cognitive control.

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10:20–10:35 AM (278)

Group performance in human-human and human-bot teams. AMI EIDELS, *The University of Newcastle, Australia*, MURRAY BENNETT, *The University of Newcastle, Australia*,

LAITON HEDLEY, *The University of Newcastle, Australia*, JONATHON LOVE, *The University of Newcastle, Australia*, JOSEPH W. HOUPT, *The University of Texas at San Antonio*, SCOTT BROWN, *The University of Newcastle, Australia* — Complex tasks may require the division of labour across multiple team members. Yet assigning multiple agents to collaborate does not guarantee efficiency. Miscommunication or constrained resources may hamper the performance of the team compared with what one might expect based on the individual performance of each operator alone. Here, we tested the performance of human-human and human-bot teams in an arcade-like computer game. Two players (a dyad) controlled horizontally moving paddles and had to prevent bouncing balls from hitting the virtual floor. We examined their performance and behavioural patterns in three conditions: separate, where they operated individually to maximise their own personal score while ignoring the other player; collaborative; and competitive. In another set of experiments we paired human players with a bot. Behaviour of one bot-type was driven by reinforcement learning. Another bot type was loosely based on principles of ideal observer. We discuss the differences between performance and behaviour in the human-human and human-bot conditions.

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10:40–10:55 AM (279)

Degrees of Contextual Influence on Action-Based Timing Behavior and Cortical Activation. HEATHER BORTFELD, *University of California, Merced*, ALI RAHIMPOUR-JOUNGHANI, *Stanford University* — Previously, we used functional near-infrared spectroscopy to assess neural engagement during a blocked performance of a modified finger-tapping task (Rahimpour et al., 2020). Findings distinguished between the timing mechanisms underlying two forms of tapping, synchronized and syncopated relative to a metronomic tone. Both versions of the tapping task included a pacing phase (tapping with the tone) followed by a continuation phase (tapping without the tone). Here we investigate the impact of a subtle manipulation of the study's experimental design on overall tapping behavior. We measured responses in 23 healthy adults as they performed the two versions of the finger-tapping tasks, either blocked by tapping type or alternating from one to the other mode for the course of the experiment. Consistent with previous findings, the behavioral indices and neural correlates of specific timing behavior both reflected context-dependent parameters. Moreover, results revealed a significant impact of study design on rhythmic entrainment in the presence/absence of auditory stimuli. Improved behavioral performance on the tapping tasks in the blocked design context suggests that such designs may be ideal for studying action-based timing behavior.

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11:00–11:15 AM (280)

"Leap Before You Look": Conditions That Promote Implicit Visuomotor Adaptation Without Explicit Learning. TEJAS SAVALIA, *University of Massachusetts Amherst*, ROSEMARY A. COWELL, *University of Massachusetts Amherst*, DAVID HUBER, *University of Massachusetts Amherst* — When learning a novel visuomotor mapping (e.g., mirror writing), accuracy can improve quickly through explicit learning (e.g., move left to go right), but after considerable practice implicit learning takes over, producing fast, natural movements. This implicit learning occurs automatically, but it has been unknown whether explicit learning is similarly obligatory. Using a reaching task with a 90-degree rotation between screen position and movement direction, we found that explicit learning could be "turned off" by introducing the rotation gradually (increments of 10 degrees) and instructing participants to move quickly. These specific conditions were crucial, because both explicit and implicit learning occurred if the rotation occurred suddenly, if participants were told to emphasize accuracy, or if visual feedback during movement was removed. We reached these conclusions by examining the time course of learning (e.g., whether there was fast improvement followed by a long tail of additional improvement), by examining the aftereffects of learning when the rotation was abruptly removed, and by using formal model comparison between a dual-state (explicit and implicit) learning model versus a single-state model applied to the data.

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11:20–11:35 AM (281)

An Approach-Avoidance Model to Infer Intent from Continuous Movement. PETER KVAM, *University of Florida*, KONSTANTINA SOKRATOUS, *University of Florida*, ANDERSON FITCH, *University of Florida* — A major challenge in artificial intelligence and human-machine teaming is to create automated systems that can understand what humans intend to do from the behavior they exhibit. To address this, we created and tested a model-based approach to making inferences about which out of a set of goals a human decision-maker is trying to accomplish. We tested this on a continuous-control task where human players were asked to control a "ship" on the screen and interact with another (computerized) player. On each trial, the human player was assigned a goal: ATTACK (run into the other ship), DEFEND (keep the other ship away from a specified location), AVOID (stay away from the other ship), INSPECT (stay near but do not run into the other ship), or HERD (move the other ship to a specified location), which they pursued for a 10-second trial. To make inferences about what goal the player was pursuing, we created a model-based system that estimates the strength of approach (motivation to go toward other player) and avoidance (motivation to stay away from other player) and compares them to gradients for each goal condition. This model-based approach to intent inference far exceeds human participants' accuracy at inferring other players' goals.

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11:40–11:55 AM (282)

Directed Forgetting: Inhibition or Selective Rehearsal? LILI SAHAKYAN, *University of Illinois Urbana-Champaign* — In intentional forgetting research, especially in the item-method directed forgetting (DF) variant, two theoretical viewpoints are entertained.

In the cognitive literature, the selective-rehearsal explanation is the dominant view, according to which the Remember-items continue to receive rehearsal, whereas the Forget-items are dropped from rehearsal, thereby producing the well-known DF effect. Thus, the DF effect is caused by the processes devoted to the Remember-items. In contrast, in the neuroscience literature, the inhibition viewpoint is the more popular account, in which Forget-items are actively inhibited, leading to the DF effect. Thus, by some accounts, the DF effect is caused by the processes acting on the Forget-items. We present a lab study using the item-method DF design, evaluating the popular theoretical accounts using self-reported strategies. The validity of verbal reports was evaluated against the actual performance, and most critically, different strategies were assessed against the recognition data. The results suggest that both theoretical accounts are supported by the strategy reports, and they indicate new challenges for finding sensitive behavioral measures to capture these underlying mechanisms.

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Spatial Cognition

Sunday, November 20, 2022, 10:00 AM-12:00 PM US EST, Back Bay B

Chaired by Sarah H. Creem-Regehr, *University of Utah*

10:00-10:15 AM (283)

Sensory Integration for Navigation: Aging and Virtual Reality. COREY S. SHAYMAN, *University of Utah*, HUNTER C. FINNEY, *University of Utah*, PETER C. FINO, *University of Utah*, JEANINE K. STEFANUCCI, *University of Utah*, SARAH H. CREEM-REGEHR, *University of Utah* — Our brains must combine information from vision and movement to maintain balance and to navigate. Aging may affect the process of combining sensory cues as well as whether cues are integrated similarly across real and virtual environments. To quantify sensory cue combination across age and environment type, older and younger adults completed a homing task in the real world and in a head-mounted display. In both environments, participants walked towards a target via multiple way-points with visual landmarks to help them encode their spatial location. Participants then walked back to the target with either visual-cues only, self-motion cues only, or congruent cues. They also completed a condition where visual cues were covertly shifted relative to self-motion cues to quantify the weighting of each sensory cue. Regardless of age, participants weighted vision higher than self-motion cues in both real and virtual environments. Preliminary results from older adults suggest sub-optimal cue combination, which could explain declines in navigational abilities with age. Results are discussed in the context of behavioral interventions for sensory integration that may improve navigational deficits.

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10:20-10:35 AM (284)

Measuring Configural Knowledge of Environments: Individual Differences in Relations Between Pointing and Shortcutting. CHUANXIUYUE HE, *University of California, Santa Barbara*, ALEXANDER BOONE, *Pacific Science & Engineering Group*, MARY HEGARTY, *University of California, Santa Barbara* — Configural (survey) knowledge is considered to be well-developed spatial knowledge and to enable flexible navigation strategies, such as taking a detour or shortcut. To measure configural knowledge, participants are commonly asked to point to unseen locations in an environment or take shortcuts to goal locations. In this study, participants (n = 28 high-spatial, n = 29 low-spatial) first learned a route through a desktop virtual maze and then were asked to point to unseen locations, take shortcuts, and point again. Pointing and shortcutting were correlated in general; however, low-spatial participants pointed randomly and showed no consistency across trials but were still able to find novel shortcuts. After completing the shortcutting task, all participants' pointing performance significantly improved and the correlation between shortcutting and pointing increased for the low-spatial participants. These results suggest that pointing and shortcutting depend on a common ability to acquire configural knowledge but make different demands on this knowledge so that the relations between these measures differ when participants are at various points on the learning curve.

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10:40-10:55 AM (285)

Learning to Escape: The Relation of Behavioral Inhibition Sensitivity to Navigation Under Threat. MEREDITH MINEAR, *University of Wyoming*, TESALEE O. SENSIBAUGH, *University of Wyoming*, MADELINE VERHEYDT, *University of Wyoming*, EVAN STABEN, *University of Wyoming* — Our study investigated the relationship between individual differences in behavioral inhibition system (BIS) sensitivity and allocentric and egocentric navigation ability under conditions of environmental threat. Participants completed a virtual navigation task within an anxiety provoking immersive virtual environment consisting of a shark-infested ocean. Half learned the location of the platform relative to the configuration of multiple large, faraway (''distal'') landmarks and the other half learned the location of the platform relative to the position of nearby (''proximal'') landmarks consisting of various small buoys. Participants also completed multiple cognitive and personality measures. We found that participants' levels of BIS were related to allocentric navigation performance, but this was moderated by participants' spatial ability with higher BIS predicting worse performance among individuals with low but not high levels of spatial ability. By contrast, behavioral inhibition was not related to egocentric navigation performance. Our data are consistent with other work suggesting that personality traits related to cautiousness and anxiety may predict poorer spatial navigation under threat.

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11:00–11:15 AM (286)

I Need to "See" It: The Role of Visual Imagery in Reading, Writing, Memory, and Attention. KATHERINE MOEN, *University of Nebraska at Kearney*, SETH LONG, *University of Nebraska at Kearney*, JOHANNA R. MCCLURE, *University of Nebraska at Kearney*, IAN JOHNSON, *University of Nebraska at Kearney* — Previous research suggests that visual imagery helps individuals excel in the STEM disciplines and the creative arts. However, there is less research on how visual imagery influences intellectual output, be it a poem or a scientific theory. The goal of the current study was to compare performance for several cognitive tasks that differ based on their reliance on visual imagery. By using a multi-method, interdisciplinary approach, we examined the mechanisms and circumstances of when visual imagery impacts cognition, reading, and writing. After completing two scales designed to measure visual imagery ability, participants completed a variety of tasks involving reading, writing, memory, and attention. Eye movements during the reading task revealed that participants had more regressions while reading texts that did not rely heavily on visual imagery compared to text that did rely heavily on visual imagery. Additionally, working-memory capacity was negatively correlated with regression duration for texts that did not rely heavily on visual imagery. These results suggest that visual imagery may facilitate reading, especially for those with low working-memory capacity.

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11:20–11:35 AM (287)

Object Warping and Representational Momentum. TIMOTHY L. HUBBARD, *Arizona State University; Grand Canyon University*, KATHLEEN CAMERON MCCULLOCH, *University of Central Lancashire*, JUSTE ZAJANKAUSKAITE, *University of Central Lancashire* — Perceived space within a stationary object is often larger than the actual space, and this is referred to as object warping. Final location of a moving target is displaced forward in the direction of motion, and this is referred to as representational momentum. Importantly, representational momentum produces anisotropy in visual space such that displacement of the leading edge of a target is smaller than displacement of the trailing edge of a target, and this suggests perceived space within an object is smaller than the actual space. Object warping and representational momentum thus make opposite predictions regarding the relative size of perceived space within a moving object. Whether object warping for a moving target would occur or would be decreased due to anisotropy related to representational momentum was examined. Whether space within the object was perceived as larger or smaller was assessed by probe judgments of the distance between two dots inside the target, and in moving targets, the line between the dots was aligned with the direction of motion. Significant object warping occurred for moving targets and for stationary targets, and magnitudes of object warping of moving targets and of stationary targets did not differ.

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11:40–11:55 AM (288)

Reasons Why You Get Lost. ESTIBALIZ HERRERA, *Bournemouth University, UK*, JOSE PRADOS, *Derby University, UK*, JOE M. AUSTEN, *Durham University, UK*, GONZALO P. URCELAY, *University of Nottingham, UK*, MATTHEW G. BUCKLEY, *Aston University, UK* — We assessed human navigational performance in a virtual T-Maze and evaluated whether different factors affect that landmark and boundary information compete for behavioural control. In Experiment 1, three groups experienced a landmark placed at varying distances from the goal (Proximal, Middle, Distal) and participants were released from a fixed start location. The Control group was trained with no landmarks. Boundary learning was tested immediately after, and the results showed competition between boundary and landmark representations in the Proximal group only. In Experiment 2, groups and conditions were kept the same, but participants' starting-point location was variable. Competition was not observed in any of the groups. In Experiment 3, we reproduced Experiment 1 but with shorter training (3 trials instead of 15); competition was no longer observed in the Proximal group. Our results show that the global representation of the environment was acquired early in training (Exp3), but it was hindered by extended training in the Proximal group (Exp1). These results suggest that proximal landmarks to the goal location support the use of egocentric strategies, which compete with the use of a global representation of the environment.

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Metacognition II
Sunday, November 20, 2022, 10:20 AM–12:00 PM US EST, Constitution AB

Chaired by Kit S. Double, *The University of Sydney*

10:20–10:35 AM (289)

The Effect of Metacognitive Ratings on Complex Problem Solving. KIT S. DOUBLE, *The University of Sydney*, DAMIAN BIRNEY, *The University of Sydney* — Eliciting metacognitive ratings (judgments of learning, confidence ratings) has been shown to affect cognitive performance. In a series of experiments using a 3 input x 3 output complex problem-solving task (CPS) we show that eliciting metacognitive ratings during the learning phase impacts how well participants learn the causal relationships that govern the system and how effectively they can control the system to accomplish their goals. The direction and magnitude of this reactivity appears to depend on both rating characteristics (e.g., wording) and person characteristics (e.g., pre-existing beliefs). We will present evidence that the metacognitive ratings affect cognitive performance in two ways: 1) by shifting attention to judgment relevant information, and 2) by increasing the subjective value of judgment relevant performance. These effects help us better understand how metacognitive processes impact cognition and provide evidence for the important role of metacognition in causal learning and complex problem solving.

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10:40-10:55 AM (290)

Hidden Agenda-Based Regulation: Extending Models of Study-Time Allocation to More Educationally Realistic Stimuli. BRENDAN A. SCHUETZE, *The University of Texas at Austin*, VERONICA X. YAN, *The University of Texas at Austin* — Previous research in agenda-based study time allocation has primarily operationalized agendas through assigning explicit point values to items. We extend the agenda-based regulation framework to more educationally realistic stimuli through the manipulation of course structure presented in a syllabus. We find support for the notion that classroom agendas—whether tests are cumulative—influence students' intentions to study specific topics ($R2 = 0.16$). We also found weaker evidence for the use of judgments of familiarity in predicting students' study intentions ($\Delta R2 = .01$, $p < .05$). This suggests that metacognitive judgments may be less important to study time allocation than has been suggested in previous research, which has predominantly used less educationally relevant stimuli and goals. In Study 2, we also asked participants to make judgments of interest and ease of learning, in addition to familiarity for each topic. Results show that students were maximizing interest while staying within the bounds of the experimental task. The types of goals adopted by learners, even in constrained experimental settings, are multi-faceted, but still ultimately explained by an agenda-based regulation understanding of study time allocation.

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11:00-11:15 AM (291)

Tip-of-the-Tongue and Feeling-of-Knowing Experiences Enhance Metacognitive Sensitivity of Confidence Evaluation of Semantic Memory. ALI POURNAGHDALI, *University of Southern California Leonard Davis School of Gerontology*, BENNETT L. SCHWARTZ, *Florida International University*, FABIAN A. SOTO, *Florida International University* — The aim of this study is to evaluate the influence of tip-of-the-tongue states (TOT) and feeling-of-knowing judgments (FOK) on the unbiased measure of metacognitive sensitivity of confidence judgments using general recognition theory (GRT). In two experiments, we asked participants to perform a memory recall task. If recall failed, participants provided judgments of TOT and FOK, memory recognition responses, and judgments of confidence on those recognition responses. Next, we fit two different GRT models to the data and used the estimated parameters of the models to construct two sensitivity vs. metacognition (SvM) curves, which represent metacognitive sensitivity of confidence, as a function of the strength of TOT and FOK judgments. The results of the GRT-based analyses showed that experiencing TOTs and high FOKs is associated with an increase in metacognitive sensitivity of confidence. These results are the first report of influence of TOT and FOK on metacognitive sensitivity of confidence.

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11:20-11:35 AM (292)

Everything in Moderation: Political Knowledge and Political Orientation Predict Political Metacognition Monitoring Bias. ALICYN AGER, *Idaho State University*, ERIKA K. FULTON, *Idaho State University*, DANIEL GRAY, *Idaho State University*, BRYAN FREGOSO, *Idaho State University*, CALVIN DIRICKSON, *Idaho State University* — Accurate political metacognition is essential to informed political decisions and the prevention of political misinformation, but extant studies on the topic arguably do not meet measurement standards in metacognitive research. We addressed this limitation while exploring the relationships of political knowledge and orientation to political metacognition accuracy. A sample of 236 MTurkers completed self-report and objective measures of political orientation and political knowledge and a test of political metacognitive accuracy. Objective measures were non-linearly related to metacognitive bias, such that those with moderate levels of knowledge and moderate orientations were less overconfident than those with more polarized knowledge levels and political views. The relationships of subjectively measured political knowledge and orientation to metacognitive bias were more nuanced. Results are compared to the mixed literature on the roles of domain familiarity and political orientation in metacognitive accuracy,while considering the different methodological approaches to exploring political metacognition. To our knowledge, this is the first study to explore political knowledge as a factor in political metacognitive accuracy.

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11:40-11:55 AM (293)

Hidden Differences in Human Experience. GARY LUPYAN, *University of Wisconsin-Madison*, RYUTARO UCHIYAMA, *Nanyang Technological University*, BILL THOMPSON, *University of California, Berkeley*, DANIEL CASASANTO, *Cornell University* — How similar are people's subjective experiences and how consequential are observed differences? If some differences have no behavioral consequences, are they therefore of no consequence? We report a set of results (N>700) that license several general conclusions: (1) Differences in subjective experience are often larger and more ubiquitous than is acknowledged. Some people have vivid visual imagery. Others have none. Some experience a constant inner voice. Others do not. Some drum their teeth to help with mental arithmetic; some can smell ants. (2) Behavioral consequences of even large subjective differences are elusive. We have known about individual differences in visual imagery for over a century, and yet links to objective behavior are surprisingly hard to come by. (3) People are largely unaware that their subjective experiences differ--often in fundamental ways--from those of others. People who are color-blind tend to find out only on being tested. People who lack visual imagery tend to think that the mind's eye is just a quirky metaphor. We then explain why a search for experiential differences, even (especially!) when they have no clear behavioral consequences, is critical for understanding robustness in human cognition.

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Prospective Memory
Sunday, November 20, 2022, 10:20 AM-12:00 PM US EST, Back Bay D

Chaired by Chiara Scarampi, *University of Geneva*

10:20-10:35 AM (294)

How Vigilance and Prospective Memory Conditions Impact Sightings of People. KARA N. MOORE, *Oklahoma State University*, JACK D. ARNAL, *McDaniel College* — Searching for a person can be a prospective memory task, which involves searching while completing an ongoing distractor task. Alternatively, searching for a person can be a vigilance-based task wherein searchers primarily prioritize searching. We examined the impact of vigilance and prospective memory conditions on sightings of people. Participants completed a dual-task paradigm including a task searching for target persons and an unrelated, ongoing task. We manipulated the dual-task importance instructions (i.e., ongoing, search, or both) and whether the intention to search was in working memory at the start of the task. In Experiment 1 the ongoing task was focal to the search task, but in Experiments 2 and 3 it was not focal. In Experiment 3, we tested lay persons and experts (i.e., law enforcement). Task importance instructions impacted the amount of attention allocated to the search task, and in Experiment 2 instructions impacted sighting rates. No impact of intention presence in working memory was found. We will discuss how these paradigmatic differences affect performance on person searches and the practical implications of these findings for missing and wanted person searches.

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10:40-10:55 AM (295)

The Role of the Reference Point and Subjective Age in Metamemory for Prospective Memory. CHIARA SCARAMPI, *University of Geneva*, MATTHIAS KLIEGEL, *University of Geneva* — In two pre-registered online experiments, we investigated the role of metamemory in younger and older adults' prospective memory (PM). In experiment 1, we manipulated the reference point used to evaluate performance (self vs. peers) and the order of presentation of the PM task and some metamemory questionnaires. Younger and older participants were similarly underconfident in the self condition and overconfident in the peers condition. Moreover, older adults reported significantly better PM abilities than younger adults, and participants generally reported more memory failures when the metamemory questionnaires were administered after the PM task and in the self condition. In experiment 2, we further investigated the role of the reference point used to evaluate performance and the relationship between subjective aging and metamemory. The findings suggest that different metacognitive measurements and their order of administration can account for age-related differences in PM performance. Theoretical and practical implications will be further discussed.

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11:00-11:15 AM (296)

Prospective Memory Training with Older Adults. ELIZABETH WIEMERS, *Bradley University*, HUNTER BALL, *The University of Texas at Arlington* — Previous research has shown that memory for future intentions (prospective memory) declines with age. This can lead to problems, like forgetting to take important medication. We aimed to mitigate memory decline in healthy older adults through a 4-week online strategy training program. Each week, participants in the training group received video instruction on strategies for maintaining prospective memories, completed two computerized and two naturalistic prospective memory tasks to practice implementing those strategies, and took a quiz over what they learned. The control group instead took daily quizzes over audio book chapters. Before and after training, all participants completed computerized tasks that measured performance on seven prospective memory tasks. Additionally, participants completed a survey about strategy use. The training group did not outperform the control group at a statistically significant level. However, participants in the training group reported using more strategies and having more confidence in their memory after training than the control group. Prospective memory is likely to continue to decline with age. However, this program may have positive impacts on daily life for older adults.

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11:20-11:35 AM (297)

Effects of Stress, Salience, and Semantic Association on Prospective Memory Errors. EVAN R. HUGHES, *Consortium Research Fellows Program, U.S. Army Research Institute*, DEBORAH M. CLAWSON, *Catholic University of America* — In prospective memory (PM), or memory for the execution of future intentions, 3 types of mistakes can occur: failing to respond to PM cues (Omission Errors), responding to PM cues with incorrect PM responses (Association Memory Errors), and making erroneous PM responses in the absence of a PM cue (Commission Errors). The current research examined the effects of pre-encoding stress, salience, and semantic association on errors in PM. Participants (n=93) were assigned to stress and no-stress groups and completed individual Zoom sessions. An online version of the Trier Social Stress Test (TSST) was used to induce acute psychosocial stress in the stress group while the no-stress group played Tetris. Participants then answered trivia questions with embedded PM cues, semantically associated lures, and non-associated words, presented saliently and non-saliently. Pre-encoding stress decreased association-memory errors. Stressfulness ratings were related to viewing the TSST as a hindrance rather than a challenge. Salience reduced omission errors but increased concurrent commission errors. Semantic association had no significant effects. These findings shed greater light on stress effects and on stimulus factors that influence PM errors.

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11:40–11:55 AM (298)

The Effects of Race and Prototypicality on Metamemory Judgments for Self and Others. TOMAS PALMA, *Universidade de Lisboa*, ALEXANDRE VIEIRA, *Universidade de Lisboa*, ANDRÉ MATA, *Universidade de Lisboa* — The cross-race effect (CRE) in face recognition is a well-studied and widely replicated psychological phenomenon with many real-world consequences, such as wrongful convictions based on eyewitness misidentification. Recently, researchers have become increasingly interested in examining whether people are metacognitively aware of this phenomenon. In the current research, we expanded the existing research on metamemory for the CRE by examining the effects of race and prototypicality (the degree to which the physical appearance of target faces resembles those traditionally associated with the category) on perceivers' metamemory judgments made for themselves versus others. Across three studies, we showed that (a) participants were aware of their greater ability to recognize White faces (versus Black) and low-prototypic faces (versus high-prototypic); (b) self- and other-judgments were highly correlated; and (c) when the judgment condition permitted, participants were able to consider and weigh the available cues to infer the other's memory performance.

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Working Memory II
Sunday, November 20, 2022, 10:20 AM–12:00 PM US EST, Back Bay C

Chaired by Evie Vergauwe, *University of Geneva*

10:20–10:35 AM (299)

The Consequences of Prioritization in Working Memory Across Prioritization Modes and Domains. EVIE VERGAUWE, *University of Geneva*, STÉPHANIE JEANNERET, *University of Geneva*, CARO HAUTEKIET, *University of Geneva*, NAOMI LANGEROCK, *University of Geneva* — Within working memory, attention can be used to prioritize mental representations that are of particular importance for the task at hand. Prioritized information is assumed to be in a privileged state within working memory, one that is associated with better memory performance and reduced distractor susceptibility. Here, we study these assumed positive consequences of prioritization and compare them directly between different prioritization modes and domains of working memory. Overall, our results show (1) quantitative differences in the memory boost due to prioritization between cue-based and reward-based prioritization modes, especially in the visual domain of working memory, and (2) qualitative differences in distractor susceptibility between cue-based and reward-based prioritization modes, in both the verbal and visual domains of working memory. Implications for the operation of the focus of attention will be discussed.

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10:40–10:55 AM (300)

Optimal Probing in Experimental Designs to Best Detect Spatial Positional Association of Response Codes for Visual vs. Verbal Information. FABIEN MATHY, *Université Côte d'Azur*, MAËLISS VIVION, *Université Côte d'Azur*, MORGANE FTAÏTA, *Université Côte d'Azur*, EMILIE BANKS, *Université Côte d'Azur*, MICHAEL FARTOUKH, *Université Côte d'Azur*, STEPHEN RAMANOËL, *Université Côte d'Azur*, ALESSANDRO GUIDA, *Université Rennes 2* — The SPoARC (Spatial Positional Association of Response Codes) effect refers to a mental spatialization of non-spatial sequences in working memory. The direction of the phenomenon is left-to-right in Westerners: recognition of a memory item is faster with the left hand for first items and faster for last items using the right hand. We investigated whether the number of probes could affect the SPoARC. Using pictures vs. words of fruits, a sample of 137 participants memorized sequences of four items and subsequently performed a recognition test for which they responded using two lateralized keys. For half of the participants, a single probe was presented after each sequence against eight probes for the other half, with half of the probes being lures in both conditions. Using individual bootstrap analyses, results showed that the effect was present in 33% more participants in the mono-probe condition. Stimulus type had, however, no effect, questioning the role of visualization in spatialization. Overall, our results suggest that increasing the number of probes may generate memory interference, producing noise in the response times.

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11:00–11:15 AM (301)

Time Sharing in Working Memory Processing. VALÉRIE CAMOS, *Université de Fribourg*, PIERRE BARROUILLET, *University of Geneva*, TAKEHIRO MINAMOTO, *Shimane University*, SATORU NISHIYAMA, *Kyoto University*, WENG-TINK CHOOI, *Universiti Sains Malaysia*, AÏKO MORITA, *Hiroshima University*, ROBERT H. LOGIE, *University of Edinburgh*, SATORU SAITO, *Kyoto University* — The TBRS model assumes that processing and storage compete in working memory (WM) for a common and limited resource, attention, on a temporal basis (Barrouillet & Camos, 2015, 2021). The present study aimed at testing this model in a task that does not exclusively focus on memory aspects (as usually done in WM literature) but allows the assessment of the reciprocal effects of memory load on processing efficiency and of the demands of this processing on memory accessibility and integrity. For this purpose, in two experiments we coupled an n-back task on letters that mainly solicits the storage component of WM with a tone discrimination task intended to solicit its processing component. Memory load was manipulated by varying the n value in the n-back task from 0 to 2, whereas the demand of the processing component was manipulated by varying the number of possible tones from 1 to 3. As expected, both experiments confirmed the predicted effects of the two manipulated factors (the n value and the number of tones) without interaction between them. However, the overall pattern of results did not perfectly fit the TBRS predictions, and alternative models of WM are discussed.

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11:20–11:35 AM (302)

A Working Memory Model Integrating Meaning. BENJAMIN KOWIALIEWSKI, *University of Zurich*, KLAUS OBERAUER, *University of Zurich* — Verbal working memory (WM) is strongly influenced by semantic similarity between items. Serial recall of lists of semantically similar words is better than of dissimilar words. No model currently exists that explains this support from semantic knowledge. We present a connectionist WM architecture integrating meaning. The core architecture encodes distributed representations of items and contexts through temporary binding. Meaning is not directly encoded into WM. Instead, semantic knowledge supports WM through sustained activation in a long-term memory semantic network. This way of integrating meaning into WM accounts for the impact of semantic similarity on WM performance in different tasks, including: (1) the beneficial effect of semantic similarity on item memory, (2) the absence of impact of semantic similarity on memory for order, and (3) the protective effect of semantic similarity against interference. Based on these results, we propose that semantic knowledge supports WM through activated long-term memory.

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11:40–11:55 AM (303)

How Can Time Help Working Memory? LEA M. BARTSCH, *University of Zurich*, EDA MIZRAK, *University of Zurich* — Working memory (WM) benefits greatly when people are given more free time between individual information they need to remember. A recent study provided evidence that the benefit is proactive – with time benefitting the items following a temporal gap – rather than retroactive. This finding was consistent with the proposal of a gradually recovering encoding resource yet seemed incompatible with prior explanations for the free time benefit. Specifically, the benefit had mostly been attributed to maintenance strategies, which can be applied during conditions of free time, on the items held in WM. However, we do not yet know whether one can use free time to apply a strategy and replenish encoding resources simultaneously. Across two experiments we instructed participants to apply various strategies and added free time at different positions within a six-item list of words. We replicate the proactive benefit of time and show that effective strategies (i.e., elaboration) lead to an overall retroactive benefit – which shows that applying these strategies benefits the items they are applied on. Taken together, our results show that free time can be used for resource replenishment and applying maintenance strategies on the contents of WM.

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Poster Sessions

Poster Session I
Thursday, November 17, 2022
Viewing 5:00–7:00 PM US EST, Authors Present 6:00–7:00 PM US EST, Hynes Convention Center Ballroom

Note: All in-person posters are also available for viewing for the duration of the conference in the virtual posters on the conference website.

6:00–7:00 PM (1001)

Spatial Auditory Task-Elicited Eye Movements: Voluntary or Reflexive? SAMUEL W. BENNETT, *Towson University,* JARED J. MCGINLEY, *Towson University,* LAURA K. HICKEN, *Towson University,* MATTHEW D. HILCHEY, *University of Toronto,* BLAIRE J. WEIDLER, *Towson University* (Sponsored by Matthew Hilchey) — During spatial auditory oddball detection tasks, participants' gaze is biased in the direction of auditory focus. One possible explanation is that the bias reflects a voluntary strategy employed by participants. Another interpretation is that it reflects an automated symbolic orienting of gaze to the direction of the cue word. The purpose of this study was to distinguish between these explanations by adding a delay and a gaze-contingent central fixation period between the cue and the auditory task. During each trial, participants heard the word "left" or "right" which designated to which ear they should listen for a potential "oddball", a change in the pitch of a looping melody. By delaying the task and reorienting participants' gaze to the center of the screen between the cue and the melody presentation, any automated effects of the cue should have dissipated during the task period. The results indicated that participants' gaze was nevertheless biased in the direction of the cue word during the task period, suggesting that a voluntary strategy was being used.

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6:00–7:00 PM (1002)

Spatial Frame of Reference for Inhibition of Return (IOR) in a 3D Environment. NOAH BRITT, *McMaster University,* HANNA HAPONENKO, *McMaster University,* HONG-JIN SUN, *McMaster University* — Inhibition of Return (IOR) involves a delayed response to visual stimuli presented in previously cued locations more than 300ms prior. Our previous IOR studies in 3D space demonstrated that compared to when a cue and target appeared at the same depth, IOR was reduced when the target appeared at a nearer location than that of the cue. In the current study, we investigated the spatial frame of reference (FR) of IOR in 3D space. In the control condition, the cue and target were presented at the same depth relative to a stationary viewpoint. Then, by introducing forward self-motion during the time interval between cue and target onset, we created experimental conditions where the cue and target appeared either at (1) the same world-centered depth but different viewer-centered distances or (2) different world-centered depth planes but the same viewer-centered distance. IOR remained high when the cue and target appeared within the same depth plane irrespective of viewer-centered distances. However, when the cue and target appeared at different depth planes, even though the viewer-centered distance was made to be the same, IOR was significantly reduced. These results suggest that IOR is controlled by a world-centered FR in a 3D setting.

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6:00–7:00 PM (1004)

Cognitive Control of Auditory Distraction: Does a Proactive Encoding Mode Attenuate Attentional Capture by an Auditory Deviant? JOHN E. MARSH, *University of Central Lancashire,* ZOE D. HUGHES, *University of Central Lancashire,* FEDERICA DEGNO, *Bournemouth University,* ROBERT W. HUGHES, *Royal Holloway, University of London* — One account of the tempering of the disruption produced by a task-irrelevant auditory deviant by cognitive control holds that high task-set activation permits a blocking of the switch of attention to the deviant following its detection. The present research examines whether the disruption to the recall of a visually-presented sequence due to attentional capture by an auditory deviant is reduced if a high task-set activation is achieved through promotion of a proactive encoding mode. Proactive encoding—specifically, the pre-activation of the representations of the possible upcoming visual items—will be engendered by presenting the same to-be-remembered items (in different orders) across all trials within a block. This will be contrasted with a block of trials wherein the to-be-remembered set changes from trial-to-trial, thereby promoting a more reactive encoding mode. An attenuation of the deviation effect in the proactive encoding condition would support the notion that such encoding plays a key role in the cognitive control of auditory attentional capture.

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6:00–7:00 PM (1005)

Pre-Pulse Inhibition of Startle as a Predictor of Inattentional Blindness: The Role of Attentional Gating and Attention. MOET AITA, *Rochester Institute of Technology,* JOSEPH S. BASCHNAGEL, *Rochester Institute of Technology,* TINA M. SUTTON, *Rochester Institute of Technology* — The inattentional blindness (IB) phenomenon describes the failure to notice an unexpected event during the performance of a visual selective attention task. Attentional gating is the process of filtering out unnecessary stimuli from the environment to aid in attention and can be measured through the pre-pulse inhibition (PPI) of the startle reflex. This study hypothesized that individuals better at attentional gating would perform worse during the inattentional blindness task (i.e. notice less changes). Thirty undergraduate students completed a series of startle trials to assess percent PPI. Then, participants watched an IB video and reported any changes they noticed while counting the number of passes the target team made. Regression results ($F(2,27)=3.28$, $p=.05$) indicated PPI was significantly associated with inattentional blindness ($\beta=.43$, $p=.02$), when controlling for familiarity of the video,

though in the opposite direction of the hypothesis. Discussion will focus on interpreting the relationship between attentional gating and inattentional blindness.

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6:00–7:00 PM (1006)

Assessing Attentional Suppression of Salient Motion Stimuli. OWEN J. ADAMS, *Binghamton University SUNY,* NICHOLAS GASPELIN, *Binghamton University SUNY* — A longstanding debate is whether salient stimuli can automatically capture visual attention. The signal suppression hypothesis proposes that salient distractors do attract attention, but can be suppressed via top-down control mechanisms to prevent capture. Although this account has garnered much support, almost all of this evidence has utilized only one class of salient distractors: color singletons. It therefore remains unclear whether other types of salient distractors, such as motion singletons, can also be suppressed. The current study directly compared suppression of color and motion singletons based on the destination of first eye movements. We find some evidence that motion singletons can be suppressed like color singletons. However, the learning effects appear to be much slower than those with color singletons.

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6:00–7:00 PM (1007)

Do Salient Abrupt Onsets Trigger Suppression? EMILE DE POOTER, *Oregon State University,* EMILY BURGESS, *Oregon State University,* CHRISTOPHER HAUCK, *Oregon State University,* ERIC RUTHRUFF, *University of New Mexico,* MEI-CHING LIEN, *Oregon State University* — Many studies have shown that abrupt onsets capture attention involuntarily. We examined whether task-irrelevant onsets trigger strong suppression of their features to reduce their ability to capture attention in the future. We used a capture-probe paradigm with target search trials (70% of the trials) and probe letter recall trials (30% of the trials). Despite efforts to promote suppression of the abrupt onset's color, we found in all three experiments that consistently associating one distractor color with abrupt onsets had no detectable impact on probe recall accuracy. We conclude that distractor features are routinely suppressed due to task-irrelevance, but salience does not noticeably enhance this suppression. The suppression mechanism is therefore geared towards helping observers discriminate between target features and distractor features, not towards beating down the most salient distractor.

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6:00–7:00 PM (1008)

Does Superior Visual Working Memory Capacity Enable Greater Distractor Suppression? CHRISTOPHER HAUCK, *Oregon State University,* MEI-CHING LIEN, *Oregon State University,* ERIC RUTHRUFF, *University of New Mexico* — Previous studies have found less capture by distractors for high visual working memory capacity individuals than low visual working memory capacity individuals. Gaspar et al. (2016) found a larger PD (believed to index suppression) to salient distractors for high-capacity individuals, suggesting that they prevent salience-driven capture via suppression. We tested this hypothesis using the behavioral capture-probe paradigm employed in Lien et al. (2021). Participants performed a color change detection task, assessing their visual working memory capacity. They then performed a visual search task (70% of the trials where a salient distractor or non-salient distractor [a triplet] appeared with the target) intermixed with probe recall tasks (30% of the trials). Replicating Lien et al., a suppression effect on probe recall accuracy was observed. Critically, high- and low-capacity individuals showed equivalent ability to suppress distractors, suggesting that suppression is not the mechanism by which high-capacity individuals achieve greater resistance to capture.

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6:00–7:00 PM (1009)

Distinct Effects of Predictiveness and Uncertainty of Reward in Value-Driven Attentional Capture. JANGKYU JU, *Korea University,* YANG SEOK CHO, *Korea University* — Two central components in attentional theories of associative learning, predictiveness and uncertainty, have been found to influence involuntary attentional allocation. Yet, the specific interplay between the two factors on value-based attentional modulation has not been examined. Hence, the present study investigated the effects of predictiveness and uncertainty of reward provision in attentional allocation. Participants identified the line orientation in a circle presented in one of the two target colors, which were associated with reward contingencies with contrasting levels of predictiveness and uncertainty. The reward contingencies were systematically manipulated across experiments: one color paired with a high-predictive, low-uncertain contingency and vice versa for the other in Experiments 1 and 2, and high- versus low-predictive reward contingencies, which controlled for uncertainty, in Experiment 3. Results supported both uncertainty- and predictiveness-driven mechanisms, warranting neither complete approval nor rejection for both accounts. This indicates that predictiveness and uncertainty of reward provision play distinct roles in generating attentional priority, implying the existence of a hybrid attentional mechanism.

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6:00–7:00 PM (1010)

The Optimal Tuning of Attention to Salient Targets Needs Memory. DIRK KERZEL, *University of Geneva* (Sponsored by Dirk Kerzel) — Visual search for a color singleton could be exclusively based on saliency. If search was exclusively saliency-based, search for one color singleton should be similar to search for two color singletons. If singleton search required memory, however, search performance should become less optimal with two than with a single target. We compared the tuning of attention to singleton color targets by means of the contingent capture paradigm. We found that the tuning was less optimal with two compared to a single

target, showing that singleton search is limited by memory. In Experiment 1, we compared two color singleton targets that deviated in opposite directions from the same nontarget color. In Experiment 2, we compared two color singleton target that were associated with distinct nontarget colors. The results were similar in both experiments, showing that memory limitations apply even though memory was not required. Thus, participants establish specific attentional templates beyond a generic attentional template for saliency.

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6:00–7:00 PM (1011)

Not So Spatial, After All? Learned Suppression of Probable Distractor Locations Acts on Spatially Invariant, Configural Representations. RYAN S. WILLIAMS, *University of Toronto,* SUSANNE FERBER, *University of Toronto,* JAY PRATT, *University of Toronto* — Does learned suppression of probable distractor locations truly reflect the active suppression of spatial positions (i.e., spatiotopic suppression)? We disentangled spatiotopic, retinotopic, and configural reference frames on this effect by intermixing biased and unbiased search displays (defined by the presence or absence of a high-probability distractor location), which varied by spatial context and/or configural properties. We consistently found a transfer of learned suppression to unbiased spatial contexts at the relative position of the high-probability location. This transfer was observed even when biased and unbiased displays differed in eccentricity (i.e., when neither the spatiotopic nor the retinotopic coordinates of the displays overlapped). Further, the transfer of learned suppression from biased to unbiased displays was significantly attenuated when the two display-types were segregated by color (e.g., red/green vs. blue/orange), even when presented in the same spatial context. Thus, learned spatial suppression effects primarily emerge via a spatially invariant, configural representation of the search display that hierarchically codes the relative locations, features, and probabilities of the search display items.

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6:00–7:00 PM (1012)

The Modulation of the Cue Validity Effect by Reward Uncertainty. JEONGSUN YOON, *Korea University,* YANG SEOK CHO, *Korea University* — Several studies have demonstrated that the uncertainty of reward provision modulates value-driven attentional capture (VDAC). Those studies mostly used the visual search paradigm to investigate the role of reward uncertainty in VDAC. However, the use of visual search tasks has a risk of extinction, resulting from separating the training and test phases. The present study used the cueing paradigm to eliminate the risk by integrating both phases into one. Color features (red and green) were associated with certain or uncertain values of reward, while the expected value was controlled. An uninformative certain or uncertain color cue was presented before the onset of the target display. The color features were task-relevant in Experiments 1 and 2, and task-irrelevant in Experiment 3. The results showed that the spatial cue-validity effect was larger when the uncertain color cue was presented than when the certain color cue was in Experiments 1 and 2. On the other hand, no such result was observed in Experiment 3. These results suggest that the level of reward uncertainty plays an important role in determining the incentive salience of stimulus features under limited conditions. We discuss what those results imply about VDAC.

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6:00–7:00 PM (1013)

Attention Bias for Negative Facial Expression Behind a Surgical Mask. XINWEI ZHAO, *Weifang Medical University,* JACKIE CHAU, *McMaster University,* HONGWEI SUN, *Weifang Medical University,* LIPING JIA, *Weifang Medical University,* NOAH BRITT, *McMaster University,* HONG-JIN SUN, *McMaster University* — It is believed that attentional bias to threat stimulus is related to the experience of anxiety. Using the dot-probe paradigm, the current study investigated attentional bias to angry facial expression over neutral expression with or without a surgical mask. During the Covid-19 pandemic, non-clinical participants were presented (for 500 ms) with a pair of faces (angry and neutral faces from the same individual) either with or without masks on both faces in a given pair. After face presentation, a probe (an arrow) emerged randomly at one of the two locations: the location for the previous angry face ("congruent" condition) or the location for the previously neutral face ("incongruent" condition). Participants were required to indicate which direction the probe was pointing at. Anxiety questionnaires were also administered, and the participant sample was split in half based on the score of trait anxiety. The results showed that, compared to faces without masks, faces with masks led to greater attention bias towards the angry over neutral expression (shorter RTs for congruent than incongruent condition) for high-anxiety individuals only. Moreover, level of anxiety was positively correlated with the attention bias for faces with masks.

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6:00–7:00 PM (1014)

The Role of Task-Relevance in the Learning of Value-Based Attentional Priority. NIYA YAN, *Texas A&M University,* BRIAN A. ANDERSON, *Texas A&M University* — Previously reward-associated stimuli persistently capture attention. Such value-based attentional priority has been mainly observed for stimuli that were physically salient or task-relevant during learning, and it remains unclear whether a reward-associated but physically non-salient and task-irrelevant feature can acquire value-based attentional priority. In the present study, participants were instructed to fixate a colored circle and were trained on a color-reward association in a learning phase, after which they completed an unrewarded test phase. In Experiment 1, the reward-associated color only appeared on targets during the learning phase, whereas in Experiment 2 the target and distractor were equally likely to be rendered in the reward-associated color. Controlling for selection history, the previously reward-associated color only captured attention in the test phase of Experiment

1. Our results indicate that stimulus-reward associations are insufficient for value-based attentional priority to develop; instead, attention to the reward-predictive feature during learning (by virtue of physical salience or task relevance) is necessary for the feature to acquire value-based attentional priority.

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6:00-7:00 PM (1015)

Instructional Learning of Threat-Related Attentional Bias. LAURENT GRÉGOIRE, *Texas A&M University,* BRIAN A. ANDERSON, *Texas A&M University* — This study aimed to determine whether threat-related attentional bias can result from instructional learning, when participants acquire knowledge of the aversive qualities of a stimulus through verbal instruction (i.e., in the absence of direct experience). Fifty-four non-clinical adults first performed a visual search task in which a green or red circle was presented as a target. They were instructed that one of these two colors (counterbalanced across participants) might be paired with an electrical shock if they responded slowly or inaccurately, whereas the other color was never associated with shock. In a subsequent test phase, in which participants were explicitly informed that no shock will be delivered, former-target-color stimuli were presented as distractors in a visual search task for a shape-defined target. In both tasks, although participants were never exposed to the electrical shock, we observed a significant correlation between threat-related attentional bias and state anxiety (measured before the experiment). Our results demonstrate that fear learning acquired without direct experience can subsequently influence attention, reflecting negative reinforcement learning, but this effect is modulated by state anxiety.

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6:00-7:00 PM (1016)

A Fear Conditioned Stimulus Is Not Distracting When It Is Not Perceptually Salient. DANA SLABBEKOORN, *University of Wisconsin-Milwaukee,* GRETA MINOR, *University of Wisconsin-Milwaukee,* TESSA STEVENSON, *University of Wisconsin-Milwaukee,* FRED HELMSTETTER, *University of Wisconsin-Milwaukee,* DEBORAH HANNULA, *University of Wisconsin-Milwaukee* (Sponsored by Deborah Hannula) — Published studies indicate that a colored circle repeatedly paired with an aversive stimulus (conditioned stimulus, or CS+) is distracting and slows attention to a search target. Critically, the CS+ in past studies has typically been the only colored stimulus in the search display, making it physically distinctive, which may contribute to reported capture effects. In two experiments, we examined whether disproportionate capture by a CS+ (relative to a safety stimulus, or CS-) could occur when all of the search display elements were differently colored shapes. When the CS was not perceptually salient, there were no differences in the proportion of saccade errors to the CS+, the CS-, or other search display distractors, and saccades latencies to targets were only modestly affected by the presence of a CS+ in the search display. Consequently, previously reported capture effects may reflect the combined influence of physical salience and aversive value on search performance.

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6:00-7:00 PM (1017)

Investigating the Appraisal Structure of Spontaneous Thoughts: Evidence for Differences Among Unexpected Thought, Involuntary Autobiographical Memories, and Ruminative Thought. MARY POULOS, *University of Minnesota, Twin Cities,* ANDRE ZAMANI, *The University of British Columbia,* DAVID PILLEMER, *University of New Hampshire,* MICHELLE D. LEICHTMAN, *University of New Hampshire,* KALINA CHRISTOFF, *The University of British Columbia,* CAITLIN MILLS, *University of Minnesota, Twin Cities* — Involuntary thinking occurs when mental states arise without intention. Such thoughts can take various forms, such as involuntary autobiographical memories (IAM), ruminative thoughts (RUM), and unexpected thoughts (UT) – all of which are popular areas of study, albeit in somewhat disparate literatures. While all three mental states arise involuntarily, it is unclear what separates them phenomenologically. We conducted a set of experiments to elucidate the appraisal dimensions behind these forms of involuntary thoughts, with a particular interest in understanding the phenomenology behind unexpected thoughts, conceptualized here as thoughts that are surprising in both timing and content. Across two experiments, we found that unexpected thoughts were less identifiably cued, more surprising in content and timing, and offered new information (i.e. insight). These results contribute to an understanding theory regarding the nature of unexpected thought and its relation to IAM and ruminative thought, which are the more commonly studied forms of involuntary thinking.

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6:00-7:00 PM (1018)

Does Mind-Wandering Create a Mental-Context Change That Facilitates Overcoming Memory Interference? RACHEL BOOTH, *University of North Carolina at Greensboro,* MICHAEL J. KANE, *University of North Carolina at Greensboro* — We tested whether task-unrelated thoughts (TUTs) benefit retrieval by inducing mental-context changes under output interference. Study 1 examined incubation effects (via a sentence-by-sentence story reading task) on recall in a long-duration fluency task (recalling animals); Study 2 replicated Study 1 with slightly longer tasks. Both studies used thought probes to assess whether TUT rates during incubation predicted post-incubation recall, as expected if TUTs create mental-context changes that reduce output interference between recall periods. Study 1 incubation participants recalled animals for 7 min pre-incubation and 2 min post-incubation (controls completed "incubation" at session's end). Study 2 increased pre-incubation fluency to 9 min. If incubation relieves output interference via mental-context change, the incubation group should outperform the control group in the final 2 min of recall. If mind-wandering facilitates that mental-context change, then TUT rates should positively predict

post-incubation recall for incubation participants, but not for controls.

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6:00–7:00 PM (1019)

Characterizing Pre-Stimulus Alpha Dynamics That Predict Stimulus-Evoked Cortical Responses and Sensory Processing. DAVID DISTEFANO, *Tufts University,* ELIZABETH RACE, *Tufts University* — Attention fluctuates across time and influences how we perceive and interact with the world around us. For example, when attention is internally oriented, responses to environmental stimuli are more variable and less accurate compared to when attention is oriented externally. Evoked neural responses are also reduced during internal compared to external attentional states, indicating reduced cortical processing of the outside world ("perceptual decoupling"). The current experiment aimed to clarify the relationship between ongoing brain activity and such fluctuations in cortical responsivity due to attentional state. Pre-stimulus alpha-band oscillatory dynamics were measured during a visual classification task and were related to the magnitude of stimulus-evoked electrophysiological responses (ERPs). Both alpha power and a novel measure of alpha phase dynamics predicted cortical responsivity to incoming stimuli as measured by ERP amplitudes. Cortical responsivity was also associated with response time variability, indicating a relationship to internal versus external attentional. These shed light on the relationship between pre-stimulus alpha dynamics and post-stimulus neural activity and behavior.

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6:00–7:00 PM (1020)

Intra-Modal Is Easier Than Cross-Modal Action Control: Evidence from Combining Manual Responses with Either Manual, Oculomotor, or Vocal Responses. LYNN HUESTEGGE, *Julius-Maximilians-Universität Würzburg,* LISA WELLER, *Julius-Maximilians-Universität Würzburg,* ALEKS PIECZYKOLAN, *Rhenish University of Applied Sciences, Cologne* — We address the central question of whether multiple action control across different effector systems is easier or more difficult than within a single effector system. In a series of experiments, we compared intra- and cross-modal action control (spatially compatible vs. incompatible) under otherwise controlled conditions. Specifically, we combined manual key press responses with one hand with either concurrent manual key press responses with the other hand or with concurrent eye movements or vocal responses. We then compared dual-response costs (response times in dual-response conditions minus those in single-response conditions) between intra-modal and cross-modal conditions. The results indicate a general advantage of intra-modal (manual-manual) over cross-modal (manual-saccade, manual-vocal) action control (for compatible and incompatible responses), thereby challenging accounts of cognitive architecture positing separate pools of capacity for different effector systems. Instead, our results suggest that holistic representations of action demands, which have the potential to enhance performance, are supported by increasing dimensional overlap (including overlap regarding action modalities) across behavioral requirements.

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6:00–7:00 PM (1021)

An Effect of Common Region Grouping on Object Substitution Masking. ABBEY S. NYDAM, *University of Toronto,* VICTORIA LOR, *University of Toronto,* JAY PRATT, *University of Toronto* — In object substitution masking (OSM), perception of a target in a visual display is affected by a four-dot mask that does not overlap the target in space. Inspired by research showing how the similarity of visual features shared between the target and surrounding dots can affect OSM, we explored the consequences of adding a relational cue that either grouped or segregated the mask and target, while keeping other visual attributes constant. We used a circular frame to group the target and surrounding dots within a common region of space and measured the OSM effect. Consistent with our hypothesis, masking was reduced when the frame was between the target, and mask dots compared with when it was around both. This shows how the detrimental effects of substitution masking can be reduced by an intervening grouping cue that segregates the target from the four-dots. Such a finding is consistent with Gestalt principles of visual perception and the re-entrant processing accounts of OSM effects.

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6:00–7:00 PM (1022)

Understanding the Role of Feature Gain and Distractor Suppression in Feature-Based Attentional Filtering. ANDREW RODRIGUEZ, *Michigan State University,* MARK W. BECKER, *Michigan State University* — The need to attend to appropriate information and ignore inappropriate information is ubiquitous in our daily lives, but what is less clear is the extent to which this type of attentional filtering is accomplished via feature gain, distractor suppression, or both. To investigate, in two experiments we used a dot filtering task to assign attentional weights (feature gain and distractor suppression) to specific colors. A second task was used to evaluate gain or suppression effects in isolation and their combined effects. In experiment 1, the task was to determine if two small letters located within two colored boxes (each appearing in separate hemifields) were the same or different. Eye movements to the colored boxes were used to evaluate gain or suppression. In experiment 2, the task involved responding to a target that was presented at fixation superimposed with a distractor (to encourage filtering of the distractor stimulus to attend to the target stimulus), and RT and accuracy were the dependent variables. Across these two different tasks, we found strong evidence for gain, weak evidence for suppression, that the combined effects were under-additive, and that both effects rapidly diminish over time.

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6:00-7:00 PM (1023)

When Visualization and Verbalization Collide: Effect of Textual Summaries on Visual Interpretations of Data. SHIYAO LI, *Emory University,* MEESHU AGNIHOTRI, *University of California, Irvine,* CINDY XIONG, *University of Massachusetts Amherst,* EMILY WALL, *Emory University* (Sponsored by Cindy Xiong) — Data visualizations leverage the strength of our visual perceptual system to make information more discoverable. Incorporating natural language capabilities in visualization tools has emerged as a promising way to help people analyze and understand data. For example, presenting textual descriptions alongside visualizations empowers people to explore data and communicate insights more efficiently (Srinivasan et al., 2019). However, verbal descriptions of patterns in data can guide readers' interpretations and increase the visual salience of a pattern, potentially leading to biases in data interpretation (Xiong et al., 2019). For example, the emphasis on patterns that support particular beliefs might lead to confirmation bias. We adopt methodologies from the intelligence analysis community to explore the interaction between textual descriptions and visualizations in reader interpretations of data, across multiple visual data representations. We measure the effect of showing textual descriptions alongside visualization on readers' interpretations of data and decision-making with data. We further discuss insights on how to best communicate information using natural language and visualizations.

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6:00-7:00 PM (1024)

Learning to Direct Attention: Consequences for Augmented Reality Training. MONIQUE CROUSE, *University of California, Santa Cruz,* TRAVIS SEYMOUR, *University of California, Santa Cruz* — Augmented reality (AR) technology can present digital cues to direct attention and aid procedural task performance (Yang, et. al., 2019). However, the impact of different types of cues on task training is poorly understood. Cues that indicate to-be-selected buttons may cause trainees to focus on the locations of buttons rather than their visual features. This focus could be detrimental for digital interfaces that can update and change icon locations easily. The current study trained people with either location cues (yellow box around to-be-pressed location) or feature cues (picture of to-be-pressed icon). Afterwards, participants perform the same tasks with a differently arranged layout of the same icons. Participants who trained with location cues had lower and more variable accuracy than participants who trained with the feature cues.

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6:00-7:00 PM (1025)

Vigilance Decrement and Mind-Wandering: Insights from an HD-tDCS/EEG Study. VÍCTOR MARTÍNEZ-PÉREZ, *University of Murcia,* ALMUDENA ANDREU, *University of Murcia,* ALEJANDRO SANDOVAL-LENTISCO, *University of Murcia,* MIRIAM TORTAJADA, *University of Murcia,* LUCÍA B. PALMERO, *University of Murcia,* ALEJANDRO CASTILLO, *University of Murcia,* GUILLERMO CAMPOY, *University of Murcia,* LUIS J. FUENTES, *University of Murcia* — Vigilance decrement and propensity to mind-wander (MW) are two ubiquitous phenomena that take place when people face with sustained attention task. Recent theoretical accounts of sustained attention argue that these two phenomena have a closely dependent relationship since their behavioral and neurophysiological manifestations covary across time-on-task. Nonetheless, empirical support for these models is still scarce and recent studies suggest that the relationship may be a sort of epiphenomenon. We aimed to address such contention by two manipulations: we switched task demands and applied anodal HD-tDCS over the left-DLPFC while participants performed a SART version that included thought probes of MW. In addition, we assessed changes in pre-post resting EEG. Our results showed that anodal stimulation just affected propensity to MW, which increased. In turn, when we manipulated task demands only vigilance decrement was affected, with the most abrupt decline in performance occurring just in the high-demand version of the task. Of important significance, alpha power predicted tDCS-related gains in MW, but not vigilance decrement. Taken together, our data suggest these two phenomena do not appear to be as dependent as assumed.

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6:00-7:00 PM (1026)

An Experimental Evaluation of Transcranial Direct Current Stimulation of the Trigeminal Nerve on Attention and Arousal. ALEXIS S. TORRES, *Arizona State University,* GENE BREWER, *Arizona State University,* MATTHEW ROBISON, *The University of Texas at Arlington,* SAMUEL MCCLURE, *Arizona State University,* STEPHEN HELMS TILLERY, *Arizona State University* — The locus coeruleus (LC) has been implicated in attention and may be partially indexed by pupillary activity. Neuroimaging studies have suggested that stimulation of LC afferents, such as the trigeminal nerve, may modulate LC activity. In the current study, we evaluated the effect of transcranial direct current stimulation (tDCS) of the trigeminal nerve on pupillary dynamics and behavioral manifestations of attention. Participants (n=225) receiving tDCS to the trigeminal nerve completed the Psychomotor Vigilance Task (PVT) and provided self-reports of task-unrelated thoughts throughout the task. Group-level estimates of mean pupil size, pupil size variability, and task-evoked pupil response were extracted across the duration of the task. Estimates of (intensity and consistency of) attention during the PVT were extracted from measures of mean response time and response time variability, and frequency of task-unrelated thoughts from thought probes. The findings reported here replicate all traditional PVT and pupillary effects but failed to find evidence for enhancement via tDCS. Competing hypotheses regarding the efficacy of tDCS will be presented along with discussions regarding future research.

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6:00–7:00 PM (1028)

A Case for Partial-XOR-Like Tasks. YU-WEI CHANG, *Syracuse University,* MICHAEL KALISH, *Syracuse University* — The partial-XOR task first proposed by Conaway and Kurtz (2015) has led to a debate on the reference point view in category learning, by which people classify items according to their similarity to stored exemplars or abstractions. Prior research (Chang, 2018, unpublished) has previously shown that some of the response profiles in the partial-XOR task cannot be explained by reference point models. However, the flexibility of exemplar models and the presence of response noise conspire to make strategy identification difficult. These difficulties in model selection suggest a need for caution in interpreting classifications of participants' response strategies. We present a model-based approach to identify strategies used in the general partial-XOR tasks, in which competing models are directly estimated using Bayesian estimation. Here we develop an appreciation of the model recovery properties for common training conditions in the partial-XOR task and report preliminary results from a novel category generalization experiment.

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6:00–7:00 PM (1029)

Categorization with Multiple Items: Empirical and Modeling Results. SEAN P. CONWAY, *University of Massachusetts Amherst,* ANDREW COHEN, *University of Massachusetts Amherst* — Participants in categorization experiments usually assign a single stimulus to one of multiple categories. Despite the real-world significance, participants are rarely asked which of multiple options belong to a single category. In the current experiment, participants selected the stimulus, from a set of 2 or 3, that most likely belongs to a learned category. The results of Experiment 1 (1-dimensional stimuli) suggest a repulsion effect, in which a nearby dominated stimulus reduced the probability of selecting the dominating stimulus. The results of Experiment 2 (2-dimensional stimuli) suggest a small attraction effect, in which the probability of selecting the dominating stimulus is increased. We extend standard exemplar-similarity models (GCM) by incorporating random utility modeling (RUM). The modeling results of both experiments suggest that stimulus utility alone may not be able to account for choice, i.e., the model must also incorporate similarity between choice options, although this finding is tentative for Experiment 2 and may represent a spatial bias.

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6:00–7:00 PM (1030)

Investigating the Impacts of an Immersive Learning Mode and Graded Feedback on Category Learning. ALEXUS S. LONGO, *Binghamton University SUNY,* MERCURY MASON, *Binghamton University SUNY,* KENNETH J. KURTZ, *Binghamton University SUNY* — Categorization research often employs traditional artificial classification learning (TACL) and a foundational category structure based on family resemblance (FR). In TACL trials, each training item is presented for classification with arbitrary labels followed by corrective feedback. In the FR structure, categories are organized around two opposite configurations (i.e., prototypes) of a handful of binary features such that each category consists of its prototype plus the off-by-one variations. Despite convention, there is reason to question whether these choices align with natural category processes and structures. We employ a richer instantiation of FR using prototypes in opposite corners of a 2D space with four levels of variation. In addition, we investigate variations on the TACL paradigm: 1) situating classification learning within an immersive, dynamic, goal-driven setting; and 2) altering the core task to predicting a graded level of category membership (akin to typicality). Results provide implications for theoretical accounts of categorization.

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6:00–7:00 PM (1031)

Uneasy on the Eyes: Unfamiliar Category Boundaries Do Not Restore Beauty in Averageness. MAR NIKIFOROVA, *University of Massachusetts Amherst,* PIOTR WINKIELMAN, *University of California, San Diego,* DAVID HUBER, *University of Massachusetts Amherst,* ROSEMARY COWELL, *University of Massachusetts Amherst* — In the "beauty in averageness" (BiA) effect, observers rate blended faces (morphs) as more attractive than the parent faces used to create them. But the BiA effect is counteracted when participants categorize the faces before rating attractiveness. Owens et al. (2016) used male-to-female morphs and found that average, gender-ambiguous morphs were rated less attractive after a male/female categorization task than in a no-categorization condition, perhaps because categorization entails greater cognitive cost for faces at the category boundary, lowering liking. We replicated Owens et al., adding a new condition: before rating attractiveness, some participants categorized the faces as gender-conforming/nonbinary. This condition positioned gender-ambiguous morphs as centroid exemplars of the category "nonbinary," rather than as disfluent stimuli in a male/female task. Surprisingly, attractiveness ratings did not differ between the male/female and gender-conforming/nonbinary conditions; in both, the BiA effect was counteracted. However, in line with a disfluency account, reaction times in the gender-conforming/nonbinary task were slowest for gender-ambiguous morphs, indicating difficulty categorizing these faces despite the new labels.

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6:00–7:00 PM (1033)

Frequency Effects on Artificial Category Learning. DONG-YU YANG, *Texas A&M University,* DARRELL A. WORTHY, *Texas A&M University* — Exemplar-based categorization assumes that the categorization process is a comparison of the similarity of the current stimulus to all known exemplars in memory. The Generalized Context Model (GCM) proposed by Nosofsky (1984, 1986) has been shown to be effective in explaining and predicting human categorization behavior. However, little is known about the effect of the relative frequency with which exemplars from each category have been encountered, on categorization performance. In the present study participants learned to classify line stimuli that

varied in length and orientation. During training, a frequency manipulation was implemented where members of one category were shown twice as often as member of the other category. In the transfer phase, participants strongly preferred the category that was encountered more frequently in the training phase. We fit modified version of the GCM, the Delta-GCM and the Decay-GCM, which assumed that similarity to more recently encountered exemplars was weighed more heavily compared to exemplars encountered further in the past. The Decay-GCM provided the best account of both recency and frequency effects on categorization behavior.

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6:00–7:00 PM (1034)

Assessing the Role of Local and Global Forms of Coherence in Category Learning at Training and at Test. JOSHUA C. GLASS, *Binghamton University SUNY,* KENNETH J. KURTZ, *Binghamton University SUNY* (Sponsored by Kenneth Kurtz) — In recent evidence, classification training can elicit two qualitative patterns of generalization: one is exemplar-based such that proximity to known members of a category best predicts membership in that category; the other involves inducing a global form of coherence in the mapping between input space and category membership. Such global coherence is an abstraction about category membership – not in the form of clusters or prototypes, but grounded in regularities like categories alternating in input space (Kurtz & Wetzel, 2021) or one category having correlated feature values while the other is anti-correlated (Conaway & Kurtz, 2017). We investigate the extent to which categorization is driven by local match to exemplars versus conforming to global structural regularities using generalization items as critical tests. Results suggest subjects alter their category representations when exposed to unlabeled test items. This finding is discussed in terms of semi-supervised learning effects and category coherence.

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6:00–7:00 PM (1035)

Symbolic Representation and Rule-Based Categorization. ANDRES SANCHEZ, *Georgia State University,* BARBARA A. CHURCH, *Georgia State University,* J. DAVID SMITH, *Georgia State University* — Extensive evidence suggests that categorization rules are held and manipulated in working memory and facilitated by an explicit-declarative verbal system (Ashby & Valentin, 2017). Thus, it could be either that language is vital to categorization or that language's abstract-symbolic representations are the vital element. These studies explored the second possibility. Human adults categorized stimuli based on color or shape dimensional rules. Across three experiments, participants were or were not provided the use of novel visual symbols that named the color or shape dimensions. The results showed that the novel visual symbols aided category learning and improved the transfer of category knowledge to novel, untrained stimuli. The results also showed that these symbols could be used to declare category rules. The results point to the importance of abstract representation (language-based or not) for rule-based categorization. They also have implications for rule learning in young children and nonhuman animals.

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6:00–7:00 PM (1036)

The Role of Context in Learning to Classify Novel Creatures. JOSHUA STIVERS, *Duke University,* PETER WHITEHEAD, *Duke University,* ELIZABETH J. MARSH, *Duke University* — Learning in the world is often contextualized; for example, animals appear in some habitats but not others, and geological features determine where rocks are found naturally. However, only a small literature examines how contextual manipulations influence the learning and transfer of categorical information. Here, the present work investigates whether classification performance is influenced by the context during learning, even when the context is not necessary for successful discrimination. In multiple studies, participants learned to classify simple creatures into two kinds. Each creature appeared embedded in one of two different environments. In one case, this pairing was random, whereas in the biased condition the context was correlated with information relevant to classification. Critically, at test, learning and transfer were assessed in a neutral, 'isolated' context. Across experiments we consistently observed an interaction between transfer and context, such that participants who learned under biased contexts were less able to identify new instances of bugs in the novel context.

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6:00–7:00 PM (1037)

The Effects of Causal Structure on the Perception of Causality. JUDITH L. BURKLE, *Syracuse University,* DANIEL CORRAL, *Syracuse University* — We report two within-subject experiments that examine (a) how subjects assign causality to proximal versus distal variables that are causally interconnected, and (b) whether this outcome varies as a function of causal structure—the specific manner in which a scenario's components are bound by shared causal relations. In both experiments, subjects were presented hypothetical scenarios that specified the causal relations among numerous variables and were asked to rate the extent to which each variable contributed to the scenario's outcome. The scenarios that were used in both experiments consisted of five causal structures: (a) causal chains, (b) positive feedback loops, (c) negative feedback loops, (d) common causes, and (e) common effects. Experiment 1 used artificial scenarios with nonsense variable names, whereas Experiment 2 used naturalistic scenarios with real-world variable names. Across both experiments, we find evidence that how subjects represent and assign causality to proximal and distal variables indeed differs based on a scenario's causal structure. These findings thus provide insights into how people represent causality across different scenarios, and how such representations change based on causal structure.

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6:00–7:00 PM (1038)

Knowledge Restructuring in Function Learning. ASHLEY DOUGLASS, *Syracuse University,* CINDY MENDOZA, *Syracuse University,* MICHAEL KALISH, *Syracuse University* — The learning of function concepts relies on cognitive mechanisms whose properties remain relatively obscure. In particular, we are concerned with the way that people's response strategies show influence of both exemplar and abstract, rule-like information. In this study, participants learned an initial function and then shifted to one of three alternatives. The initial function was always an inverse absolute value function, and the three alternatives were a shifted version of the primary function, a flipped version, and a parabolic function that closely approximated the training region of the primary function. Each of the three alternatives shares a small number of training points in common with the primary function, and each differs from the primary function in terms of the both the average difference in criterion in the training region and extrapolation predictions. The parabola has the least deviation from the initial function, but the greatest difference in terms of functional form, while the flipped has the closest form and greatest deviations. We describe the relative difficulty in post-switch learning, and attempt to characterize the response strategies that individuals adopted.

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6:00–7:00 PM (1039)

Unsupervised Categorization in a Sequential Labeling Task. JOHN CLAPPER, *California State University, San Bernardino,* BRYAN ALVAREZ, *The Ohio State University* — Unsupervised categorization is widely considered an important form of human learning, but most laboratory procedures, e.g., sorting, seem like poor analogs for how it usually occurs in everyday life. In previous research, we used a label generation task to investigate unsupervised categorization of objects shown simultaneously in a single array. This research attempts to extend that methodology to the kind of sequential presentation presumed more common in the real world. The key predictions were: (a) people should apply the same self-generated labels to objects from the same putative (experimenter-designed) categories, and (b) consistency of labeling should increase as more objects are encountered from a given category. In two experiments, people did tend to assign the same labels to objects from the same categories, and both experiments showed some evidence that these labels tended to stabilize with time (examples seen). These results suggest that label generation may be a useful procedure for realistic investigations of unsupervised categorization.

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6:00–7:00 PM (1040)

The Effect of Study Schedule and Feature Descriptions on Category Learning. LAN ANH DO, *Tufts University,* GREGORY HUGHES, *U.S. Army Combat Capabilities Development Command (DEVCOM) Soldier Center,* AYANNA K. THOMAS, *Tufts University* (Sponsored by Gregory Hughes) — A large body of literature has shown the benefit of an interleaving study schedule (i.e., randomly mixing exemplars) as compared to blocking (i.e., grouping exemplars by category) in inductive category learning. However, less is known about the comparative benefits of interleaving over blocking when feature descriptions of the to-be-learned categories are explicitly provided to participants. The present study investigated the effect of study schedule (interleaving vs. blocking) and feature descriptions (absent vs. present) in the learning of natural rock categories, by manipulating these two factors between subjects, resulting in four different conditions. Our results demonstrated the facilitative effect of interleaving over blocking, and the benefits of providing features descriptions in inductive category learning. More interestingly, study schedule and the presence or absence of feature descriptions also affected the type of error that participants made during the final transfer test. Implications and future direction will be further discussed.

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6:00–7:00 PM (1041)

Paired Comparisons in Perceptual Category Learning. VICTORIA L. JACOBY, *University of California, Los Angeles,* CHRISTINE M. MASSEY, *University of California, Los Angeles,* EVERETT METTLER, *University of California, Los Angeles,* PHILIP J. KELLMAN, *University of California, Los Angeles* — Recent work suggests that learning perceptual classifications can be enhanced by combining single item classifications with comparisons adaptively triggered by each learner's confusions (Jacoby, Massey, & Kellman, 2021). Here, we asked whether learning might work equally well using only comparison trials, where on each trial the learner sees a category label and chooses between two presented images. In a 22-category face identification task, we compared an All Comparisons condition to Single Item and Dual Item Classification conditions, where the latter presented two classifications to be made side by side. In Experiment 1, we tested these conditions in the context of an adaptive learning system that continued learning for each learner until objective mastery criteria were met. In Experiment 2, we used a fixed learning duration for all participants. Results revealed that all three learning conditions were characterized by similar learning rates (Exp. 1), and achieved similar posttest accuracy when learning investments were equated (Exp. 2). These results suggest that paired comparison trials are as effective in driving learning of multiple perceptual classifications as more demanding classification-based approaches.

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6:00–7:00 PM (1042)

Perceptual Exposure Benefits the Learning of Multiple Family-Resemblance Categories: It's Not Just Fluency. BROOKE N. JACKSON, *Georgia State University,* BARBARA A. CHURCH, *Georgia State University,* J. DAVID SMITH, *Georgia State University* — The COVIS model of categorization assumes that family-resemblance category learning is mediated by its implicit system and requires feedback. However, humans learn single family-resemblance categories by mere exposure to category members

without feedback. Ashby and Maddox (2005) attributed this learning to perceptual fluency with visual features. But another possibility—based in representational theories of perceptual learning—is that exposure unitizes visual features to create category prototypes. Predictions from these possibilities diverge when multiple family-resemblance categories must be learned. Then, only the second predicts that mere exposure can foster learning. To explore this, we exposed participants to members of two family-resemblance categories, and then tested their categorization performance on new items from the categories exposed earlier or items from different categories. Participants differentiated the categories significantly better after category-related exposure, indicating that mere exposure fosters learning on multiple categories simultaneously. These results help illuminate the role perceptual learning plays in categorization.

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6:00–7:00 PM (1043)

Measures of Lexical Ambiguity for 62,954 Words. JOSHUA LAWRENCE, *University of Oslo, Norway,* REBECCA KNOPH, *University of Oslo, Norway,* GRACE LIN, *Massachusetts Institute of Technology,* JIN KYONG HWANG, *University of California, Irvine,* ÅSTE HAGEN, *University of Oslo, Norway* — Polysemy and homonymy complicate language processing, yet are rarely systematically measured. In this study, we extracted the number of senses and meanings for 62,954 words within and across parts of speech by scraping hypernym chain and definition information from WordNet. We found that the "across part of speech senses and meanings" variable (APOSSAM) predicts lexical decision task performance with robust controls using hierarchical regression analysis: words with more senses and meanings were responded to more quickly, and APOSSAM explains unique variance in response times (%$\Delta R2 = 0.42$, $p < .001$). APOSSAM also interacts with word frequency and dispersion, such that the relationship between APOSSAM the task performance was stronger for lower frequency words and more precise (less disperse) words. We interpret the results with reference to research on incidental word learning and the semantic distinctiveness model. Lexical ambiguity is ubiquitous in English, and sense disambiguation is essential for reading comprehension. These resources will be of interest to behavioral researchers, applied educational linguists, and assessment design professionals working with lexical data.

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6:00–7:00 PM (1044)

Effects of Presentation Order on Function Discovery and Learning. YANG TERNG (RODERICK) SEOW, *Carnegie Mellon University,* JOHN ANDERSON, *Carnegie Mellon University,* SHAWN BETTS, *Carnegie Mellon University* — Function learning is the process through which humans come to learn functional relationships between a continuous cue (e.g., the fullness of the moon) and a continuous target variable (e.g., the height of the tide). While much of the literature has focused on identifying a dominant cognitive mechanism that underlies such learning, McDaniel et al. (2014) demonstrated stable individual tendencies for both exemplar-based and rule-based processes across function and category learning tasks. We extend this work by directly manipulating task factors hypothesized to influence participants' choice of learning and response strategies. Sequential presentation of cue-target exemplars was found to facilitate the use of a sequential response strategy as compared to a random presentation order. Low exemplar density – a small number of unique cue-target pairs given during training – was found to facilitate memory for trained pairs as compared to a high exemplar density training. These results support the existence of multiple function learning and response strategies and suggest that humans prefer strategies that maximize short-term performance potentially at the cost of learning the underlying abstract cue-target relationship.

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6:00–7:00 PM (1045)

When Does It Matter What People Do? ABA SZOLLOSI, *University of Edinburgh,* NEIL BRAMLEY, *University of Edinburgh* — To develop general psychological theories, research in psychology often seeks answers to questions of the form "what do people do?" – such as: "Do people make cooperative or selfish choices?", "Do they remember well what they did on a specific day?", "Do they categorize stimuli based on prototypes or exemplars?", and so on. How useful are answers to such questions? Here we argue that, under theories that expect people's knowledge to change over time, their usefulness varies considerably across subfields of psychology – depending primarily on the rate at which relevant knowledge is expected to change. That is, such answers matter more when relevant knowledge is not expected to change, either because it is biologically encoded (e.g., low-level psychological processes) or because the research question has a narrower temporal scope (e.g., applied research). However, when relevant knowledge can change rapidly, it can also rapidly change what people do – which substantially reduces the usefulness of answers to static questions about it (e.g., research on high-level cognition). We outline how taking the possibility of knowledge change seriously can aid the development of general theories across various subfields of psychology.

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6:00–7:00 PM (1046)

Working Memory Capacity Influences Affective and Non-Affective Factors That Contribute to Iowa Gambling Task Performance. ANTHONY R. STENSON, *Washington State University,* MOLLEE A. GRAY, *Washington State University,* COURTNEY A. KURINEC, *Washington State University,* JOHN M. HINSON, *Washington State University,* PAUL WHITNEY, *Washington State University* — The Iowa Gambling Task (IGT) is widely used to assess risky decision making in both patients with brain lesions and healthy participants. According to the Somatic Marker Hypothesis, advantageous choices on the IGT depend on generating affective responses that guide decisions based on past outcomes. However, evidence is mixed on the degree to which

advantageous choice is driven by anticipatory affective responses or explicit knowledge of deck outcomes. The current experiment examined whether individual differences in working memory capacity (WMC) are related to strategy and choice behavior, as well as to anticipatory skin conductance response (SCR). We found that greater WMC was associated with higher IGT performance earlier in the task, as well as higher anticipatory SCR. These results suggest that individuals with lower WMC have more difficulty accessing both affective and non-affective information about past choice outcomes that contribute to good IGT decision making.

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6:00–7:00 PM (1047)

SET! Eye Gaze Markers That Predict Decision-Making During a Competitive Card Game. MADISON LEE, *Vanderbilt University,* DANIEL LEVIN, *Vanderbilt University* — Although previous research has revealed cognitions in games such as chess, little research has explored how gaze predicts on-line decisions in games. The card game SET is particularly interesting because it depends on deep processing based on difficult comparisons between visual properties. Previous research has demonstrated that SET responses can be predicted using eye movements, but did not specify which gaze parameters predict performance and did not use a real-world environment. We therefore tested participants playing SET while wearing head-mounted eye-tracking glasses. Eye movements in 2-second bins from 0-8 seconds before each "SET" call were analyzed. Fixation durations 0-2 seconds before calling "SET" was significantly greater than durations 0-2 seconds before opposing players called "SET." Similarly, pupil diameter 0-2 seconds before calling "SET" was greater than that when an opposing player called "SET." Results demonstrate that gaze patterns reveal deeper processing of visual properties immediately before a competitive decision.

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6:00–7:00 PM (1049)

Mechanisms and Motivations of Low-Quality News Sharing on Facebook. MITCH DOBBS, *Northeastern University,* KENNETH JOSEPH, *University at Buffalo, SUNY,* ZIJIAN AN, *University at Buffalo, SUNY,* BRIONY SWIRE-THOMPSON, *Northeastern University* — Older adults share significantly more low-quality news on social media than younger adults. While several theories have been proposed to explain this difference in sharing behavior, they have yet to be empirically compared. This study examines the mechanisms and motivations behind sharing high-quality and low-quality news on Facebook, and how they differ among younger and older adults. We asked younger (18-30) and older (65+) adults to donate news URLs they have shared on Facebook over the past five years. Participants then completed tasks assessing cognitive decline (cognitive failures, inhibitory control, working memory), digital literacy, gullibility, loneliness, and demographics such as partisanship. Finally, a survey was populated with the 3 lowest and 2 highest-quality URLs shared by each participant, which they were asked to rate for credibility, accuracy, and motives for sharing. Results highlight the determinants of sharing low-quality news for older and younger adults, as well as the differences in sharing motivations for low and high-quality news. These findings will assist platforms, fact-checkers, and policymakers in designing more effective interventions for slowing the spread of misinformation online.

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6:00–7:00 PM (1050)

DIACOG: A Cognitive Intervention for African American Adults with Type 2 Diabetes. TEAIRRA EVANS, *The University of Alabama,* SHEILA BLACK, *The University of Alabama* — This study uses cognitive strategies to promote medical compliance in African Americans living with diabetes. Research shows that cognitive interventions promote adherence to medical regimens in people living with diabetes; however, there is little evidence to support the effectiveness of these interventions within the African American community, specifically older adults. Diabetes is a disease that disproportionally affects minority groups, people with lower socioeconomic status, and older adults. The extensive self-management regimen combined with the reduction of cognitive resources due to age could influence older adults' ability to follow all factors of the medical regimen. Through the use of cognitive strategies, this study provides dietary education and cognitive strategies to older adults with diabetes. It is hypothesized that older adults equipped with a cognitive strategy to easily comprehend nutritional labels will more accurately categorize foods than older adults exposed to traditional nutritional labels alone.

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6:00–7:00 PM (1052)

Chronic Stress and Risky Decision Making Processes in Young Adults. ASHLEY D. DOONAN, *Saint Louis University,* TONY W. BUCHANAN, *Saint Louis University* — Components of risky decision making, such as risk perception, risk aversion, and risk taking behavior, may be impacted by chronic stress. Research suggests that college students report higher chronic stress than non-student peers; however, it is unclear what impact the chronic stress of the pandemic has had on university students compared to their community peers, and especially how this influences their risk-based decision making. We sought to understand how chronic stress might impact risk-based cognitions in students and non-student peers. We assessed chronic stress, risk perception, risk aversion, and risk taking behavior in university students (N = 140) and community peers (N = 140) aged 18-25. We administered self-report chronic stress scales: the Domain Specific Risk Taking scale to assess risk cognitions, and the Balloon Analogue Risk Task to assess risk-taking behavior. Results show that community peers report more chronic stress and lower risk taking behavior compared to college students. In both groups, chronic stress was related to greater risk perception and lower risk aversion. These data represent an important step in understanding how chronic stress, such as a pandemic, impacts decision making among young adults.

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6:00–7:00 PM (1053)

Effects of Time, Emotions, and Intellectual Humility on Detection of Misinformation. DANIEL LEVINE, *The University of Texas at Arlington,* AMANDEEP DHALIWAL, *The University of Texas at Arlington,* KIRSTIE JONES, *The University of Texas at Arlington,* AMAN CHAHAL, *The University of Texas at Arlington* — As a source of news sharing, social media platforms have given opportunities to spread misinformation. We investigate the role of an intellectual humility trait and saliency of emotional triggers on accuracy in detecting misinformation about abortion. This inquiry is one of four to examine intellectual humility and its relationship with misinformation and belief formation. Moravec et al. (2022) reported improvement in fake news evaluation by asking participants a self-referential question. In this study, the forced time delay was added to encourage individuals to engage in more prolonged contemplation (i.e., analytical processing) of the news while simultaneously priming a negative emotion by manipulating the saliency of distressing images (i.e., emotional processing). We hypothesize that forced time delay increases accuracy above and beyond self-referential questions. We hypothesize that negative valence interferes with the accurate judgment of the news but is mediated by the intellectual humility trait.

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6:00–7:00 PM (1054)

Effects of Arousal and Framing on Risky Choice in Younger and Older Adults. AALIM MAKANI, *Toronto Metropolitan University,* RACHEL APPIAH, *Toronto Metropolitan University,* MARGOT D. SULLIVAN, *Toronto Metropolitan University,* JULIA SPANIOL, *Toronto Metropolitan University* — Value-based decisions, such as risky financial choices, are sensitive to affective influences. In a recent study (Sullivan et al., 2021), we demonstrated that experimentally-induced physiological arousal modulated risk preference in younger and older adults. However, this study examined gain-framed choices only. In the current preregistered experiment, we sought to test whether arousal effects on risky choice would extend to the loss domain. Younger and older adults (N=107) made a series of choices between smaller-safer and larger-riskier financial prospects. Incidental arousal (high vs. low) and choice domain (gain vs. loss) were manipulated within subjects. Loss trials elicited slower responding and greater risk taking than gain trials in both age groups. Incidental arousal had no effect on risk taking in either the gain or the loss domain. We hypothesize that integral affect from loss trials overshadowed the effects of experimentally-induced arousal, and we discuss this finding with reference to a recent account of losses as modulators of attention (Yechiam & Hochman, 2013).

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6:00–7:00 PM (1055)

Authoritarianism, Social Solidarity, and Vaccine Attitudes as Predictors of Covid-19 Vaccination. SERGIO BARBOSA, *Universidad del Rosario,* JOHANNA SÁNCHEZ-MORA, *Universidad Nacional de Colombia,* JAVIER CORREDOR, *Universidad Nacional de Colombia* — We aimed at identifying how authoritarianism (Bizumic & Duckitt, 2018), social solidarity (Rusu, 2012), and general vaccine attitudes (Martin & Petrie, 2017) predict Covid-19 vaccination willingness. Vaccination willingness was measured using an ad-hoc, 10-item scale measuring how much participants favor different measures taken to motivate vaccination (e.g., government mandating vaccination). The study was preregistered (https://aspredicted.org/blind.php?x=7TY_YJX) and all materials, data, and preprints are available in OSF (https://osf.io/2kcnf/). 307 participants answered an online survey. A stepwise regression of preregistered variables using .05 F-change for variable entry and .10 F-change for variable removal shows that authoritarianism (B=,162, p=.002), social solidarity (B=.107, p=.011), and vaccine attitudes (B=.727, p=000) significantly predict vaccination willingness. Introducing control variables shows that being vaccinated against Covid-19 had an effect in willingness to vaccinate (B=-.399, p=000). These results suggest that Covid-19 vaccination willingness results from a combination of factors including general attitudes towards vaccines as well as beliefs around political functioning of society.

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6:00–7:00 PM (1056)

Heuristics and Biases in Dyads vs. Individuals. JACOB BREAUX, *Montclair State University,* MICHAEL BIXTER, *Montclair State University* (Sponsored by Michael Bixter) — Much of the heuristic and bias research up to this point has been relegated to studying individuals, and there is a severe lack of attention devoted to the same phenomena at the team and small-group level. The purpose of this study will be to identify performance differences in a variety of heuristic and biases between individuals and dyads. Participants will complete the decision task either alone or with a partner. The decision task consists of twelve different heuristic and bias problems, including base-rate neglect, regression to the mean, conjunction effect, framing effect, and the sunk cost fallacy, to name a few. The current study will contribute to the judgement and decision-making literature by providing novel information about differences in decisions between individuals and dyads across a variety of heuristics and biases. The project is currently ongoing and data collection will conclude by early Fall.

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6:00–7:00 PM (1057)

Role of Intellectual Humility and Distress on Vaccination Attitudes. AMANDEEP DHALIWAL, *The University of Texas at Arlington,* DANIEL LEVINE, *The University of Texas at Arlington,* ELAINE WONG, *The University of Texas at Arlington,* LONDON GILES, *The University of Texas at Arlington* — Individuals with the trait of intellectual humility (IH) tend to have positive perceptions regarding vaccines (Huynh et al., 2021) among other pro-social values (Krumrei-Mancuso, 2017). Furthermore, psychologically distressed people show hesitancy toward the COVID-19 vaccine for themselves and their families (Xu et al., 2021). In our study (N = 167),

IH partially mediated the relationship between distress and vaccination attitudes. Distress predicted negative perception towards vaccines $F(2,164) = 22.86$, $p < .001$, $R2 = .22$, $b = .08$, $t(164) = 6.10$, $p < .001$ while IH predicted positive attitude towards vaccines $b = -.07$, $t(164) = -2.67$, $p < .001$. Albeit a small effect (indirect effect = .01), these results indicate that there may be some buffering effect of intellectual humility on people experiencing distress which could impact vaccination attitudes. Additionally, generally trusting individuals tended to report negative attitude towards vaccines ($b = .31$, $p < .001$).

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6:00–7:00 PM (1058)

Effects of Verbal and Numerical Phrasing of Risk Information in Decision-Making. MICAH DUVALL, *Louisiana State University of Alexandria,* CLAYTON HISLOP, *Louisiana State University of Alexandria,* GAVIN JANISE, *Louisiana State University of Alexandria,* LOGAN DUFF, *Louisiana State University of Alexandria,* MARK LACOUR, *Louisiana State University of Alexandria* — Judgment and decision-making research often uses numerical probability phrases to convey risk. There has been a lack of emphasis on how risks are presented verbally in real world domains (drug advertisements, messaging from world health organizations, retail). After examining several examples from these domains, we found that organizations tended to use one of two verbal formats to convey risk: (1) ones that convey the size of the risk (i.e., its magnitude) by using phrases like "there is a very remote chance"; (2) ones that indicate that a risk is present but without any attempt at conveying the actual magnitude of the risk (e.g., "there is a chance"). In other words, the latter category merely conveys that an outcome is within the "realm of possibility." Across two similar studies (total n = 3,220), we asked participants to make a single hypothetical decision. They were randomly assigned to five decision contexts. Within these, either a "realm of possibility," magnitude, or numerical phrase was used to convey risk. Results suggested that the use of "realm of possibility" phrases results in the greatest perceptions of risk. Also, using verbal phrases generally creates stronger risk perceptions compared to numerical phrases.

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6:00–7:00 PM (1059)

Evaluating the Efficacy of Stress as a Screening Tool in Voir Dires: Assessing Its Effects on Cognition and the Ability to Render Competent Verdicts. KALYNE LYNCH, *University of Massachusetts Lowell* — Prior research has focused primarily on the utility of bias scales in optimizing juror selection (Kassin & Wrightsman, 1983; Jones et al., 2015); yet, studies have additionally shown that jurors can vary in psychosocial stress experienced throughout the trial process (NCSC, 1998; Bornstein et al., 2005). Thus, the potential of using the Perceived Stress Scale (PSS; Cohen et al., 1983) as a juror screening tool was evaluated being that stress influences a number of cognitive processes related to decision making (Soares et al., 2012; Morgado et al., 2015). The PSS was administered at the beginning of the study. Participants (n = 55) were then asked to report a verdict and answer questions related to their comprehension of the trial. Jurors who reported higher PSS demonstrated significantly lower comprehension of the trial evidence than did those with lower PSS scores, $t(53) = 2.49$, $p = .02$. Other significant relationships were found in relation to verdicts rendered and verdict consistency. Stress may impact different cognitive processes needed to render a competent verdict, though future studies will require a larger and more diverse sample size to ensure the results generalize.

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6:00–7:00 PM (1060)

Prospect Theory and Reasoning About COVID-19 Probabilities. JAVIER CORREDOR, *Universidad Nacional de Colombia,* JOHANNA SÁNCHEZ-MORA, *Universidad Nacional de Colombia,* JUAN DAVID HERNANDEZ-POSADA, *Universidad Nacional de Colombia* — This study describes how COVID-19 contagion risk is associated in a non-linear manner with the perception of other health risks and with emotional reactions. More interestingly, this study shows that these relationships are consistent with the mathematical model of subjective probability proposed by prospect theory (Tversky & Kahneman, 1992). In particular, the study finds prospect theory patterns between contagion risk and death risk for oneself but not for others, and between contagion risk and different types of negative emotional reactions. A similar relationship was observed between contagion risk and the risk derived from going out during the pandemic. The article compares models that use linear estimation with models using prospect theory estimates. Results indicate that prospect theory models have better fit estimates than linear models. Additionally, this article shows that non-linear relationships of this type can be fitted also using cubic models, which allows more straightforward parameter estimation. The importance of including non-linear relationships in the evaluation of health risks is discussed.

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6:00–7:00 PM (1061)

The Repetition-Based Truth Effect: Reduced Discrimination Ability or a Shift in Response Bias? OLIVER SCHMIDT, *Philipps-Universität Marburg,* DANIEL W. HECK, *Philipps-Universität Marburg* — The repetition-based truth effect refers to the phenomenon that repeated statements are more likely judged as 'true' than new statements. So far, it is not fully clear whether it reflects a reduced ability of discriminating between true and false statements or a shift in response bias towards judging statements as 'true'. To address this question, we adopt the two-high-threshold model (2HTM) for truth judgments (Hilbig, 2012), a multinomial model assuming that knowledge and guessing determine observed judgments. The model assumes that repetition leads to a response-bias shift conditional on the lack of knowledge and is thus equivalent to the knowledge-conditional model proposed by Fazio et al. (2015). In contrast, the fluency-conditional model assumes that knowledge is used only when not relying on a general, fluency-induced response bias, which overall results in a reduced discrimination ability. To compare the models, we

use a standard truth-effect paradigm and manipulate prior knowledge by selecting easy and difficult questions and guessing by informing participants about the base rate of true and false statements. We also assess the observed and fitted response patterns using receiver operating characteristic (ROC) curves.

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6:00–7:00 PM (1062)

Does Hand Proximity Enhance Cognitive Control? GIORDANA GROSSI, *SUNY New Paltz,* ANNIE OLMSTEAD, *The Pennsylvania State University,* JESSICA CONKLIN, *SUNY New Paltz,* KAYLIN VERMILYEA, *SUNY New Paltz* — Previous studies have reported a reduction of the Stroop effect when words are presented near, compared to away from, the hands (proximal vs. distal). One of the hypotheses raised to explain the effect concerns enhanced cognitive control near the hands. In this study, we manipulated hand proximity along with the percentage of incongruent trials (20% vs. 80%), a factor known to affect cognitive control. If cognitive control is enhanced near the hands, the Stroop effect would be smaller in the proximal than distal position when most trials are congruent (congruency x percentage of incongruent trials x hand proximity interaction). Forty-nine participants completed the Stroop task in 2x2x2 repeated-measure design. As expected, the Stroop effect was moderated by the percentage of incongruent trials (it was larger when most trials were congruent). We also observed a three-way interaction with hand proximity, but not in the expected direction. It remains unclear whether hand proximity enhances cognitive control.

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6:00–7:00 PM (1063)

Using Visual Interference to Investigate the Embodiment of the Conceptual Features of Shape and Color. NATHAN LAUTZ, *University of Connecticut,* EILING YEE, *University of Connecticut* — There is evidence that the neural systems involved in perceiving particular visual features, like color and shape, are also active when conceiving of those features (e.g., conceiving the blackness and roundness of a tire). But when representing these features, is there a distinction within the visual system in the functional involvement of the systems for perceiving color and shape? In this study, we used a visual interference paradigm to investigate this question. Participants made judgements on triads of words to decide which pairs of words were more similar in terms of shape, on half of trials, or color, on the other half. Half of triads were paired with concurrent visual interference – color gradients for half of participants, abstract shapes for the remaining half, flashed at 3 Hz behind the triad of words. Preliminary analyses show that, unexpectedly, shape interference may facilitate (rather than disrupt) shape judgements, and that color interference does not specifically disrupt color judgements. Interestingly, participants' vividness of visual imagery abilities may interact with interference effects. These findings suggest visual feature-specific differences in the embodiment of conceptual knowledge.

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6:00–7:00 PM (1064)

Individual Differences in Interoceptive Accuracy and Sensibility Influence Effects of Attentional Manipulations on Processing of Emotion Concepts. ALEXANDRA E. KELLY, *Drexel University,* PRIYA DUDHAT, *Drexel University,* EVANGELIA G. CHRYSIKOU, *Drexel University* — Emotions are associated with bodily states that potentially necessitate context-specific embodied simulations for concept comprehension. Whether interoception, our interpretation of our physiological state, plays a critical role in these simulations remains unknown. Here, we manipulated attention to respiratory rate and used a feature-verification task to assess processing of emotion, concrete, and abstract (but non-emotion-related) concept-feature pairs. Participants were guided through a mindful breathing exercise and instructed to pay attention to the sensations of breath before beginning the task. They reported an estimate of number of breaths taken during the preceding minute at intervals throughout the experiment, while we continuously recorded respiration rate. Using a linear mixed effects model, we examined how individual differences in multiple measures of interoceptive ability contributed to reaction times to verify features by conceptual category. Our results indicate that interoceptive resources may be recruited for processing emotion concepts, but the impact on processing speed is dependent on individual differences in baseline interoceptive sensibility and task-concurrent engagement of those resources.

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6:00–7:00 PM (1065)

Processing Misinformation: Role of Psycholinguistic Lexical Variables. NADIA LANA, *McMaster University,* VICTOR KUPERMAN, *McMaster University* — In this age of misinformation, effective public engagement with science is a growing concern. Yet there is little understanding how misinformation is processed compared to scientific evidence. This study examines how psycholinguistic lexical variables (concreteness and affect) influence reading, understanding and attitudes toward scientific and conspiracy texts. 100 adult English speakers read short texts (conspiracy theories vs. scientific evidence) that were manipulated to vary in degree of concreteness and affect. After each text, participants rated comprehension and trustworthiness of the text. Participants also completed a survey on beliefs and relationships with science (FINSCI, 2021) to evaluate individual differences. Preliminary findings confirm our hypothesis: Texts representing conspiracy theories and scientific evidence were rated higher and comprehended more accurately if they contained more concrete and emotionally loaded words. Implications for public messaging are discussed.

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6:00–7:00 PM (1066)

Black Is Right, Yellow Is Left. HSIN-MEI SUN, *College of St. Scholastica,* DAYELISE DAVIDSON, *College of St. Scholastica* — Previous studies suggest that positive ideas are implicitly associated with one's dominant side. For example, the body-specificity

hypothesis (Casasanto, 2009) states that right-handed individuals tend to associate positive valence (e.g., good) with the right space and negative valence (e.g., bad) with the left space, while the opposite is true for left-handed individuals. Can the body-specificity hypothesis be extended to color-space associations? Research has found robust color-emotion associations, such as black/yellow and sadness/joy, across countries and cultures (Jonauskaite et al., 2020). Would colors associated with positive emotions be more likely to be assigned to one's dominant side? To answer this question, we had participants move color labeled blocks to one of two boxes located to their left and right. We hypothesized that a majority of participants would move the colors associated with positive emotions to the box on their dominant-hand side and the colors associated with negative emotions to the box on their nondominant-hand side. However, our results showed the opposite pattern, suggesting that the body-specificity hypothesis does not extend to color-space associations.

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6:00–7:00 PM (1067)

Automatic Activation of a Sensory-Based Functional Knowledge. STEVE BUENO, *Université Sorbonne Paris Nord,* ALIX SEIGNEURIC, *Université Sorbonne Paris Nord,* HAKIMA MEGHERBI, *Université Sorbonne Paris Nord* — The semantic-priming paradigm has been largely used to explore the mental lexicon and far more rarely to put the embodied cognition theory to the test. However, one study showed priming effect for words that were solely related on the basis of shared manipulation-features but not on the basis of shared semantic-features (e.g., stroller-lawnmower; Myung et al., 2006). Nevertheless, this study was conducted under an auditory paradigm and then fell short to provide clear information about the time course of manipulation-features activation. The present study aims to test priming effects based on manipulation-features under a visual lexical decision task and a categorization task to address task demand. The time course of the manipulation-features activation is explored through the variation of different prime durations. Results are discussed in the framework of the embodied cognition theory.

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6:00–7:00 PM (1068)

The Role of Emotional Content in Segmenting Naturalistic Videos into Events. RUIYI CHEN, *Cornell University,* KHENA M. SWALLOW, *Cornell University* — Humans naturally divide continuous experience into meaningful events (event segmentation) when they encounter changes in the ongoing situation, resulting in event boundaries. Though various situational changes (e.g., goal and location changes) make event segmentation more likely, a core feature of experience, emotion, has been generally overlooked in the literature. Like events, emotion may guide attention and structure memory over time, influencing when the brain's internal model of ongoing experience is updated. We therefore hypothesized that emotion interacts with event segmentation. Participants pressed a button to identify either emotional changes or event boundaries while viewing moderately arousing videos. Results showed that participants agreed with each other about when emotional changes occurred in the videos, and the emotional changes they identified correlated with event boundaries marked by another group. Independent, continuous ratings of valence and arousal of the videos by naïve viewers were also obtained, and changes in these ratings were also predictive of event boundaries. Thus, the way people divide ongoing experience into events appears to be tied to emotion.

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6:00–7:00 PM (1069)

Effects of Emotionally Valenced Objects on Associative Memory of Events. LINDSEY R. PUGH, *Florida Atlantic University,* ALAN W. KERSTEN, *Florida Atlantic University,* JULIE L. EARLES, *Florida Atlantic University,* ELIZABETH ESCUAGE, *Florida Atlantic University* — Kersten et al. (2021) revealed that participants remembered negatively valenced actions better than neutral actions but did no better at binding negative actions with the people who performed them than they did with neutral actions. We were interested in testing whether emotion only enhances memory for individual features of an event or whether emotion can also enhance binding of certain combinations of features. In particular, we tested the effect of emotionally charged objects on the ability to remember those objects and the actions associated with them. Participants saw a series of brief videos involving an actor performing two different actions on two specific examples of each of a number of object categories (e.g., two different guns), some neutral in valence, some positive, and some negative. Participants were later tested on their ability to distinguish old events from novel conjunctions of particular objects with the actions that had been performed with the other members of the same categories. Participants did better at distinguishing old events from these conjunction items for negatively valenced objects than for neutral objects, suggesting enhanced binding of emotional objects with their associated actions.

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6:00–7:00 PM (1070)

Executive Involvement in Source Memory for Actions Varies with the Number of Sources. MEGAN S. SMITHWICK, *Florida Atlantic University,* ALAN W. KERSTEN, *Florida Atlantic University,* JULIE L. EARLES, *Florida Atlantic University,* CARLOS VACA ANGUS, *Florida Atlantic University* (Sponsored by Alan Kersten) — Source memory typically engages frontally-mediated executive processes, whereas item memory recruits more basic medial temporal memory mechanisms. A key difference between source and item memory tasks, however, is the typically much larger number of items than of sources, perhaps more strongly encouraging strategic processing of source information than of item information. We tested the impact of this variable using a test of source memory for actions, with those actions performed either by an equally large number of actors or by just two actors. To manipulate opportunities

for executive involvement, participants performed a secondary tone counting task either while encoding the actions, retrieving the actions, or during neither encoding nor retrieval. When many actors performed the actions, distraction at encoding yielded decreased memory for individual features of the events (i.e., individual actors and actions), but had no specific impact on source memory for the actions (i.e., who did what). In contrast, when just two actors performed the actions, distraction impacted source memory performance above and beyond any impacts on memory for individual features, suggesting greater executive involvement with small numbers of sources.

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6:00-7:00 PM (1071)

Failures to Detect Reversed Events Persist Without Disruptions and Do Not Impact Event Memory or Event Segmentation. YINING DING, *Washington University in St. Louis,* MADISON LEE, *Vanderbilt University,* DANIEL LEVIN, *Vanderbilt University* — A previous study by Hymel, Levin, and Baker (2016) demonstrated that participants had difficulty detecting events that were misordered while viewing live-action videos, which suggests that sequence coding may not be a necessary constituent of event perception. This study tested whether this difficulty would persist in the absence of the between-action disruptions used by Hymel et al, and whether more sensitive measures might reveal the impact of event reversals. We tested whether reversals would impact event memory and event segmentation. We found that reversals did not increase visual detail encoding, or event segmentation, but subevents during the reversal affected the timing of segmentation responses. These results reinforce the idea that viewers do not engage in moment-to-moment examination of event sequence as a default process. We argue that brief reversals rarely achieve awareness and minimally impact viewers' representation of events, especially when no task-specific demand focuses attention on event sequence.

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6:00-7:00 PM (1072)

A Hybrid Model of Event Comprehension Predicts Human Activity at Human Scale. TAN NGUYEN, *Washington University in St. Louis,* MATT BEZDEK, *Washington University in St. Louis,* SAMUEL GERSHMAN, *Harvard University,* AARON BOBICK, *Washington University in St. Louis,* JEFFREY M. ZACKS, *Washington University in St. Louis* — Humans perceive a continuous stream of sensory input as discrete events. According to Structured Event Memory (Franklin et al., 2020), humans learn event schemas through similar experiences in the past and use these event schemas to continuously predict what will happen next. When there is a discrepancy between the currently activated event schema's predictions and sensory input, an event boundary is perceived and a different event schema is activated. Here, we present a hybrid model of event cognition that combines the strengths of probabilistic reasoning and neural networks to learn event models and generalize to new events. The model uses a Bayesian process to learn across-event relations and recurrent neural networks to learn within-event relations. We trained the model on a large-scale corpus of activity sequences, using features representing the actor's body position and motion, and the semantics of interactive objects. For activity sequences that the model has never seen before, we show that the model learns to predict naturalistic human activity, the model segments the activity in a human-like fashion without being reinforced for segmentation, and it forms event models that correspond with human judges' action categories.

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6:00-7:00 PM (1073)

Predictive Looking and Predictive Looking Errors in Daily Activities. SOPHIE SU, *Washington University in St. Louis,* MATT BEZDEK, *Washington University in St. Louis,* CHRISTOPHER HALL, *Washington University in St. Louis,* JEFFREY M. ZACKS, *Washington University in St. Louis* — People automatically segment continuous streams of stimuli into distinct episodes while watching everyday activities. Prediction errors, the difference between prediction and reality is theorized to drive segmentation. An implicit and continuous measurement of people's prediction errors while watching movies is needed to test theories and validate computational models. Previous studies have shown people look predictively for static pictures and at critical periods in movies. However, it's unclear if predictive looking is present throughout movies. We present a model of predictive looking in which people's previous gaze patterns are predictors of the current frame's saliency density. We tested this model using participants' group gaze density maps and movie actors' hand locations. We showed that people's past gaze up to 3 seconds is predictive of actors' current hand locations. Prediction error generated based on gaze density is correlated with segmentation density, making it a potential candidate to serve as an implicit measure of people's prediction error and a benchmark of computational models.

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6:00-7:00 PM (1074)

Explicit Teaching of Finger Counting in Kindergarteners. CÉLINE POLETTI, *University of Lausanne,* MARIE KRENGER, *University of Lausanne,* MARIE LÉTANG, *Éditions Nathan,* CATHERINE THEVENOT, *University of Lausanne* — Kindergarteners aged from 5-to-6 years were involved in an intervention program targeting finger counting. A crucial question in the current literature is whether explicitly teaching children to represent the operands of an addition problem and count their fingers raised (i.e., ALL strategy) can help them to solve the problems. Out of 41 children, 10 children did not count on their fingers at the beginning of the program. Our results show that 7 of them were able to learn the finger counting strategy. Moreover, after the intervention, the performance of children who did not count on their fingers initially was improved after the intervention (i.e., from 64% to 90% of correct responses). Therefore, we show that learning to use fingers to solve arithmetic problems through explicit teaching is possible and that, crucially, this

kind of intervention can improve children's performance. This last conclusion can be formulated for the first time.

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6:00-7:00 PM (1075)

The Influence of Leading Zeros on the Left Digit Effect in Number Line Estimation. HILARY BARTH, *Wesleyan University,* LEAH VAIDYA, *Wesleyan University,* SELENA DELGADO, *Wesleyan University,* SARAH HAMMOND, *Wesleyan University,* RACHEL HSU, *Wesleyan University,* COURTNEY LITTS, *Wesleyan University,* JINJIA HU, *Wesleyan University,* JESSICA PORDY, *Wesleyan University,* SHANTHI SOANS, *Wesleyan University,* ABBY WOLK, *Wesleyan University,* ANDREA L. PATALANO, *Wesleyan University* — Placements in number line estimation tasks are strongly shaped by the leftmost digits of target numerals: for example, numerals like 899 and 901 are placed far apart on a 0-1000 line despite their similar magnitudes. Does this effect exist when the leftmost digit is a zero and the informative hundreds-place digit is not the leftmost? We asked whether adults (N = 37) would exhibit a left digit effect on a 0-1000 number line task when target numerals had leading zeros (e.g. 0899). Participants also completed a block of typical trials (no leading zeros in target numerals). Analyses were preregistered. A typically large left digit effect was found both when target numerals contained leading zeros (d = 1.12) and when they did not (d = 0.84). The size of the effect did not differ significantly between these conditions. This finding shows that the left digit effect is really a leftmost meaningful digit effect, at least in adults.

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6:00-7:00 PM (1076)

Telling People About the Left Digit Effect in Number Line Estimation Does Not Reduce the Effect. GINA GWIAZDA, *Wesleyan University,* CHARLES BONDHUS, *Wesleyan University,* KELSEY KAYTON, *Ohio University,* HILARY BARTH, *Wesleyan University,* ANDREA L. PATALANO, *Wesleyan University* — A robust left digit effect (LDE) arises in number line estimation where numerals with different leftmost digits but nearly identical magnitudes (e.g., 298 and 302) are placed farther apart on a number line than is warranted. Past efforts to motivate individuals to perform more accurately on the number line estimation task have not led to a reduction in the LDE. In two studies, we investigated whether telling people about the LDE reduces or eliminates the effect. In Study 1, participants (N = 134 adults) were randomly assigned to either an instructional or a control condition in which they completed two blocks (60 trials per block) of a self-paced 0-1000 number line estimation task. In Study 2, participants (N = 143 adults) completed the same task, with an added manipulation check and further questions about strategies, effort, and confidence. In both studies, there was a large LDE in each block and condition. The intervention did not lead to a reduction in the LDE relative to the control condition in either study, despite participants indicating greater effort and confidence following the intervention. These findings demonstrate that the LDE is not easily reduced, even when one is made aware of it.

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6:00-7:00 PM (1077)

The Influence of Benchmarks on the Left Digit Effect in Number Line Estimation. KELSEY KAYTON, *Ohio University,* PRAKRITI MITTAL, *Wesleyan University,* HILARY BARTH, *Wesleyan University,* ANDREA L. PATALANO, *Wesleyan University* — A left digit effect exists in number line estimation where numerals with different left most digits, but similar magnitudes (e.g., 699 vs. 701), are placed farther apart than is warranted. The effect is robust, and previous efforts to reduce the effect using motivational incentives and accuracy feedback have been unsuccessful. In a preregistered study, we tested the use of a benchmark intervention to reduce the left digit effect. Participants (N = 165 adults) completed three blocks of 60 trials each of a 0-1000 bounded number line task, where the middle block contained unlabeled benchmarks at quartiles for half of the participants. We found a statistically significant interaction, indicating a reduction in the left digit effect during and following the benchmark intervention. There was also a small positive correlation between one's left digit effect in the first block of the number line task and one's left digit effect on a separate consumer judgment task. These results provide evidence that the left digit effect can be reduced, and motivate future consideration of whether improvements extend to other judgment tasks as well.

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6:00-7:00 PM (1078)

The Left Digit Effect in an Unbounded Number Line Task. ANDREA L. PATALANO, *Wesleyan University,* KELSEY KAYTON, *Ohio University,* GREG FISCHER, *Wesleyan University,* HILARY BARTH, *Wesleyan University* — There is a left digit effect in number line estimation where numerals with different leftmost digits (e.g., 699 vs. 701) are placed farther apart on a number line than is warranted, despite having nearly the same magnitudes. The left digit effect has been studied using a bounded number line task, in which the number line bounded by two endpoints (e.g., 0 and 100) and the task is to place target numerals on the line. We investigated the extension of the left digit effect to the unbounded number line task (that starts at 0 but does not have a labeled endpoint), which involves using the size of one unit to estimate the location of a target numeral, and invokes different strategies than those employed in the bounded number line task. In a preregistered study, participants (N = 58 adults) completed four blocks (with 38 trials per block) of a 0-100 unbounded number line task. We found a statistically significant left digit effect with a large effect size. The findings provide evidence that the left digit effect is not specific to the bounded number line and may arise during the conversion of multidigit numerals to magnitudes.

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6:00–7:00 PM (1079)

(Dis)Similarities Between Non-Symbolic and Symbolic Number Representations: Insights from Vector Space Models. XUEYING REN, *University of Pittsburgh,* MELISSA LIBERTUS, *University of Pittsburgh* — Competing theories have emerged about the relation between non-symbolic and symbolic number representations. One theory suggested that similarities between non-symbolic and symbolic number processing can be explained by the principle of efficient coding, which suggests that perception should be optimized when the stimuli occur more frequently in a natural environment. In line with this, language learning and use are also contextual and probabilistic, which could follow the same efficient coding principle. In this study, we used a vector semantic model to quantify word distributions in a natural language environment and investigate the (dis)similarities underlying non-symbolic and symbolic number representations. To this end, we tested 73 adult participants on a number comparison task with both non-symbolic (dots arrays) and symbolic numbers (English words and Arabic numbers). We will test whether participants' task performance can be best explained by the numerical ratio between numbers or by efficient coding principles. Importantly, we will test whether these results differ by number format.

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6:00–7:00 PM (1080)

Be Original: Divergent Thinking Mitigates the Impact of Math Anxiety on Math Performance. MAREIKE B. WIETH, *Albion College,* ANDREA P. FRANCIS, *Albion College,* OLIVIA LORENZONI, *Albion College,* DOMONIC J. MCDONALD, *Albion College* — Considering a problem from different perspectives is essential for math problems requiring multiple solutions (Leikin, 2009). Increased divergent thinking is associated with increased mathematics performance (Jeon, Moon, & French, 2011; Kroesbergen & Schoevers, 2017). Math anxiety has been shown to hinder math performance (e.g., Ashcraft and Kirk, 2001; Ashcraft, 2002), especially when problems require more than simple memory retrieval (Ashcraft & Krause, 2007). The current study explored the role of divergent thinking, in particular originality, in math anxious and non-math anxious individuals completing number sequence tasks. Consistent with previous research, participants with high math anxiety performed significantly worse on the number sequence tasks than participants with low math anxiety. However, this finding was qualified by an interaction with originality, such that highly math anxious participants who showed high original thinking performed significantly better on the number sequence tasks than highly math anxious participants with low original thinking. These findings suggest that promoting divergent thinking, in particular originality, may mitigate the deleterious effects of math anxiety on mathematical performance.

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6:00–7:00 PM (1081)

Which One Is Bigger? Comparing Symbolic Numerical Comparison Tasks. FRAULEIN RETANAL, *University of Ottawa,* VERONIC DELAGE, *University of Ottawa,* EVAN F. RISKO, *University of Waterloo,* ERIN MALONEY, *University of Ottawa* — The processing of numerical magnitude is commonly assessed using one of two tasks; comparison to a standard, where participants compare a single digit to a fixed standard (e.g., 5), or simultaneous comparison, where participants compare two digits presented simultaneously (e.g., 7 and 2). Performance is faster and more accurate as the numerical distance between two numbers increases (i.e., people are faster and more accurate to identify 7 as larger than 2 relative to 7 as larger than 6). This numerical distance effect (NDE) arises in both simultaneous comparison and comparison to a standard. Thus, these tasks are used interchangeably. Across two studies, we tested the theory that the NDE generated in the simultaneous comparison tasks arises due to the placement of numbers along a spatial number line held in working memory whereas the NDE that arises in comparison to a standard is not. Consistent with our theory, while NDE generated when comparing simultaneously presented digits is negatively correlated with spatial ability, the NDE generated when comparing a digit to a standard is not. The implications of these data for our understanding of numerical comparison tasks and numerical representation more generally will be discussed.

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6:00–7:00 PM (1083)

Recruitment of Number Magnitude Representations Helps (and Hurts) Bar Graph Comprehension. JIMIN PARK, *University of Minnesota,* SASHANK VARMA, *Georgia Institute of Technology* — Data visualization is the study of how to best communicate information using graphic representations. The current study applies theories and experimental paradigms from the numerical cognition literature to investigate how people understand the numerical values depicted in bar graphs. The central prediction is of an orientation effect, with better understanding when bars are oriented horizontally versus vertically (the default in Excel) because the former aligns with the purported mental number line. Pilot study data support our prediction of orientation effect. Moreover, the pilot study also found the predicted order effect, with faster comparison of bars on vertically oriented bar graphs when they are ordered from smallest to largest left-to-right (versus right-to-left). Finally, comparison times were driven by differences in the magnitudes of the bars rather than the numerical values they depict (which was manipulated by changing the scale of the axis). We plan to complete data collection by Summer 2022.

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6:00–7:00 PM (1084)

Shared Mental Number Line with an Inanimate Partner Is Induced After Exposure to Advances of Artificial Intelligence. DENISE WU, *National Central University,* JOSEPHINE LEE, *Taipei Fuhsing Private School,* KAI JAY WONG, *National Central University,* JUNG-YU SUNG, *National Central University,* JUI-CHUNG LI, *New York University Population Center* — Our previous research has indicated that participants share the mental representation of an abstract number line only with a human partner but not with an inanimate partner (i.e., a computer program). In the present study, college students performed the classic SNARC task by judging the oddity of a centrally presented number after reading an article describing the advances of artificial intelligence (AI) or those of quantum computing (QC). The SNARC effect was determined by whether left-sided responses were faster to small than large digits, while right-sided responses were faster to large than small digits. The results revealed the typical SNARC effect when participants collaborated with an inanimate partner only after reading the article of AI advances but not after reading that of QC advances. These findings imply that people can share mental representations with computers if the former believe that the latter have similar intellectual capacities.

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6:00–7:00 PM (1085)

Do Musical Ability/Training and Working Memory Updating Play a Role in Second Language Morphosyntax Learning? VICTORIA TKACIKOVA, *University of Pittsburgh,* NATASHA TOKOWICZ, *University of Pittsburgh,* TESSA WARREN, *University of Pittsburgh* — What makes some adults better second language (L2) learners than others? At the individual level, recent research has highlighted a link between working memory updating and L2 learning (e.g., Morales et al., 2015) and between musical experience and L2 learning, but mainly in the phonological domain (e.g., Zeromskaite, 2014). Through a language training and self-paced reading paradigm, the present study assessed the role of musical ability/training and working memory updating in L2 morpho-syntax learning in online and offline processing. The results showed that learners with more musical ability/training and higher working memory updating abilities performed better on an assessment of newly-learned L2 grammar than learners with less musical ability/training and lower working memory updating. Reading times at the violation also showed different patterns for these learners than their less-skilled counterparts, suggesting that learners with more musical skill and working memory updating may adopt more top-down strategies during reading. These results emphasize the importance of capturing individual differences in conjunction with linguistic differences to better understand differences in adult L2 learning outcomes.

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6:00–7:00 PM (1086)

Are Language Self-Evaluations More Biased for Some People Than Others? ESTEBAN HERNÁNDEZ-RIVERA, *McGill University,* ANNE L. BEATTY-MARTÍNEZ, *McGill University,* MEHRGOL TIV, *McGill University,* DEBRA TITONE, *McGill University* — Bilingualism researchers often rely upon self-evaluation data to quantify people's language habits, proficiency, and experience. However, the social value people attach to particular language behaviours and their "inner-comparison-group" might jointly bias these self-assessments. To study this, we examined French-English bilingual adults' (n=68) self-assessments across distinct aspects of L1/L2 experience in relation to benchmark measures of L1/L2 performance. There were two key findings: 1) French L1 bilinguals' self-evaluations of L2 proficiency were less coupled with objective measures compared to English L1 bilinguals, suggesting they may have overestimated their global abilities; 2) English L1 bilinguals' French accentedness judgements were less coupled with general L2 proficiency compared to French L1 bilinguals, in a manner suggesting they may have underestimated their accent. These preliminary results suggest that people's self-evaluations potentially vary with sociolinguistic history and one's inner comparison group. We are currently testing this hypothesis for larger groups and more objective, targeted, benchmark measures.

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6:00–7:00 PM (1087)

Phonological Similarity Judgements Among Moderately Proficient Adult English Language Learners. ANNA MORO, *McMaster University,* DANIEL SCHMIDTKE, *McMaster University* — In previous work on adult Chinese L1 – English L2 learners, enrolled in an 8-month university bridging program, word reading ability was determined by phonological processing and listening skills (Schmidtke & Moro 2021). We examined bilingual phonological processing further in this population. Adapting Schmitterer and Schroeder's (2019) methods for investigating rime judgement (RJ) in German, we created a new auditory RJ task. Each target word (e.g., right) included 4 conditions, representing degrees of phonological overlap: rime (fight), body (rice), nucleus (bike) and control (thumb). 2 cohorts (n=121) with moderate English proficiency were tested at the beginning (t1) and end (t2) of the program. At both timepoints, participants displayed greater accuracy and speed in rime and control conditions; significantly less accuracy and speed in the nucleus condition, and least accuracy and speed in the body condition. Significant gains in latency occurred by t2. Results are discussed with reference to the psycholinguistic grain size theory (Schmitterer & Schroeder 2019; Ziegler & Goswami 2005) and accounts (e.g., Lin, Cheng & Wang 2018) that consider language-specific sub-syllabic unit preferences in bilingual phonological processing.

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6:00–7:00 PM (1088)

Five Days to Learn Dutch! Language Experience and Exposure Affect Learning Online. GUADALUPE MENDOZA, *University of California, Irvine,* KELLIE WEAST, *University of California, Irvine,* MEGAN NAKAMURA, *University of Florida,* CESAR M. ROSALES, *University of Florida,* ELEONORA ROSSI, *University of Florida,* JUDITH F. KROLL, *University of California, Irvine* — We report a study in which bilingual and monolingual learners engaged in five days of Rosetta Stone rapid language training in Dutch, a language novel to them and not overheard in the ambient environment. Each language lesson lasted for approximately an hour over each of the five days. In the pandemic context, ambient language exposure was artificially simulated through daily brief immersive language videos in English and Dutch. We compared the performance of these learners on measures of semantic verbal fluency, grammaticality judgments in Dutch, and semantic categorization in Dutch before and after language training. After only five days of training, all learners acquired some Dutch, but the performance of bilingual learners was differentially enhanced by exposure to the Dutch videos, suggesting that their past language experience enabled them to exploit the brief immersion context. We discuss the implications for claims about the consequences of prior language experience and language immersion for new learning.

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6:00–7:00 PM (1089)

First and Second Language Associative Network in Second Language Learners: An ERP Study. MAR SUAREZ, *University of Salamanca,* M. SOLEDAD BEATO, *University of Salamanca* — How do the associative networks of the first language (L1) and the second language (L2) differ? To answer this question, the associative priming effect in the L1 and the L2 were examined by means of reaction times and the N400 event-related potential (ERP) component as a function of associative strength. Sixty-five undergraduate students whose L1 was Spanish, and that have learned English as an L2, participated in a lexical decision task. In this task, prime-target relationship (strong, weak, unrelated pairs) was manipulated as a within-subject factor, and language (L1, L2) as a between-subject factor. Furthermore, word length, frequency, orthographic neighborhood, orthographic similarity, and participant's knowledge of L2-word meaning were kept under control. The results showed that whereas the associative priming effect and the N400 effect in the L1 were found in strongly and weakly associated word pairs, in the L2 the effects were only found when word pairs were strongly associated. These findings provide evidence that the associative network in the L2 is less well organized and has fewer connections than in the L1. Results will be discussed in terms of the Revised Hierarchical Model.

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6:00–7:00 PM (1090)

The Effect of Language Proficiency on Retrieval Induced Forgetting: An Investigation Among Greek Native Speakers Who Learn English as a Second Language. ELVIRA MASOURA, N/A, *Aristotle University of Thessaloniki,* VASILIKI A. KARAGIORGOU, *Aristotle University of Thessaloniki,* GREGORY KIOSEOGLOU, *Aristotle University of Thessaloniki* (Sponsored by Elvira Masoura) — Retrieval Induced Forgetting (RIF) is a phenomenon in which the retrieval of a subset of information causes the forgetting of other information, related to the former. Research data indicates that RIF is significantly affected by the knowledge of a language, as levels of RIF are lower in a second language. We examined whether varying knowledge of a second language affects the phenomenon. We compared two groups, 60 advanced learners and 60 beginners, all native Greek speakers who learn English as a second language. They repeatedly practiced and recalled lists of words in their native and in second language. No significant differences in RIF were observed between the two groups, while beginners, but not advanced learners, showed more RIF in their native language. Furthermore, we alternated the language (Greek, English) that we asked participants to use during the practice and the retrieval of the words. We found that RIF appeared in significantly higher levels when participants were practicing in the foreign language and retrieving in native. We interpreted our results as an indication that RIF is due to inhibitory mechanisms.

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6:00–7:00 PM (1091)

The Role of Working Memory in Cross-Situational Word Learning. YE LI, *Arizona State University,* VIRIDIANA L. BENITEZ, *Arizona State University* — Cross-situational word learning (CSWL) is a powerful mechanism to resolve referential ambiguity by calculating word-referent co-occurrences across individually ambiguous naming events. Despite its robustness as a group-level capacity, less is known about the learning process underlying structural variations. The study aimed to probe the learning process when the word-referent mapping was unique (1:1 structure) or overlapped (2:1 structure), through individuals' language experience and working memory (WM, spatial and phonological). Sixty-one monolinguals and 78 bilinguals completed two CSWL tasks for both structures, a symmetry span, and a listening span task. Results showed no language group differences in both structures. However, both working memory types correlated with CSWL regardless of language experience, but only in 1:1 structures. We suggest a dissociation of the CSWL learning process by structure. Learners may adopt memory-dependent explicit processes (hypothesis-testing) for 1:1 structures, but memory-independent implicit processes (associative-learning) for 2:1 structures.

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6:00–7:00 PM (1092)

Who Provided the Correction? Gender and Knowledge Revision Evaluations. JOSEPH BUREY, *University of Minnesota,* VICTORIA JOHNSON, *University of Minnesota,* PANAYIOTA KENDEOU, *University of Minnesota* (Sponsored by Panayiota Kendeou) — A communicator's gender influences how their credibility and claims are evaluated. However, little is known about how gender influences these evaluations in the context of knowledge revision. We investigated the influence of communicator gender on credibility judgments and confidence in the truthfulness of their claims. Participants read texts describing either a male or a female who held a misconception. Then, a secondary character (male or female) responded by either correcting the misconception (refutation) or continuing the conversation (non-refutation). Gender identities of the sources were suggested based on "she/he" pronouns in the text. Results indicated that participants were more confident in the truthfulness of corrections made to females' misconceptions than to males' misconceptions, independent of the corrector's gender. Further, same-gender corrections were most effective. When misconceptions were held by females, female correctors were rated as more credible and participants were more confident in the truthfulness of the corrections, and vice versa. These findings suggest that gender cues influence evaluations of credibility and veracity of knowledge revision statements.

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6:00–7:00 PM (1093)

The Unspoken Code: A Quantitative Analysis of the Expectations and Realities of Community Leadership Among Open-Source Software Developers. ALEXANDRA PAXTON, *University of Connecticut,* NELLE VAROQUAUX, *Université Grenoble Alpes, Centre National de Recherche Scientifique (CNRS), & Institut Polytechnique de Grenoble* — Free and open-source software (FOSS) is critical infrastructure for today's digital ecosystem, undergirding daily functions from operating systems to scientific programming packages. Studying the communities of people who create and protect this digital infrastructure improves basic science (by growing our understanding of real-world psychological dynamics) and yields applied benefits (by supporting the health of critical digital infrastructure). FOSS projects rely largely on volunteer labor of "contributors" (who write new code and flag problems with existing code); contributors are guided and overseen by a core group of "maintainers." Working up from a contributor to a maintainer requires substantial work, but as a badge of honor, becoming a maintainer substantially benefits software developers within their communities and their careers. Previous research has identified major gaps in diversity, equity, and inclusion within the FOSS community. In this paper, we study the naturalistic traces of software developers as they work and communicate on GitHub—an open platform for developing and sharing code—to quantify the differences between the expectations and realities of who achieves maintainer status on FOSS projects.

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6:00–7:00 PM (1094)

User Disagreement in the U.S. Political Debate: An Exploration of Truth-Seeking and Belief-Speaking Texts on Twitter. FABIO CARRELLA, *University of Bristol,* SEGUN AROYEHUN, *Graz University of Technology,* JANA LASSER, *Graz University of Technology,* ALMOG SIMCHON, *University of Bristol,* DAVID GARCIA, *Graz University of Technology,* STEPHAN LEWANDOWSKY, *University of Bristol* — Online misinformation is becoming an increasingly harmful concern for democracies at a time when social media is widely used for political communication and news consumption. The concept of truth is threatened by opinion polarization, where evidence-based assertions are often counter-balanced by belief-based claims, resulting in two distinct components of discursive honesty. Against this backdrop, we measure the levels of user engagement that truth-seeking and belief-speaking texts attract on Twitter. We collect tweets from U.S. Congress members and analyze the ratio between replies and retweets to observe the polarity of the public's response to a given tweet. Generally, tweets with more comments than retweets are considered to be less endorsed by the audience and therefore more debated. Findings suggest that Republicans produce more contentious engagement than Democrats, both in terms of belief-speaking and truth-seeking. In addition, truth-seeking tweets have generally attracted more controversial engagement in both parties over time.

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6:00–7:00 PM (1095)

Is There Super-Audience Design for Arousal Tuning? An Evaluation Study of Utterances by Professional Caregivers to Elder People in a Virtual Setting. ETSUKO T. HARADA, *University of Tsukuba,* RYUTA TAKAWAKI, *University of Tsukuba,* EMIKO TANAKA, *Musashino University* — With the concept of audience design, cognitive and sociolinguistics researchers have shown that speakers design their utterances to make better understanding for their recipients. However, there might be some more additive audience design for not only for understanding but also for tuning or coordinating hearer's emotions or moods, when we observe a daily conversation between parents and children, or a medical staff and a patient. To see the possibility of such Super-audience design, we collected utterance data by 20 professional caregivers or nurses in two facilities for the elderly, to speak to a virtual residence in different times in a day with different responses in a simulated private room, and we executed an evaluation investigation with those video data about the arousal/ valence/ naturalness of each utterance and the whole conversation by 10 psychology students. Results showed that arousal values of utterances were generally higher in the morning than at night, while valence and naturalness were not changed by the time of the day. Implication of the results and their potential applicability to robot design will be discussed.

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6:00–7:00 PM (1096)

The Voice of Politeness: Perceptions of Voice Assistant Politeness Across Contexts. ELISE DUFFAU, *University of California, Santa Cruz,* JEAN E. FOX TREE, *University of California, Santa Cruz* — We compared politeness perceptions of a voice assistant in social (icebreaker) and nonsocial (tangram) tasks. In an analysis of partial data we found that though the general politeness perception of the strategies is consistent with how people perceive the strategies as spoken by a human, we see differences in what face saving strategy is evoked. For example, negative politeness strategies tend to evoke strong feelings of respecting autonomy when spoken by a voice assistant in both social and nonsocial tasks. With human perceptions negative politeness strategies are more strongly evoked in social tasks. As another example, some positive politeness strategies tended to show strong perceptions of desirability and cooperation. This effect is more specific and weaker for voice assistants than we observed in humans using these strategies. We discuss how the perception of politeness changes when expressed by a voice assistant agent as well as its effect on request compliance.

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6:00–7:00 PM (1097)

Task Goals Modulate the Alignment of Linguistic Strategies and Joint Attention During Collaboration. ALEXIA GALATI, *University of North Carolina at Charlotte,* CAMILA ALVIAR, *Vanderbilt University Medical Center,* RICK DALE, *University of California, Los Angeles,* MORENO COCO, *Sapienza Universitá di Roma & IRCCS Santa Lucia Foundation* — Interpersonal alignment is known to support performance in joint tasks that require perspective monitoring (e.g., route planning), but the benefits of alignment may not generalize to other tasks. Tasks with more degrees of freedom for organizing the interaction (e.g., visual search) may require individuals to complement their behavior to be most successful. In this study, dyads (N = 17) completed 5 route planning and 5 visual search trials involving maps. We assessed the benefits of alignment in language use and joint attention by examining linguistic strategies in transcripts and subjecting time series of eye-fixations to Cross-Recurrence Quantification Analysis. Preliminary analyses show that dyads aligned their gaze more in route planning than visual search, and their accuracy benefitted more from gaze alignment. Dyads also aligned their references to landmarks more in visual search than in route planning. This may suggest that dyads compensate for their distributed attention in visual search by increasing referential alignment. We present analyses of the full dataset (N = 36) to shed light on how patterns of alignment and complementarity, within and across modalities, emerge in the interaction to serve task goals.

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6:00–7:00 PM (1098)

Boosters Boost, Hedges Hedge: How Words of Negotiation Affect the Interpretation of Gradable Adjectives. ALLISON NGUYEN, *University of California, Santa Cruz,* JEAN E. FOX TREE, *University of California, Santa Cruz* — Gradable adjectives are adjectives that receive an interpretation from a contextually derived standard (e.g., tall is relative to the group you are making the comparison to). We tested how words of negotiation affect the interpretation of these words relative to their unmodified versions. We had 12 words we tested, across two conditions, which were sets of antonyms that share the same scale: the positive member (such as full) and the negative member (empty). We found that in the positive condition, words canonically considered hedges lowered the rating compared to the unmodified condition and boosters boosted the rating. In the negative condition, we found that absolutely, certainly, and clearly boosted the rating but everything else lowered it compared to the unmodified condition. Across both conditions, partially lowered the rating more than any other word of negotiation.

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6:00–7:00 PM (1099)

Leveraging a Multidimensional Linguistic Analysis of Constructed Responses Produced by College Readers. LAUREN E. FLYNN, *University of Minnesota,* JOSEPH MAGLIANO, *Georgia State University,* DANNY FELLER, *Georgia State University,* KATHRYN S. MCCARTHY, *Georgia State University,* DANIELLE MCNAMARA, *Arizona State University,* LAURA K. ALLEN, *University of Minnesota* — The goal of this study was to assess the relationships between computational approaches to analyzing constructed responses made during reading and individual differences in the foundational skills of reading in college readers. We also explored if these relationships were consistent across texts and samples collected at different institutions. The study used archival data that involved college participants who produced typed constructed responses under think-aloud instructions while reading history and science texts. They also took assessments of vocabulary knowledge and proficiency in comprehension. The protocols were analyzed to assess two different ways to determine their cohesion: the first assessing how readers established connections with themselves (i.e., to other constructed responses they produced) and the second assessing connections between the constructed responses and the texts that were read. Additionally, the comparisons were made by assessing both lexical (i.e., word matching) and semantic (i.e., high dimensional semantic spaces) comparisons. The results showed that both approaches for analyzing cohesion and making the comparisons were correlated with vocabulary knowledge and comprehension proficiency.

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6:00–7:00 PM (1100)

Examining Phenomenological Experiences of Multilingual Readers. PUREN ONCEL, *University of Minnesota,* SARAH D. CREER, *University of Minnesota,* ANDREW R. LAGOS, *University of New Hampshire,* KATHRYN S. MCCARTHY, *Georgia State University,* LAURA K. ALLEN, *University of Minnesota* — Despite substantive work examining multilingual reading comprehension, relatively few studies have focused on how multilingual readers differ

from monolinguals in their phenomenological experiences. The current study examined whether reports of visual imagery, verbal-thinking, and transportation differed for mono- and multilingual readers, and if experiences were influenced by reading instructions. Mono and multilingual participants (n=313) were instructed to read a narrative a) for comprehension or b) focusing on specific text elements (i.e., character, events, and scenes) while periodically responding to thought probes. After reading, participants' experiences of transportation into the narrative world were measured. Results revealed a significant interaction between language and instructions on reports of visual imagery and transportation; however, no effect was found for reports of verbal-thinking. Overall, this study lays the groundwork for future research to explore the mechanisms underlying readers' phenomenological experiences, especially regarding to understand the variability in using visual imagery between mono- and multilingual readers.

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6:00-7:00 PM (1101)

The Role of Standards of Coherence in Discourse Comprehension: Effects of Reading Task on Inference Activation. PAUL W. VAN DEN BROEK, *Leiden University,* AMY DE BRUÏNE, *Leiden University,* ANNE HELDER, *Leiden University,* AMANDA C. DAHL, *Georgia State University,* SARAH E. CARLSON, *Georgia State University,* CATHERINE BOHN-GETTLER, *College of Saint Benedict and St. John's University* — Reading comprehension revolves around the construction of a mental representation in which information from the text and from the reader's knowledge is combined. We investigated whether inferential processes that are typically considered passive are influenced by task-related standards of coherence. In a prototypical lexical-decision design, participants read short narratives in versions that were either highly constraining or neutral towards a particular inference, followed by a lexical-decision task on target words representing the inferences. This design was embedded in a broader task manipulation, in which participants answered questions about the texts that demanded either superficial or deeper comprehension. Importantly, these questions were unrelated to the target inferences. Results indicate that reading task influenced the speed with which readers identified target words, with the deeper comprehension task leading to significantly shorter lexical-decision times. This suggests that presumably passive inferential processes are influenced by the standards of coherence elicited by the supra-textual task.

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6:00-7:00 PM (1102)

Recall of Ambiguous Homographs Is Shaped by Conversational Partners. MELISSA J. EVANS, *Vanderbilt University,* SARAH BROWN-SCHMIDT, *Vanderbilt University,* MIN KYUNG HONG, *Vanderbilt University* — The context surrounding language influences how it is understood and how it is later remembered. Relevant context can include both the physical context and communicative elements. Prior work biased interpretation of ambiguous homographs with a preceding cue word; when cue and homograph were presented in the same physical context, cueing and recall were enhanced (Tullis et al., 2014). Across four experiments, we test if conversational partners and communication goals can act as associative contexts, and how context may shape order of recall. Participants viewed a word list and were tasked with writing a sentence that used each word. This was followed by a free recall task. Cues (e.g. river) preceded ambiguous homographs (e.g. bank) by three words. When speaking to the same person, participants were more likely to interpret a homograph in the way that aligned with the cue word and were more likely to recall the word pair sequentially.

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6:00-7:00 PM (1104)

In Science We Trust? Factors Influencing Belief and Trust Across Scientific Domains. VICTORIA JOHNSON, *University of Minnesota,* REESE BUTTERFUSS, *Arizona State University,* PANAYIOTA KENDEOU, *University of Minnesota* — In an increasingly polarized information ecosystem, individuals encounter scientific information from different sources that vary in political leanings, with potential effects on belief in the information and/or trust in the sources communicating that information. In a set of three online experiments with US adults, we examined the extent to which different information sources (i.e., conservative media vs. liberal media vs. scientific institutions) interacted with factors such as individuals' epistemic beliefs, individuals' political ideologies, and the tentativeness of the claim to influence belief in claims and trust in sources for a variety of topics/domains. Overall, the findings highlight complex patterns of belief and trust of scientific claims among liberals and conservatives. Contextual factors such as source partisanship and tentativeness of the claim, as well as individual factors such as epistemic beliefs and political ideologies, influence belief in scientific claims and trust in sources across domains.

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6:00-7:00 PM (1105)

Interference from Adjacent Items in Automatic Word Recognition: Effects of Lexicality and Visual Complexity. DZAN ZELIHIC, *University of Oslo,* LAOURA ZIAKA, *University of Oslo,* BOB MCMURRAY, *University of Iowa,* KEITH APFELBAUM, *University of Iowa,* KRISTIN SIMONSEN, *University of Oslo,* ATHANASSIOS PROTOPAPAS, *University of Oslo* — Single word reading is typically investigated using isolated words but in realistic settings words appear in sentences. To examine potential interference from adjacent words, presumably as a function of word reading automaticity, we have previously used a backward-masking flanker design in a visual world paradigm. Target words were centrally presented for 75 ms in three conditions: baseline (no flankers), visual flanking (strings of % signs), and word flanking (unrelated words). Findings for 60 adult Norwegian speakers indicated that word recognition is prone to interference from adjacent words, even

for skilled adult readers, but not from symbols. Here we adopt the same experimental design to investigate if interference depends on lexicality and if the lack of a visual effect is due to low flanker complexity. We employ new flanker conditions, namely pronounceable pseudowords and complexity-matched visual strings. Data collection for a comparable sample of 60 participants is currently in progress. We hypothesize that interference effects will be detected, primarily in the pseudoword-flanking condition. Results will be presented in comparison to the corresponding conditions of the previous experiment.

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6:00–7:00 PM (1106)

Effects of Age and Familiarity on Visual Word Recognition in Korean: Evidence from a Web-Based Large Scale Lexical Decision Task. HYUNAH BAEK, *Gwangju Institute of Science and Technology,* PETER GORDON, *University of North Carolina at Chapel Hill,* WONIL CHOI, *Gwangju Institute of Science and Technology* — Previous studies have reported inconsistent results regarding the influence of aging on word familiarity (or frequency) effects. The present study examined age differences in familiarity effects in Korean visual word recognition through a web-based large scale lexical decision task. 497 adult Korean speakers in their 20s to 60s participated in the task, in which they decided the lexicality of 120 Korean words varying in frequency and 120 nonwords. Another group of 58 speakers with a similar age distribution was asked to rate subjective familiarity of each word. Overall, both lexical decision accuracy and response times increased by age, and more familiar words were recognized more accurately and more rapidly. Crucially, there was a significant interaction between age and familiarity, which was mainly driven by younger participants' noticeably less accurate and slower responses to low-familiarity words. These results are discussed in relation to earlier findings and hypotheses on frequency effects in word recognition.

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6:00–7:00 PM (1107)

Defining Neighborhood Density Across Modalities. ANN KOCHUPURACKAL, *Tufts University,* ARIEL GOLDBERG, *Tufts University* — Despite decades of research, it is still unknown exactly how phonologically/orthographically similar words affect production. Psycholinguistic studies have typically investigated neighbors (words differing from the target by 1 segment), but it is possible that multiple dimensions of similarity are important and at different stages of stages of production. It is also unknown whether lexical similarity influences production differently across modalities. The goals of this study are to: 1) investigate whether other definitions of similarity are relevant to production (and at what stages) and 2) whether similarity has the same influence across spoken and typed production. Participants completed a picture naming task in separate spoken and typed response blocks. Data collection is ongoing (target n = 60) but when complete, 2 broad analyses will be reported. Accuracy and latency will be used to determine whether positional and non-positional neighbor definitions are relevant at lexical stages of processing. Word and segment duration will then be analyzed to determine whether these definitions influence post-lexical stages of processing. Analyses will compare typed and spoken responses in order to compare processing across modalities.

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6:00–7:00 PM (1108)

Olé, Öle, and Ole: When the Nuances of Each Orthography Modulate Reading. MELANIE LABUSCH, *Universidad Nebrija,* MARÍA FERNÁNDEZ-LÓPEZ, *Universitat de València,* ANA BACIERO, *Bournemouth University,* ANA MARCET, *Universitat de València,* MANUEL PEREA, *Universitat de València* — Most Latin-based languages use vowels with diacritics to adjust the Latin script to the nuances of each language (e.g., stressed syllable in Spanish; a different phoneme in German, among others). This issue immediately raises the question: are these vowels encoded as separate letter units from their base letters? As the function of diacritics varies between languages, we examined whether the answer to this question was language-dependent. To that end, we conducted a series of semantic categorization experiments where each word was presented intact or with an added (or omitted) diacritics. The experiments were conducted in languages as different as Spanish, German, and French. Relative to the intact words, we found a large reading cost of adding/omitting diacritics in German and a negligible cost in Spanish, with French being in the middle. This language-dependent pattern constrains the mapping between the visual stimulus onto the letter level in models of word recognition.

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6:00–7:00 PM (1109)

Asymmetrical Cross-System Priming Effects Between Fingerspelled Fonts and Printed Letters for Deaf ASL-English Bilinguals: An Electrophysiological Study. KATHERINE J. MIDGLEY, *San Diego State University,* ZED SEHYR, *San Diego State University,* PHILLIP J. HOLCOMB, *San Diego State University,* KAREN EMMOREY, *San Diego State University* — Letter recognition plays an important role in reading and follows different processing phases, from early visual feature detection to the access of abstract letter representations. Deaf ASL-English bilinguals experience orthography in two forms: printed letters and fingerspelling. In a single letter unmasked priming paradigm, we investigated whether printed letters and fingerspelled fonts have shared representations and follow a similar time course of processing. EEG was recorded while participants performed a probe detection task (the letter Y). After observing similar letter to letter priming for deaf and hearing readers, experiment 2 investigated priming effects within and across the two orthographic systems in deaf participants. We found asymmetrical cross-system priming effects; priming occurred only when primes were fingerspelled and targets were either fingerspelled or printed letters. Fingerspelled and printed letters do not seem to belong to the same orthographic system but may be co-activated via shared higher-level representations of letter names.

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6:00-7:00 PM (1110)

Deciphering the Tolerance to Letter Distortion: The Case of Letter Rotation. MARÍA FERNÁNDEZ-LÓPEZ, *Universitat de València,* PABLO GOMEZ, *California State University, San Bernardino,* MANUEL PEREA, *Universitat de València* — Readers have a wide tolerance to letter distortion; however, the limits of this invariance are still under debate. To shed light on this issue, we focused on a single parameter, rotation, as it serves to disentangle predictions from influential neurally-inspired models of word recognition. The Local Combination Detectors (LCD) model predicts invariance up to 45°, whereas the SERIOL model predicts a linear cost until 60°. To examine these predictions, we conducted lexical decision and semantic categorization tasks (Experiments 1 and 2) when the letters were rotated at 0°, 22.5°, 45°, and 67.5°. We found a minimal cost at 22.5°, sizeable at 45°, and considerably large at 67.5°. In Experiment 3, we narrowed the focus using four moderate rotation angles (22.5°, 30°, 37.5°, and 45°). We found a gradual reading cost that increased at 45°. Thus, while there is a resilience limit around 45° favoring LCD, less steep angles also produce a reading cost, backing the SERIOL model.

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6:00-7:00 PM (1111)

Inhibitory Orthographic Neighbor Priming Effects for Two-Character Chinese Words. STEPHEN J. LUPKER, *University of Western Ontario,* HUILAN YANG, *Zhejiang Gongshang University* — In masked priming lexical decision tasks in alphabetic or syllabic script languages, latencies are longer when a word target is primed by a higher frequency neighbor (e.g., blue–BLUR) than when primed by an unrelated word of equivalent frequency (e.g., care–BLUR) - an "inhibitory neighbor priming effect". In contrast, Zhou and Marslen-Wilson (1995) demonstrated facilitory orthographic neighbor priming for two-character Chinese words (e.g: 华丽–华贵) when not controlling for relative prime-target frequencies. Experiment 1 tested whether inhibitory neighbor priming effects obtain for two-character Chinese words when prime-target frequency is varied systematically. Word neighbor primes (e.g., 容易–容貌) produced an inhibitory neighbor priming effect when the prime was higher frequency than the target, paralleling effects in other script languages. In further experiments paralleling those in other languages, two-character targets primed by nonword neighbors (容待–容貌) or single constituent characters matching the target in either position (容–容貌) showed significant facilitation. These results suggest that lexical activation/competition processes for two-character Chinese words are reasonably similar to those for words in alphabetic languages.

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6:00-7:00 PM (1112)

Are Proper Nouns Sensitive to Letter Similarity Effects? ANA MARCET, *Universitat de València,* MELANIE LABUSCH, *Universidad Nebrija,* MARÍA FERNÁNDEZ-LÓPEZ, *Universitat de València,* PABLO GOMEZ, *California State University, San Bernardino,* LYDIA MUÑOZ, *Universitat de València,* MANUEL PEREA, *Universitat de València* — As predicted by models of visual word recognition, lexical decision experiments have consistently shown negligible effects of letter similarity for misspelled common words (e.g., viotin and viocin [baseword: violin] behave similarly). In contrast, misspelled brand names show robust effects of letter similarity (e.g., Goople [baseword: Google] produces more errors and longer latencies than Goosle; Perea et al., 2022). Here we examined whether proper nouns (i.e., another type of words with a distinct neuropsychological status) are also more sensitive to letter similarity effects than common words. We conducted two lexical decision experiments. The pseudowords were misspelled city names that were visually similar or not to their baseword (e.g., Barceloma vs. Barcelosa [baseword: Barcelona]), and the words were correctly-spelled city names. Results in both experiments only showed a minimal letter similarity effect due to a small subset of items. Thus, orthographic processing in proper nouns resembles that of common words more than those of brand names.

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6:00-7:00 PM (1113)

Parafoveal Processing Provides a Head Start on Word Recognition, But Integration Requires Foveation. SARA MILLIGAN, *University of South Florida,* VICTORIA ESTEVEZ, *University of South Florida,* ELIZABETH R. SCHOTTER, *University of South Florida* — Efficient reading is an important skill that is crucial for success in everyday life. The surprising speed at which people are capable of extracting meaning from symbols on a page depends, in part, on the fact that readers can begin to preprocess upcoming words in a text before even looking at them, in parafoveal vision. One open question regarding parafoveal processing is whether it can be leveraged to achieve full recognition and contextual integration of a visually proximate word. In the present study, we measured ERPs and used an RSVP with parafoveal flankers paradigm to present sentences with sentence-final target words that were manipulated for predictability and contextual fit. Additionally, we used a masking manipulation to dissociate whether semantic retrieval, indexed by the N400, and contextual integration, indexed by the LPC, required foveal input or could proceed using parafoveal input alone. We found that the N400 is elicited parafoveally, but that the LPC was only present when the word was presented foveally. These results suggest that parafoveal processing facilitates word recognition, but is insufficient for integrating that word into a broader semantic context. This pattern has implications for models of reading.

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6:00-7:00 PM (1114)

Lexical Access in a Parallel Reading System: The Role of Competition During Lexical Integration. AARON VANDENDAELE, *Ghent University,* JONATHAN GRAINGER, *Aix-Marseille University* — It has been established that early visual

identification processes benefit from having simultaneous access to multiple words during reading. However, once word recognition reaches the lexical threshold, further identification turns serial. Here, we argue that integration of orthographic information at the sub-lexical level happens in parallel, but subsequent lexical information is pulled into separate channels and treated serially. We used a masked version of the Flanker paradigm in which participants had to type the centrally presented target word. When flankers were full-word orthographic neighbors (aide aile aide), accuracy was lower compared to the non-overlap baseline condition. On the contrary, when flanker words were the same neighbors split into bigrams, accuracy was significantly higher. These results suggest that full-word integration can occur at the lexical level. However, this integration is inhibitory instead of facilitatory, and driven by conflict between word representations as they compete for recognition.

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6:00–7:00 PM (1115)

Inhibition of Word Representations After Violated Semantic Predictions. JINA KIM, *University of Iowa,* KRISTI HENDRICKSON, DOCTOR, *University of Iowa* — For language comprehension to be fast and efficient, there is a general consensus that listeners make use of sentence context to predict upcoming words. However, much less is known about how prediction occurs, including what happens to predicted representations when prediction fails. In the current study we adopted a Cross-Modal Lexical Priming Paradigm to compare activation for predicted words (e.g., dog, in the sentence: On sunny days, I visit the park to walk my ___) after hearing three types of violations: semantically plausible violations (e.g., monkey), semantically implausible violations (e.g., dozen), and non-linguistic violations (e.g., a beep sound). The result showed that predicted words are inhibited when listeners are confronted with linguistic violations (plausible or implausible), but no non-linguistic violations.

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6:00–7:00 PM (1116)

Uncovering Individual Differences in Hemispheric Specialization for Words and Faces. ALISON ROBERT-LOUCHE, *SUNY New Paltz,* ELIZABETH HIRSHORN, *SUNY New Paltz* (Sponsored by Elizabeth Hirshorn) — Previous research supports a lateralization for visual processing of words (left) and face (right), which is linked with the acquisition of literacy. This lateralization is consistent with a hemispheric specialization for analytic (left) vs. holistic (right) processing respectively in the two hemispheres. However, previous research has shown variability in lateralization of visual word processing as a function of inversion sensitivity, which is associated with greater holistic processing. We examined native English speakers who exhibit a range of inversion sensitivity for words and investigated if lateralization of face processing is related, such that the greater inversion sensitivity would be linked with less right hemisphere lateralization for faces. Behavioral measures included word inversion sensitivity and a behavioral lateralization task (using left/right visual field presentation). We found that greater inversion sensitivity is correlated with less of a left-visual field (right hemisphere) bias for faces, which is consistent with our hypothesis.

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6:00–7:00 PM (1117)

The Nature of Shared Traumatic Experiences: When, How, and How Often Do We Share Trauma with Others? NADINE P. HUTCHISON, *Flinders University,* MELANIE TAKARANGI, *Flinders University* — People share traumatic events with others but how often and the unique ways in which such events are shared remains unclear. Thus, across two studies, we investigated how, how often and when people share traumatic events, and whether sharing such events relates to PTSD symptomology (N = 1,008). In Study 1, most participants (78.5%) perceived their most stressful/traumatic event as shared primarily due to discussing the event (verbal sharing), having the same emotions as others about the event (emotional sharing), having others present during the event (physical sharing), and knowing others who had experienced a similar event (relational sharing). In Study 2, we assessed the frequency and characteristics of these forms of sharing along with attitudinal (i.e., same attitudes about the event) and perpetrator (i.e., perpetrator involved in the event) sharing. Most participants (98.6%-99.4%) shared their most stressful/traumatic event with others in some way. Further, verbal, emotional, and physical sharing were related to lower PTSD symptomology while perpetrator sharing was related to higher PTSD symptomology. Our findings demonstrate that people commonly share a range of traumatic events in various unique ways.

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6:00–7:00 PM (1118)

Autobiographical Recall and Episodic Future Thinking in Blind Individuals. ALI I. TEKCAN, *Boğaziçi University,* KARDELEN YÖYEN, *Boğaziçi University* (Sponsored by Ali Tekcan) — Based on the well-established relationship between visual imagery and autobiographical memory, this study aims to examine the effects of blindness on autobiographical recall and episodic future-thinking processes. More specifically, we compared sighted and blind individuals' memories and future events in terms of phenomenology (e.g., visual imagery, auditory imagery, spatial layout) and retrieval type (direct vs generative). We also comparatively tested the Basic Systems and the Scene Construction approaches with regard to the variables that account for fundamental elements of autobiographical remembering: sense of reliving, vividness, and belief. To address these, blind and sighted participants recalled two memories and imagined two future events in response to different cue words and filled out the extended version of Autobiographical Memory Questionnaire by Rubin et al. (2019), as well as reporting the experience underlying their retrieval of memories and future events. Relationships between retrieval type and phenomenological characteristics were also examined.

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6:00-7:00 PM (1119)

Memory and Dream Recall in Film Professionals: Effects of Visual Imagery and Creativity. IMRE TEZEL, *Boğaziçi University,* ALI I. TEKCAN, *Boğaziçi University* — There is evidence that visual imagery and scene construction ability contributes to one's sense of reliving of autobiographical memories. Data also show that people with hyperphantasia are overrepresented in creative occupations (e.g., arts, entertainment; Zeman et al., 2020). Given these findings, it is reasonable to expect stronger autobiographical recall (e.g., detail, reliving) as well as dream recall in individuals in creative occupations. In the present study, we tested whether individuals in the film industry (e.g., script writers, directors and producers) who would be expected to have stronger visual imagery as well as scene construction ability, would differ from matched controls in retrieval and phenomenology of autobiographical memories and dreams. Participants from the film industry and age-, gender-, and education-matched control participants were asked to recall three memories and three dreams from within the last month. They also rated phenomenology regarding the memories and dreams. Participants' visual imagery and creativity capacity have also been addressed in relation to measures of autobiographical memory and dream recall.

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6:00-7:00 PM (1120)

The Relationship Between Flashbulb Memories and Social Media Use. OLIVIA L. JÄGGI, *Washington University in St. Louis,* CHRISTOPHER L. ZERR, *Washington University in St. Louis,* JAMES V. WERTSCH, *Washington University in St. Louis,* HENRY L. ROEDIGER, III, *Washington University in St. Louis* — Flashbulb memories are highly vivid and confidently held autobiographical memories surrounding the circumstances in which an individual first learned of a shocking or significant event. Thus far, research on flashbulb memories has focused on encountering the information via traditional media sources or personal communication. Because of the growing ubiquity of social media as a source of news and social interaction, this study aimed to examine whether those who learned of public events through social media have less vivid flashbulb memories than found in previous studies of people who encountered events via traditional news or personal communication. Participants described personal and public flashbulb memories and provided their source; they also rated them on several characteristics including vividness, confidence, and emotional valence. Additionally, they provided information about their social media behavior, such as engagement, context, and time spent on social media, as well as their news consumption patterns. This study sought to clarify if and how the growing use of social media relates to the formation and canonical features of flashbulb memories.

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6:00-7:00 PM (1121)

Collective Change: Perceived Differences in Collective Remembering Across Time in Younger Versus Older Adults. CLAIRE HOU, *Claremont McKenna College,* SHARDA UMANATH, *Claremont McKenna College,* MAGDALENA ABEL, *University of Regensburg,* AMY CORNING, *University of Michigan,* KATHRINE M. WHITMAN, *Claremont McKenna College* — Collective memory refers to a group's shared representation of the past. They are typically slow to change over time but do change. To investigate such potential shifts, representative samples of over 150 Young Adults (YAs) and Older Adults (OAs) in the U.S. and Germany rated the emotional valence of 12 national historic events for their country. To study self-perceptions of across time, YAs rated their imagined future emotional valence and OAs reported their past emotional valence on the same events. Our results show YAs and OAs hold differing opinions on numerous events, suggesting shifting public perceptions across generations. For the U.S., the trajectory from the past to present to future was mostly negative (or, less positive). OAs reported feeling more negative about most events today than in the past. Today, YAs were mostly more negative than OAs. YAs anticipated few changes in the future; if anything, they anticipated feeling less positively. For Germany, OAs indicated higher emotionality today than in the past (i.e., more negative/positive today). Yet, YAs were less emotional (less negative/positive) today than OAs. YAs again anticipated few changes in the future; if anything, they anticipated becoming less emotional.

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6:00-7:00 PM (1122)

Memories of Emotions of First Consensual Sexual Encounter. MARIO E. HERRERA, *University of North Carolina at Asheville,* MORGAN HOPKINS, *University of North Carolina at Asheville,* KELSEY SKAINE, *University of North Carolina at Asheville,* CAITY MULLEN, *University of North Carolina at Asheville,* STRATTON CARR, *University of North Carolina at Asheville,* JACK HENDRIX, *University of North Carolina at Asheville* — Are memories of intimate moments prone to distortions? According to reconstructive memory and appraisal theories, memories for emotions are prone to distortions based on changes in current appraisals of the event or person. In the current experiment, we investigated the effects of current reappraisals of participants' first consensual partners on the recall of memories of emotions felt during the first 24 hours following participants' first consensual sexual encounters. We predicted positive reappraisals would increase memories of positive emotions (e.g., feeling happy, joyous, excited) -- a positive distortion. In addition, we predicted negative reappraisals would increase memories of negative emotions (e.g., feeling ashamed, angry, embarrassed) -- a negative distortion. We found that positive reappraisals of a person's first partner resulted in higher ratings of joyful recollections. When individual differences (emotion regulation strategies and current relationship status with the first partner) were controlled, positive

reappraisals increased recollections of happiness and joy. Males remembered more positive memories of emotion from their first consensual experience than females.

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6:00-7:00 PM (1124)

Flashbulb Memories for Local, Personally Experienced Events: The Case of Campus Closing Due to COVID-19. JEN H. COANE, *Colby College,* YAN XUAN, *Colby College,* MACKENNA GREENBERG, *Colby College,* KAI CHANG, *Colby College,* SHARDA UMANATH, *Claremont McKenna College* — The decision by many colleges to send students home in March 2020 was a salient event. Unlike typical flashbulb memory events, this one was not unexpected but likely had a profound emotional impact on all members of the college. Additionally, unlike other flashbulb memory events, this one was local and directly affected respondents, rather than being a more distant and indirectly experienced event. The emotional impact was strong, given that every member of the community was directly and personally affected. In this study, participants answered questions about episodic details of the decision and their emotional responses to it within a few days of the announcement and about 5 months later. Compared to memories for a control event, episodic details surrounding the decision were more consistent across time, although there was change. Confidence in accuracy for these details did not change. Qualitative responses suggest both positive and negative emotions surrounded the decision to send students home; participants who, in hindsight, agreed more with the decision rated their mood more positively after a delay than immediately. These findings suggest a mix of stability and change in memory for complex and emotionally intense events.

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6:00-7:00 PM (1125)

Testing Transition Theory: The Effect of Starting University on People in Our Lives. ÖYKÜ EKINCI, *University of Alberta,* TUGBA UZER, *TED University,* PETER LEE, *University of Medicine and Health Sciences,* NORMAN R. BROWN, *University of Alberta* — Transition Theory (Brown, 2016) suggests that lifetime periods are characterized by a certain set of event components (e.g. people, activities, locations). As transitions lead to changes in daily life, the event components are influenced by the degree of change. The previous study from our lab showed that many new event components are introduced to one's life after a transition for those who went through a major change. Based on this initial study and the premises of Transition Theory, we aimed to examine how starting university gives rise to new event components (specifically, people) and how it relates to the perception of change. We asked first-year undergraduate students to report the people they had spent time with during the last year and indicate their relationship with each person in relation to their transition to university. We found that starting university brought new people into one's life, especially if one went through a major transition (changed cities to start university) compared to a minor one (attended university in hometown), and the perception of change in people is related to the number of people they continue to see through the transition, and those they meet after, rather than the ones they stopped seeing.

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6:00-7:00 PM (1126)

Nostalgia's Impact on Autobiographical Memory Accessibility and Specificity. LINDA HENKEL, *Fairfield University,* JENNY A. MEYER, *Fairfield University,* RILEY BLOZZON, *Fairfield University* — When people experience nostalgia they report decreased loneliness and increased social connectedness. Can nostalgia also influence the accessibility of their autobiographical memories? In two experiments we examined the qualities of autobiographical memories that came to mind after people were exposed to nostalgic stimuli. Young adults watched a video featuring music, clothes, objects, foods, and places popular in either their childhood (nostalgia condition) or contemporary life (control condition), and then retrieved personal memories in response to cue words. Results showed that the number of memories that came to mind was similar in both the nostalgia and control conditions. However, personal memories came to mind quicker and were more emotional and intense for participants who watched the nostalgic video than for those who watched the control video. The largest number of memories produced were ones involving a single event that occurred once, in a time period less than 24 hours (i.e., specific memories), and this was true in both the nostalgia-evoking condition and the control condition. Prior studies have examined social and emotional benefits of nostalgia, and our work suggests there may be cognitive benefits as well.

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6:00-7:00 PM (1127)

Involuntary Autobiographical Memories and Mind Wandering: The Same or Different? RYAN C. YEUNG, *University of Waterloo,* MYRA A. FERNANDES, *University of Waterloo* — Memories of one's personal past are often retrieved involuntarily and repetitively. Recent evidence shows that these recurrent involuntary autobiographical memories (IAMs) are common and predictive of mental health (e.g., symptoms of posttraumatic stress disorder [PTSD]). However, it remains unclear how recurrent IAMs relate to other spontaneous cognitions, such as mind wandering (MW). Both recurrent IAMs and MW involve task-unrelated thought, and both have been linked to PTSD symptoms (e.g., intrusive memories/thoughts following stressful experiences). Here, we administered self-report measures of recurrent IAMs, trait MW, and PTSD symptoms to undergraduates (N = 2701). Hierarchical multiple regressions indicated that the presence and frequency of recurrent IAMs were significantly predicted by spontaneous MW, but not deliberate MW. Further, while spontaneous MW significantly predicted PTSD symptoms, the presence and frequency of recurrent IAMs explained unique variance beyond MW. Our work suggests that recurrent IAMs are related to spontaneous MW, and highlight that spontaneous

cognitions predict mental health. Results also suggest that recurrent IAMs are distinct from spontaneous MW in that they uniquely predict PTSD symptoms.

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6:00–7:00 PM (1129)

Does Odor-Evoked Autobiographical Memory Retrieval Curb Chocolate Cravings? KRISTI MULTHAUP, *Davidson College,* SERENA HU, *Davidson College* — The study examined whether odor-evoked memory retrieval curbs chocolate craving. Ninety-three undergraduates indicated their baseline chocolate cravings immediately after a craving induction and again after an intervention. For the intervention, they either retrieved a memory after smelling Ivory soap (odor-memory), imagined the smell of Ivory soap (odor-imagery), or listened to a speech in Dutch (control); all groups answered questions about the intervention. Odor-memory condition participants took fewer chocolate bars at the end of the session than control participants, a naturalistic behavioral measure of cravings. Self-reported cravings declined in all conditions; a post-hoc explanation is that cognitive activity was well matched across conditions. Females reported greater post-intervention, but not baseline, chocolate cravings. The present study demonstrates that cognitively engaging interventions as brief as 90 s are sufficient to disrupt chocolate cravings. The possibility of incorporating brief, self-guided, distraction-based interventions invites future research, particularly on possible gender differences in effectiveness.

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6:00–7:00 PM (1131)

The Cost of Source Monitoring in Recognition of Instances of Repeated Events. EVA RUBINOVA, *University of Aberdeen,* HEATHER PRICE, *Thompson Rivers University* — In repeated-event paradigms where participants view and later recall a series of similar events, we typically observe primacy and recency effects: Participants remember more accurate details from the first and final instances. Although encoding-level differences are expected to contribute to these patterns, researchers typically assess memory using free recall, thus contaminating memory performance with retrieval-level processes. We tested potential differences at the level of encoding directly by examining participants' memory using a recognition task. Participants viewed videos depicting four similar narratives (four different sets were used for stimuli sampling). In Experiment 1 (between-subjects), participants were either asked to decide whether an item was "Old" (i.e., presented in any of the videos) or "New," or decide whether an item occurred in Video 1/2/3/4 or was "New." In Experiment 2 (within-subjects), video attribution followed an old/new decision. We predicted that reaction times for hits would be faster for items from Video 1 compared to Video 2, and that decisions would be faster in the task not requiring source monitoring (old/new decisions). We found support for our pre-registered hypotheses in both experiments.

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6:00–7:00 PM (1133)

Simultaneous vs. Sequential Lineups: Encoding Conditions and Decision Rules. CHARLES A. GOODSELL, *Canisius College,* SCOTT D. GRONLUND, *University of Oklahoma,* CURT CARLSON, *Texas A&M University–Commerce,* EMMA R. MARZEC, *Canisius College* — In two experiments we tested eyewitness identification performance from simultaneous or sequential lineups. In Experiment 1, we varied encoding conditions and sequential suspect position. Weaker encoding resulted in a simultaneous lineup advantage and differences in early vs. later sequential suspect positions. Because we used a stop rule in the sequential lineup, witness who choose an innocent filler prior to viewing the suspect never got the opportunity to see him. If these witnesses are able to choose the guilty suspect and avoid the innocent suspect, then this could result in similar performance to the simultaneous lineup. Alternatively, these witnesses may simply continue to choose, and therefore not show improved discriminability. Experiment 2 tested this idea by allowing witnesses to make additional choices in the sequential lineup. We utilized different sequential decision rules (first choice, suspect choice, last choice) to investigate the impact of sequential suspect placement.

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6:00–7:00 PM (1134)

Testing Diagnostic Feature Detection Theory Predictions for Sequential Eyewitness Lineups. JEROME HOOVER, *University of Massachusetts Amherst,* ANDREW COHEN, *University of Massachusetts Amherst,* JEFFREY J. STARNS, *University of Massachusetts Amherst* — In a sequential eyewitness lineup, a witness considers one lineup member at a time. Prior work on sequential lineups suggests higher discriminability for lineup members in later positions, a prediction made by diagnostic feature detection theory (DFDT). The basic idea is that features that are shared across lineup members cannot be used as reliable recognition cues to guide identification, and that these shared features become more apparent as the lineup progresses. Using artificially-generated faces, we investigate this prediction by manipulating innocent-suspect-perpetrator similarity and suspect-filler similarity. The results suggest significant effects of position and similarity and provide mixed support of DFDT predictions.

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6:00–7:00 PM (1135)

Using Confidence, Decision Time, and Decision Justifications to Sort Between Reliable and Unreliable Identification Decisions from Simultaneous and Sequential Lineups. NYDIA T. AYALA, *Iowa State University,* ANDREW M. SMITH, *Iowa State University,* GARY L. WELLS, *Iowa State University* — Past research on eyewitness lineups has found that both confidence and decision time are useful for sorting between guilty-suspect identifications and innocent-suspect identifications. More recent research suggests that the language used to justify an identification decision might have discriminative value over and above confidence and decision time; however, researchers have only just begun to examine the

postdictive value of eyewitness language. We randomly assigned eyewitness-participants (N = 7,000) to a 2 (culprit: present, absent) x 2 (lineup presentation: simultaneous, sequential) and asked them to (1) make an identification decision, (2) express their level of confidence in that decision, and (3) to explain why they made that identification decision. We also measured decision time. We use a logistic regression model with LASSO regularization to determine which combination of variables best discriminate reliable from unreliable identification decisions and whether justification language differs for simultaneous and sequential lineup procedures.

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6:00–7:00 PM (1136)

Can a Distinctive Feature Be Useful? Testing the Effect of a Replication with Variance Lineup on Eyewitness Identification. JACOB A. HEMBY, *Texas A&M University–Commerce,* CURT CARLSON, *Texas A&M University–Commerce,* MARIA CARLSON, *Texas A&M University–Commerce* (Sponsored by Curt Carlson) — If a perpetrator is described by an eyewitness as having a distinctive feature (e.g., a scar), police could create a fair photo array by either removing the scar or replicating it across all lineup members. Prior research indicates that such a facial feature will harm discriminability compared to no encoded feature, and that replication may increase discriminability over removal. The purpose of this study is to test a replication with variance photo array in which each member has a similar (but not identical) distinctive feature that fits the description and compare it with removal and replication photo arrays. Receiver Operating Characteristic (ROC) analysis indicates that replication with variance yields higher discriminability over both replication and removal lineup procedures. This is a promising new lineup procedure when dealing with a suspect with a distinctive feature.

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6:00–7:00 PM (1137)

How Does the Showup Procedure Impact Later Lineup Accuracy and Confidence? SARA DAVIS, *University of North Florida,* KATIE INGRAM, *University of North Florida,* DANIEL PETERSON, *Skidmore College* — Misidentification of innocent suspects by mistaken eyewitnesses is one of the leading causes of false convictions. This is due in part to vulnerabilities in the architecture of human memory as well as procedural aspects of the criminal justice system which exploit these vulnerabilities. The purpose of the present study is to investigate how one police procedure – the use of showups – influences performance on a later lineup task and confidence in that lineup decision. In a pre-registered study, participants were required to first view a crime video. They were then shown either a.) a showup with the culprit from the video present; b.) a showup with the culprit from the video absent; or c.) no showup. Approximately one day later, participants were shown a lineup containing either the guilty culprit or the innocent suspect. We found that the administration of a prior showup had a negative impact on later lineup accuracy, particularly when the same target was repeated across showup and lineups. Showup administration also had a differential impact on confidence in lineup decisions, suggesting that showup procedures influence metacognitive calibration in addition to memorial accuracy.

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6:00–7:00 PM (1138)

A Stronger Memory for the Perpetrator May Attenuate Effects of the Identification Procedure on Eyewitness Identification. ROBERT LOCKAMYEIR, *SUNY Oneonta,* CURT CARLSON, *Texas A&M University–Commerce,* ALEX WOOTEN, *Hollins University,* ALYSSA JONES, *North Carolina Wesleyan University,* MARIA CARLSON, *Texas A&M University–Commerce,* JACOB A. HEMBY, *Texas A&M University–Commerce* — The identification procedure can greatly affect eyewitness performance, but this may be contingent upon a relatively weak memory for the perpetrator. In a large preregistered experiment (N = 13,728), we manipulated memory strength and tested participants with a target-present or -absent showup or lineup (size 3 or 6). All fillers were description-matched but were of low or high similarity with the target. We replicated the advantage of fair simultaneous lineups over showups and the advantage of low- over high-similarity fillers when memory for the perpetrator's face was weaker (short exposure duration), but both effects were significantly reduced when memory was stronger. There was no effect of lineup size regardless of memory strength or filler similarity. We conclude that some recommendations to police may be more robust than others across changes in estimator variables such as memory strength and that more research is needed on interactions between estimator and system variables.

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6:00–7:00 PM (1139)

Understanding the Evidentiary Value of Direct Suspect Responses in Eyewitness Lineups. MICHAEL D. TUTTLE, *University of Massachusetts Amherst,* JEFFREY J. STARNS, *University of Massachusetts Amherst,* ANDREW COHEN, *University of Massachusetts Amherst* — The present study examines the evidentiary value of eyewitness lineups using unorthodox lineup procedures. We argue that the primary aim of an eyewitness lineup procedure is to gain as much accurate evidence as possible about the guilt or innocence of the suspect. Therefore, we take a particular interest in lineup procedures for which the witness must make a direct response to the suspect regardless of their ultimate identification decision (e.g., even if they identify a filler). Through our analyses of receiver operating characteristics (ROCs) and Expected Information Gain (EIG), we find evidence that witnesses can provide information about suspect guilt or innocence even when their primary response was not a suspect identification. This confers an advantage to lineup procedures that ensure a direct response to the suspect on every identification attempt. We also separately evaluated how these direct-response procedures increased information gain for guilty and innocent suspects, and we found that the pattern of information gain depends on how the lineup is conducted (e.g., simultaneous versus sequential presentation).

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6:00–7:00 PM (1140)

Face Recognition Ability and the Relationship Between Verbal Confidence and Accuracy for Cross-Race Eyewitness Identifications. JESSICA GETTLEMAN, *University of Virginia,* AUSTIN NGUYEN, *University of Virginia,* CHAD DODSON, *University of Virginia* — Cross-race identifications (IDs) occur when an eyewitness responds to a lineup for a suspect of a different race than their own. It is well-documented that these IDs are less accurate than same-race IDs (Meissner & Brigham, 2001) due to the cross-race effect (CRE). One explanation for the CRE addresses face recognition ability, suggesting those who are already poor face recognizers for same-race faces are more likely than stronger face recognizers to exhibit "face blindness" for other-race faces (Wan et al., 2017). Therefore, we aimed to assess the importance of face recognition ability in determining the accuracy of cross-race IDs and confidence judgments about them. We asked Asian and White participants to respond to both Asian and White lineups and provide their confidence in their IDs numerically and verbally before completing two well-validated measures of face recognition ability: the Cambridge Face Memory Test-Caucasian and -Chinese. Face recognition ability predicted cross-race ID accuracy as well as the strength of the confidence-accuracy relationship for these IDs, and we present results from a machine learning classifier used to quantify the predictive value of verbal confidence statements for same- and cross-race IDs.

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6:00–7:00 PM (1141)

Will Confidence Ratings Increase Accuracy in Perceptual Matching As They Do in Memory? ADVA SHOHAM, *Tel Aviv University,* GALIT YOVEL, *Tel Aviv University,* YONATAN GOSHEN-GOTTSTEIN, *Tel Aviv University* — People are poor at comparing two images of a person they are not familiar with (Burton & Jenkins, 2011). This task involves no memory at all but rather the comparison of two physically presented images—it is purely perceptual. The current study is motivated by recent findings in the eyewitness literature, wherein participants are required to compare a memory trace to a presented image—an ostensibly more difficult task. Recently, under a variety of conditions, high-confidence memory eyewitnesses were found to be highly accurate in their recognition judgments (Wixted & Wells, 2017). Will high confidence participants likewise demonstrate good perception? In two experiments, participants were presented with a target image and, simultaneously, with a lineup of images that were chosen using a deep neural-network algorithm. Participants could choose a face from the lineup, or reject the lineup. Either way, they rated their confidence. Upon computing calibration—with calculations adjusted for the perceptual task—high-confidence participants were found to be highly accurate in their perceptual judgments. Thus, like in memory, confidence is a key factor for perceptual decisions and should be taken into account in forensic decisions.

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6:00–7:00 PM (1142)

Archives Take Two! Mining the Data Across National Exoneration Databases for Causes of Wrongful Conviction. MAEVE C. HALDEMAN, *Roger Williams University,* KIMBERLY N. RODRIGUES, *Roger Williams University,* GARRETT BERMAN, *Roger Williams University,* MICHAEL P. TOGLIA, *Cornell University* — Previously, we proposed a "looking back to move forward" approach in leveraging archival datasets to inform further archival and experimental investigations. This strategy emerged from Innocence Project-Innocent Record (IP-IR) wrongful conviction case analyses examining the causes of mistaken identification. Fine-tuning this archival looking back methodology was guided by predictions regarding estimator variables, which can and have produced experimental predictions for moving forward with new studies. Presently, we report archival data mining of a much larger exoneration dataset, the National Registry of Exonerations (NRE), comparing the results with the IP-IR while exploring the six major causes of unjust convictions. Notably, lineup misidentifications were not the leading cause of injustice within the NRE data. Rather, official misconduct and perjury/false accusations topped the list. The NRE also revealed that on average multiple causes (M=2.20) contributed to erroneous convictions, so, unsurprisingly, single cause ("pure") cases reflect only 25% of cases. New experimental predictions will be discussed while arguing that our two-prong strategy will systematically advance novel innocence research that informs best practices.

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6:00–7:00 PM (1143)

How Does Matching a Feature Across Lineup Members Affect the Decision Process? MELISA AKAN, *University of Massachusetts Amherst,* JEFFREY J. STARNS, *University of Massachusetts Amherst,* ANDREW COHEN, *University of Massachusetts Amherst* — Many recognition decisions require identification of a target, which may or may not be present, among multiple alternatives. The police lineup is a famous example. In a lineup, the suspect, who may or may not be guilty, is presented alongside similar-looking fillers who are known to be innocent. The suspect may also be presented alone, referred to as the showup procedure. The present work explores memory and decision processes for the lineup and showup tasks using simple stimuli with precisely controlled features. We manipulated the composition of lineups by matching the fillers to the suspect on features that were differentially useful in discriminating guilty and innocent suspects, or by using a random sample of fillers. Lineup composition had a clear effect on discriminability, and lineups differed from showups only under certain conditions. We discuss the implications of our results for the possible mechanisms involved in compound identification and detection tasks.

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6:00–7:00 PM (1144)

Effects of Verbalization on Speaker Identification of Target Voice. HARUNA INOUE, *Hosei University* — This study explored the effects of the similarity of verbalized information between target and distractor voices on speaker identification. Participants listened to the target voice and either described it using one of three categories ("adjective-selection," "adjective-rating," or "free-description") or did not describe it (Control). They then rated "the degree to which the voice sounded like the target person" for three types of voice stimuli: the target voice, a high-similarity voice (verbalized information was similar to the target voice), or a low-similarity voice (verbalized information was dissimilar to the target voice). Results showed that "the degree to which the voice sounded like the target person" in the free-description category was significantly higher than in the control group in the high-similarity voice condition. These results suggest that verbalization leads participants to misidentify the high-similarity voice as the target person. Therefore, a verbal overshadowing effect in previous studies may have occurred because verbalization caused participants to perceive the high-similarity voice as the target person as much as the target voice, leading them to choose the high-similarity voice.

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6:00–7:00 PM (1146)

Belief Elicitation Beyond Numerical Knowledge and Parametric Distributions. PABLO LEON VILLAGRA, *Brown University,* LUCAS CASTILLO, *University of Warwick,* NICHOLAS CHATER, *University of Warwick,* ADAM SANBORN, *University of Warwick* — Accurately eliciting people's beliefs is a fundamental goal of psychology. However, standard methods, such as asking participants for the deciles of a distribution, usually only capture a rough outline of what people know. In addition, these methods have predominantly been limited to examining numerical beliefs. Based on the idea that people generate samples to derive inferences, we investigated whether tasks in which participants generate random sequences of items can be used to elicit their beliefs. In a set of preregistered online experiments, we first asked participants to produce the deciles of a distribution and generate random examples to uncover their beliefs about numerical environmental statistics. We found that the elicited beliefs closely matched the true environmental distributions and could predict behavior in a subsequent task. We then expanded our analysis to non-numerical domains (people's beliefs about popular travel destinations) and assessed the influence of geospatial and frequency information in participants' sequences. Overall, our results suggest that random generation is on par with decile elicitation, with additional benefits when reproducing idiosyncratic or non-numerical beliefs.

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6:00–7:00 PM (1147)

A Psychometric Model of Affective State Changes as a Function of Mental Flexibility. FRANCESCA BORGHESI, *IRCCS Istituto Auxologico Italiano,* VALENTINA MANCUSO, *eCampus University,* FRANCESCA BRUNI, *IRCCS Istituto Auxologico Italiano,* MARTA PIZZOLANTE, *Universitá Cattolica del Sacro Cuore,* ALICE CHIRICO, *Universitá Cattolica del Sacro Cuore,* GIUSEPPE RIVA, *IRCCS Istituto Auxologico Italiano & Università Cattolica del Sacro Cuore,* ELISA PEDROLI, *eCampus University,* PIETRO CIPRESSO, *University of Turin & IRCCS Istituto Auxologico Italiano* — The study proposes a new three-dimensional psychometric model for measuring behavioral, subjective, and neuro-psycho-physiological changes associated with an emotional episode. It is based on an intersection of Russel's consolidated two-dimensional model of arousal-valence and a third component defined as mental flexibility, which includes high-level cognitive processes linked to the emotional sphere, such as emotional intelligence and creative thinking. The research design creates a multidimensional machine learning model, both linear and non-linear, by combining elements of emotional induction via VR with cognitive-affective test results: first, participants were given validated tests to measure cognitive-affective processes related to mental flexibility, followed by emotional stimuli via VR headset, collecting arousal and valence measures. Preliminary results will be presented during this conference. The hypothesis is that those with a lower level of mental flexibility move less flexibly in the transition from one affective state to another, as anchored and influenced by the previous activation.

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6:00–7:00 PM (1148)

A Reanalysis of Implied Truth Effect Data Using Order-Constrained Inference. MEICHAI CHEN, *University of Illinois Urbana-Champaign,* MICHEL REGENWETTER, *University of Illinois Urbana-Champaign* — Many statistical analyses performed in psychological studies add extraneous assumptions that are not part of the theory. These added assumptions could adversely influence the conclusions one derives from the analyses. Order-constrained inference allows researchers to avoid unnecessary assumptions, translate conceptual theories into direct testable hypotheses, and run competitions among competing hypotheses. On top of these advantages, this reanalysis highlights how one can use order-constrained modeling to formulate more nuanced hypotheses and test these hypotheses jointly. The data set comes from Pennycook, Bear, Collins, and Rand (2020). The authors hypothesized that attaching warnings to a subset of fake news headlines increases the perceived accuracy of other headlines that are unmarked. Moreover, they also expected this effect to disappear when attaching verifications to true headlines. Using the QTEST software (Regenwetter et al., 2014; Zwilling et al., 2019), I assessed these hypotheses jointly for each individual headline. The analysis supports the authors' original hypotheses. To further leverage order-constrained inference, I ran a competition among multiple competing hypotheses using Bayesian model selection methods.

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6:00-7:00 PM (1149)

Evaluating Classical Maximum Likelihood Estimation for Estimating Shifted-Wald Models of Response Times. BRYANNA L. SCHEULER, *Tarleton State University,* THOMAS J. FAULKENBERRY, *Tarleton State University* — Response times (RTs) are a common measure to tap into the processes underlying observable behavior. Commonly, these RTs are fit to a model and latent population-level parameters are estimated. But how can we be sure that our estimation methods correctly recover these population parameter values? In this study we examined the validity of using classical maximum likelihood estimation (CMLE) to estimate parameters from shifted-Wald models of response times. We performed a parameter recovery study, using 1000 simulated datasets randomly generated from shifted-Wald distributions with known target parameters. We systematically varied both number of participants and trials in our synthetic datasets. Across most datasets, CMLE was largely accurate, with low root-mean square deviations and mean biases. Except for datasets in which there were only 20 trials per participant, there were moderate to high correlations between target parameters and those estimated from the model. Importantly, number of trials per participant was more impactful on successful estimation than the number of participants. In all, CMLE performed well for fitting shifted-Wald models of RTs, provided we observe at least 80 trials per participant.

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6:00-7:00 PM (1150)

Reevaluating Confirmation Bias and Context Effects Using Order Constrained Inference. EMILY LINE, *University of Illinois Urbana-Champaign,* MICHEL REGENWETTER, *University of Illinois Urbana-Champaign* — Many hypotheses in the field of psychology and law are only verbally stated, are not directly tested, and are often indistinct. We examine hypotheses from a paper investigating context effects and confirmation bias in a sample of judges (Rassin, 2020) and translate them into mathematical "order constrained" hypotheses. Rassin predicted judges would make different decisions regarding follow-up investigations based on the context of the case. He further predicted that judges' initial determination of guilty or not guilty would bias their future decisions regarding the case (congruent with confirmation bias). We formed several competing mathematical models based on the verbal hypotheses in the paper and tested them using the QTEST software (Regenwetter et al., 2014; Zwilling et al., 2019). The analysis provides new insights into heterogeneity of behavior. Model comparison revealed that decisions to pursue incriminating investigations versus exculpatory investigations should be modeled separately; a model only considering context is best for incriminating investigation decisions while a model only considering confirmation bias is best for exculpatory investigation decisions.

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6:00-7:00 PM (1151)

A Comparison in Recognition-Memory Data of Type I Error Rates: Comparing d', Percent Correct and d_a. ADVA LEVI, *Tel Aviv University,* CAREN M. ROTELLO, *University of Massachusetts Amherst,* YONATAN GOSHEN-GOTTSTEIN, *Tel Aviv University* — The replication crisis sounded a warning signal that many scientific discoveries may be false. One particular cause for such false discoveries is the use of accuracy measures that yield high rates of Type I errors. Here, we focus on binary tasks, as in yes-no recognition. Rotello et al. (2008) used computer simulations to show that due to the incorrect assumption of equal variance of lures and target, d′ typically yields high rates of Type I errors for iso-sensitive conditions that differ in bias. Previously, using computer simulations, we demonstrated the advantage of using the related signal-detection measure, d_a, which does not require the equal-variance assumption. When computed in unequal lure-and-target variance scenarios, our simulations revealed lower type I error rates for d_a. However, to fully demonstrate the validity of d_a, empirical data is required. We used an implied base-rate manipulation in a recognition task. We then measured performance in iso-sensitive conditions and computed d_a (and other classic measures). Our results show a substantially lower false discovery rates using da, as compared to other measures.

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6:00-7:00 PM (1152)

Examining Individual Differences Using Intersubject Correlations Multiple Sensory Modalities Based on Physiological and Behavioral Data. JUNHYUK JANG, *Jeonbuk National University,* JONGWAN KIM, *Jeonbuk National University* — Prior studies have demonstrated representations of valence and arousal using various sensory stimuli. However, dominance has not been sufficiently studied. The present study investigated whether individuals' affective representations of dominance differed across three modality conditions(auditory, visual, and haptic). Intersubject correlation (ISC) was used to examine the consistency of participants' physiological and behavioral responses. The results revealed that, first, the ISC of low dominance condition differed from the ISC of high dominance condition in auditory condition. The consistency of high dominance data set was greater than low dominance data set. Second, the ISC of high dominance condition was lower than the ISC of low dominance condition in visual condition. The results indicated that participants' reactions to visual stimulus were consistent at a low dominance level. Last, regardless of the dominance level, the consistency of individuals' reaction was the highest in haptic modality condition, indicating different dominance levels of consistency depending on sensory condition. Additionally, we propose that the ISC can be a useful measure for understanding dominance across individuals` representation patterns.

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6:00-7:00 PM (1153)

Towards a Data Driven Conceptualization of Gratitude. JOLINE GUITARD, *Université de Moncton,* ANNE-MARIE RAINVILLE, *Université de Moncton,* MÉLANIE PERRON, *Laurentian University,* ANNIE ROY-CHARLAND, *Université de Moncton* — Quickly growing research in the field of gratitude has caused many different definitions of the concept, which contributes to inconsistent conceptualizations across studies (Emmons, 2004; Gulliford et al., 2013; Lambert et al., 2009). Gratitude has been conceptualized as a state, a trait, an attitude, a behavior, and an emotion, and there is a lack of consensus on whether gratitude and gratefulness are distinct concepts (Adler & Fagley, 2005; McCullough et al., 2002; Morgan et al., 2017; Rusk et al., 2016). The current study aimed to empirically test these theoretical conceptualizations by using a novel statistical approach to the question. A total of 251 participants completed six different gratitude questionnaires. We performed an exploratory factor analysis on all items of the six questionnaires to explore how they would naturally divide into factors. Results suggest that close to 50% of gratitude can be explained by nine factors. Also, the factors found in the current study support some, but not all theoretical conceptualizations. We discuss how our current results will contribute to the quest of properly defining and conceptualizing gratitude based on empirical data.

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6:00-7:00 PM (1155)

How Does an Emotional Eyewitness Affect a Jury's Verdict Decision? CASSIE ANN E. RIDLEY, *University of Central Oklahoma,* JACLYN MAASS, *University of Central Oklahoma* — Eyewitness testimony is heavily relied on in court. There is a large amount of research on how eyewitness's reliability and defendant's behavior can influence a jury's verdict decision. However, there is less research on how an eyewitness's emotions are perceived by a jury and how that may influence the believability of the eyewitness. Many people self-assess that their own memories are more accurate when tied to strong emotions (compared to neutral), even though there does not tend to be any difference in the actual accuracy of the memories. Does this also apply to how we assess the accuracy of another person's memory? The current work will investigate how the emotion displayed by an eyewitness (sad or neutral) will impact jurors' perceptions of the believability of the witness, with implications for the verdict decision making process.

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6:00-7:00 PM (1156)

Predicting Affective Responses Based on Physiological Data Using Regression-Based Decoding. HYEONJUNG KIM, *Jeonbuk National University,* JONGWAN KIM, *Jeonbuk National University* — Regression-based decoding can be useful to predict responses measured employing continuous variables. Using this method, we aimed to predict participants' signed and unsigned valence and arousal ratings based on physiological data. We used data of Sharma et al. (2019) in which thirty participants watched eight emotional videos (two exemplars for 'amusing', 'boring', 'relaxing', and 'scary', respectively). Participants were asked to rate valence and arousal while eight physiological responses were measured. Cross-participant regressions-based decoding was performed to predict valence and arousal ratings based on physiological measurement data using leave-one-out paradigm. Results showed that the accuracy of correctly predicting signed valence significantly higher than chance level but not unsigned valence. Also, arousal was significantly decoded. These results indicated that the affective representations were successfully identified and consistent among individuals in signed valence, but not unsigned valence.

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6:00-7:00 PM (1157)

Testing Can Potentiate Learning in Distracting Online Environments. DAHWI AHN, *Iowa State University,* JASON C.K. CHAN, *Iowa State University,* KARL SZPUNAR, *Toronto Metropolitan University,* HYMNJYOT K. GILL, *Toronto Metropolitan University,* RACHEL O'DONNELL, *Iowa State University* — While watching online lectures, students often have other websites or applications open, which can cause distractions and reduce learning and engagement. We investigated if interpolated testing could protect learners from external sources of distractions. Participants watched STEM-based online lectures that were divided into four segments. Participants either took a test after every segment (i.e., test condition) or saw review slides after the first three segments and took a test after the fourth segment (i.e., review condition). In addition, participants watched the lecture with various levels of distractions (i.e., control, moderate distractions via memes, and strong distractions via TikTok videos). Preliminary data (~30 participants per condition, ~1/4 of the targeted sample size) show that interpolated testing improved subsequent learning in the control condition, but more importantly, the same effect was present when participants watched the lecture with moderately or strongly distracting materials. Further, interpolated quizzes increased attention towards the lecture. This finding suggests that interpolated testing can potentiate learning in distracting environments.

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Poster Session II
Friday, November 18, 2022
Viewing 11:00 AM-1:00 PM US EST, Authors Present 12:00-1:00 PM US EST, Hynes Convention Center Ballroom

Note: All in-person posters are also available for viewing for the duration of the conference in the virtual posters on the conference website.

12:00-1:00 PM (2001)

Exploring the Effect of Initial Testing on Source Cues of Earwitness Memory. MCKINZEY TORRANCE, *Tufts University,* JOHN BULEVICH, *Stockton University,* AYANNA K. THOMAS, *Tufts University* — Repeatedly retrieving one's memory for a crime leaves people susceptible to misleading post-event information. Specifically, mock eyewitnesses that took a memory test prior to encountering post-event information had worse memory for the crime and reported more post-event information on the final memory test compared to participants that did not complete an initial test. The present studies explore how initial testing influenced source cues for an overheard crime, and subsequent news report. Participants heard a crime, then took an initial memory test, before listening to a news report with information inconsistent with the crime. Then, they took a final memory test, and a source monitoring test of their final test answers. In experiment 1, we investigated the effect of initial testing compared to a filler task when the crime and post-event information are consolidated in different sessions. In experiment 2, we compared the effect of initial testing when the crime and post-event information are consolidated in different sessions, to when the crime and post-event information are consolidated in the same session. We found that initial testing, and timing of the initial test, affected participants source cues for the crime.

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12:00-1:00 PM (2003)

Role of Executive Function in Learning from Immersive Virtual Reality. ALYSSA P. LAWSON, *University of California, Santa Barbara,* RICHARD E. MAYER, *University of California, Santa Barbara* — Immersive learning reality (IVR) can be an effective motivational tool in learning new material, but it can also introduce distractions into the lesson that must be dealt with by the learner (Parong & Mayer, 2018, 2021). To deal with distractions, students may need to recruit their working memory capacity (WMC) and/or their executive function (EF) ability, which vary between individuals. The purpose of this research is to understand how individual differences in WMC and EF relate to learning from a distracting IVR lesson compared to a less distracting slideshow lesson. Participants watched a lesson either in IVR or with a computer-based video. They also completed 5 classic individual difference tasks that assessed either WMC or EF. A week later, participants took a test on the material presented. Overall, there were no differences in how much people learned from the lesson, but executive function ability played a role in learning from the IVR lesson and not the slideshow lesson, as determined by a stepwise regression. This research suggests that learning in IVR increases one's need to engage in attentional control to ignore distractors, but well-designed slideshow lessons do not require as much use of this control.

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12:00-1:00 PM (2005)

Understanding Study Strategies of High- and Low-Performing Younger and Older Adults. RACHELE J. DIFAVA, *University of Massachusetts Lowell,* NAYANTARA KURPAD, *University of Massachusetts Lowell,* JONATHAN W. AUBE, *University of Massachusetts Lowell,* MIKO M. WILFORD, *University of Massachusetts Lowell* — The current research examined study strategies employed by current (i.e., younger adults; YA) and former undergraduates (i.e., older adults; OA). We aimed to identify the strategies employed by academically high-performing individuals and determine if there were differences between YA and OA in the strategies they used. YA and OA were asked about their use of study strategies and the perceived effectiveness of these strategies. After which they completed a memory task involving a series of flag-country pairs. High-performing participants (60%) indicated that retrieval practice was the most frequently used strategy. YA used highlighting and found it to be effective compared to OA. OA found note-taking to be an effective strategy compared to YA. On the memory test, YA performed better than OA. YA also made overconfident predictions and significantly lower postdictions compared to OA. Overall, we found that participants in both groups use different strategies to achieve success.

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12:00-1:00 PM (2007)

Optimal Learning Sequence as Function of Strategy: Examining Transfer Performance After a Delay. JEXY AN NEPANGUE, *California State University, East Bay,* JAYDE HOLT-WYINDON, *California State University, East Bay,* JERI L. LITTLE, *California State University, East Bay* — The optimal sequence for learning (interleaving vs. blocking) can depend on various factors. In this study, we examined whether the optimal sequence depends on participants' strategies (memorizing vs. rule-abstraction) and assessed transfer immediately after training and again at a longer delay. In the first session, participants learned English-like letter strings from multiple categories in either a blocked or interleaved sequence and were instructed to find a rule or memorize. Then, they classified transfer items that would be classified in opposite ways based on similarity versus the rule. In the second session, participants classified transfer items, completed a relearning phase, classified transfer items again, and completed a strategy questionnaire. For transfer performance, there was an interaction between sequence and strategy such that for memorizers, interleaving was better than

blocking, but for rule-abstractors, blocking was better than interleaving. Memorizers forgot items over the delay but rebounded by the end of the relearning phase; rule abstractors, however, showed minimal forgetting over time. This study has implications for optimizing learning in educational contexts.

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12:00-1:00 PM (2008)

Does Retrieval Practice Impact Students' Study Order Decisions During Category Learning? ADDISON L. BABINEAU, *Texas Christian University,* PAYTON AYDELOTT, *Texas Christian University,* S. UMA TAUBER, *Texas Christian University* — During category learning, students' study order decisions to switch between categories (interleave) or to stay in the same category (block) can be influenced by their preferences and the structure of the categories they are learning. However, it is unclear if study order decisions are also influenced by retrieval practice. During retrieval practice, students can evaluate their knowledge and receive feedback on their learning that may influence their decisions differentially relative to students completing study-only trials. In two experiments, participants learned to classify categories of rocks (e.g., metamorphic) by completing study or test trials, and they made study order choices by selecting what category to study on the subsequent trial. As expected, retrieval practice substantially altered students' decisions to switch between categories (i.e., interleave their study). These findings have significant implications for category learning as well as for self-regulated learning.

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12:00-1:00 PM (2009)

The Effectiveness of Nudging Self-Regulated Study Decisions on Learning and Transfer. PETER WHITEHEAD, *Duke University,* ELIZABETH J. MARSH, *Duke University* — What are effective study strategies during self-regulated learning, and can we promote their adoption? Here, we investigated whether using nudges to promote an interleaved study strategy during self-regulated learning affects decision-making as well as learning and transfer outcomes. While much work in behavioral economics has demonstrated the effectiveness of nudges, these principles have largely not been applied in studies of self-regulated learning. One strategy—interleaving—in which the study sequence of exemplars is intermixed, has been posited to form interconnected representations of learning by directing attention to differences between exemplars. Alternatively, interleaved sequences could simply increase attentional engagement, leading to better learning and transfer. Over 3 experiments, we examined the effectiveness of nudges to interleave on study decisions and, subsequently, on transfer and memory performance in category learning. We consistently modified behavior using nudges, however, failed to show differences in transfer and learning outcomes. Together, these results speak to the mechanisms underlying transfer and learning benefits for interleaving during experimenter- and self-regulated study.

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12:00-1:00 PM (2010)

Learning with Cartoons: An Extention of the Emotional Design Hypothesis. FANGZHENG ZHAO, *University of California, Santa Barbara,* RICHARD E. MAYER, *University of California, Santa Barbara* — What is the effect on students' learning outcomes and learning experiences of converting a narrated slideshow on lightning formation with black-and-white line drawings (original group) into one in which the key elements are rendered as colorful cartoon-like characters (cartoon group)? We conducted two between-subjects experiments in which participants were randomly assigned to groups. The narrator's voice in both groups was a computer-generated female happy voice in Experiment 1 or a real female happy voice in Experiment 2. The cartoon group scored higher on a transfer posttest than the original group in both experiments. On subsequent questionnaires, the cartoon group reported feeling more positive (i.e., happy and content) during learning than the original group (in Experiment 1 and the combined experiments); and reported that the instructor was more engaging, better at facilitating learning, and more human-like (in Experiment 2 and the combined experiments). The results are consistent with the emotional design hypothesis, which predicts better learning from lessons in which key elements induce positive emotions.

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12:00-1:00 PM (2011)

Learning Preferences and Individual Differences in Design Fixation. EVANGELIA G. CHRYSIKOU, *Drexel University,* DONG-HO KIM, *Drexel University,* JULIE MILOVANOVIC, *University of North Carolina at Charlotte,* SNEHA S. BODA, *Drexel University,* MADDIE NAVEA, *Drexel University,* JOHN GERO, *University of North Carolina at Charlotte* — Problem solving in design is frequently susceptible to fixation, restrictions and mistakes introduced in the design process due to previous practice, that often impede the generation of effective design solutions. Research has shown that the inclusion of examples in the problem's instructions is associated with a tendency to conform to those examples during creative generation. Individual differences in learning tendencies during concept building might underlie one's susceptibility to design fixation. In this exploratory study, we investigated whether an exemplar-based approach to learning reinforces the impact of examples in design tasks, by increasing the salience of the example design features relative to the abstract relationships that unite them. In contrast, an abstraction-based approach to learning may emphasize the abstract design rules governing the example designs, thus offering protection from design fixation to their features. We examined how learning tendencies relate to performance on a design fixation task relative to a control design task, using a multimethod approach regarding the quantification of design fixation, learning tendencies, and individual differences through various behavioral assessments.

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12:00–1:00 PM (2012)

Explaining Errors Supports Learning for Low Spatial Individuals. ALLISON J. JAEGER, *Mississippi State University* — Science learning is challenging because it requires comprehending complex systems and diagrams. In math, research has found that explaining incorrect worked examples can support learning. Incorrect worked examples have also been shown to support 3D diagram understanding. This study explored the effectiveness of explaining highlighted errors in conceptual diagrams for supporting comprehension of expository science text. Results demonstrated that explaining highlighted errors in incorrect diagrams supported comprehension compared to a sketch condition and a control condition. Further, these results interacted with spatial thinking skills such that only high spatial students demonstrated improved comprehension in the sketch and control conditions, whereas low spatial students showed equal levels of comprehension to high spatial students in the incorrect diagrams condition. Together, these findings demonstrate that activities requiring learners to explain errors in diagrams are beneficial for learning and may be especially beneficial activities for students with low spatial thinking skills.

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12:00–1:00 PM (2013)

Effectiveness of Infographics for Learning Historical Timelines. LISA D. BLALOCK, *University of West Florida,* MORGAN KELLY, *University of West Florida* — Infographics have become a popular multimedia learning format in educational settings. However, most of the research on infographics focuses on design principles and not how effective they are for learning. In the current study, 106 participants studied timeline information about 3 Renaissance artists, each under a different learning modality: a timeline infographic, a paragraph of text, and a narrated PowerPoint video. Learning was evaluated using a multiple choice quiz. We also surveyed participants on learning preferences, including which format they learned the most from, which was the most engaging, and which was the most challenging. The results showed no significant differences in learning between the 3 learning modalities, though there was a slight advantage for the infographic condition. Participants overwhelmingly felt they learned the most from the narrated video (66%), and they found that format the most engaging (53.8%). They also overwhelmingly rated the paragraph as the most challenging format to learn from (73.6%). These data suggest that while different learning modalities may lead to comparable learning outcomes, learners find some modalities to be more engaging, which may lead to better long-term outcomes.

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12:00–1:00 PM (2014)

Snap & Write: Examining the Effect of Taking Photos and Notes on Memory for Lecture Content. MARY MCCOOK, *University of California, Riverside,* JULIA S. SOARES, *Mississippi State University,* ANNIE S. DITTA, *University of California, Riverside* — Recent research in a simulated classroom environment has demonstrated a photo-taking benefit such that information associated with lecture slides that were photographed was remembered better than for the unphotographed slides (Ditta, Soares, & Storm, under review). The present study is a replication and extension of this prior work and examines how photo-taking interacts with more naturalistic note-taking behaviors. In a within-subjects design, participants were asked to watch three lecture videos and record the information in one of three ways (counterbalanced) while attending to a short lecture video: only watch (baseline), take notes, or take notes and take photos of each slide. After watching the lectures, participants took multiple-choice tests on the lecture content. We hypothesized that being asked to take both notes and photos would increase participants' cognitive load (Sweller, 1994) and perhaps reduce or even eliminate the photo-taking benefit observed in prior work. Thus, we predicted that memory for lecture content would be the best when participants took notes but would be reduced when they did not record information at all and when they took both photos and notes simultaneously. Data collection is underway.

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12:00–1:00 PM (2015)

Attending to Visual Cues and Peer Videos Differentially Affects College Students' Learning During Online Lessons. TAYLOR MARCUS, *Tulane University,* JILL L. KING, *Tulane Brain Institute, Tulane University,* JULIE MARKANT, *Tulane University* (Sponsored by Julie Markant) — Although the COVID-19 pandemic abruptly shifted learning online, there remains substantial variability in the format of virtual learning environments. Many platforms include videos of the instructor and classmates, as well as additional features intended to cue students' attention to relevant content. Research has established that visual cues alone can enhance learning, but the effect of peer video presence on learning and attention to course content remains unclear. We examined college students' (N = 17, anticipated N = 50) attention to and learning from online, pre-recorded lessons that included an instructor video, a peer video, and visual cues that highlighted relevant text. Preliminary results showed that the visual cues increased participants' looking to the relevant text ($t(14) = 2.92$, $p = .011$), which in turn related to improved learning of lesson content ($r(15) = .60$, $p = .018$). Participants also spent more time looking at the peer video when it was present ($t(14) = 2.68$, $p = .018$), but this instead related to poorer learning of lesson content ($r(15) = -.59$, $p = .021$). These results suggest that visual cues can facilitate learning, but the presence of peer videos may instead distract from learning.

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12:00–1:00 PM (2016)

Sharing vs. Caring: Evaluative Mindsets Can Reduce Reproductions of Inaccurate Social Media Content. CLAIRE E. MASON, *Northwestern University,* NIKITA A. SALOVICH, *Northwestern University,* DAVID N. RAPP,

Northwestern University — Concerns about the spread and influence of false ideas are at the forefront of theoretical and everyday discussions. In two experiments, we examined whether and how exposure to inaccuracies conveyed on social media (e.g., Twitter) can affect people's knowledge about the world. Participants evaluated tweets containing true or false information for interest, accuracy, or whether they would "like" the tweet. Afterwards, participants answered open-ended, general knowledge questions related to the contents of the tweets. Participants were more likely to reproduce false ideas and less likely to respond with correct answers after reading tweets containing false as compared to true or unrelated information. Participants who evaluated tweets for accuracy were less influenced by presented inaccuracies than were participants who made interest or "like" judgments. These results underscore the importance of evaluative mindsets for reducing belief in and the spread of inaccuracies online.

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12:00-1:00 PM (2017)

How Do Students Regulate Their Study of Examples and Definitions When Learning Key Concepts? SABRINA BADALI, *Kent State University,* KATHERINE A. RAWSON, *Kent State University,* JOHN DUNLOSKY, *Kent State University* — When students are learning multiple concepts, interleaving study of the concepts is typically more effective than blocking by concept. Additionally, studying both examples and definitions is beneficial for learning. The current project investigated students' self-regulated choices to block or interleave their study of examples and definitions for multiple concepts. Students saw a list of 10 social psychology concepts and selected which one they wanted to study next. Then, they chose whether they wanted to study an example or the definition of the concept. Students could study concepts in any order they wanted and could revisit them as often as they wanted. Thus, students had control over whether they interleaved or blocked their learning of the concepts and how many times they studied an example and/or the definition for each concept. Across two experiments, students chose to study both examples and the definition for concepts, but most students chose to block their studying by concept instead of interleaving. However, students' choices to block their studying did not consistently impact final test performance.

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12:00-1:00 PM (2018)

An Experimental Examination of Active Learning's Influence on Memory, Mind Wandering, Affect, Metacognition, and Effort. LAURA J. BIANCHI, *University of Waterloo,* JOYCE PARK, *University of Waterloo,* ALYSSA C. SMITH, *University of Waterloo,* SUZANNE KEARNS, *University of Waterloo,* DANIEL SMILEK, *University of Waterloo,* PATRICK L. CRAVEN, *Lockheed Martin Corporation,* EVAN F. RISKO, *University of Waterloo* — Researchers and educators have often argued that active learning is superior to more passive forms of learning (e.g., lectures); however, the mechanisms underlying this putative superiority could be better understood. To this end, we conducted a 3-part experiment examining the influence of a popular type of active learning – peer instruction – across a range of learning relevant variables (i.e., learning, mind wandering, affect, metacognition, and effort). In our study, participants were first asked to read a textbook-like passage of the material to gain background knowledge of the topic. In part 2 of the study, participants were brought into "class" and either watched a video lecture or took part in peer instruction, after which they reported on their effort, metacognition, and other experience questionnaires (e.g., affect) as well as completed a test of the material from parts 1 and 2. Part 3 occurred 1 week later and consisted of a test on the material. Results revealed effects of condition on mind wandering, affect, and effort but limited differences between the groups on memory for the material. The implications for learning and the development of a deeper mechanistic understanding of active learning will be discussed.

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12:00-1:00 PM (2019)

Online Lecture Breaks Can Promote Media-Multitasking and Harm Learning. KITTY M.Q. GUO, *McMaster University,* ABIGAIL J. FISHER, *McMaster University,* NOAH D. FORRIN, *McMaster University,* FARIA SANA, *Athabasca University,* JOSEPH A. KIM, *McMaster University* — While online lecture breaks are a promising intervention to improve learning, there is limited research examining what types of breaks are effective (and what types are counterproductive). We examined the effect of break length and frequency on attention and learning during a 50-minute pre-recorded lecture video in a simulated virtual classroom. Undergraduate students were randomly assigned to take no breaks, one 6-minute break halfway through, or three 2-minute breaks equally distributed throughout the lecture. We found that participants performed significantly better on the post-lecture quiz in the no breaks condition, compared to the break(s) conditions, and in the one 6-minute break condition, compared to the three 2-minute breaks condition. Consistent with this result, participants in the break(s) conditions retrospectively reported significantly more media multitasking than those in the no breaks condition. This study suggests that not all lecture breaks are beneficial to learning—some may even be detrimental. Future studies should consider the effect of different break activities on learning.

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12:00-1:00 PM (2020)

Collaborative Retrieval Practice Reduces the Frequency of Mind-Wandering During Learning. ALEXANDER G. KNOPPS, *North Dakota State University,* KATHRYN T. WISSMAN, *North Dakota State University* — Mind-wandering is a normal phenomenon that occurs in many environments including social and educational settings. Concerning educational contexts, research has shown that mind-wandering can have a negative impact on recall and memory, suggesting that finding ways to reduce the frequency of mind-wandering is important for supporting learning and retention. The present research evaluates the extent to which engaging in

collaborative learning reduces the frequency of mind-wandering. Participants individually studied categorical word lists and then engaged in retrieval practice either individually or as a dyad. During retrieval practice, participants responded to mind-wandering probes, which asked them to indicate whether they were on task or off task. All participants completed an individual final test. Consistent with prior research, results showed collaborative inhibition during practice and post-collaborative benefits on the final test. Most importantly, results provide novel evidence that engaging in collaborative (versus individual) retrieval practice reduces the frequency of mind-wandering during learning.

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12:00-1:00 PM (2021)

Does a Note-Taking Intervention and Lecture Overview Impact Students' Main Idea Identification in Notes? PAIGE E. NORTHERN, *Southeast Missouri State University,* S. UMA TAUBER, *Texas Christian University* — Most students take notes during lectures to facilitate their learning of course content. Note-taking supports students' learning by 1) facilitating superior acquisition of information and 2) providing students with an external source of information to review in preparation for a memory test. The extent to which students benefit from note-taking, however, depends on their success at identifying key concepts and including them in their notes. We aimed to improve this in the current set of experiments. Across 3 experiments, students completed a novel note-taking intervention or they did not, watched a lecture video with or without a lecture overview, completed a memory test, and answered questions about their note-taking. The intervention and lesson overview did not impact students' main idea identification or memory performance (except in Experiment 2), but students believed they did. These results shed light on barriers to taking high-quality notes during class lectures and students' limited ability to modify their note-taking habits.

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12:00-1:00 PM (2022)

Visual Error Detection: Considering the Role of Elaboration. HOLLY A. TAYLOR, *Tufts University,* PHILLIP KANG, *Tufts University,* LAUREN A. MASON, *Tufts University,* GREGORY HUGHES, *U.S. Army Combat Capabilities Development Command (DEVCOM) Soldier Center,* AYANNA K. THOMAS, *Tufts University* — Elaboration-based strategies can support learning by helping to form memory connections. However, elaboration when learning complex visual stimuli is understudied. For complex stimuli, elaboration could help learning via relevant connections or could impair learning by increasing cognitive load. The present study evaluated these competing hypotheses. Participants learned errors and non-error differences in a simulated Army cargo bag's set-up either with or without elaboration. After learning, participants completed three memory tasks: error detection, error categorization, and free recall of bag components. Results showed that both groups learned errors in the bag set-up well. However, elaboration aided identification of non-error differences. Further, free recall positively correlated with non-error difference identification. These results suggest that elaboration aids complex visual learning. Subjective reports suggest that participants realized the utility of the elaborations. Future research should evaluate the generalizability of these findings to other complex stimuli.

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12:00-1:00 PM (2023)

Scientific Reasoning as a Predictor of Performance on Hypothetical Inference Questions. TRICIA A. GUERRERO, *University of Illinois Chicago,* THOMAS D. GRIFFIN, *University of Illinois Chicago,* JENNIFER WILEY, *University of Illinois Chicago* (Sponsored by Thomas Griffin) — Prior research has shown that inferences that are not required to maintain coherence are seldom made during online reading. However, they are often tested after reading as a measure of comprehension, and readers may not have developed mental model necessary to respond to them. The current study attempted to increase the depth of processing that readers engage in by providing a test-expectancy prior to reading. Results suggest that an inference test-expectancy does improve performance on both bridging and application-based inference questions compared to a control condition. In addition, while performance on bridging inferences was best predicted by traditional reading measures such as vocabulary and the ACT reading test, application-based hypothetical inferences were less reliant on these measures and more so predicted by scientific reasoning skill.

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12:00-1:00 PM (2024)

Your Best Effort? Study Strategies and Subjective Experience. CAITLIN M. REINTJES, *McMaster University,* JEREMY MARTY-DUGAS, *McMaster University,* JOSEPH A. KIM, *McMaster University,* FARIA SANA, *Athabasca University* — While retrieval practice is a more effective strategy for long-term retention, rereading course material is a more popular strategy among undergraduates. One possible explanation for this discrepancy is that these strategies may differ in terms of how they are subjectively experienced. In the present study we investigate whether varying study strategy leads to systematic changes in student experience. After an initial reading phase, 264 undergraduate students were randomly assigned to study a passage using either rereading or retrieval. Participants reported on their experience of cognitive effort (assessed via ratings of perceived difficulty, expended effort, and fatigue), as well as their experience of flow (i.e. deep, effortless concentration) while studying. Immediately following these ratings, students completed a knowledge test. Preliminary results suggest that those who used rereading performed significantly better on the memory test than those who engaged in retrieval. Further, perceived difficulty did change as a result of strategy, although flow, expended effort, and fatigue do not appear to differ between strategies. Results indicate that subjective experience may be an important predictor of academic performance.

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12:00-1:00 PM (2025)

Assessing Participant Characteristics, Treatment Engagement, and Adherence to Intervention Between In-Person and Online Settings. DOMENICO TULLO, *University of California, Irvine,* YI FENG, *University of California, Irvine,* ANJA PAHOR, *Univerza v Mariboru,* YUE J. HE, *University of California, Riverside,* AARON R. SEITZ, *University of California, Riverside,* SUSANNE M. JAEGGI, *University of California, Irvine* — Typically, research examining the viability of cognitive interventions is limited by convenience sampling, which in turn reduces generalizability and may lead to ambiguity in subsequent replication studies. Similarly, an intervention's efficacy can vary as a function of individual differences. To overcome these obstacles, some interventions have been adapted for online delivery. Particularly, the field of cognitive training, plagued by inconsistent findings and coupled with the shift towards research identifying for whom the intervention works best, has moved online. This shift has enabled the recruitment of diverse and representative samples. Nevertheless, questions regarding balanced sample parameters, adherence, and engagement are vital prior to evaluating cognitive training programs delivered online. Here, we compare and contrast participant characteristics, treatment compliance, and engagement on a cognitive training task, Recollect, a gamified version of the traditional n-back paradigm, administered to young adults as a function of online (n=684) and in-person (n=346) settings. The findings from this study outline the challenges, benefits, and future opportunities for interventions with technology-assisted delivery.

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12:00-1:00 PM (2026)

Forgetting of Newly-Learned Words: Fragmented or Holistic Depending on the Nature of Encoding. REBECCA CROWLEY, *Royal Holloway, University of London,* JAKKE TAMMINEN, *Royal Holloway, University of London,* AMIR-HOMAYOUN JAVADI, *University of Kent* — The cognitive mechanisms that integrate newly-learned words with existing words and semantic knowledge in the mental lexicon have been intensely researched. Much less is known about how distinct elements constituting a single lexical representation become integrated with each other. Taking inspiration from episodic memory research (e.g., Joensen et al., 2019), we sought to establish whether there is a statistical association between retrieval successes of different lexical elements of the same new word (i.e., retrieval dependency). Across three pre-registered experiments, participants encoded new words made from an orthographic word form (e.g., "flimir") presented alongside pictorial (e.g., picture of a balloon) and auditory (e.g., sound of a baby crying) elements representing semantic word context. Retrieval dependency emerged immediately after encoding, showing that lexical elements, like those of event memories, become rapidly bound together in memory, but retrieval dependency disappeared after one week, showing that new lexical representations, unlike event memories, fragment across forgetting. Such fragmentation was prevented however if an extra opportunity for testing or restudy occurred immediately after encoding.

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12:00-1:00 PM (2027)

Collaborative True/False Practice Testing Results in Different Patterns of Learning Than Individual True/False Practice Testing. MEGAN IMUNDO, *University of California, Los Angeles,* VAISHALI R. DENTON, *University of California, Los Angeles,* JORDAN A. BRABEC, *University of California, Los Angeles,* ELIZABETH L. BJORK, *University of California, Los Angeles* — True/false practice testing can enhance learning of both previously tested and previously related (but not directly tested) concepts. This benefit can differ, however, between "true" practice and "false" practice, as different question types elicit contrasting patterns of retrieval (Brabec et al., 2021). Here, we investigated if the benefit of true/false practice testing collaboratively would be consistent across question type, as practice testing in groups may encourage more comprehensive retrieval of information than practice testing alone (Johnson et al., 1998). Participants read two passages and then either took a true/false practice test in groups or individually. Then, all students took a cued-recall test individually. This study replicated the results of Brabec et al. (2021) when students practice-tested individually. In partial support of our hypothesis, collaborative practice testing benefited learning of directly tested information regardless of question type; but surprisingly, there was no benefit of collaborative practice testing for previously related information. These results suggest that practice testing collaboratively may lead to different effects on learning than practice testing individually.

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12:00-1:00 PM (2028)

Does Retrieval Demand Moderate the Effectiveness of Covert Retrieval Practice? MICHELLE L. RIVERS, PHD, *Texas Christian University,* PAIGE E. NORTHERN, *Southeast Missouri State University,* S. UMA TAUBER, *Texas Christian University* — Retrieval practice typically promotes memory, but response format (overt vs. covert retrieval) may moderate its impact. Overt retrieval results in better learning compared to covert retrieval for learning definitions to key terms (Tauber et al., 2018), whereas covert and overt retrieval are equally effective for learning single words (e.g., Smith et al., 2013). Could retrieval demand explain these mixed outcomes? Across two experiments, college students studied key terms and their definitions and then restudied or practiced retrieval overtly or covertly. Some students practiced retrieving definitions (i.e., material with a high retrieval demand), whereas other students practiced retrieving key terms (i.e., reduced retrieval demand). Two days later, students completed a criterion test on either the key terms or the definitions. Results suggest that mode of retrieval practice (covert vs. overt) mattered, as did whether students practiced key terms or definitions. These results provide insight into the processes

underlying covert versus overt retrieval and inform educational recommendations.

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12:00-1:00 PM (2029)

The Effects of Retrieval Practice, Variability, and Spacing on the Transfer of Knowledge. RACHEL SMITH-PEIRCE, *Washington University in St. Louis,* NATHANIEL WOODWARD, *The University of Texas at Austin,* ANDREW C. BUTLER, *Washington University in St. Louis* — Retrieval practice is an effective learning activity that promotes superior transfer of knowledge relative to repeated study (Pan & Rickard, 2018). Introducing variability during retrieval practice further promotes transfer relative to repeated practice on the same item (Butler, Black-Maier, Raley, & Marsh, 2017). The present study investigated whether the benefits of variable retrieval practice depend upon practice being massed. Participants watched geology videos that contained a total of 12 concepts, and then either answered three questions or read three study points about each concept. Each of the three questions and study points were presented two days apart with the first presented immediately after the corresponding video. Variable versus repeated practice was manipulated between participants. The final test consisted of 12 new application questions. A 2x2 mixed ANOVA revealed that variable practice produced better transfer than repeated practice ($F(1,146) = 9.05$, $p = .003$, $\eta^2 = 0.06$), but neither the main effect of practice activity nor the interaction were significant ($Fs < 2$). Introducing spacing into variable retrieval practice eliminated the testing effect observed in previous experiments with massed practice.

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12:00-1:00 PM (2030)

An Investigation of the Impact of Structure-Building on Learning from Testing and Feedback. KAYLYN WERTZ, *Radford University,* HANNAH BENZ, *Radford University,* KATHLEEN ARNOLD, *Radford University* — The retrieval practice effect specifies that memory is enhanced when the to-be-remembered information is actively retrieved (Rowland, 2014), but previous research has displayed mixed findings regarding how individual differences may impact this effect (Agarwal et al., 2017; Arnold et al., 2017). Learners who are less skilled at building mental models, important for narrative comprehension, may not benefit as much from retrieval practice when learning from narratives, especially when feedback is not given. The current study examines how structure-building ability (McDaniel et al., 2021) may moderate the retrieval practice effect when feedback is or is not given. We used a 2 (test, restudy) X 2 (feedback, no feedback) mixed design, with test/restudy manipulated within-participants and feedback manipulated between-participants. After reading a passage, participants were tested on four facts and read four fact statements. Half of the participants received correct answer feedback. After a two-day delay, participants took a final test and completed the Multimedia Comprehension Battery (Gernsbacher et al., 1990) to assess structure-building ability. Results have implications for the generalization of the retrieval practice effect.

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12:00-1:00 PM (2031)

Multiple Short Tests or One Long Test: Which Is Better for Learning? SHAUN BOUSTANI, *University College London,* HILARY DON, *University College London,* DAVID SHANKS, *University College London* — Testing can enhance memory, but what is the optimal placement of tests during a learning episode? Two potential placements are having short interim tests administered throughout learning or a single longer test at the end. The grain size hypothesis stipulates that interim testing should result in better retention at final cumulative assessment as retrieval success during practice is expected to be higher. However, previous research has found that although interim tests result in better practice performance, this does not translate into an advantage at cumulative assessment. We evaluated the grain size hypothesis using lists of related and unrelated words and exposure-matched restudy controls. We also assessed whether the benefit of interim tests on cumulative assessment was dependent on the format of cumulative tests. Interim tests enhanced both practice and cumulative assessment performance and this was not dependent on test format. A meta-analysis of the extant literature also found a large practice test effect and a smaller, but still significant, cumulative assessment effect, in line with the grain size hypothesis.

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12:00-1:00 PM (2032)

Take Some Guesses! An Exploration of the Consequences of Multiple Attempts in the Pretesting Effect. KELSEY K. JAMES, *University of Houston-Clear Lake,* BENJAMIN C. STORM, *University of California, Santa Cruz* — Pretesting, or answering a question prior to learning the associated information, can be a powerful tool for learning. By the nature of this type of test, however, learners are likely to answer questions incorrectly. In the current project, we explore the idea that incorrect guesses may cause competition and thereby impair access to the correct answer. If this is the case, making more incorrect guesses could lead to worse performance compared to making a single guess. Theories behind the pretesting benefit (e.g., Retrieval Effort, Elaborative Retrieval), however, would seem to predict the opposite—that making multiple guesses could lead to an increase in benefit for later memory. Three experiments were conducted to determine whether generating multiple pretest guesses is beneficial or detrimental for learning. A consistent benefit of pretesting was found. However, no difference was found between conditions in which three guesses were made as opposed to one. In short, despite reasons to expect that memory might be improved or impaired by extra guesses, no evidence was found to suggest that this is the case.

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12:00-1:00 PM (2034)

Prompting Learners to Engage in Knowledge Updating of the Pretesting Effect. MICHELLE L. RIVERS, PHD, *Texas Christian University,* STEVEN PAN, *National University of Singapore* — The pretesting effect refers to the finding that taking tests on yet-to-be-learned information can benefit learning relative to non-testing methods (e.g., reading) if the correct answers are studied afterwards. Using a knowledge updating approach that entailed two cycles of pretesting versus reading followed by a criterial test, we investigated the extent to which learners develop metacognitive awareness of the pretesting effect through experience (as evidenced by predictions of test performance), and three forms of external support—performance feedback, prediction reminders, and recall prompts—that might improve, or provide insights into, such awareness. Across multiple experiments, we found that learners lack awareness of the pretesting effect, believe that reading is more effective even after experiencing both techniques, and need to be made aware of expectation-performance discrepancies before acknowledging that pretesting is more effective. These results underscore the challenge of, and highlight several means of dislodging, inaccurate beliefs about the efficacy of pretesting.

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12:00-1:00 PM (2035)

No Evidence for a Visual Testing Effect for Novel, Unnameable Objects. ANNA MCCARTER, *University of Massachusetts Amherst,* DAVID HUBER, *University of Massachusetts Amherst,* ROSEMARY COWELL, *University of Massachusetts Amherst* — The well-documented testing effect shows a memory benefit when verbal materials are recalled rather than re-studied. Here, we investigated whether the testing effect is a basic property of learning that occurs for all stimulus materials, or whether it uniquely applies to verbal/semantic information. To minimize the impact of semantic information, we used novel, abstract images consisting of a shape and fill. Following initial study, half of the images were re-studied while the others were subject to recall practice. Practice involved presenting one feature (shape or fill) of a stimulus and asking the participant to recall and select the feature that goes with it. In a series of experiments, we repeatedly found no memory benefit for the items that were recall-practiced over the items that were re-studied. In fact, in the majority of experiments, the re-studied items were remembered significantly better than the recall-practiced items. This suggests that the testing effect does not occur for purely visual material, and therefore may not be a universal process across content types.

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12:00-1:00 PM (2036)

Overt Spatial Attention Hampers Working Memory Retrieval When Location Is Task-Irrelevant. SORI KIM, *University of South Carolina,* JESSICA GREEN, *University of South Carolina,* ANASTASIA C. JAVORIS, *University of South Carolina* — We investigated the effect of allocating spatial attention during working memory maintenance when spatial information is irrelevant to the memory task and how this effect is modulated by eye movements. Participants memorized four colored shapes, and then, after a delay, judged whether a new array of four items was identical or not with the previous one, regardless of whether those items were in the same locations. During the delay period of the memory task, we presented a secondary task to shift spatial attention to a location that was congruent, incongruent, or neutral relative to the location of the memory target. We found that allocating spatial attention to the location of a memory item hampered the retrieval of the item but this interference was only evident when participants could freely move their eyes. When participants kept their eyes centrally fixated throughout the task no such effect of spatial attention on working memory maintenance was observed. Our results show that when participants are allowed to freely move their eyes during the maintenance period of a memory task, the overt shift of spatial attention interferes with retaining memory items when spatial information is irrelevant to the task.

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12:00-1:00 PM (2037)

Attentional Prioritization in Working Memory Changes Interactions with Task-Relevant Perception. JOSEPH M. SAITO, *University of Toronto Mississauga,* FRIDA PRINTZLAU, *University of Toronto Mississauga,* YVANNA YEO, *University of Toronto Mississauga,* KEISUKE FUKUDA, *University of Toronto Mississauga* — Individuals typically shift their focus of attention (FoA) in visual working memory (VWM) towards items that are relevant for impending behavior (i.e., high-priority, HP) and away from those that may become relevant later (i.e., low-priority, LP). However, it is unclear how attentional prioritization in VWM affects interference caused by new task-relevant percepts. We tested this question by cuing participants to shift their FoA between two colors (Exp.1) or shapes (Exp.2) held in VWM and compare the cued item with a probe stimulus. Afterwards, a second cue indicated which VWM item was to be reported. We found higher report precision on no-probe trials when the same item was cued twice, suggesting that maintaining HP items in the FoA limited representational decay. However, reports of LP and HP items were both biased towards relevant probes, and these biases were comparable or larger in LP items. Using modelling, we found that LP and HP items were both vulnerable to representational shifts induced by the probe, but LP items were especially prone to swap errors. Thus, VWM items are susceptible to task-relevant interference regardless of attentional priority, but prioritization mitigates lost correspondence with encoded items.

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12:00-1:00 PM (2038)

The Impact of Visual Working Memory Chunking on Visual Search. LOGAN DOYLE, *University of Toronto,* SUSANNE FERBER, *University of Toronto* — Stimulus regularity (Zhao et al., 2013) and the online content of visual working memory (VWM, Moorselar et al., 2014) both bias the deployment of attention.

Similarly, when items in VWM are presented together with regularity, they can be stored more efficiently in a process called chunking (Brady et al., 2009). We investigated how VWM chunking impacts performance on a subsequent visual search task. In the first experiment, participants alternated between blocks of visual search and VWM tasks. While evidence of chunk learning was observed (β = 1.07, SE = 0.052, z = 2.79, $p < 0.001$), the chunked colours were not prioritized over their random counterparts when presented as singletons (β = 0.16, SE = 8.29, t = -0.13, p = 0.89). This finding persisted even when the visual search was performed during the retention interval of the VWM task (β = -1.71, SE = 8.95, t = -0.19, p = 0.84). These experiments demonstrate no significant impact of VWM chunking on visual search, despite their regularity and maintenance in VWM. We speculate that long-term memory mediates the interaction between chunking and attention.

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12:00-1:00 PM (2039)

Examining the Role of Attention During Feature Binding in Visuospatial Working Memory. DAVID T. GOLDENHAUS-MANNING, *University of Essex, Wivenhoe Park,* NICHOLAS COOPER, *University of Essex,* VANESSA M. LOAIZA, *University of Essex* — We investigated whether the role of attention in feature binding in visuospatial working memory depends on whether the features are intrinsic (integrated within) or extrinsic to (not part of) the object. Participants viewed an array of different-colored shapes in different locations, followed by a retention interval and probed recall, wherein one intrinsic (shape, color) or extrinsic (location) feature prompted recall of a remaining feature (e.g., a shape probe prompted recall of color) along a continuous color/shape/location wheel. The retention interval either remained blank (no-cue) or presented a shape, color, or location retro-cue to determine whether extrinsic retro-cues reduce binding errors relative to a no-cue baseline, whereas intrinsic retro-cues may have little impact, suggesting that attention specifically benefits extrinsic feature binding. Our results showed that retro-cues did not reduce extrinsic or intrinsic binding errors, regardless of the nature of the cue. However, retro-cues increased target memory, regardless of the nature of the retro-cue or binding type. This suggests that guiding attention towards an intrinsic or extrinsic feature benefits all features, regardless of the nature of the feature binding.

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12:00-1:00 PM (2040)

Temporal Integration of Visual Summary Representations. BUGAY YILDIRIM, *Boğaziçi University,* AYSECAN BODUROGLU, *Boğaziçi University,* YELDA SEMIZER, *New Jersey Institute of Technology* — The current project aims to investigate how the temporal integration of visual representations is operated by the visual system. In doing so, the focus will be on the biases (e.g., central tendency, recency) reported in the temporally extended ensemble processing literature. Additionally, the effects of allocation of attentional resources on temporal integration processes are included in our inquiry. First, we report the results of a secondary data analysis conducted on a continuous report attentional blink (AB) data, in which participants estimated orientations of the target items, that revealed a central tendency bias indicating that the same mechanism might be involved in both temporal integration of visual summary representations and the target estimations in the AB paradigm. Secondly, as this is an ongoing project, we are now collecting our own data in an AB setting, sampling target orientations from two distinct distributions to replicate and extend the findings of the secondary data analysis and to test for whether summary representation of two targets are integrated together or held separately.

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12:00-1:00 PM (2041)

Temporal and Informational Limitations of Orientation Ensemble Averaging. JACOB ZEPP, *University of South Florida,* CHAD DUBE, *University of South Florida* — Visual perception and memory research suggests participants can form statistical summaries of features computed across multiple stimuli. Debate exists as to the proportion of feature information that is integrated into the ensemble summary (all information vs a subsample), as well as the stage within which the summary is formed (prior to or within STM). The current work describes two experiments that provide insight into the dynamics of ensemble code formation. In the first, subject responses in a whole-report task are compared to responses in an orientation averaging task over equivalent displays. In the second, orientation averaging performance is compared between backward pattern masked and unmasked displays, over a range of exposure durations, to determine the reliance of ensemble generation on STM information consolidation. Together, the experimental results are used to inform a model of ensemble perception placed within current models of memory and attention.

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12:00-1:00 PM (2042)

Visual Field Benefits of Retrocues. SUMMER SHEREMATA, *Florida Atlantic Unversity* — Leftward biases in a number of visuo-spatial tasks are often often associated with right hemisphere dominance for visuospatial processing. In visual short-term memory, performance has been shown to be higher in the left-, as compared to the right-, visual field for single-feature objects. However, an increasing number of behavioral and neuroimaging studies have shown that increasing attentional and memory demands can lead to rightward shifts of resources. To directly assess whether visual attention demands can result in a rightward shift of resources, here we used retrocues indicating the visual hemifield of a probed memory item. Participants were asked to remember multiple colored squares across the visual field. During the memory delay a retrocue was presented to indicate the location of the memory probe on 75% of trials, while in the remaining 25% of trials no cue was presented. Left visual field biases were seen for uncued trials, but not cued trials. Furthermore,

cue effects were specific to the right visual field memory probes. These results suggest that directing participants to attend to the right, but not left, visual field results in a rightward redeployment of resources.

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12:00-1:00 PM (2043)

Individual Differences in Attention to Predict Ensemble Coding Performance. LARAMIE STARLING, *University of South Florida,* CHAD DUBE, *University of South Florida* — Ensemble coding refers to the ability of participants to extract statistical summaries of sets of visually-presented items. Some models of the process assume a state of distributed attention facilitates such extraction. In the present study, we took an individual differences approach: we examined performance on classical visual search tasks for features or conjunctions as compared to the same participants' performance on an ensemble averaging task, using the same stimuli and displays (ensembles of oriented Gabor patches). Orientation, spatial frequency, and set size were varied for search tasks and orientations were varied for the averaging task. The performance slopes—measured as the change in response time cost (conjunction - feature search RT) as more Gabor patches are added to the display—were used to predict the ensemble averaging precision for individuals. According to the distributed attention model (Baek & Chong, 2020), there should be a negative relationship between focused attention and ensemble averaging performance. However, we found no such relationship. We discuss possible alternative explanations for these findings and their implications for current ensemble averaging models.

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12:00-1:00 PM (2044)

Do Mental Representations Adapt to Task-Specific Goals? MIRKO THALMANN, *Max Planck Institute for Biological Cybernetics,* THEO A. J. SCHAEFER, *Max Planck Institute for Human Cognitive and Brain Sciences,* STEPHANIE THEVES, *Max Planck Institute for Human Cognitive and Brain Sciences,* CHRISTIAN DOELLER, *Max Planck Institute for Human Cognitive and Brain Sciences,* ERIC SCHULZ, *Max Planck Institute for Biological Cybernetics* — Do mental representations change in an adaptive way? Broadly, previous theories assume that each encounter with a stimulus leads to a separate episode being stored or that encoding a stimulus several times leads to a more complete and perhaps less error-prone representation of the stimulus. In contrast, we suggest that representations change in an adaptive way. Our theory assumes that a sensory representation is a noisy version of a presented stimulus and only stored in memory if it is helpful to achieve the current task goal. We test qualitative predictions, derived from a computational implementation of that theory, in an experiment in which participants learn to categorize two-dimensional stimuli into two categories. In short, the theory predicts that representations are attracted by the category centers and repulsed by the category boundaries. We measure participants' representations in a continuous-reproduction task before the categorization task as a baseline and after the categorization task to examine representational change. The results are not in line with the qualitative predictions. We discuss problems with the experiment and potential adjustments to the experimental design to further test the theory.

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12:00-1:00 PM (2045)

Tracking the Time Course of the Removal of Information from Working Memory Using Electrophysiology. MIRIAM TORTAJADA, *University of Murcia,* JOHANNES FAHRENFORT, *Vrije Universiteit Amsterdam,* VÍCTOR MARTÍNEZ-PÉREZ, *University of Murcia,* LUCÍA B. PALMERO, *University of Murcia,* ALEJANDRO SANDOVAL-LENTISCO, *University of Murcia,* ALEJANDRO CASTILLO, *University of Murcia,* LUIS J. FUENTES, *University of Murcia,* CHRISTIAN N. L. OLIVERS, *Vrije Universiteit Amsterdam,* GUILLERMO CAMPOY, *University of Murcia* — Because working memory (WM) is limited in capacity, removing no longer relevant information is of particular importance. Previous behavioral studies have shown that this removal follows a specific time course. The main goal of the present work is to study the electrophysiological substrate of this time course using EEG. To this end, participants completed a visual working memory task involving delayed color recognition. There were three conditions: two baseline conditions, one with a fixed high load (four colors) and one with a fixed low load (two colors). The crucial third condition started with high load (four colors), after which a retro-cue indicated which two were to be retained, and which two could be dropped. Multivariate Pattern Analysis (MVPA) was applied to the EEG recording to track with high temporal resolution the dynamics of dropping the information from WM following the retro-cue. Results and implications of studying the time course of removal are discussed.

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12:00-1:00 PM (2046)

The Automaticity of Feature Binding in Working Memory. HIU WAH CHEUNG, *University of Essex,* NICOLAS GEERAERT, *University of Essex,* VANESSA M. LOAIZA, *University of Essex* — Feature binding involves integrating different features (e.g., color, shape) into object representations in visual working memory (WM). A persistent question in the literature concerning whether feature binding is an automatic or resource-demanding process may further depend on unitization, that is, whether the to-be-bound information is intrinsic (part of the stimulus itself) or extrinsic (not part of the stimulus). We recruited British and Chinese participants to complete a visual WM task. Participants were presented with to-be-remembered colored shapes. Colors were integrated within (i.e., intrinsic binding) or as backgrounds (i.e., extrinsic binding) of the shapes. During retrieval, participants selected among three options that included the correct target, an incorrect new item, and a recombined lure. Hierarchical Bayesian multinomial processing tree models were fit to the data to estimate parameters representing binding and

item memory. The current results suggest that intrinsic binding is not more automatic than extrinsic binding, as participants showed similar binding memory between intrinsic and extrinsic stimuli. This result shows that the automaticity of feature binding may not depend on unitization.

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12:00-1:00 PM (2047)

The Time Course of Establishing a Memory Representation in Visual Working and Long-Term Memory. ANA RODRIGUEZ, *University of Zurich,* ALESSANDRA S. SOUZA, *University of Porto,* KLAUS OBERAUER, *University of Zurich* — How, and how fast, are memory representations consolidated? Short-term consolidation is the process of creating a stable memory representation from sensory input. It requires free-time and attention. In Experiment 1, we compared the time-courses of establishing visual memory traces in working memory (WM) and episodic long-term memory (LTM) by varying the time available for consolidation in a continuous-reproduction color-object task. Consolidation was completed after 1000 ms in WM, but it continued up to 5000 ms in episodic LTM. Mixture modeling indicated that consolidation time affected the probability of recall or the strength of the color-object binding, but not the precision of the feature representations in memory. Furthermore, Experiment 2 provided evidence that these findings cannot be explained by temporal distinctiveness. Our study shows that the creation of robust memory traces follows different time-courses in WM and LTM, suggesting that different mechanisms contribute to memory formation in these systems, and that a substantial contribution of episodic LTM to performance in WM is more likely with slower presentation rates.

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12:00-1:00 PM (2048)

Hemispheric Asymmetry of Proactive Interference Resolution in Visual Working Memory. LI ZHOU, *Bemidji State University,* KEITH GORA, *Bemidji State University,* TRAVIS RICKS, *Bemidji State University,* ASHLEY LAUBACH, *Bemidji State University* — Proactive interference (PI) has been known affects the storage of working memory (WM) for a long time. In current study, we investigated PI effect in visual WM by was using "recent-probe" paradigm with 4 colored squares instead of words or numbers. Twenty four college students participated the study and their event-related potentials (ERPs) was measured to study the temporal dynamics of PI in visual WM. Behavioral results showed that participants experienced PI and responded slower for recent negative probe trials than non-recent negative probe trials. Late positive component with range of 600 ms to 900 ms after the onset of probe was related to PI resolution as it had lower amplitude for recent negative probe than non-recent negative probe. In addition, LPC at left frontal, central, and parietal electrodes was significantly lower than right frontal, central and parietal electrodes. The results indicated that left hemisphere played a critical role in PI resolution.

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12:00-1:00 PM (2049)

Model Selection to Explain Training-Induced Changes in Visual Working Memory. SHUANGKE JIANG, *University of Sheffield,* MYLES JONES, *University of Sheffield,* CLAUDIA C. VON BASTIAN, *University of Sheffield* — Computational visual working memory (VWM) models are typically fitted to single-occasion data to investigate the theoretical structure and functions of VWM. However, individuals' VWM performance can change substantially after several training sessions. The current study aims to investigate which of four popular VWM models can best account for these changes observed throughout training. For this purpose, we first fitted the Standard Mixture Model (Zhang & Luck, 2008), Swap Model (Bays et al., 2009), Target Confusability Competition Model (Schurgin et al., 2020) and Signal Discrimination Model (Oberauer et al., 2021) to data of a training group (N = 46) who practised an orientation reproduction task in a six-session online training study. Preliminary results showed that the Swap Model provided the best fit to the data from all training sessions as well as pre- and post-sessions. This suggests three key components of VWM representations (random guessing pU, swap errors pN, precision kappa) best reflect the training-induced changes.

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12:00-1:00 PM (2050)

Reliability of Change Detection Measures of Visual Working Memory Varies Across Feature Dimensions. BRANDON J. CARLOS, *University of Houston,* BENJAMIN J. TAMBER-ROSENAU, *University of Houston,* PAULINA A. KULESZ, *University of Houston* — We report an initial cohort (N=26) completing change-detection tasks within a larger project aimed at developing reliable measures of individual differences in visual working memory. Recent work on change detection reliability (Xu et al., 2018, doi:10.3758/s13428-017-0886-6) examined only color. We examined memory for color, orientation, and complex form using otherwise-identical tasks in the same participants. Most importantly, we observed significantly greater reliability for color than orientation, with intermediate reliability for form. Thus, acceptable task parameters do not generalize across feature dimensions. More preliminarily, accuracy and K were numerically more correlated than d-prime across set sizes 4 and 6 within feature dimensions, but the opposite pattern was observed across feature dimensions. Should this preliminary result replicate in subsequent cohorts using potentially more reliable tasks, it would have important implications for the role of decision criterion bias in relating individual differences in working memory to other variables (c.f., Williams et al., 2022, doi:10.31234/osf.io/jnt7r).

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12:00–1:00 PM (2051)

An Application of Statistical Information Theory to Understand Elements of STM in the Atkinson-Shiffrin Framework. CHAD DUBE, *University of South Florida* — The Atkinson-Shiffrin model (AS) assumes retrieval from LTM results in activation of related information in STM. A submodel, the retrieving effectively from memory model (REM), describes parts of this process in detail. But one detail is unclear: What does REM send to STM on a recognition test? At least three alternatives have been tested: a summary value of likelihood ratios (Phi rule), an activated subset of likelihood ratios (Subset rule), or one likelihood ratio (MAX rule). I use an application of information theory to statistical decision-making to help decide between the rules. The results suggest a hybrid of the Subset and MAX rules is best (Malmberg, 2008). The results help link parameters of REM to limits of resolution, number of slots, and informational capacity, and they reveal an unexpected relation between ensemble coding of features and familiarity signals during recognition.

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12:00–1:00 PM (2052)

Interactions Between Working Memory and Face Network in Trustworthiness Judgments. SANIKA PARANJAPE, *The George Washington University,* SARAH SHOMSTEIN, *The George Washington University,* DWIGHT KRAVITZ, *The George Washington University* — Visual working memory (VWM) is a cognitive process by which visual information is temporarily maintained and manipulated and is traditionally studied using basic low-level features (e.g., color, shape). The maintenance of simple features has been shown to involve the same neural circuits as perception, and therefore affects ongoing feature perceptual processing. However, few studies have investigated these interactions for complex naturalistic stimuli, such as faces and their associated complex decisions (e.g., trustworthiness). If VWM recruits the perceptual face network, there should be interactions between maintained faces and ongoing high-level judgments of other faces that scale with their physical similarity. Here, using an orthogonal dual-task paradigm (Kravitz & Teng, 2019), we test whether maintaining faces of darker skin tones engenders an implicit race bias that carries over to trustworthiness judgments of other physically similar faces. Demonstrating that implicit bias in VWM affects ongoing perception provides strong support for the recruitment of the perceptual face network by VWM.

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12:00–1:00 PM (2053)

Does a Sense of Agency Improve Visual Working Memory for Controlled Objects? ADAM VILANOVA-GOLDSTEIN, *University of Notre Dame,* JAMES BROCKMOLE, *University of Notre Dame* — A sense of agency arises when our actions cause anticipated effects in the world. Past research has shown that selective attention is biased toward (Wen & Haggard, 2018; Huffman & Brockmole, 2020), and long-term memory is improved for (Hon & Yeo, 2021), objects we control relative to those we do not. We examined the potential effects a sense of agency may have on visual working memory (VWM). Participants controlled, to varying degrees, the movement of serially presented objects on a screen. Objects either obeyed directional keypresses that caused them to move away from a central fixation point and then out of view (agency), or object movement was initiated by the keypress with direction selected randomly (no agency). Experiment 1 used a cued recall task to determine if a sense of agency increases VWM capacity, and Experiment 2 used a Sternberg-like memory search task to determine if agency speeds access to information stored in VWM. Together these experiments address a potential path from attentional biases that occur while controlling an object and subsequent improvements in the long-term storage of those objects.

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12:00–1:00 PM (2054)

Visual Sensory Memory Provides No Capacity Benefit for Complex Stimuli: Evidence Against an "Iconic" Memory. MARY CATINGTON, *Mississippi State University,* MICHAEL PRATTE, *Mississippi State University* — Visual sensory memory is characterized by its high capacity, with typical estimates nearing 10 simple visual items. This finding has led sensory memory to be modeled as a precise snapshot, or "icon", of visual input. Whereas previous work on iconic memory utilized simple visual stimuli, if sensory memory is indeed an icon, then it should also have a high capacity for storing more complex stimuli. To test this prediction we measured the capacity of iconic memory for storing faces. Participants studied one or three faces, and after a brief 33 ms retention interval were cued to report one of the faces. Capacity in this sensory memory task was estimated to be only slightly greater than one single face – nearly identical to working memory capacity for faces. This result indicates that visual sensory memory is not a 'snapshot' of the visual world, but is likely comprised of simple visual features.

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12:00–1:00 PM (2056)

Visual Interference with Symmetry in VWM. JESSE SARGENT, *Francis Marion University,* SAMANTHA TRAMMEL, *Francis Marion University,* KAYLA ALLEN, *Francis Marion University,* ETHAN WASCHE, *University of Rochester* — Visuospatial working memory (VWM) for patterns is greater if the pattern is symmetrical (the symmetry effect). On each trial, participants viewed a pattern of 5 or 6 squares that were randomly arranged or were symmetrical about the vertical midline. Then there was a 6 s. delay after which participants clicked on the remembered square locations. During the delay, participants either saw a color patch or a dot location to remember (visual, and spatial interference, respectively) or looked at a black screen (unfilled delay). The symmetry effect was greater after visual interference compared to the unfilled delay condition, consistent with previous results showing increased symmetry effect with task difficulty. However, although the visual interference

also increased task difficulty, it did not increase the symmetry effect. This suggests that visual interference was selectively disruptive of symmetry, and that symmetry may be a visual rather than a spatial property of VSWM contents.

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12:00-1:00 PM (2057)

Cognitive Offloading Benefits Performance and Reduces Interindividual Variability: A Meta-Analysis. LOIS K. BURNETT, *Stony Brook University,* LAUREN L. RICHMOND, *Stony Brook University* — Cognitive offloading, the use of physical action to reduce the cognitive demands of a task, has recently been shown in multiple papers to benefit performance of memory-based tasks. At the same time, this relatively new field currently lacks a systematic understanding of the benefits afforded by cognitive offloading, how offloading impacts performance variability, and factors that moderate these outcomes across studies. To address these key questions, we conducted a traditional meta-analysis and used a novel meta-analysis of variance approach to characterize performance variability under offloading and internal memory conditions. Cognitive offloading was found to provide a large boost to performance and reduce interindividual performance variability compared to internal memory. Moderator analyses indicated that the benefit of offloading is larger for adults than children, for within- than between-subjects designs, and when offloading is required rather than optional. The benefit of offloading did not differ by study modality (online vs. in-person) nor memory task type (prospective vs. retrospective). Study design recommendations and statistical implications for future work in this emerging field will be discussed.

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12:00-1:00 PM (2058)

The Benefits and Costs of Nighttime Melatonin Supplementation: Melatonin Improves Sleep But Impairs Morning Cognition in Healthy Young Adults. ELLE M. WERNETTE, *Michigan State University,* KIMBERLY FENN, *Michigan State University,* ERIK M. ALTMANN, *Michigan State University* — Exogenous melatonin improves sleep in individuals with sleep disorders, but it is unclear if melatonin affects sleep in healthy adults. We assessed the effect of melatonin on sleep and morning cognition in healthy young adults. Participants arrived in the evening and completed the Psychomotor Vigilance Task (PVT; a measure of attention), the UNRAVEL task (a measure of procedural performance), and the Paired Associates Learning (PAL) test (a measure of long-term memory). Participants then took a pill, under double-blind conditions, containing either melatonin or placebo and received an 8-hour sleep opportunity with polysomnography to measure sleep. Approximately one hour after waking, participants completed the PVT, UNRAVEL, and PAL test again. Preliminary results show a trend for melatonin to reduce the time individuals spent awake during the night after initially falling asleep. Interestingly, those who took melatonin showed more placekeeping errors in the morning compared to those who took placebo, but there was no difference between the groups on the PVT or PAL test. Thus, taking exogenous melatonin may benefit sleep in healthy young adults, but it may also impair certain cognitive functions the following morning.

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12:00-1:00 PM (2059)

Time Estimation and Passage of Time Judgment Predict Eating Behaviors During COVID-19 Lockdown. JIAXUAN TENG, *University of Arizona,* SARA LOMAYESVA, *Arizona State University,* EVE A. ISHAM, *University of Arizona* — Poor eating habits often lead to health concerns. While mental health conditions such as stress and anxiety have been linked as predictors for eating behaviors, cognitive factors may also contribute to eating practices during the early stages of the mandatory COVID-19 lockdown. In the current study, participants responded to a survey that asked them to judge the passing of time (PoTJ) and to produce short intervals (via a time production task) as an index of the internal clock speed. Additionally, they responded to questions about snacking frequency and the tendency to overeat during lockdown. We observed that those who judged time to pass slowly also reported a greater tendency to snack and overeat during the pandemic. Additional analysis also revealed that the effect of PoTJ on snacking is moderated by the internal clock speed such that those who felt time was passing by slowly, and in combination with a faster internal clock (as indexed by shorter duration production), had a greater tendency to snack. The results suggest that different aspects of temporal cognition play potential roles in influencing different types of eating behaviors. Our findings therefore have implications for eating disorders, along with the potential of time-based intervention or behavioral modification approaches.

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12:00-1:00 PM (2060)

The Relation of Intelligence and Defensiveness in High-Risk Operational Personnel. WILLIAM B. RIDGWAY, *University of Nevada, Las Vegas,* CHARLES A. MORGAN, III, *University of New Haven,* YARON G. RABINOWITZ, *Marine Special Operations School* — Cognitive ability has repeatedly been shown to predict selection in the assessment of nonroutine critical mission personnel (Beal, 2010; Hazlett & Sanders, 1999), with personality measures adding validity to selection decisions (Ones et al., 2007). Picano et al. (2002) developed an index of responses to a sentence completion test (SCT) that indicated response avoidance, termed verbal defensiveness. Personnel high in SCT verbal defensiveness are significantly less likely to be successful in selection and assessment programs and are rated lower by psychologists in psychological suitability (Picano et al., 2006). Using a sample of high-risk operational personnel (N = 129), the current study sought to examine the relationship between SCT defensiveness and Multidimensional Aptitude Battery-II Verbal IQ (MAB-II VIQ; Jackson, 1998), as well as the g-saturated Armed Services Vocational Aptitude Battery General Technical (ASVAB GT). Our results revealed that each measure

served as a reliable predictor of selection and assessment outcome; however, SCT defensiveness was not related to MAB-II VIQ or ASVAB GT score. Overall, our results suggest that SCT defensiveness does not appear to simply reflect verbal or intellectual ability.

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12:00-1:00 PM (2062)

Thinking and Doing: The Behavioral Mechanisms Underlying Concurrent Cognitive and Motor Control. KIRSTEN A. VERHAEGEN, *KU Leuven,* HANS STUYCK, *KU Leuven,* BART ABEN, *KU Leuven,* GETHIN HUGHES, *University of Essex,* BERT REYNVOET, *KU Leuven,* EVA VAN DEN BUSSCHE, *KU Leuven* — A recent framework about cognitive control and multitasking based on computational models predicts that if tasks share fewer representations, multitasking capacity should increase. As a result, performance decrements during multitasking should decrease or multitasking might even benefit performance. To study this prediction, we developed a cognitive-motor dual-task, with two tasks assumed to rely at least partially on separate rather than shared representations. Specifically, a numerical Stroop task was combined with a computer mouse motor task. As such, it combines high and low cognitive control conditions with high and low motor control conditions. The task was administered in children, young adults and older adults. In all developmental groups, we observed that participants exerted cognitive control more efficiently (i.e., smaller congruency effects) on trials that required high versus low motor control. Mouse tracking data provide additional insights into these effects. Our findings demonstrate that the concurrent exertion of motor control may facilitate – rather than hamper – the exertion of cognitive control.

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12:00-1:00 PM (2063)

Actual Procrastination, but Not Self-Evaluation, Predicts GPA. SERE E. POLITANO, *St. John's University,* DANA CHESNEY, *St. John's University* — It has been thought that procrastination hurts performance. Intuitively, putting things off to the last minute and then rushing to complete a task should yield poorer outcomes than if the appropriate amount of time was spent on a task. But does a student's self-assessed procrastination actually predict academic performance? As part of their course requirement or for extra credit, 50 undergraduate students completed an Academic Procrastination Scale and reported their GPA. Results showed no significant correlation between self-reported procrastination and academic outcomes ($r(48) = 0.083$, $p > 0.5$). However, actual procrastination did predict GPA. The last 25 participants -- who completed their surveys in the last two weeks of the semester -- had significantly lower GPAs than the first 25 participants (GPA of first 25: $M = 3.672$, $SE = .058$; GPA of last 25: $M = 3.464$, $SE = 0.064$; $t(48) = 2.40$, $p = 0.02$). This suggests that actual procrastination, but not a self-evaluation of academic procrastination, may be predictive of academic success. Further research should continue on this topic with larger and more diverse samples.

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12:00-1:00 PM (2064)

Specific or Nonspecific? Effect of Stimulus-Response Event Sequence on Temporal Preparation. TIANFANG HAN, *Purdue University,* ROBERT PROCTOR, *Purdue University* (Sponsored by Robert Proctor) — Responses are faster when a warning signal precedes an imperative stimulus by a foreperiod (temporal preparation). Langner et al. (2018) found that, in a choice reaction task, repetition of the stimulus-response (S-R) event had a larger modulation on the reaction time (RT) at the short foreperiod. We conducted three experiments to test the explanation provided by Langner et al. Experiment 1 used a non-aging foreperiod distribution and showed that the asymmetric modulation by S-R event sequence is unrelated to the direction of the foreperiod-RT function. Experiment 2 used an identical design but manipulated the inter-trial interval (ITI) between trial blocks. The results showed no asymmetric modulation of S-R event sequence in the long-ITI condition. In Experiment 3, each response was mapped to two different stimuli. The stimulus rather than response aspect of the S-R event affected the direction of the foreperiod-RT function. Our results showed that the asymmetric modulation by S-R event sequence was caused by a short-lived priming effect, which enhanced the information processing of the stimulus identical to the preceding one. This priming effect reflects a stimulus-specific aspect of temporal preparation.

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12:00-1:00 PM (2065)

Two Types of Between-Task Conflict Trigger Respective Processing Adjustments Within One Dual-Task. DEVU MAHESAN, *University of Greifswald,* MARKUS JANCZYK, *Universität Bremen,* RICO FISCHER, *University of Greifswald* — In dual tasking, two kinds of between-task conflict, i.e., backward crosstalk effects (BCE), are discussed: conflict at the response selection stage when Task 1 (T1) and Task 2 (T2) have dimensional overlap (compatibility-based BCE) and conflict at motor execution stage when inhibition from a T2 no-go-trial interferes with response execution in T1 (no-go BCE). Research suggests that these BCEs differ in their cognitive processes and control regulations. We investigated whether both BCEs can be produced in a single dual-task set-up and whether they trigger their respective processing adjustments (i.e., sequential modulation). In all three experiments, participants categorized numbers as smaller/larger than 5 in T1, and the number 5 served as the no-go stimulus in T2. In Experiments 1 and 2, numbers were responded to irrespective of numerical size in T2 (go-response). In Experiment 3, participants performed number-size categorization also in T2. Dimensional overlap was provided by size information in both stimuli. Our results showed that both BCEs could occur in the same dual-task and trigger their respective sequential modulation, provided a strong dimensional overlap paired with advance T2 preparation is made possible.

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12:00-1:00 PM (2066)

Extreme Mental Gymnastics: Do Cognitive Control and Flexibility Predict Extremist Views? MEGAN CAPODANNO, *Georgia State University,* HEATHER M. KLEIDER-OFFUTT, *Georgia State University,* JOHN HORGAN, *Georgia State University* — Violent extremism, or the use or threat of use of violence against civilian targets in the pursuit of some social, political, religious, or other ideological agenda, is one of the most disturbing social issues of the current era (Horgan, in press). However, little is known about its cause. Specifically, little research has examined the underlying cognitive processes associated with the endorsement of these extreme viewpoints. Cognitive control (generally, the ability to focus and inhibit irrelevant information) and cognitive flexibility (the ability to adjust or shift behavior based on the environment) are two cognitive processes shown in the literature to influence decision-making (Gabrys et al, 2018). The current research examines if cognitive control and flexibility predict endorsement of extremist views about social situations. Preliminary results suggest a relationship among cognitive control, cognitive flexibility, and endorsement of extremist views. Further regression analyses will be conducted.

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12:00-1:00 PM (2067)

Error Awareness and Post-Error Slowing: The Effect of Manipulating Trial Intervals. GEZELLE DALI, *The University of Melbourne,* CATHERINE ORR, *The University of Melbourne,* ROBERT HESTER, *The University of Melbourne* — Post-error slowing is considered to be an error-related process that relies upon error awareness; however, evidence regarding this relationship is mixed. The current set of experiments aimed to investigate the role of error awareness in post-error slowing in an error awareness task with up to three dynamic conditions. Each condition manipulated the interval between lure trials (infrequent trials requiring a different response to target trials) such that they were presented randomly (standard condition), closely spaced (proximal condition), or widely spaced (distal condition) among target trials. Our results show that under these conditions, error awareness and post-error slowing are only weakly related. Post-error slowing was greatest in the standard condition, while accuracy was lowest in this condition. Exclusion of the first post-error trial eliminated all effects, indicating there were only transient differences in post-error reaction time adjustments that were exclusive to the first post-error trial. These findings align with non-functional accounts of post-error slowing and support the notion that post-error slowing and cognitive control can be separate processes that are largely not dependent on error awareness.

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12:00-1:00 PM (2068)

What Does Tangney, Baumeister, and Boone's (2007) Brief Self Control Scale Truly Measure? JOHN HOSSEIN MAJOUBINIA, *San Francisco State University LACE Lab,* KENNETH PAAP, *San Francisco State University,* NITHYA BALAKRISHNAN, *San Francisco State University LACE Lab,* REGINA T. ANDERS-JEFFERSON, *San Francisco State University LACE Lab* (Sponsored by Hossein Mahjoubinia) — Self-report scales are often purported to measure self-control or impulse-control, but the two constructs enjoy moderately strong correlations. Self-control scales, like the 13-item Brief Self-Control (BSC) scale, are typically used as a unitary scale, but exploratory factor analyses usually yield two factors that sometimes distinguish between initiatory self-control and impulse control. Disconcertingly, performance-based measures and self-report measures are weakly correlated. Self-report measures typically have the better record of predicting positive and negative outcomes in everyday life. Thus, it may prove to be unfortunate that the vast majority of studies testing factors hypothesized to enhance executive functioning use performance-based measures. We compared the original 13-item BSC (4 positive & 9 negative items) to a mirrored version, an all-positive, and an all-negative version. The results from 1,000 M-Turk participants show that valence and other subtle wording changes alter: (1) an item's factor loading, (2) Cronbach's alpha for the entire scale, and (3) that different versions of the "same" self-control scale differentially predict Raven's IQ, self-esteem, mental health, satisfaction with life, and happiness.

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12:00-1:00 PM (2069)

Can Different Mnemonic Acronyms Improve Resilience Toward Interruptions in a Memory-Based Procedural Task with Sequential Constraints? TARA RADOVIC, *Technische Universitaet Berlin,* DIETRICH MANZEY, *Technische Universitaet Berlin* — Previous research provided some evidence that a mnemonic acronym can improve resilience toward interruptions in a memory-based procedural task with sequential constraints. This study examines whether provision of a different mnemonic acronym during learning of the primary task can improve the resilience toward interruptions. Each letter of a mnemonic acronym coded one step of the task, requiring a binary decision about a property of a complex visual stimulus. While performing the task, participants were interrupted between different steps with a 2-back task for 6s or 30s, after which they had to resume the primary task at the correct step. Resumption times, sequence, and non-sequence errors were analyzed. Results revealed that different mnemonic acronyms do not lead to comparable effects in terms of resilience toward interruptions. This suggests that a cognitive representation of the procedural task depends on prominence of the internal structure of the mnemonic acronym.

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12:00-1:00 PM (2070)

TMS Reveals Distinct Patterns of Proactive and Reactive Inhibition in Motor System Activity. DOMINIC M.D TRAN, *The University of Sydney,* ILLEANA PRIETO, *Macquarie University,* ROSS OTTO, *McGill University,* EVAN J. LIVESEY, *The University of Sydney* — Our ability to suppress actions when required is essential for everyday life. While response inhibition has been widely

studied, most research focuses on reactive inhibition—stopping an action when cued. Preparation to stop ahead of time, or proactive inhibition may recruit different psychological and neurophysiological processes. We studied both reactive and proactive inhibition by adopting a two-step continuous performance task (DPX) often used to study cognitive control, combined with transcranial magnetic stimulation (TMS). Using TMS, we mapped changes in corticospinal excitability and inhibition in the lead-up to initiating or suppressing a response. We found distinct neural signatures at critical timepoints when participants were preparing in advance to inhibit a response and while inhibiting a response. Notably, motor system activity during early timepoints was predicted by a behavioural index of proactive capacity and could predict whether participants would later successfully inhibit their response. Our findings demonstrate that combining TMS with a two-step CPT can be useful for studying reactive and proactive inhibition, and reveal that successful inhibition is determined earlier than previously thought.

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12:00-1:00 PM (2071)

The Simon Effect Asymmetry with Finger- and Palm-Press Responses. QI ZHONG, *Purdue University,* JING CHEN, *Rice University,* ROBERT PROCTOR, *Purdue University* (Sponsored by Jing Chen) — If stimuli vary in task-irrelevant left and right locations, performance is better when the stimulus and response are spatially congruent rather than incongruent. This Simon effect is asymmetric, being larger for stimuli in the right hemifield for right-handers. Typically, the responses are keypresses made with the index fingers, but in a prior study comparing foot and hand responses, the hand responses were palm-presses made on pedals. Left-handers showed a larger Simon effect for left-hemifield stimuli with the palm presses, but right-handers did not show the typical larger effect for right-hemifield stimuli. To determine whether this latter result was reliable, in the present experiment participants performed a Simon task with index-finger presses and with palm-presses in separate blocks. The opposing asymmetries for right- and left-handers were evident for both response modes, tending to be larger in reaction-time but smaller in percent error with the palm-presses than with the finger-presses. This result is consistent with prior evidence that the Simon effect asymmetry is a consequence of effector dominance. For both left- and right-handers, the asymmetry occurs with both finger-press and palm-press responses.

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12:00-1:00 PM (2072)

Dissociable Effects of Cueing and Priming of Timing and Effector in Response Preparation. MELISA MENCELOGLU, *Brown University,* JOO-HYUN SONG, *Brown University* — Preparing the timing of a given movement and the effector to execute the movement is important to optimize motor behavior. We studied temporal and effector preparation via top-down cueing and bottom-up priming. We orthogonally manipulated the cue-to-target delay (short/long) and response hand (left/right). On each trial, we presented temporal and effector cues, informative or uninformative, followed by a short or long delay before an arrow target. Participants (N=24) indicated the direction of the arrow (left/right) with their corresponding hand. We also examined the priming effects driven by repetitions or switches of timing and effector. Temporal cueing and temporal priming speeded responses, showing that top-down and bottom-up biases in temporal preparation have effects in the same direction. While effector cueing had a speeding effect, effector priming had a small delaying effect, showing that top-down and bottom-up biases in effector preparation have opposing effects. The slow-wave ERP component indexing anticipatory processes (CNV) reflected the same pattern. Overall, these behavioral and ERP findings signify a dissociation between temporal and effector preparation regarding the involvement of top-down and bottom-up biases.

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12:00-1:00 PM (2073)

Motor Induced Motor Inhibition. GEOFF COLE, *University of Essex,* PAUL A. SKARRATT, *University of Hull* — Response Inhibition, as measured with paradigms such as the Stop-Signal task, most often manifests itself in terms of reaction time and error rates. In the present work, we describe a novel paradigm revealing that a participant's specific motor responses can influence subsequent judgments. When making a free choice decision between two stimuli, participants are less likely to choose a stimulus if that choice requires a response that has just been made. As well as eliminating attentional orienting as an explanation we show that the effect is relatively short lived (< 1250 ms) and is localised to a specific response (i.e., the effector that initiates the inhibition is also used to indicate the choice). We also find that the effect occurs in a variety of situations including size judgements and decisions about facial attraction. We conclude that an individual's own motor responses can induce a form of motor inhibition that affects decision-making.

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12:00-1:00 PM (2074)

Motor Control in Individuals with ADHD and Their Unaffected Siblings. MAEVE H. KOLENIK, *University of Delaware Developmental and Aging Neuroscience Education (DANE) Laboratory,* STEPHANIE DEL TUFO, *University of Delaware* — ADHD is a neurodevelopmental disorder characterized by impaired levels of inattention, disorganization, or hyperactivity-impulsivity, which are not consistent with developmental age or grade level (DSM–5; APA, 2013). ADHD is associated with deficits across a range of developmental areas (e.g., communication, motor). ADHD is also highly heritable; 25-35% of parents with ADHD have offspring with ADHD (Faraone & Biederman, 1997), 25-50% of siblings both have ADHD (Biederman et al., 1995), and 70-92% of identical twins both have ADHD (Brickell et al., 2015). Even those unaffected siblings--biological siblings of individuals with ADHD who do not meet diagnostic criteria despite the genetic risk, show delays or deficits in motor

development (e.g., van Rooij et al., 2015). In an investigation into over 450 adults (18 -35) we found differences in developmental motor milestone onsets and adult spelling ability between individuals with ADHD, unaffected siblings of individuals with ADHD, and typically developed individuals.

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12:00-1:00 PM (2075)

What Is (Not) Behind Partial Repetition Costs: Event Files Do Not Fully Occupy Bound Feature Codes. VIOLA MOCKE, *University of Würzburg,* ELENA BENINI, *Rheinisch-Westfälische Technische Hochschule Aachen University,* JUHI PARMAR, *Friedrich-Schiller-University Jena,* MORITZ SCHILTENWOLF, *University of Tübingen,* WILFRIED KUNDE, *University of Würzburg* — Feature binding accounts state that features of perceived and produced events are bound into event-files. Performance while responding to an event is impaired when some, as opposed to all or none, of this event's features already belong to a previous event-file. While these partial repetition costs are generally considered to be indicators for prime feature binding, their cause is still unclear. Possibly, bound features are occupied and must be unbound before they can enter a novel event file. In an online experiment (n = 108), participants responded to the font color of a word (response) by pressing one of three keys while ignoring the word meaning (distractor). We compared costs of partial repetition from prime to probe between trials in which an intermediate trial did not repeat any prime features and trials in which it repeated either the response or distractor of the prime. Partial repetition costs occurred in the probe, even when one (vs. none) of the prime features repeated in the intermediate trial, albeit significantly reduced. Thus, single bindings do not fully occupy feature codes. The decrease in partial repetition costs after re-binding a prime feature might instead result from a limited binding capacity.

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12:00-1:00 PM (2076)

Suppression-Induced Forgetting of Motor Sequences. MARKUS SCHMIDT, *Pädagogische Hochschule Ludwigsburg,* MICHAEL C. ANDERSON, *University of Cambridge, MRC Cognition and Brain Sciences Unit,* TOBIAS TEMPEL, *Pädagogische Hochschule Ludwigsburg* — In a think/no-think (Anderson & Green, 2001) adaption for motor sequences, we examined effects of suppressing retrieval on later recall in two experiments. Upon associating sequences with individual cues through practice cycles, a subset was retrieved in response to their respective cues (think trials), others were suppressed. In such no-think trials, cues were shown but participants were instructed to prevent execution of the associated motor response as well as to even suppress its recollection. Results revealed that suppressing retrieval impaired later memory in comparison to baseline items, that were not cued at all after initial training. Final recall and execution speed were affected depending on learning effort. In Experiment 1, where emphasis was put on training recall rate, suppression affected reaction time, not recall accuracy. Suppressed items reaction time analyses revealed a robust slowing of execution. Reducing initial training in Experiment 2 led to suppression affecting recall accuracy. Results show that inhibitory control processes during retrieval suppression influenced motor memory representations. They do so by not only affecting actions' accessibility, but also by reducing execution speed, once retrieved.

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12:00-1:00 PM (2077)

Individual Differences in Deepfake Detection: Cognitive Ability and Non-Ability Traits. ZACHARY TIDLER, *Georgia Institute of Technology,* RICHARD CATRAMBONE, *Georgia Institute of Technology* — This study is a follow-up to a previous study in which affect detection (AD) ability and political orientation were shown to be strong predictors of one's performance detecting deepfake (digitally altered) videos. The current work sought to demonstrate a hypothesized moderating effect of fluid intelligence on the relationship between AD ability and deepfake detection (DFD) performance in a sample of 72 participants. No such relationship was found. The current work also sought to test the relationship between other non-ability traits and DFD performance. Correlations between DFD performance and cognitive reflectivity (r = .37), fluid intelligence (r = .53), vocabulary (r = .64), and verbal reasoning (r = .63) are presented and discussed. The study also replicated the previously-detected, strong relationship between AD ability and DFD performance (r = .65). Personality correlates are also presented, although none of those included in this study correlated significantly with DFD performance.

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12:00-1:00 PM (2078)

Investigating Elements of Listening Effort: Relations Among Multiple Dimensions. RICARDO CASTAÑEDA OLAYO, *The University of Texas at San Antonio,* JEFFREY MOCK, *The University of Texas at San Antonio,* EDWARD J. GOLOB, *The University of Texas at San Antonio* — The amount of mental effort experienced while listening ("listening effort") depends on multiple factors, including acoustic properties of the message, background noise level, and hearing ability. Listening effort is recognized as a broad construct, but there is no consensus on subdimensions. We propose and test the idea that listening effort has dimensions of cognitive workload, mental fatigue, and mood, and predict that the three dimensions are inter-related, but have different responses to a challenging listening effort task. Young adults (n=85) reported fatigue and mood before and after listening for tones in background noise (auditory psychomotor vigilance task, aPVT). Novel psychometric measures of aPVT workload were collected. The set of fatigue and mood measures were correlated at baseline (all p values <.001), but the aPVT attenuated correlations among fatigue and mood (ns or p>.04) without reducing correlations within each dimension (all p values <.001). Workload was positively related to stronger moods after the aPVT (p's <.01). Findings support the idea that listening effort has

multiple dimensions that can have different responses to the same listening effort challenge.

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12:00-1:00 PM (2079)

Dimensionality of Natural Auditory Scene Perception: A Factor Analysis Study. MARGARET A. MCMULLIN, *University of Nevada, Las Vegas,* NATHAN C. HIGGINS, *University of South Florida,* BRIAN GYGI, *East Bay Institute for Research and Education,* JOEL S. SNYDER, *University of Nevada, Las Vegas* — Theories of auditory and visual scene analysis suggest the perception of scenes relies on the identification and segregation of objects within it, resembling a detail-oriented processing style, but it is possible that a more global process also occurs while analyzing auditory scenes. We evaluated the contributions of high-level global and low-level acoustic information to auditory scene perception. Participants rated scenes on 8 global properties (e.g., openness) and an acoustic analysis evaluated which low-level features predicted the ratings. We submitted the acoustic measures and ratings to separate exploratory factor analyses, explaining 57% and 64% of the variance in the data, respectively. Eight regressions calculated which acoustic features predicted global property ratings; each scale was predicted by at least one acoustic variable. The acoustic variables did not completely predict ratings, suggesting global variables may be processed at a high level where acoustic features have been removed. These results provide evidence for the ability to perceive scenes from a global perspective. Additionally, our open-source scene collection will make future studies on perception, attention, and memory for auditory scenes possible.

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12:00-1:00 PM (2080)

The Stability of the Speech-to-Song Illusion. RODICA R. CONSTANTINE, *University of Nevada, Las Vegas,* ERIN HANNON, *University of Nevada, Las Vegas* — In the Speech-to-Song (STS) illusion, multiple repetitions of a natural spoken utterance can give rise to a perceptual switch wherein the stimulus begins to sound song-like to the listener. We predicted that excerpts that elicit the STS illusion at an initial session will continue to be rated as song-like across delays from 1 to 56 days. Across two testing sessions, we repeatedly presented listeners with stimuli known to elicit the STS illusion and asked them to rate the degree to which each repetition sounded song-like. Ratings to all stimuli increased across sessions ($p < .001$), indicating the illusion increased with a delay. At session 2, stimuli initially rated as "song" during session 1 were rated significantly higher than those initially rated "speech" ($p < .001$). There were individual differences in the delay-related increase in the STS illusion, which were a marginally correlated with musical engagement (as reflected by the Goldsmiths Musical Sophistication Index/Gold-MSI subscale) and tendency to attend to lyrics during music listening ($p = .08$). Results thus far indicate that the STS illusion is stable and may even increase over delays.

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12:00-1:00 PM (2081)

The Auditory Looming Bias Decreases with Coincident Visual Information. MAGGIE MCCRACKEN, *University of Utah,* JOHN NEUHOFF, *The College of Wooster* (Sponsored by John Neuhoff) — The auditory looming bias is the tendency to underestimate the arrival time of approaching sounds. However, moving objects typically emit audiovisual cues with visual information yielding more accurate arrival time judgments. In two experiments using loudness change as a proxy for auditory motion, participants judged loudness change of looming and receding sounds. Half were presented with congruent visual stimuli. When presented with varying amounts of auditory and visual change, visual stimuli did not influence estimates of looming sounds. A point of subjective equality task revealed that auditory and visual changes needed to increase to be perceived as equivalent across domains. The second PSE stimuli experiment showed that loudness change between looming and receding sounds was greatest in the unimodal auditory condition. These results imply that motion estimates are most cautious when only presented with auditory information. These results demonstrate that ambiguous auditory estimates can be moderated by vision.

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12:00-1:00 PM (2082)

Competition Between Audiovisual Correspondences Aids Understanding of Interactions Between Auditory and Visual Perception. LAURA M. GETZ, *University of San Diego* — An audiovisual correspondence (AVC) refers to an observer's consistent matching of sensory features across two modalities; for example, between auditory pitch and visual elevation. We previously showed that participants are faster to classify the height of a pitch in the presence of congruent visual elevations but found no RT differences in the presence of objects of different sizes; visual dimensions of spatial frequency, brightness, and sharpness fell in between these two extremes (Getz & Kubovy, 2018, Cognition). To further investigate the strength of these AVCs, we created trials where elevation competed for pitch congruency with each of the other four visual dimensions. We expected that congruency between pitch and elevation would be more important than congruency between pitch and spatial frequency, brightness, sharpness, or size. As predicted, in all four studies, we found that RTs when only elevation was congruent were just as fast as when both dimensions were congruent. In contrast, RTs when only spatial frequency, brightness, sharpness, or size was congruent (and elevation was incongruent) were just as slow as when both dimensions were incongruent. We interpret these results based on the metaphor we use for pitch in English.

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12:00-1:00 PM (2083)

Reduced Susceptibility to Rubber Hand Illusion in the Broader Autism Phenotype. AARON MITCHEL, *Bucknell University,* NICK PERRY, *Bucknell University,* PAIGE FURANO, *Bucknell University,* DANA PARDEE, *Bucknell University,* BELLA

ROACHE, *Bucknell University* — Multisensory integration (MSI) plays a key role in many cognitive, social, and affective processes, and differences in MSI have been reported among individuals diagnosed with neurodevelopmental disorders such as autism spectrum disorder (ASD). Likewise, recent research has established that these differences in MSI extend to the broader autism phenotype (i.e. individuals with heightened but subclinical levels of autistic traits). To date, this research has focused largely on audiovisual integration, often in the domain of speech (e.g. McGurk effect); thus, in the present study, we examined the relationship between visuotactile integration and sub-clinical levels of ASD traits by measuring individual differences in autism quotients (AQ) and susceptibility to the rubber hand illusion. We found that increased AQ scores were negatively correlated with the amount of proprioceptive drift toward the rubber hand but were not associated with subjective feelings of ownership, consistent with findings from studies of those diagnosed with ASD. Overall, the present study provides evidence of reduced visuotactile integration within the broader autism phenotype.

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12:00-1:00 PM (2084)

Comparison of Localization Accuracy and Precision Metrics in Studies of Spatial Perception and Crossmodal Recalibration. PATRICK BRUNS, *University of Hamburg,* CAROLINE THUN, *University of Hamburg,* BRIGITTE RÖDER, *University of Hamburg* — The ability to localize sensory stimuli can be quantified with either error-based metrics derived from single-trial localization errors or regression-based metrics derived from a linear regression of localization responses on the true stimulus locations. Here we tested the agreement between these two approaches in estimating sound localization accuracy and precision in a sample of 188 subjects. In a subsample (n = 57) with available data, we additionally tested which metric best assessed correlations between crossmodal spatial recalibration and baseline localization performance. Our findings show that, in contrast to common conceptions, the variability of single-trial localization errors (variable error in error-based metrics) and the amount of target eccentricity overestimation (slope in regression-based metrics) were highly correlated, suggesting that both reflected localization precision. Localization accuracy was mainly reflected in the spatial bias and was moderately correlated with precision metrics. The amount of crossmodal recalibration was significantly predicted by the amount and direction of pre-existing biases, highlighting the need to account for inter-individual baseline differences in studies of spatial learning.

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12:00-1:00 PM (2085)

Semantic Association Increases the Subjective Duration of Word Pairs. JOHN A. REEDER, PH.D., *Simmons University* — Time perception is affected by various non-temporal stimulus features. Most prior findings involve perceptual factors (like size and motion) and emotional factors (like fear), but this experiment reveals a conceptual one: semantic association. Sixty participants saw 96 pairs of words presented for 2.3, 3.5, or 4.7 s. Half the pairs were related (WAND-MAGIC) and half were unrelated (CROWN-TIGER), counterbalanced across conditions. Participants made a temporal reproduction judgment by pressing a button to indicate whether they thought the words were related and holding it for as long as they thought the presentation had lasted. In a significant difference at the 4.7 s interval, subjective duration was 102 ms longer for related pairs than for unrelated pairs. That is, more time seemed to pass when participants were thinking about meaningful relationships. This novel result is consistent with attentional gate models of time perception as well as the "processing principle" proposed by Matthews & Meck (2016).

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12:00-1:00 PM (2086)

Repetition and Representation: Examining the Effect of Image Degradation on Expectation-Related Alterations in Subjective Duration for Repeated Stimuli. CORINNA D. MCFEATERS, *University of New Brunswick,* DANIEL VOYER, *University of New Brunswick* — The finding that expected repeated stimuli appear to be longer in duration than unexpected repeated stimuli has be replicated many times. This finding has been ascribed to the fact that subjective duration is a function of its representational strength, and expectation facilitates construction of a stronger perceptual representation. In this context, degradation of images should result in shorter subjective durations because the representation of the degraded image would be weaker. Following from this background information, we utilized multiple forms of degradation (blur, visual noise, and pixelation) in a method of comparison task requiring time estimation for faces with 110 participants. Results showed that intact images had the shortest subjective durations, rather than the longest. In addition, expectation-related lengthening of subjective duration was observed in degraded and intact images, alike, although this effect was inconsistent across types of degradation. Implications of these findings for accounts of expectation's role in the repetition effect for time perception, particularly for the relationship between representation and subjective duration, will be discussed.

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12:00-1:00 PM (2087)

Numerosity Judgements in the Tactile Modality: A Diffusion Model Account. ANA BACIERO, *Bournemouth University,* BRANDON ISLER, *DePaul University,* PABLO GOMEZ, *California State University, San Bernardino* — Sequential-sampling models such as the Diffusion Model (Ratcliff, 1978) provide a reliable explanation of the cognitive mechanisms involved in 2-choice decision making: noisy evidence is accumulated until one of the two response thresholds is reached. This model accounts for data of many different perceptual and cognitive 2-choice tasks in the visual modality. Here, we expand this framework by applying it to data from the tactile modality. We devised a tactile numerosity judgement task in which

we presented a group of raised dots – ranging from 1 to 5 – to participants' index finger and asked them to indicate whether there were a lot or a few dots. Results show that response times were shorter for more extreme quantities (i.e., 1 or 5 dots), increasing with as quantity was more uncertain. More importantly, the diffusion model fits show the model can capture the distribution of response times. These results provide not only an effective account to explain tactile numerosity judgements, but also binary decisions across modalities.

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12:00-1:00 PM (2088)

The Effect of Happy and Sad Mood on Level of Processing in Haptics. MÜGE CAVDAN, *Justus Liebig University Giessen,* AYCAN KAPUCU, *Ege University,* KATJA DOERSCHNER, *Justus Liebig University Giessen,* KNUT DREWING, PROF. DR., *Justus Liebig University Giessen* — Research suggests that happy and sad mood promote global and local visual processing, respectively. However, it is unclear whether mood also affects the level of processing in haptic perception. We investigated this question in an experiment where classical music was used to induce happy and sad mood in different participant groups. After mood induction, blindfolded participants were asked to scan haptic stimuli with their fingers. Globally, the stimuli (~33 mm across) were either a triangle, a circle, or a square that were each composed of smaller (~3 mm) local relief shapes: either triangles, circles, or squares. On each trial, participants explored three stimuli: a probe with identical local and global shapes, and two comparison stimuli, matching the probe either in local or global shape. Participants had to report which of the two comparisons appeared more similar to the probe. In the sad group, participants chose the locally-matching comparison more frequently than in the happy group, confirming that sad mood promotes local processing also in touch. Overall, participants chose the globally matching comparison more often, suggesting a more important role for global processing in active touch than previously assumed.

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12:00-1:00 PM (2089)

The Perceived Duration of Touch Varies Across the Body. SOPHIA GREKIN, *Tufts University,* STEPHANIE BADDE, *Tufts University* (Sponsored by Stephanie Badde) — The perceived size of an object touching our skin famously varies across the body. Here, we measured whether analogous distortions hold for the perceived duration of the tactile sensation. Indeed, participants perceived tactile stimuli on the hands as considerably longer than stimuli on the forearm or forehead. These results were stable across multiple sessions and could not be explained by stimulus salience. Our results reveal biases in the perception of tactile durations that might be driven by prior assumptions about the duration of a touch at different body parts.

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12:00-1:00 PM (2090)

Hunting for Haptic Targets: First Feels Followed by Focal Search. HUNTER B. STURGILL, *University of California, Riverside,* DAVID A. ROSENBAUM, *University of California, Riverside* — People search for items with touch, as in feeling for keys, coins, or other objects in a bag. Such haptic search has been little studied, especially compared to visual search. We had university students search in an unseen container for a 1-inch long plastic pipe whose length differed from the other pipes in the container. The numbers and lengths of the distractors varied. The model that best accounted for the search times and accuracies had two stages: (1) an initial sweep that potentially allowed the target to be found if the distractors were sufficiently different; (2) a second focused search typified by pinching, clutching, or aligning the pipes. Because this model is similar to prevailing models of visual search, our work points to deep connections with other search processes, as noted by others whose haptics research laid the foundation for this study.

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12:00-1:00 PM (2091)

Sexual Selection for Human Improvisational Musical Ability. ANNA TESCH, *Arizona State University,* K. JAKOB PATTEN, *Arizona State University,* KRISTINA KNOWLES, *Arizona State University,* VAUGHN BECKER, *Arizona State University* — For songbirds and several other species throughout the animal kingdom, there is a correlation between desired vocalization and mating success. In humans, however, there are conflicting results plagued with quasi-experimental problems. The present study experimentally interrogates perception of attractiveness as a function of musical aptitude. 20 musicians were asked to improvise a 30 second song (all in C major). Songs were then pseudorandomly paired with 24 different faces (4 instances of 3 different levels of attractiveness and 2 genders) from the Chicago Face Database, such that all attractiveness levels were paired with any given song. Participants rated songs for overall quality, then rated the attractiveness of the "composer." Quality of song had a significant positive effect on the perception of attractiveness; better songs made composers seem more attractive, $F(2, 1761.7) = 27.9$, $p < .001$.

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12:00-1:00 PM (2092)

More Than Meets the Eye: A Systematic Review of the Neural Substrates of Intentional Forgetting. KYLA MALAYANG, M.SC., *Memorial University of Newfoundland,* VICTORIA A.J KAVANAGH, M.SC., *Memorial University of Newfoundland,* JUSTINE YICK, *Memorial University of Newfoundland,* JONATHAN FAWCETT, PH.D., *Memorial University of Newfoundland,* HEATH MATHESON, PH.D., *Memorial University of Newfoundland* — Intentional forgetting refers to the updating of memory, in order to deliberately forget irrelevant information. The item-method directed forgetting paradigm is a common approach to the study of intentional forgetting, during which participants are presented

with images or words, one at a time, each followed by an instruction to remember (R) or forget (F) the item in question. Although much work has been conducted exploring the behavioural correlates of intentional forgetting, the neural mechanisms involved remain unclear. For this reason, a systematic review was conducted to integrate evidence from studies using electroencephalography, functional magnetic resonance imaging, and repetitive transcranial magnetic stimulation. Evidence suggests the involvement of a frontal-parietal control network that regulates activity in surrounding brain regions, including those situated in the medial temporal lobe. These findings challenge the prevalent belief that intentional forgetting represents a passive process (e.g., the passive decay of F items), with implications for active-based theoretical accounts of intentional forgetting.

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12:00-1:00 PM (2093)

Reconsidering the Mirror Neuron System: Illuminating the Importance of Higher-Order Cognitive Processes in Understanding Complex Motor Behaviors. CONNOR J. FINLINSON, *Idaho State University,* LAWRENCE PAUL BEHMER JR., *Idaho State University* — The idea that the mirror neuron system (MNS) reflects one's ability to understand the intention of another person's biological goal-directed behavior remains controversial. Clearly, people can determine motor intentions by observing behavior, but if action understanding is not facilitated by the MNS, what mechanism is driving this process? To answer this question, we recorded EEG while participants observed and imitated goal-directed behaviors during trials in which the goal was unambiguous and discernible early or ambiguous and discernible late. Even though we observed a significant difference in mu-power compared to baseline in motor clusters during the observation intervals, there was no difference between ambiguous and unambiguous conditions; however, frontal theta-power was significantly greater during ambiguous compared to unambiguous conditions during grasp and goal-execution intervals. Taken together, these findings suggest that changes in mu-power in the motor clusters may be reflecting general action-related processes and not mirror properties, whereas changes in frontal theta might be reflecting higher-order cognitive processes that are required to understand and interpret complex motor behaviors.

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12:00-1:00 PM (2094)

Neural Oscillations Differentiate Effective and Less Effective Strategies. TREVOR J. BELL, *Kansas State University,* ALEXYS ANGUIANO, *Kansas State University,* KELLY KREHBIEL, *Kansas State University,* ALEXANDRIA C. ZAKRZEWSKI, *Kansas State University,* MATTHEW G. WISNIEWSKI, *Kansas State University,* HEATHER BAILEY, *Kansas State University* — Strategies can counteract retrieval failures by providing memory cues during encoding. Past literature evaluated the behavioral accuracy of strategies, but less is known about neural oscillations associated with strategy use. The current research addressed this gap using time-frequency analyses of electroencephalography (EEG) recorded during a paired-associates memory task. Participants were presented with word pairs (e.g., Draw–Neon) in set sizes of 3-10. Afterwards, participants completed a cued recall test and reported whether they used effective (e.g., imagery) or less effective (e.g., rehearsal) strategies. Word pairs that were later remembered exhibited higher theta power (4–7 Hz) during encoding than those that were later forgotten. Bands of alpha (8-12 Hz) and beta power (17-27 Hz) showed greater power for less effective strategies during encoding. Results are consistent with prior work proposing a role for theta oscillations in encoding. It is plausible beta recruitment is correlated with an internal rehearsal loop while alpha increases with number of maintained items. Thus, the current data can speak to potential differences in the "effortfulness" of employing effective compared to less effective strategies.

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12:00-1:00 PM (2095)

Ready for Action: Long-Term Memory Triggers Covert Response Preparation at Retrieval. MANDA FISCHER, *University of Toronto & Baycrest Health Sciences,* MORRIS MOSCOVITCH, *University of Toronto & Baycrest Health Sciences,* CLAUDE ALAIN, *University of Toronto & Baycrest Health Sciences* — Does long-term memory (LTM) prepare us to act? Evidence suggests that LTM speeds up response times (RT) to targets, though the degree of benefit varies widely. This variability may occur because the memory representation was not adequate to facilitate behaviour. We assessed memory and response preparation using high-density recordings of neuroelectric activity. First, participants were presented with memory-cued (clip and lateralized target tone) and neutral-cued (clip alone) trials. Importantly, we manipulated the associative memory representation by directing attention to the clip or the target at learning. At retrieval, participants were tested on their LTM associations between audio-clip and lateralized target. RT benefits for detecting the target when embedded in memory compared to neutral trials, an explicit memory for target presence, an implicit target-location memory, and a lateralized readiness potential (LRP), were evident only in the attention-to-target study. Further, implicit memory and response preparation measures were positively correlated. Our findings provide evidence of a dissociation between implicit and explicit associative LTM at the neural level, with the former facilitating behaviour by mediating response preparation.

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12:00-1:00 PM (2096)

Hit Refresh: On Decoding the Neural Signatures of Attentional Refreshing in Working Memory with EEG. STÉPHANIE JEANNERET, *University of Geneva,* LEA M. BARTSCH, *University of Zurich,* NORA TUROMAN, *University of Geneva,* PROSPER A. FIAVE, *University of Geneva,* EVIE VERGAUWE, *University of Geneva* — Working memory (WM) is a limited-capacity system that maintains information according to behavioral goals

and demands. A proposed attention-based maintenance mechanism in WM is known as refreshing, which is assumed to be used spontaneously to help us retain visual, verbal, and spatial memoranda. However, we have reached the limit of behavioral methods to study the occurrence and operation of refreshing. Here, we used multivariate pattern analysis on electroencephalographic (EEG) data with the aim to decode refreshing, by tracking the temporal dynamics of representations maintained in WM. By doing so, we may better establish the existence of refreshing. Specifically, we tested a memory trained pattern classifier on delay-period EEG activity – when participants were cued to refresh a given category exemplar from an item series (e.g., a color among a face, scene, and pseudoword). As a first index of refreshing, we predicted that we would find category evidence for the first item of a series across subsequent retention intervals. Further, we sought to test for the beneficial effects of refreshing observed in the behavioral literature, by correlating improved category recall performance with greater category-specific decoding.

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12:00-1:00 PM (2097)

Modifier Position Affects Statement Believability. PETER J. WEBER, II, *Mississippi State University,* HOSSEIN KARIMI, *Mississippi State University* — Simple shifts within the syntactic structure of a sentence can have significant effects on comprehension difficulty as well as how sentences are perceived. Prior research has shown that post-modified words ("a king who is cruel") are retrieved from memory more easily relative to pre-modified words ("a cruel king", Karimi et al., 2019). In the current project, we explored the potential influence of modifier position on statement believability, namely, how much people believe a statement they have not heard before. In addition to pre- and post-modified words, critical statements included unmodified words that served as the baseline condition. Everything else was identical across the three conditions. The results showed significantly greater believability ratings for statements including post-modified words relative to those including pre-modified words. Our results lay the groundwork for future investigations into how syntactic structure affects perceptions of linguistic information.

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12:00-1:00 PM (2098)

Transfer of Learned Cognitive Control Settings Within and Between Tasks. MERVE ILERI TAYAR, *Washington University in St. Louis,* CAROLINE MOSS, *Washington University in St. Louis,* JULIE BUGG, *Washington University in St. Louis* — Cognitive control is modulated based on learned associations between conflict probability and stimulus features like color. We investigated whether such item-specific control transfers to novel stimuli or a novel task. During training, participants experienced an item-specific proportion congruence (ISPC) manipulation in a Stroop (Experiment 1) or Flanker (Experiment 2) task with mostly congruent (MC) and mostly incongruent (MI) colors. During transfer, participants performed the same task and encountered novel transfer stimuli paired with MC or MI colors. Evidencing within-task transfer, responses were faster to incongruent transfer stimuli comprising an MI color compared with an MC color. In Experiment 3, we investigated between-task transfer from Stroop to Flanker. After training with an ISPC manipulation in the Stroop task, a Flanker task was completed with the same colors but without an ISPC manipulation. Responses were faster for incongruent stimuli paired with the previous MI colors compared with the previous MC colors. This novel evidence for between-task transfer suggests learned control settings may be automatically retrieved and executed when stimulus features (color) signaling these control settings are encountered.

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12:00-1:00 PM (2099)

Generalizability of Learned Flexibility Induced by Switch Probability Manipulation. COREY NACK, *Purdue University,* YU-CHIN CHIU, *Purdue University* — Cognitive flexibility increases when control demand increases. Compared to a list with rare switches in a task switching paradigm, a demanding frequent-switch list elicits smaller switch costs. Labeled the list-wide switch probability (LWSP) effect, this cost reduction reflects learned flexibility. However, uncertainty remains regarding whether learned flexibility generalizes. If learned flexibility is context specific, the LWSP effect will show limited transfer. Here, the LWSP effect was tested for transfer in two experiments. Experiment 1 (N=95) found transfer: frequent-switch lists had increased voluntary switch rate. This finding replicated others and supported within-task generalizability. Conversely, Experiment 2 (N=150) provided evidence against across-task generalizability. Even though cues signaling control demand remained, novel task sets introduced in switch-unbiased lists eliminated the LWSP effect. Thus, the LWSP effect is task- and list-specific. These findings are compatible with Dreisbach and Fröber (2019)'s concurrent activation account of learned flexibility: Frequent switches are overcome by keeping only the two relevant task-sets active.

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12:00-1:00 PM (2100)

Context Modulates Control over Inhibition of Recently Abandoned Task-Sets. JESSICA SHOEMAKER, *Duke University,* AUDREY SIQI-LIU, *Duke University,* TOBIAS EGNER, *Duke University* — Switching between tasks requires activating the currently relevant task-set and inhibiting the previous task-set to prevent interference. A behavioral signature of this inhibition is the "backward inhibition" (or n-2 repetition) effect, which describes greater response-times and error-rates on ABA (backward inhibition) than CBA (control) trial-sequences, thought to reflect residual inhibition of the recently abandoned task-set. Previous work in task-switching and conflict-control has found that people adapt to fluctuating control demands, resulting, for instance, in smaller mean switch costs when switching is required more frequently. In the current study, we investigated whether this type of control-learning could also affect

backward inhibition. Participants switched between three number classification tasks, and we manipulated the proportion of inhibition versus control trials across different blocks. Results indicate that inhibition costs in error-rates but not response-times scale inversely with the frequency of inhibition trials, suggesting that contextual learning modulates control over inhibition of recently abandoned task-sets.

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12:00-1:00 PM (2101)

Eye-Voice Span in Single-Item and Multi-Item Stroop Tasks: Tracking Within-Task Alterations. LAOURA ZIAKA, *University of Oslo,* ATHANASIOS KATSAMANIS, *Athena Research Center,* ATHANASSIOS PROTOPAPAS, *University of Oslo* — Previous studies have shown that performance within serial (i.e., multi-item) naming tasks deteriorates during the course of the task. In contrast, no within-task deterioration is seen in discrete (i.e., single-item) naming tasks. This pattern of results has been attributed to spatial interference from adjacent items and a consequent shift from a more parallel to a more serial processing via attentional lockout scheduling. The proposed attentional shift should also be evident in the spatial eye-voice span (the distance between the currently fixated item and the currently named item) and the temporal eye-voice span (the elapsed time between first fixation on an item and articulation onset of that item). To test this prediction, in the present study 42 adult participants performed single-item and multi-item Stroop tasks under eye tracking and recording of vocal responses. Gaze-voice alignment is currently in progress, to be followed by spatial and temporal eye-voice span calculation. We hypothesize that during the course of the multi-item task the spatial eye-voice span will decrease and the temporal eye-voice span will increase. In contrast, no change in the temporal span is expected in the single-item task.

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12:00-1:00 PM (2102)

Wrong Place, Right Time: Temporal Dynamics of Conflict in Eriksen's Flanker Task. MERCEDES B. VILLALONGA, *Brandeis University,* ROBERT SEKULER, *Brandeis University* — Eriksen's flanker task is a gold standard for assessing psychophysical conflict. To understand the task's temporal dynamics, we combined behavioral assays and evidence accumulation modeling. With 14 subjects, we manipulated the onset asynchrony (SOA) between a 2D array of flankers and the target embedded in the array. Time of flanker onset varied randomly and unpredictably over trials, ranging from 400 ms before the target to 200 ms after the target. Trials with congruent or incongruent flanker-target combinations were intermixed. Increased response times and error rates were seen with incongruent stimuli, the canonical congruency effect (CE). SOA significantly affected CE: when flankers preceded the target, CE increased, with a maximum when SOA = -100 ms; delaying flankers until after target onset reduced CE. Using a diffusion model for conflict tasks, fits of individual and group data showed that SOA significantly affected parameters representing flanker activation's magnitude and time-course. Additionally, when SOA conditions produced little flanker conflict, target-related information accumulated more quickly. Our results provide new perspectives on the dynamics of selective attention and response activation under conflict.

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12:00-1:00 PM (2103)

Getting Ready (Not) to Act: How Preparation Time Determines Inhibitory Control Underlying Dual-Action Benefits in Multiple Action Control. JENS KÜRTEN, *Julius-Maximilians-Universität Würzburg,* TIM RAETTIG, *Julius-Maximilians-Universität Würzburg,* JULIAN GUTZEIT, *Julius-Maximilians-Universität Würzburg,* LYNN HUESTEGGE, *Julius-Maximilians-Universität Würzburg* — Executing one action while simultaneously inhibiting another, prepotent, action can be harder than executing both actions concurrently. Such dual-action benefits are characterized by frequent false-positive executions of the unwarranted prepotent response in single-action conditions (i.e., failures of inhibition), compared with only few errors in dual-action conditions. The current study addresses the effects of preparation time on such inhibitory control difficulties. In two experiments we varied preparation time block-wise as well as intermixed within blocks of trials. Following one of four preparatory intervals (100, 400, 700, 1500 ms), participants performed either a single manual key press, a highly prepotent saccade, or both actions in response to a single peripheral visual target. The rate of false-positive saccades and thus the extent of dual-action benefits decreased as a function of preparation time. The results emphasize that the relative (in)ability to prepare for inhibitory control demands is a major determinant of performance benefits associated with dual (vs. single) action execution.

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12:00-1:00 PM (2104)

Attention Control Predicts Fluid Intelligence After Controlling for Processing Speed. CODY A. MASHBURN, *Georgia Institute of Technology,* RANDALL W. ENGLE, *Georgia Institute of Technology* — Performance on many cognitive control tasks benefits from faster, more efficient processing. This creates ambiguity between cognitive control and processing speed as constructs related to cognitive ability (e.g., Rey-Mermet et al., 2019). To resolve this, we administered a battery of tests measuring fluid intelligence, speed, and attention control. Speed was measured using two up/down thresholding tasks (prosaccade and inspection time). The attention control tasks used were antisaccade accuracy and selective visual arrays k-scores (Martin et al., 2020). These were used to predict fluid intelligence. We used inspection time and prosaccade thresholds to mediate the relationship between the cognitive control tasks and fluid intelligence. Better accuracy on both cognitive control tasks was associated with lower thresholds on the prosaccade and inspection time tasks. However, the relationships between the cognitive control tasks and fluid intelligence remained significant. These results are inconsistent with the notion that cognitive control is explained away

by individual differences in processing speed and consistent with the notion that attention control is a determinant of intelligence (Kovacs & Conway, 2019; Engle, 2018).

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12:00-1:00 PM (2105)

Thought Constraint as an Individual Difference Variable. MATT E. MEIER, *Western Carolina University,* REBECCA DANIEL, *Western Carolina University,* ANNA SMITH, *Duke University,* NICK BROSOWSKY, *University of Manitoba,* PAUL J. SELI, *NCEJCQ* — Christoff et al. (2016) called attention to a potentially important dimension of thought: the dynamics, or levels of constraint, of thought. Here, we sought to complement the growing literature on thought dynamics by conducting a preregistered quasi-experimental study where subjects (both in the lab and online) completed sustained attention tasks (sustained attention to response task and the metronome response task) with embedded thought probes that asked subjects to report on the dynamics, task-relatedness, and other thought aspects. With probes administered in two tasks, we estimated the across-task consistency of probe responses and assessed how different probe responses were associated with sustained attention task performance (response time variability and accuracy). Also, we included measures of psychological disorder symptoms (e.g., rumination, depression, anxiety, ADHD) to test predictions made by Christoff et al. (2016) of associations between thought dynamics and psychological disorders.

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12:00-1:00 PM (2106)

Age-Related Differences in Learned Attentional Flexibility. CATHERINE W. SEITZ, *Wake Forest University,* ELAYNA R. SEAGO, *Wake Forest University,* ANTHONY W. SALI, *Wake Forest University* (Sponsored by Anthony Sali) — Individuals anticipate upcoming demands and adjust their readiness to shift spatial attention, referred to as learned attentional flexibility, according to environmental statistical regularities. We tested older (age 70-85) and younger (age 18-22) adults to determine if there were age-related differences in learned attentional flexibility. We used a rapid serial visual presentation task in which participants shifted and held attention in response to visual cues. Target detection response times (RT) indicated shift readiness, and we manipulated the shift likelihood across alternating blocks of trials. While both older and younger adults demonstrated larger RT costs for shift trials relative to hold trials in low shift likelihood blocks than in high shift likelihood blocks, older adults showed greater context-based changes than did younger adults. We also fit the RT data with a series of reinforcement learning models using Hierarchical Bayesian Inference (HBI) for model fitting and comparison. Older adults updated predictions more strongly after a violation of expectations than did younger adults, suggesting that aging is associated with an increased reliance on immediate trial history for setting shift readiness predictions.

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12:00-1:00 PM (2107)

Exploring the Mechanisms Related to Attention Biases for Threat in Social Anxiety. VALERIE BENSON, *University of Central Lancashire,* KATERINA PAVLOU, *Cyprus Institute of Marketing,* ATHINA MANOLI, *Queen Mary University of London,* JULIE HADWIN, *University of Birmingham* — Social anxiety disorder (SAD) is a common mental health disorder in children and SAD impacts quality of life. Cognitive models of anxiety propose that attentional biases toward threatening information play etiological and maintenance roles in anxiety. Threat processing is related to automatic attentional orienting to threat, difficulty disengaging from task-irrelevant threatening stimuli, and vigilance-avoidance of threat. The current study examined attentional processing in relation to SAD symptoms in N = 38 children (25 males) aged between 9-11 years old. We employed the Remote Distractor Paradigm (RDP) and presented faces that displayed different expressions (happy, angry, neutral) to act as distractors in a task where participants were required to 'look at' a non-face target presented at a lateral location. Distractors could appear at central, parafoveal and peripheral eccentricities. Higher symptoms of SAD were associated with slower latencies to the target in the presence of angry compared to happy and neutral face distractors, regardless of the distractor eccentricity. The findings indicate that social anxiety is characterised by difficulty disengaging from task-irrelevant threat.

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12:00-1:00 PM (2108)

Incremental Versus One-Shot Episodic Learning in Task Switching. JACKSON COLVETT, *Washington University in St. Louis,* JIHYUN SUH, *Pohang University of Science and Technology,* JULIE BUGG, *Washington University in St. Louis* — Previous experience with control can affect a person's current performance, and multiple forms of previous experience have distinct impacts. Participants can learn incrementally about the proportion of task switches in a list, such that they reduce switch costs in lists with mostly switches compared to lists with mostly repetitions. Separately, work on one-shot episodic learning has shown that when a specific stimulus appears multiple times, participants reactively retrieve the previous instance (i.e., prime trial) from episodic memory, and implement the associated control state on the subsequent instance (i.e., probe trial). Our design made both forms of learning available to participants. Each 12-trial sublist was either mostly switching (66% switches) or mostly repeating (33% switches), and four sets of prime-probe pairs were integrated into each list. We found that the one-shot learning effect dominated: participants retrieved the control state from the prime trials rather than implementing the control state associated with the proportion of switches in the list. We are currently examining whether episodic learning still dominates under conditions designed to favor incremental learning of control states.

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12:00–1:00 PM (2109)

Examining the Independence of Flanker and Simon Effects in the Auditory Modality. JULIA R. BRZAC, *Clarkson University,* LAUREN MEYERS, *Clarkson University,* LAUREN PETLEY, *Clarkson University* — When tasks require the processing of conflicting information, it is the role of the executive system to resolve this conflict and enable successful task completion. Common tasks for studying conflict resolution include Simon, Stroop, and flanker tasks, among others. Although these tasks are conceptually similar, there is evidence both for and against the notion that they tap the same neural resources. The present study extends this debate by examining the overlap between auditory Simon and flanker tasks. Thirty-eight young adults completed a combined auditory conflict task, in which two simultaneous voices (target and flanker) spoke the words "right" or "left" in the same ear to evoke a lateralized response. While both ear-response (Simon) conflict and target-flanker conflict significantly slowed response times and decreased accuracy, the Simon effect was very weak. Effects of conflict on response times were additionally qualified by an interaction in which the Simon effect was only present for congruent flanker trials. The results might suggest either shared neural resources, or modulation of the Simon effect by the attentional demands of the auditory flanker task.

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12:00–1:00 PM (2110)

Motor Interference Between Tasks Stems from an Advance Lock-Out. LUCAS ROTOLO, *Université Bourgogne Franche-Comté,* FRANÇOIS MAQUESTIAUX, *Université Bourgogne Franche-Comté, Besançon,* ERIC RUTHRUFF, *University of New Mexico,* LAURENCE PICARD, *Université Bourgogne Franche-Comté* — Why is dual-task interference especially severe when both responses are manual? To explain this finding, Ulrich et al. (2006) proposed a stubborn motor bottleneck. Here we hypothesize that this motor interference reflects an advance lock-out of Task-2 processing. In Experiment 1, we replicated Maquestiaux et al. (2020) by showing very little dual-task interference between a vocal Task 1 (only 2 ms) and a very easy manual Task 2 consisting of indicating an arrow's direction with a spatially-compatible manual response (141 ms). But, in Experiment 2, merely changing the Task-1 response modality from vocal to manual yielded 324 ms of interference on the same extremely easy, ideomotor compatible Task 2. Critically, response time also increased dramatically on occasional single-task trials of Task 2 (by 182 ms), even though Task 1 was not even presented and no motor response was executed. This suggests that participants locked out Task 2 in advance.

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12:00–1:00 PM (2111)

Investigating Which Cognitive Processes Are Assisted by Viewing Virtual Nature. BROOKE CHARBONNEAU, *Montana State University,* KEITH A. HUTCHISON, *Montana State University,* JASON WATSON, *University of Colorado Denver* — Viewing natural stimuli has shown to have beneficial effects on cognition. However, not everyone has access to nature, making them more dependent on virtual nature images instead. This study aimed to investigate which cognitive processes could benefit from viewing nature in an online setting. Two hundred and nineteen participants were recruited from Montana State University and completed two tasks that measured either working memory capacity, attentional control, or memory. Within each task, one of 40 nature images or 40 urban images were randomly presented before each trial for a total of 80 trials. Results revealed higher performance after viewing nature images across attentional control tasks, but not for working memory capacity or memory. However, this effect became marginal after controlling for preference for natural settings and nature images. These results indicate a small, but significant, benefit of viewing natural settings for attentional control, an essential component of all higher-order cognition.

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12:00–1:00 PM (2112)

Confidence for Intrusion Errors in the Attentional Blink Depends on the Target-Defining Feature. MATTHEW JUNKER, *Southern Illinois University Carbondale,* REZA HABIB, N/A, *Southern Illinois University Carbondale* (Sponsored by Reza Habib) — Research examining intrusion errors during a two-target Rapid Serial Visual Presentation (RSVP) task typically defines target stimuli by the presence of surrounding annuli. Using this paradigm, previous research has observed that selection of response stimuli is delayed for the second target as indicated by a post-target pattern of errors (Vul et al., 2008) and that participants are confident in these erroneous responses (Recht et al., 2019). The present research replicates this finding and demonstrates that this pattern is not observed when the target-defining feature is conjoined with the response feature (e.g., the color of a to-be-reported letter). In a follow-up experiment, we demonstrate that high confidence for post-target intrusion errors is potentially due to the time required to focus attention to the RSVP stream from the annulus. Future conclusions concerning patterns of errors during a two-target RSVP task should consider how target-identifying features influence these errors.

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12:00–1:00 PM (2113)

Event Segmentation and Cognitive Control Use. CASSANDRA SKROTZKI, *Toronto Metropolitan University,* KESAAN KANDASAMY, *Toronto Metropolitan University,* LIXIA YANG, *Toronto Metropolitan University* — The Dual Mechanisms of Control framework posits two distinct cognitive control modes: proactive and reactive control. When completing the AX-Continuous Performance Test (AX-CPT), proactive control requires the active maintenance of goal-relevant information in working memory across the cue-probe delay, whereas reactive control reactivates goal-relevant information only upon probe presentation. Cognitive control use shifts from a predominantly proactive strategy in young adulthood towards a more

reactive strategy in older age. Semantic representations help specify event boundaries that separate continuous streams of perceptual information into meaningful event models in memory. Prior research showed that placing an event boundary between each cue and probe in the AX-CPT, by means of a spatial shift from the left to the right side of a computer screen, enhanced young adults' proactive control use. It is unclear whether this same manipulation may also enhance reactive control use in a sample of reactively biased older adults. Using a modified AX-CPT, this study will examine whether placing a spatial event boundary between each cue and probe can enhance both young and older adults' existing proactive and reactive control strategies.

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12:00-1:00 PM (2114)

The Role of Perceptual Noise in Response Conflict: A Bayesian Model Comparison. JORDAN T. DEAKIN, *University of Birmingham,* DIETMAR HEINKE, *University of Birmingham* — In a recent flanker study, we examined the influence of perceptual noise on visual selective attention using random-dot kinematograms (RDKs) and fitted two popular diffusion models to this data using a Bayesian framework. We used evidence-based Bayes Factor and found that compared to a single stage model, a dual stage model better accounted for the observed interaction between the congruency effect and noise. In particular, the dual stage model was better able to capture the change in congruency effect across response time quantiles, while the single stage model consistently underestimated this effect. On the poster we will discuss the underlying cause for these differences and why the dual stage model is preferred. We will also present results from additional empirical studies involving perceptual noise to further evaluate the two models.

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12:00-1:00 PM (2115)

Hemodynamic and Psychological Mechanisms of Cognitive Impairment During Exercise. MYUNGJIN JUNG, *University of Mississippi,* MINSOO KANG, *University of Mississippi,* PAUL D. LOPRINZI, *University of Mississippi* — PURPOSE: To evaluate whether attention and prefrontal cortex (PFC) O2 explain why cognition is impaired during high-intensity exercise (Ex). METHODS: Eleven adults (Mage=20 years) participated in a 2 (Condition: Ex, Control) × 2 (Time: Baseline, Endpoint of Ex) design, with both factors occurring as within-subject factors. The Ex and Control conditions, respectively, involved cycling at a high (> ventilatory threshold) or low-intensity (< ventilatory threshold) for 15 minutes. At baseline and at the end of Ex (while still exercising), participants completed a Color/Word Stroop task. PFC tissue saturation index (TSI, via fNIRS) and attention (self-report; associative-dissociative scale) were measured throughout the conditions. Within-subject mediation analysis was computed (MEMORE macro in SPSS). RESULTS: Cognition (Incongruent Stroop) was impaired during Ex when compared to baseline (Ex: 89% v 83%, Control: 87% v 91%; pinteraction < .05). However, changes in PFC O2 and attention did not mediate this effect, ps > .05. CONCLUSION: PFC O2 and attention did not explain the cognitive impairment effects observed during high-intensity Ex. Other factors (e.g., altered dopamine/noradrenaline) should be explored as potential mechanisms.

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12:00-1:00 PM (2116)

Does Task Demand Moderate the Impact of Emotionally Valenced Mind Wandering on Task Performance? MARC A. ASTACIO, *Nova Southeastern University,* MATTHEW S. WELHAF, *Washington University at St. Louis,* AUDREY V.B. HOOD, *Montana State University,* HALEY GOLLER, *Western Carolina University,* JONATHAN B. BANKS, *Nova Southeastern University* (Sponsored by Jonathan Banks) — The frequency of mind wandering appears to be altered by several factors, including working memory capacity, attention control, boredom, and task demand. The impact of mind wandering may vary as a result of several factors, including the emotional valence of the mind wandering (Banks, Welhaf, Hood, Tartar, & Boals, 2016). Less is known about how task demand may impact the frequency of emotionally valenced mind wandering or their impact on task performance. The current study examined the impact of emotionally valenced mind wandering on performance during an n-back task with varying demand levels (1-back and 2-back). Results suggest that although task demand did not alter the frequency of emotionally valenced mind wandering, task demand altered the impact of mind wandering on task performance (accuracy and RT variability), such that only negatively valenced mind wandering uniquely impacted 1-back performance, but both neutral and negatively valenced mind wandering impacted 2-back performance. These findings further support the importance of examining the content of mind wandering.

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12:00-1:00 PM (2117)

How Do We Narrow Our Attentional Focus? Using Affective Ratings to Assess the Involvement of Inhibition. NIYATEE NARKAR, *University of Guelph,* MARK J. FENSKE, *University of Guelph* (Sponsored by Mark Fenske) — Narrowing our attentional focus can be critical for survival, as it enhances the processing of information to fulfil needs or avoid threats. Some accounts (amplification-plus-inhibition) suggest effective processing inside a narrowed attentional focus is accomplished in part through the inhibition of distracting or otherwise-irrelevant peripheral information. Other accounts (amplification only) contest this role of inhibition and maintain that narrowing attentional focus solely requires enhancing the processing of stimulus representations within the focus. Here we combined a global/local perceptual manipulation of the scope of attention with an affective-evaluation task to test between these competing hypotheses. Because inhibited stimuli tend to be later rated more negatively than non-inhibited stimuli, an involvement of inhibition in narrowing attention to local elements of stimuli should cause them to become devalued compared to stimuli to which attention

was broadened to global elements. Our results (N=154) underscore the potential usefulness of affective ratings for probing attentional mechanisms.

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12:00–1:00 PM (2118)

The Relationship Between Trait Anxiety and Components of Attention. GIA M. MACIAS, *Purdue University,* DARRYL W. SCHNEIDER, *Purdue University* — The relationship between trait anxiety levels and different components of attention is unclear. The current research addressed how trait anxiety (measured using the trait version of the State and Trait Inventory for Cognitive and Somatic Anxiety) is related to attentional effects associated with alertness and cognitive control in a study involving an arrow flanker task with alerting cues. Alerting effects in response times and error rates were positively correlated with anxiety scores, whereas congruency effects (indexing cognitive control) and the alerting–congruency interaction were not associated with trait anxiety levels. One interpretation of the results is that heightened sensitivity to abrupt-onset stimuli might underlie the observed relationship between trait anxiety and alertness.

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12:00–1:00 PM (2119)

Chronotype and Time of Testing Modulate the Time Course of Automatic and Controlled Processes in a Semantic Priming Paradigm. LUCÍA B. PALMERO, *University of Murcia,* MIRIAM TORTAJADA, *University of Murcia,* VÍCTOR MARTÍNEZ-PÉREZ, *University of Murcia,* ALEJANDRO SANDOVAL-LENTISCO, *University of Murcia,* GUILLERMO CAMPOY, *University of Murcia,* LUIS J. FUENTES, *University of Murcia* — Responding to the demands of everyday life requires both automatic processing and controlled strategies. Controlled processing (slower and costly) has been linked to certain modulatory factors such as chronotype and time of day, whereas automatic processing (faster and less resource-demanding) has been shown to be invariant to these effects. In the present study we addressed the time course of chronotype and time of day effects on both types of processes in a semantic priming task. Because related trials amounted to 20% only, facilitatory automatic effect is expected at 100 ms SOA and inhibitory controlled effect is expected at 450, 600, and 800 ms SOAs. Our results showed that not only controlled but also automatic processing may be modulated by chronotype and time of day, although only in Evening-types. This pattern of results is in line with theories that propose the better adaptation and flexibility of Morning-types.

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12:00–1:00 PM (2120)

A Novel Measure of Individual Differences in Sustained Attention and Its Relation to Attention Control. JASON S. TSUKAHARA, *Georgia Institute of Technology,* RANDALL W. ENGLE, *Georgia Institute of Technology* — In our effort to create valid and reliable measures of attention control, we developed a novel attention task—the sustained attention-to-cue task (SACT). The critical element in this task is sustaining attention at a spatially cued location over a variable wait interval. This task has demonstrated to be a reliable and valid measure of individual differences in attention control (Draheim et al., 2021). However, there were no accuracy differences for shorter and longer wait time intervals—questioning whether this task is indeed measuring sustained attention. A second version of the task was developed to further improve the SACT. In a large sample (N = 307), the second version of the SACT showed a linear decease in accuracy with longer wait time intervals. Critically, individuals higher on attention control showed less of a decrease in accuracy due to wait time compared to those with low attention control. There was no relationship of individual differences in working memory capacity or fluid intelligence with the effect of wait time on performance. These results suggest that the second version of the SACT is a valid measure of sustained attention and reflects individual differences in the ability to control attention.

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12:00–1:00 PM (2121)

Saving the Stroop? A Multiverse Approach to Using the Stroop as an Individual-Differences Task. MATTHEW S. WELHAF, *Washington University at St. Louis,* BRIDGET A. SMEEKENS, *Elon University,* MICHAEL J. KANE, *University of North Carolina at Greensboro* — Theoretical questions about attention control as an individual-differences construct have been complicated by measurement concerns: Do attention control tasks often correlate poorly because they are unreliable or because no such general-ability construct exists? We know that the field's frequent reliance of difference scores in attention control tasks (e.g., Stroop, flanker) contributes to poor reliability and weak factor loadings. Thus, alternative or improved tasks are needed to allow for construct valid individual-differences measurement. We altered two common manual Stroop tasks (color-word; tally-digit) to introduce theoretically and empirically motivated difficulty manipulations between trial blocks (MacLeod, 1991; Melara & Algom, 2003). Taking a mini-multiverse approach, we scored these tasks in various ways, and compared their reliabilities, correlations with each other, factor loadings on an attention control factor, and latent variable correlations with working memory capacity and mind wandering propensity. Implications for the use of these measures in individual-differences research are discussed.

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12:00–1:00 PM (2122)

Measuring Executive Functions: Difference Scores Do the Best Job After All. GIDON T. FRISCHKORN, *University of Zurich,* RICARDO REBMANN, *Technische Universität Dresden,* KLAUS OBERAUER, *University of Zurich* — In the past years reaction time differences from experimental tasks were criticized for their bad psychometric properties and lack of control for speed-accuracy

trade-offs. Therefore, many researchers advised against using such scores as indicators for cognitive processes in individual differences research. To test these claims, we simulated response times and accuracies from two cognitive models of inhibition processes, the Diffusion Model for Conflict Tasks, and the Shrinking Spotlight Diffusion Model. These simulations allowed us to assess which performance indicators can best recover individual differences in model parameters representing inhibitory processes. The results show that reaction time differences fared best in recovering individual differences in inhibitory processes. They even surpassed differences between drift-rates of the standard diffusion model, that control for speed-accuracy trade-offs. These results question the claim that reaction-time differences are not suited to isolate individual differences in cognitive processes. On the contrary, if we take our best cognitive theories of conflict tasks seriously, reaction-time differences are the most valid measures of individual differences in inhibitory processes.

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12:00-1:00 PM (2123)

Individual Differences in Self-Regulatory Traits: Associations with Classroom Task-Unrelated Thoughts and Performance. MICHAEL W. MCHALE, *University of North Carolina at Greensboro,* MICHAEL J. KANE, *University of North Carolina at Greensboro* — A secondary data analysis of Kane et al. (2021) investigates whether individual differences in self-regulation traits (conscientiousness, self-control, and procrastination) predict task-unrelated thought (TUT) rates and academic performance within university psychology courses. During a semester-long, three-phase protocol, 851 undergraduates at two public US institutions had their in-lecture TUT rates measured on two separate occasions; auditory thought probes signal students to indicate whether their immediately preceding thoughts were on or off-task. Students also completed self-report questionnaires at the start and end of the semester (the three self-regulation traits of interest were assessed at end-of-semester). Multiple group analyses (with classrooms as groups) tested whether self-regulation traits predicted TUT rate and course grades, and whether TUT rate mediated any associations between self-regulation traits and grades. Follow-up analyses tested whether any of these self-regulation associations held when additional personality traits and academic behavior measures were added to the models.

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12:00-1:00 PM (2124)

Alerting, Orienting, and Executive Control Attention in Individuals with Chronic Mild Traumatic Brain Injury. ILEANA RATIU, *Arizona State University,* ARIANNA N. LACROIX, *Purdue University* — Individuals with mild traumatic brain injury (mTBI) experience acute changes in attention. Specifically, they demonstrate difficulty inhibiting distractors and benefit more from temporal and spatial cues, rather than temporal cues alone. This study extends this exploration to chronic mTBI. Twenty-six participants with mTBI and 32 controls completed the classic Attention Network Test (ANT) and a verbal ANT using letters. Alerting (readiness to perceive information) and orienting (ability to select information from a spatial location) were measured using pre-stimulus cues containing temporal information (alerting cue), temporal and spatial information (orienting cue), or no information (no cue). Executive control (ability to maintain a goal while inhibiting distracting information) was measured by asking participants to make a decision regarding a central stimulus flanked by distractors. The groups showed similar alerting and executive control effects but different effects for orienting. Individuals with mTBI experienced greater benefit from the orienting cues than controls on both tasks, suggesting that individuals with mTBI continue to rely on both temporal and spatial information to maintain task performance in chronic mTBI.

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12:00-1:00 PM (2125)

Race Bias in Perception of Misbehavior Among Boys with Attention Deficit Hyperactivity Disorder. HOLLY WHITE, *University of Michigan Ann Arbor,* KAITLIN MULLIGAN, *University of Michigan Ann Arbor* — Among children with Attention Deficit Hyperactivity Disorder (ADHD), disruptive behavior is more likely to be construed as oppositional, and less tolerated by teachers, in Black boys compared to White boys. In an exploratory analysis of a sample of ADHD children, we found that parents of Black male children were more likely to endorse characteristics consistent with Oppositional-Defiant Disorder (ODD) compared to parents of White male children. Parents of Black boys rated their children's behavior as more impulsive and inattentive, compared to parents of White boys, despite the children not showing differences in levels of attention and impulsivity on objective measures (e.g., computerized tasks) as a function of race. The disparity between parent ratings and laboratory measures for Black boys may reflect differences in parental expectations, acceptance of disruptive behavior, and/or higher sensitivity to problem behavior. Findings will be discussed in terms of implications for children's self-efficacy and systemic racial bias.

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12:00-1:00 PM (2126)

Searching for Individual-Difference Factors in Distractor Devaluation and No-Go Devaluation Effects: Inhibitory Control, Emotional Reactivity, and Visual Working Memory. BROOKE PARDY, *University of Guelph,* ELIZABETH M. CLANCY, *University of Guelph,* MACKENZIE BAIN, *University of Guelph,* ROBYN MAHOOD, *University of Guelph,* MARK J. FENSKE, *University of Guelph* — Ignoring or withholding a behavioural response from a stimulus causes it to become affectively devalued. Leading accounts suggest this results from an aversive reaction elicited when inhibition is applied to prevent interference from distracting or otherwise-inappropriate stimulus/response representations. Accordingly, the lingering change in stimulus value in these 'distractor devaluation' and 'No-go devaluation' effects occurs because the aversive response becomes associated in memory with the

perceptual details of the inhibited stimulus. Here we examine whether individual differences in inhibitory control, emotional reactivity, and visual working memory can account for between-participant variability observed in these stimulus-devaluation effects. Neither behaviourally-assessed inhibitory control nor self-reported emotional reactivity were predictive of the magnitude of either form of stimulus devaluation. However, individual differences in behavioural measures of attentional control of visual working memory were predictive of distractor devaluation. Overall, our findings highlight the potential usefulness of individual-difference approaches for testing theories regarding the affective consequences of cognitive control.

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12:00-1:00 PM (2127)

Individual Differences in Sustained Attention: Both Ability and Motivation Matter. MATTHEW ROBISON, *The University of Texas at Arlington* — The present study reanalyzes data from five previously published datasets comprising over 1,000 participants to assess the relative contributions of cognitive ability and self-reported intrinsic motivation to sustained attention. Participants in all studies completed a variation of the psychomotor vigilance task (PVT), self-reported their motivation either before or after the task, and completed a set of complex span measures of working memory capacity (WMC). Both time-on-task effects (i.e., vigilance decrements) and vincentile distributions were analyzed to examine whether WMC and motivation exert general effects on performance, mitigate vigilance decrements, and/or reduce attentional lapses. Overall, WMC tended to exert a general influence on performance in the form of faster reaction times (RTs), with the effect mostly localized in the slow end of the distribution, whereas higher self-reported motivation was associated with both faster RTs overall and a mitigation of the vigilance decrement. The data are consistent with a cognitive-energetic framework of individual differences in sustained attention, in which both cognitive and conative factors exert influences on behavior.

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12:00-1:00 PM (2128)

Stable Attentional Control Demands Across Individuals Despite Extensive Learning. CHONG ZHAO, *University of Chicago,* EDWARD VOGEL, *University of Chicago* — Classic models of expertise propose that when first learning a task, success is primarily determined by the individual's attention and working memory. However, as skill is developed performance becomes less dependent on attention control. Here, we tested whether individual differences in attentional control ability continued to predict LTM performance for picture sequences even after participants showed massive learning increases for the sequence. In Experiment 1-3, subjects performed source memory task in which they were presented a sequence of 30 objects shown in one of four quadrants, or 30 centrally positioned objects with an external black square in one of the four quadrants, and then were tested on each item's position. We repeated this procedure for 5 times. Interestingly, we discovered that individual differences in attentional control continually predicted LTM accuracy across all repetitions. In Experiment 4, we replicated the stable attentional control demands with extensive learning of word pairs. Together, these results suggest that developing expertise does not eliminate the contribution of attentional control ability for LTM but may instead reflect more optimized attention control during expert task performance.

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12:00-1:00 PM (2129)

Acquired Knowledge or Fluid Ability? An Examination of Identity, Adverse Impact, and Equity in High-Stakes Testing. MARIEL KATE BARNETT, *Case Western Reserve University,* CODY A. MASHBURN, *Georgia Institute of Technology,* ALEXANDER P. BURGOYNE, *Georgia Institute of Technology,* RANDALL W. ENGLE, *Georgia Institute of Technology* — A priority for psychological science in the 21st century is to foster equity and inclusion in occupational settings. One avenue that demonstrates a need for a focus on equity is high-stakes testing, such as the assessments used for personnel selection. We suggest that an equitable test is one that minimizes group differences based on identities such as age, race, ethnicity, sex, and gender while predicting criterion performance equivalently across groups. We provide an overview of the concepts of adverse impact and predictive bias. We discuss how some group differences in performance on high-stakes tests such as the Armed Services Vocational Aptitude Battery (ASVAB) appear to be driven by differences in acquired knowledge, and we suggest that supplementing high-stakes tests with measures of fluid ability, including tests of attention control, could reduce group differences in performance without sacrificing criterion validity. We report the results of a large (N > 300) study in which we identified the cognitive ability tests that best mitigate group differences across protected classes of people.

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12:00-1:00 PM (2130)

Three-Minute Tests of Attention Control: Reliable and Valid Predictors of Complex Task Performance. ALEXANDER P. BURGOYNE, *Georgia Institute of Technology,* JASON S. TSUKAHARA, *Georgia Institute of Technology,* CODY A. MASHBURN, *Georgia Institute of Technology,* RANDALL W. ENGLE, *Georgia Institute of Technology* — Individual differences in the ability to control attention are correlated with a wide range of important outcomes, from academic achievement and job performance to health behaviors and emotion regulation. Nevertheless, the theoretical nature of attention control as a cognitive construct has been the subject of heated debate, spurred on by psychometric issues that have stymied efforts to reliably measure differences in the ability to control attention. We introduce three efficient, reliable, and valid tests of attention control that each take less than three minutes to administer: Stroop Squared, Flanker Squared, and Simon Squared. Two studies comprising more than 600 participants demonstrate that the three "Squared"

tasks have great internal consistency (avg. = .95) and test-retest reliability (avg. r = .67). The Squared tasks loaded highly on a common factor, which was strongly correlated with an attention control factor based on established measures (avg. r = .81). Moreover, attention control correlated strongly with fluid intelligence, working memory capacity, and processing speed, and helped explain their covariation. We found that the Squared attention control tasks accounted for 75% of the variance in multitasking ability at the latent level. Our results suggest that Stroop Squared, Flanker Squared, and Simon Squared are reliable and valid indicators of attention control.

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12:00-1:00 PM (2131)

The Visual Attention for Peri-Personal Space of People with Autistic Spectrum Disorder. AYAKO H. SANEYOSHI, *Teikyo University,* NAOKO INADA, *Teikyo University,* MASAKI TSUJITA, *The University of Tokyo,* TOMOE HAYAKAWA, *Teikyo University,* HIMIKO TOYAMA-KURAHO, *Teikyo University,* CHIKASHI MICHIMATA, *Sophia University,* SHIN'ICHIRO KUMAGAYA, *The University of Tokyo* — The visual attentional superiority of near-body (hand) space was compared for individuals with autistic spectrum disorder (ASD, N=22) and for individuals typically developing (TD, N=24). Two groups were matched for age, sex, and IQ. The participants were asked to detect the targets presented with random ISIs. The target was presented in the near-hand space or in the far-hand space. The results showed that TD participants detected the target faster in the near-hand space condition than in the far-hand condition, but no such advantage was observed for participants with ASD. The perceptual characteristics of the peri-personal space of ASD subjects were discussed.

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12:00-1:00 PM (2132)

Binding of Task-Irrelevant Contextual Dimensions in Language Switching. ELENA BENINI, *Rheinisch-Westfälische Technische Hochschule Aachen University,* IRING KOCH, *Rheinisch-Westfälische Technische Hochschule Aachen University,* SUSANNE MAYR, *University of Passau,* ANDREA M. PHILIPP, *Rheinisch-Westfälische Technische Hochschule Aachen University* — To speak in a certain language, bilinguals need to selectively activate the correct language. This requires cognitive control, which is often investigated through language switching paradigms. Previous research suggested considerable overlap in control processes in language switching and task switching. As feature binding and retrieval processes seem to shape task-switching performance, we expect them to influence language control as well. In Experiments 1 and 2 (Ns=48), participants typed the name of a depicted object in each trial, in which the currently relevant language was indicated by a symbolic cue that also contains an irrelevant dimension (i.e., the context). We found larger language repetition benefits when the context repeated than when it switched. This may indicate that the irrelevant context is bound with the language and retrieves it when the context repeats in the subsequent trial. In Experiment 3 (N=49), participants only typed the first letter of the response, and we found that also the response enters such language-context bindings. We discuss the implications of the interaction between language control and short-term bindings.

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12:00-1:00 PM (2133)

The Impact of Bilingual Language Experience on Executive Function in Young Adults. SOMAYYA SALEEMI, *University of Ottawa,* SHANNA KOUSAIE, *University of Ottawa* (Sponsored by Shanna Kousaie) — Bilingual language experience may bolster interference suppression and cognitive control; however, findings are inconsistent. Crucially, both positive and null results must be interpreted in the context of the vast individual differences and diverse language experiences that exist. Notwithstanding the multidimensional nature of language experience, in previous research individuals are generally dichotomized into seemingly uniform groups – bilinguals vs. monolinguals. Age of acquisition of a second language impacts language/cognitive processing and brain organization, but current language exposure and code-switching are also important. This study uses multiple regression to determine if these language constructs are independent from one another and the contribution of each for predicting performance on four executive function tasks (i.e., Stroop, Simon, Verbal/NonVerbal n-back). A series of generalized linear mixed-effect models are used to examine the association between language experience and executive function performance on the different tasks. Both positive and null results will be presented, and a novel method to objectively measure language proficiency (i.e., speech samples) will be proposed.

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12:00-1:00 PM (2134)

Can One Prepare to Read in Another Language? The Effect of Preparation on Language Switch Cost in Visual Word Categorisation. BRONTË GRAHAM, *University of Exeter,* STEPHEN MONSELL, *University of Exeter,* HEIKE ELCHLEPP, *University of Exeter,* AURELIU LAVRIC, *University of Exeter* — The reduction in task switch cost with preparation is seen as an index of endogenous control. A similar pattern in bilingual picture naming appears to index endogenous proactive control of output language. But in visual comprehension tasks, language switch costs are often small, or even absent; most words unambiguously cue the language or map to meaning without the need for language selection. Whether bilinguals can intentionally select the language in advance of reading is unknown. Swedish-English bilinguals completed a semantic categorisation task in which the language was cued 150 or 1000ms before the word was seen. Demand for endogenous selection was increased for half the participants by interspersing interlingual homographs on 20% of trials (e.g., barn = child in Swedish/farm building in English). Performance on non-homographs showed that interspersing homographs resulted in a larger switch cost, but in their absence there was still a non-zero switch cost. Increasing preparation time did

not significantly reduce the switch cost in either condition. This suggests that an endogenous language selection mode can be adopted in bilingual comprehension but that it operates only reactively – i.e., following stimulus onset.

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12:00-1:00 PM (2135)

Isolating the Influence of Syntactic Factors in Bilingual Language Control from Word Length and Eye Movements. EMALIE HENDEL, *Université de Moncton,* ANNIE ROY-CHARLAND, *Université de Moncton,* DOMINIC GUITARD, *University of Missouri,* JOËL DICKINSON, *Laurentian University,* JEAN SAINT-AUBIN, *Université de Moncton* — Unintended language intrusions occur very rarely in bilingual speech. However, these errors are more frequent in mixed-language reading and occur more often on short or function word than on longer or content words. These errors can serve to highlight bilingual language control processes. However, no study to date has equated word length across word functions and languages. To better understand the role of attentional processes on language intrusion errors, we compared the traditional single-word language switching task with text displayed as a series of paragraphs to a Rapid Serial Visual Presentation (RSVP) procedure. In Experiment 1, 48 French-English bilinguals read texts aloud in which target word length was equated within and across functions and languages (mer/sea, ses/his). Results revealed more language switches on function words than on content words. In Experiment 2, we replicated these results using an RSVP procedure to control for eye movements.

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12:00-1:00 PM (2136)

Examining Bilingualism Through Code-Switching: How Does Bicultural Identity Shape Cognitive Control and Bilingual Processing? ARIEL CHAN, *University of California, Los Angeles,* SHOICHI IWASAKI, *University of California, Los Angeles,* JUDITH F. KROLL, *University of California, Irvine* — Drawing on the past research, our study examines in detail how bilinguals' biographical language experience and their multicultural identity impact their cognitive control and code-switching practices. We examine two groups of Cantonese-English bilinguals: Heritage speakers of Cantonese, born and raised in the U.S, and adult immersed bilinguals, who were born and raised in a Cantonese-dominant context, but immigrated to the English-dominant environment in the U.S. All bilinguals completed questionnaires on identity, code-switching, and language use, and participated in a comprehension task on code-switching, a picture-naming task, and an AX-continuous performance task to assess their cognitive behavior for proactive versus reactive cognitive control. We suggest that speakers' individual but not biographical identity (heritage vs. immersed) is a better predictor of their cognitive control, and bilinguals with harmonious bicultural identities would exhibit enhanced proactive cognitive control, lower global switch cost, and faster response times to unfamiliar code-switching contexts.

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12:00-1:00 PM (2137)

The Role of Ambient Language Exposure and Cognitive Control for Learning Grammatical Gender in Spanish as a Third Language. ANDREA TAKAHESU TABORI, *University of California, Irvine,* JUDITH F. KROLL, *University of California, Irvine* — The ability to learn a new language feature seems to depend on whether the learner has formal knowledge of a language with a similar feature (Sabourin, Stowe, & De Haan, 2006). There is also preliminary evidence that informal language knowledge stemming from ambient exposure (Bice & Kroll, 2019) and cognitive control ability (Bartolotti & Marian, 2012) are predictive of language learning. In the present study, we examined the relationship between informal ambient language exposure to multiple languages and cognitive control ability for learning Spanish grammatical gender. Mandarin-English bilinguals (n = 75) without formal Spanish knowledge were asked to complete tasks that assessed their ambient language exposure (to Spanish and other languages), their cognitive control abilities, and a grammatical gender learning task. Results indicate that greater reliance on proactive control in the cognitive control measure and greater ambient exposure to Spanish predicted better learning of Spanish grammatical gender.

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12:00-1:00 PM (2138)

Bilingualism and Selective Attention to the Mouth. ASLI YURTSEVER, *Iowa State University,* JOHN G. GRUNDY, *Iowa State University* — Infants raised in bilingual environments pay attention more to the mouths of talking faces than infants raised in monolingual environments. This attention to the mouth is believed to be the result of trying to make use of the redundancy of audio-visual cues in distinguishing between two different languages. However, it is currently unknown how bilingualism affects these attention processes in adults. The present study examines monolinguals and bilinguals performing an attentional task, in which irrelevant information will sometimes be present at the mouth and sometimes at the eyes of a face. We will recruit 350 online participants and administer extensive language background questionnaires. We anticipate that if bilingualism enhances attention to the mouth, bilinguals should have more difficulty ignoring the conflicting stimuli at the mouth. We also expect that different bilingual experiences will lead to modified effect sizes and that the largest effects will appear on continuous metrics of second-language experience rather than a dichotomous group split.

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12:00-1:00 PM (2139)

Does Bilingualism Impact Age-Related Increases in False Hearing? CHAD ROGERS, *Union College,* ISABELA ALBUJA, *Union College* — Bilinguals frequently outperform monolinguals in some tasks that are associated with age-related declines to cognitive control. Green (1998) proposed the Inhibitory Control Model (ICM) that states that when speaking a given language, bilinguals need to inhibit the other language they know but are not currently using. The

ICM holds that constant inhibition of the non-target language reinforces bilinguals' inhibitory control abilities, which confer benefits on more general cognitive control tasks. This study examined whether an age-related bilingual advantage would generalize to the false hearing task (e.g., Rogers, 2017), a language task related to cognitive control (Failes, Sommers, & Jacoby, 2020). Young and older participants who were monolingual or bilingual heard a cue followed by a target masked in noise. The cue was related to the target (e.g., "BARN-HAY"), a word that sounds like the target ("BARN-PAY"), or was unrelated to the target (e.g., "BARN-FUN"). Participants identified the word in noise, rated their confidence, and were instructed to respond only on the basis of what they heard, not the cue. Results will be discussed in terms of bilinguals' presumed capacity of inhibiting irrelevant stimuli as predicted by the ICM.

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12:00–1:00 PM (2140)

Grammatical Gender Effects in L2 Spanish Learners. RACHEL C. EVANS, *Louisiana State University,* JANET L. MCDONALD, *Louisiana State University* — Languages such as Spanish classify their nouns by grammatical gender (Bed = Cama {Feminine}, Cheese = Queso {Masculine}) and this may affect native speakers' performance on explicit tasks such as the Vocabulary Rating Task (Bender et al., 2016) and performance on implicit tasks including the Extrinsic Affective Simon Task (EAST) and Semantic Relatedness Task (Bender et al., 2016; Cubelli et al., 2011). The current literature has insufficient research on the effects of grammatical gender on the performance of second language (L2) learners and typically uses explicit tasks (Boutonnet et al., 2012). The current study examined how learners of Spanish of various levels of training performed on both a Vocabulary Rating Task, in which participants rated nouns as either feminine or masculine on a 4-point Likert scale, and an EAST, which assesses implicit associations in a forced-choice task using accuracy and reaction time. Preliminary findings showed grammatical gender effects for all levels of learners on the explicit task and they were evident in some of the learners for the implicit task (EAST). Thus, it appears at least for Spanish, the influence of grammatical gender in L2 learners can occur early in the learning process.

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12:00–1:00 PM (2141)

The Role of Cognitive and Social Factors in Processing Non-Binary Spanish Pronouns. ALEXANDRA ROMÁN IRIZARRY, *University of California, Irvine,* JUDITH F. KROLL, *University of California, Irvine,* JULIO TORRES, *University of California, Irvine* — To name non-binary individuals in Spanish, a language with a binary grammatical gender system, speakers have proposed the marks –x and –e to mark a neuter gender. This study adopted a psycholinguistic approach to examine how cognitive and social factors can influence the linguistic processing of pronouns with –x and –e. Participants were Spanish-English bilinguals who completed two online self-paced reading tasks in Spanish, one that examined reading times on non-binary pronouns and another that assessed grammatical gender violations. Participants also completed the AX-continuous performance task and the Gender Sex Diversity Scale. We predicted that reading times on non-binary pronouns would reflect cognitive control and gender attitudes: (1) proactive control will result in shorter reading times, while reactive control will result in longer reading times; (2) grammatical gender violations should reflect processing costs; and (3) positive attitudes towards gender and sex diversity was expected to reduce reading times.

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12:00–1:00 PM (2142)

Cognitive Ability Predicts Workload Capacity Among Elders. KANTHIKA LATTHIRUN, *National Cheng Kung University,* TZU-YUN HUANG, *National Cheng Kung University,* CHENG-TA YANG, *Taipei Medical University Graduate Institute of Mind, Brain and Consciousness & National Cheng Kung University* — This study investigated the relationship between cognitive ability and workload capacity (WLC) among elders. 41 participants (aged 65-79, M=70.54 years) performed the Montreal Cognitive Assessment (MoCA) and a redundant-target task to measure cognitive ability and WLC, respectively. The redundant-target task requires participants to make a positive response when either the target color or shape is presented. The participants were split into two groups by their MoCA score - the High-MoCA and the Low-MoCA group. Systems Factorial Technology (SFT) was conducted to examine the capacity difference between the two groups. Results showed that the High-MoCA participants had larger WLC than the Low-MoCA participants. Specifically, the High-MoCA group was of supercapacity while the Low-MoCA group was of unlimited capacity. The functional principle component analysis suggested that this capacity difference is especially significant at early response times. Our results highlighted the potential relationship between cognitive ability and workload capacity, implying that elders with higher cognitive ability have better ability for attention control and information integration.

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12:00–1:00 PM (2143)

Social Cognitive Changes with Advancing Age. ELISABETH BRADFORD, *University of Dundee,* HEATHER FERGUSON, *University of Kent* — Social cognition plays an integral part of our daily lives; whether communicating with a friend or stranger, we are constantly using our social cognitive abilities to compute and evaluate mental states of both ourselves and our interactive partners. The current study examined how consideration of 'self' and 'other' perspectives – and the ability to switch between these two perspectives – changes across the lifespan. A large (N = 312) continuous age sample of community-based participants, aged 10-86 years, completed a false-belief task, assessing how efficiently they could attribute belief states to themselves and other people. A sub-sample of participants (N = 139) returned ~two years later to examine potential changes in perspective-taking and perspective-shifting abilities across time.

Results revealed increased egocentric processing with advancing age, although there was no change in perspective-shifting efficiency as a consequence of age. Longitudinal data supported stable perspective-shifting abilities within individuals across two time points.

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12:00–1:00 PM (2144)

Influence of Future Time Perspectives and Risk Perception During COVID-19 on Emotional Memory in Older and Younger Adults. JULIE Q. PHAM, *Southern Methodist University,* DAVID ROSENFIELD, PH.D., *Southern Methodist University,* HOLLY J. BOWEN, PH.D., *Southern Methodist University* — With age, time horizons shrink and can motivate attention towards emotionally meaningful goals and away from negative affect. This shift, referred to as the positivity effect, is correlated with emotional memory biases that occur in older adults. Comparatively, younger adults have exhibited similar patterns when faced with uncertainty about the future (e.g., terminal illness, major historical events). We aimed to study if shifts in future time perspectives emerged due to increase in risk perception related to the COVID-19 pandemic and the effects on emotional memory. Data was collected from an online sample (N = 848) at two timepoints. Interactions using longitudinal linear regressions examined age group and changes in future time perspective and risk perception on the number of positive and negative memories recalled regarding COVID-19. A main effect of age indicated a greater number of emotional negative memories recalled in younger compared to older adults, even when controlling for race, political affiliation, and history of COVID diagnosis. Changes in future time perspective and risk perception did not have a significant direct effect on this relationship. Findings support emerging research suggesting the positivity effect in aging can present as a prioritization to inhibit negative information and inform how individuals remembered the start of the global pandemic.

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12:00–1:00 PM (2145)

Effects of Loneliness Across the Adult Lifespan: An Examination of Brain Structure. HANNAH L. APOSTOLOU, *The University of Alabama,* IAN M. MCDONOUGH, *The University of Alabama* — In aging populations, increasing amounts of older adults are reporting high levels of loneliness. Previous research has demonstrated that people reporting more loneliness have smaller gray matter volumes using voxel-based morphometry (VBM). Although popular, VBM measures intensity of gray matter signal rather than volume, per se. Other common measures of brain volume that abide by more traditional calculations, measured through programs such as FreeSurfer, might offer a complementary perspective on how loneliness impacts brain structure. The present study used data from the Alabama Brain Study on Risk for Dementia that collected structural magnetic resonance imaging, cognition, and psychosocial questionnaires in adults aged 20-30 and 50-74. We examined how feelings of loneliness were differentially related to these two measures of brain structure and, in turn, how such declines in brain structure were related to cognition.

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12:00–1:00 PM (2146)

Effects of Age Across Cognitive Processes: Comparing ERPs and Microstates. CATHY REED, *Claremont McKenna College,* CHANDLYR DENARO, *Claremont McKenna College,* ASTRID PETROPOULOS, *Carleton College & Claremont McKenna College,* JASMIN P. JOSHI, *Claremont McKenna College,* ANJALI THAPAR, *Bryn Mawr College,* ALAN A. HARTLEY, *Claremont McKenna College* — Findings of increased latency and reduced amplitude in older adults suggest the possibility of a general mechanism. Some theories postulate older individuals recruit frontal regions to support processing. We compared ERP and microstate analyses to better understand age-related neural differences. Older and younger adults participated in four tasks while EEG was collected: face processing (N170), attention/categorization (P3), semantic processing (N400), and error processing (ERN). Results showed differential age-related condition effects across tasks. For the N170, older and younger adults showed similar microstates, but older adults had larger face vs car amplitude differences. Similar ERN effects were found at central electrodes, but older adults had less negative amplitudes. The P3 and N400 showed smaller condition amplitude differences at centroparietal electrodes and less focal distributions of neural responses. Older adult amplitudes differed from younger adults for target but not standard conditions (P3) and for related but not the unrelated conditions (N400). Microstate analysis confirmed the timing and existence of age-related differences across ERPs and confirmed more diffuse activation rather than frontal recruitment.

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12:00–1:00 PM (2147)

Knowledge, Difficulty, and Experience: The Effect of Syntactic Complexity in the Detection of Semantic Illusions for Young and Older Adults. SARA GORING, *Claremont Graduate University,* LISE ABRAMS, *Pomona College,* ANDREW CONWAY, *New Mexico State University* — Semantic Illusions are failures to detect information that contradicts prior knowledge. Because these occurrences are breakdowns in the employment of knowledge, rates of undetected semantic illusions are not necessarily reflective of individual differences in crystalized intelligence (e.g., general knowledge, vocabulary). For example, older adults often have more knowledge compared to young adults, yet previous research indicates the failure to detect semantic illusions is consistent across age groups. The current project compared young and older adults in detection of semantic illusions for items with either simple or complex syntax. Preliminary data indicates the older adult's detect semantic illusions more often than young adults and increasing the complexity of the syntax of the items only increases this effect. Examining the experimental results, in conjunction with the individual difference

variables collected (crystalized intelligence, fluid intelligence, rationality) allows for a broader perspective on semantic illusions within the context of varying cognitive ability across the lifespan.

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12:00-1:00 PM (2148)

Unitization Paradigm Using Gestalt Principles Enhances Memory Recognition in Aging. ASHLEY STEINKRAUSS, *The Pennsylvania State University,* CATHERINE CARPENTER, *The Pennsylvania State University,* AMY A. OVERMAN, *Elon University,* NANCY DENNIS, *The Pennsylvania State University* — Prior work has shown that associative memory declines as we age while item memory remains relatively stable (Naveh-Benjamin, 2000). Unitization may support associative memory by allowing item-item pairs to be processed in manner similar to a single item (Ahmad et al., 2014). The current work examined age-related differences in memory between associative, item, and unitized information using the gestalt principle of proximity to facilitate unitization. Older adults demonstrated improved recollection for unitized pairs compared to associative pairs but neither condition produced memory that exceeded that seen for single items. Furthermore, unitized pairs presented in a logical configuration showed greater recollection compared to pairs simply presented as interacting. We conclude that while unitized pairs do not act as a single item, they are better remembered than the associative condition suggesting that unitization is a more efficient encoding strategy compared to unrelated associations.

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12:00-1:00 PM (2149)

Past and Future Episodic Detail Retrieval Is Reduced Among Clinically Normal Older Adults at Higher Genetic Risk for Late-Onset Alzheimer's Disease. MÓNICA ACEVEDO-MOLINA, *VA Boston Healthcare System* , SEAN THAYER, *University of Arizona,* KILEY HORN, *University of Arizona,* HANNA NKULU, *University of Arizona,* LEE RYAN, *University of Arizona,* JESSICA ANDREWS-HANNA, *University of Arizona,* MATTHEW GRILLI, *University of Arizona* — Remembering and imagining personal events that are rich in episodic (i.e., event-specific) detail is compromised in older adults who have mild cognitive impairment, a known risk factor for Alzheimer's disease dementia. Less clear is whether lower episodic detail generation is associated with higher risk for Alzheimer's disease dementia before mild clinical decline is detectable. We compared past and future autobiographical thinking in clinically normal older adult carriers of the Alzheimer's disease-associated apolipoprotein E e4 allele (APOE4) (n = 39) to demographically and neuropsychologically similar non-APOE4 carriers (n = 43). APOE4 carriers showed a robust reduction for episodic details, but not for non-episodic details when remembering past events and imagining future events. Despite normal neuropsychological functioning, past and future autobiographical thinking are commonly compromised in older APOE4 carriers. Reduced episodic detail generation, therefore, may be an early cognitive associate of higher risk for Alzheimer's disease dementia.

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12:00-1:00 PM (2150)

Implicitly Learned Bias Influences Perceptual Decision-Making in Younger and Older Adults. JULIA SCHORN, *University of California, Los Angeles,* SAI GORIJAVOLU, *University of California, Los Angeles,* BARBARA KNOWLTON, *University of California, Los Angeles* — People can implicitly learn stimulus base-rate biases (or priors, in a Bayesian framework) in a perceptual learning task and use them to make decisions. However, it remains unknown how this ability changes during healthy aging. Here, we examine whether an implicitly learned base-rate bias is applied similarly for younger and older adults. We used a two-alternative-forced-choice task first introduced in Perugini et al (2016) in which participants judged the direction of moving dots in the dynamic Glass pattern stimulus (rightward or leftward). There were two colors of stimuli; one was unbiased while the other was biased towards an orientation, unbeknownst to the participants. A confidence rating on a Likert scale and audio feedback followed each orientation judgment. We found a main effect of coherence on bias, with bias influencing decisions more at 0% or 13% coherence as compared to higher coherence trials. There was no effect of age, so our results suggest that implicitly learned base-rate priors can influence decision-making when sensory information is unreliable, but do not contribute when sensory information is more robust, and this is true for decision-making across the lifespan.

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12:00-1:00 PM (2151)

SNPs in Alzheimer's Disease Risk Genes Are Associated with Regional Grey Matter Volume Alternations in Middle-Aged Adults. KANA KIMURA, *University of Wisconsin-Milwaukee,* JENNA BLUJUS, *The Warren Alpert Medical School of Brown University,* IRA DRISCOLL, *University of Wisconsin-Milwaukee* — While age-related changes in structural brain integrity have been studied extensively, middle age is often omitted, despite being a potentially critical period for intervention prior to substantial disease-related damage. Single nucleotide polymorphisms (SNPs) in APOE, TOMM40, CLU, CR1, PICALM and SORL1 are associated with Alzheimer's disease (AD) risk. Here we examine associations between aforementioned genes and regional gray matter (GM) volume in middle-aged adults (N=132; ages 40-60; 80 F). Voxel-based morphometry (VBM; FSL v5.0.10) was applied to T1-weighted images acquired on a 3T GE Signa scanner to examine voxelwise GM differences. GM volumes were significantly lower in the left inferior/middle temporal gyrus and the bilateral temporal pole in association with CLU_rs1113600 and the left temporal pole in association with APOE_rs405509 risk alleles (P's < .05). We report lower regional GM volumes in association with APOE and CLU in generally healthy, non-demented, middle-aged adults. Although studies examining brain integrity in relation to AD risk genes in middle-aged

adults are still limited, our results are in accord with the existing literature on regional GM volume alternations in APOE and CLU risk allele carriers.

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12:00-1:00 PM (2152)

The Impact of Self-Reported Ability Across Multiple Sensory Modalities on Cognitive and Physical Health in Older Age: A Longitudinal Approach. REBECCA HIRST, *Trinity College Dublin & The Irish Longitudinal Study on Ageing,* FIONA N. NEWELL, *Trinity College Dublin,* ALAN MICHAEL O' DOWD, *Trinity College Dublin & The Irish Longitudinal Study on Ageing,* ANNALISA SETTI, *University College Cork & The Irish Longitudinal Study on Ageing,* ROSE ANNE KENNY, *The Irish Longitudinal Study on Ageing & Mercer's Institute for Successful Ageing at St. James's Hospital* — It is well established that sensory decline typically occurs with age. However, it remains unclear what factors are related to a change in perceived sensory function across modalities in older adults. We explored the longitudinal associations between demographics; lifestyle; and sensory, physical, mental, and cognitive health and the hazard of transitioning from normal to impaired self-reported vision, audition, olfaction, and gustation among a large sample of older adults (N = 5,066). Analysis revealed an increased probability of reporting impairment in one sense if reporting impairments in other senses, albeit not consistently. Only self-rated impaired health was associated with an increased probability of self-reported impairment across all senses. Age and current smoker status were associated with an increased probability of self-reported impairment for three of the four senses. Several other sensory and non-sensory covariates (e.g., participant sex, depression, eye disease) exhibited more modality specific associations. Our results suggest that perceived sensory decline is associated with both global and modality-specific factors, thereby furthering our understanding of the impact of sensory health in ageing.

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12:00-1:00 PM (2153)

Episodic Simulation of Novel Situations Across the Lifespan. A. DAWN RYAN, *Brock University,* RONALD SMITKO, *Brock University,* KAREN L. CAMPBELL, *Brock University* — The constructive episodic simulation hypothesis states that similar cognitive processes are used to reconstruct old memories and to simulate new, hypothetical events (episodic simulation). Relatedly, episodic simulation can make imagined events feel "pre-lived," and research shows that imagining helping scenarios increases willingness to help beyond levels evoked by passively reading the same stories. Moreover, in younger adults these findings are more pronounced in familiar, compared to unfamiliar, scenarios. However, to date, much of the literature on episodic simulation of novel scenarios compares events set in familiar settings (e.g., a university graduation) to those set in unfamiliar places that people are unlikely to visit (e.g., Mount Everest). In the current study we examine the mechanisms of episodic simulation in younger and older adults when imagined situations are more, compared to less, familiar to each age group (e.g., dealing with dating apps vs. writing out a cheque). Preliminary results suggest that phenomenological experiences such as subjective scene imagery and emotional concern during simulation may differ across age groups. Potential mechanisms of episodic simulation across the lifespan will be discussed.

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12:00-1:00 PM (2154)

Spontaneous Retrieval Deficits in Amnestic Mild Cognitive Impairment: The Role of Cue-Driven, Bottom-Up Processing. MICHAŁ WERESZCZYŃSKI, *Applied Memory Research Laboratory, Institute of Psychology, Jagiellonian University, Cracow, Poland,* AGNIESZKA NIEDŹWIEŃSKA, *Applied Memory Research Laboratory, Institute of Psychology, Jagiellonian University, Cracow, Poland* — In the absence of cure, research has increasingly focused on characterizing the early cognitive markers of Alzheimer's disease (AD). Novel Spontaneous Retrieval Deficits hypothesis stipulates that involuntary retrieval processes (e.g. mind wandering), which are preserved in healthy ageing, are compromised in amnestic Mild Cognitive Impairment (aMCI), and at the earliest stages of AD. In this poster we present results of our study in which individuals with aMCI and Healthy Controls completed task in which they were presented images both highly or weakly associated with their personal experience. aMCI participants demonstrated reduced mind-wandering while being exposed to the stimuli highly associated with their personal experience but not when exposed to the stimuli weakly associated with their personal experience. Our results provide strong support for the Spontaneous Retrieval Deficits hypothesis and expand current knowledge about this phenomenon by demonstrating, that it is primarily explained by the cue-driven, bottom-up processes.

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12:00-1:00 PM (2155)

Reduced Effects of Distinctiveness of Crossmodal Associations in Older Adults. AMY A. OVERMAN, *Elon University,* JOSEPH D. STEPHENS, *North Carolina Agricultural and Technical State University,* JORDYN L. COWAN, *Brandeis University,* MADISON K. TARKENTON, *Elon University* — Various theoretical accounts of age-related memory differences can be characterized as a reduction in the diagnosticity of information stored in memory (Stephens & Overman, 2019); that is, older adults may encode generic features, even when stimulus features are relatively distinctive. In the present study, two experiments tested the effect of pair distinctiveness on associative memory in young and older adults. In Experiment 1, participants studied picture-sound pairs in which half of the pairs consisted of stimuli drawn from one of three categories (musical instruments, vehicles, sports). Test stimuli were intact and recombined pairs, with semantically-related pairs being recombined only within their respective categories. As predicted, intact versus recombined pair discrimination was better for unrelated pairs in young adults

only. To test possible age-related effects of competing information at encoding, Experiment 2 used the same paradigm, including test pairs that were recombined into direct matches such that the picture and sound represented the same object/activity. Older adults were more likely than young adults to endorse these matched pairs as "old," suggesting a failure to inhibit encoding of irrelevant associations.

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12:00–1:00 PM (2156)

Exploring Benefits of Written Production in Older Adults. KIMBERLY WEAR JONES, *High Point University,* STACY LIPOWSKI, *High Point University,* ANGELA CANDA, *John Carroll University,* AVA DEMONTE, *High Point University,* JENNA GINTHER, *High Point University,* SAMANTHA A. RIVEROS, *High Point University* — Words that are read aloud are remembered better than words that are read silently. Although a previous study has shown this say-look production effect in older adults (Lin & MacLeod, 2012), no research has examined whether older adults receive benefits from other forms of production. Thus, the goals of this study were to examine the effectiveness of writing for older adults and to determine whether there are developmental trends in production effects between young and old adulthood. Thirty undergraduates, 30 middle aged adults (45-55 years), and 30 older adults (65 years and above) completed the Montreal Cognitive Assessment (MOCA) to test for cognitive impairments. Then they studied a list of 45 words counterbalanced into three conditions: read silently, say aloud, and write. Participants completed a recall test followed by a recognition test. Developmental trends regarding the effectiveness of writing as a production strategy for recall and recognition memory will be discussed.

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12:00–1:00 PM (2157)

The Benefits and Costs of Context Reinstatement in Younger and Older Adults. OLIWIA ZABOROWSKA, *SWPS University,* BEATRICE G. KUHLMANN, *University of Mannheim,* KATARZYNA ZAWADZKA, *SWPS University,* MACIEJ HANCZAKOWSKI, *Adam Mickiewicz University* — Older adults often display impaired memory for associations, relative to memory for individual items. However, it is not clear to what extent this impairment stems from older adults' inability to encode associations or their inability to strategically use these associations at retrieval. Here we examined this issue by focusing on the effects of context reinstatement, where strategic use of item-to-context associations is not required. To eliminate any strategic use of context, we assessed context reinstatement not only for correct recognition of old items but also for incorrect recognition of perceptually highly similar lures. Experiment 1 demonstrated that impairing encoding of item-to-context associations in young adults eliminated both benefits and costs of context reinstatement. Experiments 2 and 3 showed that promoting encoding of item-to-context associations produced robust benefits and costs of context reinstatement in both young and older adults, even when older adults' ability to reject similar item lures remained impaired. Experiment 4 revealed that context reinstatement effects are eliminated for older adults, but not young adults, when encoding of items is promoted. This encoding orientation, however, improves older adults' ability to reject similar item lures. The results suggest that older adults are less efficient in encoding information their attention is not explicitly directed to—be it items or associations.

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12:00–1:00 PM (2158)

Blank Slate: A Mobile App to Promote Retention of New and Old Memories in Older Adults. AMY SMITH, *Quinnipiac University,* RENEE DECARO, *Boston University,* GREGORY HUGHES, *U.S. Army Combat Capabilities Development Command (DEVCOM) Soldier Center,* ANNA MARIN, *Boston University School of Medicine,* NATHANIEL RIVARD, *Yale School of Medicine,* RICHARD FEINN, *Quinnipiac University,* MATT TREVITHICK, *Blank Slate Technologies,* ANDREW BUDSON, *U.S. Department of Veteran's Affairs* — We examined the usability and efficacy of a mobile application called Blank Slate Technologies (BST) for helping older adults retain new and old memories. The BST app features a spaced-retrieval algorithm that, over time, becomes customized to each user's forgetting curve such that users are prompted daily to review information they are most likely to soon forget. In the present study, 20 young adults and 20 older adults used the BST app for a few minutes each day for four weeks to practice retrieving recently-learned information (facts about the country Georgia) and older, fading information (celebrity names that they knew but had difficulty recalling). Then they took two recognition tests, spaced one week apart. Results indicated that the BST app was both easy to use and effective at promoting long-term retention for both young and older adults. The BST app is a promising tool for helping adults of any age retain important memories with little daily effort, with the added conveniences of providing reminder notifications and being accessible from one's smartphone.

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12:00–1:00 PM (2159)

Neural and Behavioral Measures of Working Memory Updating in Healthy Older Adults with Alzheimer's Disease Biomarkers. CHANG-MAO CHAO, *University of Notre Dame,* JOSHUA D. KOEN, *University of Notre Dame,* ZENGBO XIE, *University of Notre Dame,* DANIEL HENRICKSON, *University of Notre Dame,* CHENLINGXI XU, *University of Notre Dame,* NATHAN ROSE, *University of Notre Dame* — Working memory (WM) declines as a function of age and neurodegenerative conditions such as Alzheimer's disease (AD); however, the nature and source of the declines are unclear. In an ongoing, longitudinal study (the Notre Dame study of Health & Well-being), healthy older adults with or without AD biomarkers are being compared to predict and elucidate the source of WM declines. We aim to compare indices of WM updating from behavioral (performance on an n-back task) and neural (EEG decoding) data between individuals with vs. without the

APOE-e4 allele, a gene that is associated with increased AD risk. Preliminary analyses demonstrated no significant difference in behavioral performance between participants who are carriers (N=8, age mean/SD = 70.9/8.1 years) and noncarriers of the e4 allele (N=18, age mean/SD = 68.9/6.5 years). Stimulus category (scene, object, or face) could be accurately decoded from EEG voltage data in both e4 carriers and noncarriers. There were no significant differences in decoding accuracy between carriers and non-carriers on this initial assessment. Ongoing analyses will reveal the sensitivity of WM updating measures to detect AD risk over future assessments as the sample sizes increase.

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12:00-1:00 PM (2160)

Working Memory Re-Exposure Improves Episodic Memory in Older and Younger Adults. KATHY XIE, *University of Michigan, Ann Arbor,* PATRICIA REUTER-LORENZ, *University of Michigan, Ann Arbor,* ELIZABETH LEE, *University of Michigan, Ann Arbor* — According to the associative deficit hypothesis, age-related declines in episodic memory (EM) are due to difficulty forming and retrieving associations. Associative binding deficits during working memory (WM) may also contribute to EM decline. We investigated whether re-exposure to word-pairs (associations) or single words (items) during a three-alternative forced choice WM recognition test helps or harms EM in 115 older (OA) and 120 younger adults (YA) recruited from Prolific. OA received longer study times per pair to compensate for age-related reductions in processing speed. We used a multinomial process tree model to derive separate estimates of EM for associations (word-pairs) and individual items. The results suggest that pair re-exposure during a WM test benefits associative and item EM for both age groups. Contrasting with the well-known age-related associative deficit, OA showed superior associative EM compared to YA, even for YA and OA subsets selected for equivalent WM performance. However, the representativeness of our online samples, and differing study times may limit the generality of these group differences. Nevertheless, WM re-exposure improved EM for both groups, suggesting a WM testing benefit regardless of age.

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12:00-1:00 PM (2161)

Relationship Between Caregivers' Input and Language Development of Children with Autism: A Literature Review. KATHLEEN M. DEMAIO, *Emmanuel College,* XIAOWEI ZHAO, *Emmanuel College* (Sponsored by Xiaowei Zhao) — In this study, we examined the literature on the relationship between language acquisition and caregiver input in children with Autism Spectrum Disorder (ASD). In total, 37 studies from the year 1990 to 2022 were included, and around 800 children ranging from 3 months to 7 years old with (or at high risk of) Autism were assessed on their verbal language and social communication development. The data mainly came through video and audio recordings of play interactions and verbal communication between the children and their caregivers. Some trends these studies focused on include how caregivers' behaviors influences their children's focus of attention, social behavior and affect, use of gaze during interactions, gestures, and primarily, speech development. Maternal sensitivity, responsivity, gestures, environment, and types of utterances are all factors that play an important role in language learning for children with ASD.

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12:00-1:00 PM (2162)

Visual and Auditory Discrimination Learning in High Functioning Children with Autism Spectrum Disorder: Modality Specific Abnormalities in Perceptual Learning? BARBARA A. CHURCH, *Georgia State University,* BROOKE N. JACKSON, *Georgia State University,* KAY LANE, *Georgia State University,* JONATHAN RODGERS, *Canisius College,* CHRISTOPHER LOPATA, *Canisius College,* EDUARDO MERCADO, III, *University at Buffalo, SUNY* — Research suggests children with autism spectrum disorder (ASD) learn and generalize visual family-resemblance categories atypically (e.g., Church et al., 2010, 2015), particularly when learning from exposure. This may reflect impaired perceptual learning (Mercado et al., 2021). However, it is unknown whether perceptual discrimination learning is also atypical and if abnormalities extend to other modalities. To address this, high-functioning (HF) children with ASD completed auditory and visual discrimination tasks, after either exposure to or training with stimuli presented in either progressive or random orders of difficulty. In the visual task, HF children with ASD only performed well after progressive training, suggesting impaired perceptual learning from visual exposure. In the auditory task, they showed a progressive advantage after both exposure and training, suggesting intact auditory perceptual learning. Impaired visual but typical auditory perceptual learning may explain why HF children with ASD are socially impaired while retaining the capacity to learn language.

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12:00-1:00 PM (2165)

The Influence of Type of Test on Production Effects in First Graders. STACY LIPOWSKI, *High Point University,* HANNAH TAMELING, *High Point University,* CAITIE BROOK, *High Point University,* ANGELA CANDA, *John Carroll University,* MARY PYC, *Unaffiliated* — The production effect is the finding that memory is better for items that are studied aloud than those studied silently. Although previous research with children has shown a production effect, recent research demonstrates that the effect disappears when children also complete a written condition (Lipowski et al., 2021); this differs from findings with adults. Performance on a recall test revealed a production effect for items that were written (compared to silent and spoken items), but memory was not better for spoken items than silent items. The current study examined whether this finding could be explained by type of test. Thirty first graders studied 15 images using three encoding strategies: looking silently,

saying aloud, and writing. Then students completed a 3-minute distractor task and took a final recall test and a recognition test. Results on the recall test replicated the previous study showing the benefit of writing and no difference between studying aloud and silently. Possible age-related and test-type explanations will be discussed as they relate to the production effect for aloud, silent, and written items.

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12:00-1:00 PM (2166)

Improving Children's Learning Abilities Through Interventions Targeting Learning Strategies and Intelligence Beliefs. RÉMI DORGNIER, *Université Bourgogne Franche-Comté,* LAURENCE PICARD, *Université Bourgogne Franche-Comté,* FRANÇOIS MAQUESTIAUX, *Université Bourgogne Franche-Comté, Besançon,* MARIE MAZEROLLE, *Université Bourgogne Franche-Comté* (Sponsored by Marie Mazerolle) — Here we evaluated the impact of crosscutting skills interventions targeting intelligence beliefs and learning strategies on children's learning performance. One hundred and twelve children (9-11 years old), participated to a 3-step study composed of a pre-test and 2 one-hour intervention, each one followed by a post-test. Children were randomly assigned to either a control group or an experimental group. In the experimental group, the first intervention promoted a malleable conception of intelligence and highlighted the importance of effort in skill acquisition (i.e., growth mindset; Yeager et al., 2019). The second intervention taught children about deep learning strategies (i.e., mental imagery and self-reference). In contrast, control participants received two interventions about the human body. The results showed that promoting a growth mindset increased the amount of efforts mobilized by the children. It was also shown that promoting deep encoding strategies improved children's episodic memory performance, and especially strategic component. Practical implications for children's learning at school will be considered.

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12:00-1:00 PM (2167)

Learned Attention Proactively Modifies Sensitivity to Visual Features. DOUG A. ADDLEMAN, *Dartmouth College,* VIOLA S. STOERMER, *Dartmouth College* — Selective attention is sensitive to environmental statistics. For example, visual search is faster when targets or distractors appear more often in one color than other colors. This could occur either via proactive enhancement (or suppression) of specific features or through reactive search processes. We tested this with a visual search task in which participants (N=200) judged the orientation of a target 'C' among seven distractor 'C's. Unbeknownst to participants, targets (Exp. 1) or distractors (Exp. 2) appeared more often in a specific, 'rich' color (on 75% of search trials). On 18% of trials, instead of the search array, a probe appeared briefly in the frequent color, another search color, or gray. Participants indicated whether they saw a colorful probe or not. In Exp. 1, participants responded faster to search targets in the target-rich color ($p < .001$, $\eta p2 = .15$); they also detected probes more accurately in the target-rich color ($p = .02$, $d = 0.24$). In Exp. 2, participants were faster when the search distractors were in the distractor-rich color ($p < .001$, $\eta p2 = .12$) and less accurate at detecting distractor-rich color probes ($p = .007$, $d = 0.28$). We conclude that learned attention proactively enhances and suppresses visual features.

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12:00-1:00 PM (2168)

Vertical Attention Bias in Pictorial Similarity Judgments for Young Children and Adults. MATTHEW LANGLEY, *Arizona State University,* KAITLIN VAN HOUGHTON, *Arizona State University,* MICHAEL K. MCBEATH, *Arizona State University,* KELSEY LUCCA, *Arizona State University* — Research demonstrated that adults show a vertical attention bias in pictorial similarity judgements for the top of objects and the bottom of scenes (Langley & McBeath, submitted). This bias reflects a generic downward vantage tendency and is consistent with the perceptual attunement that varies as a function of the informative aspect of visual stimuli. Here, we examine the vertical attention bias in children (aged 4-7 years old) and adult participants. On a given trial, participants were presented with naturalistic picture triptychs and judged if the central object or scene appeared more similar to comparison objects or scenes that contain the same top vs the same bottom. We tested two general hypotheses: (1) Children will show a vertical attention bias for the top of pictured objects and the bottom of pictured scenes; (2) The magnitude of children's bias will not be as strong compared to adult participants. Results confirm that children of this age show a vertical attention bias and that the magnitude is somewhat weaker to that of adult participants. Exploratory analysis revealed that the same age trend occurred within the population of children with vertical bias increasing with age. Taken together, the findings support that 4-7 year old children also focus their attention on their action space, where they interact more with tops of objects and bottom of scenes.

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Poster Session III

Friday, November 18, 2022

Viewing 5:00-7:00 PM US EST, Authors Present 6:00-7:00 PM US EST, Hynes Convention Center Ballroom

Note: All in-person posters are also available for viewing for the duration of the conference in the virtual posters on the conference website.

6:00-7:00 PM (3001)

Impact of Social Interaction on How Elders and Young Adults Feel. SANGIN LEE, *Jeonbuk National University,* BOBAE LEE, *Jeonbuk National University,* JONGWAN KIM, *Jeonbuk National University* — This study aimed to expand our understanding of the role of social interaction in affective responses using the Chieti

Affective Action Video database (Di Crosta et al., 2020; La Malva et al., 2021). Two researchers coded videos with or without social interaction, and pooled valence and arousal responses of young and old adult participants' data. Then, we conducted repeated-measures ANOVAs with valence condition (positive vs. negative), age, and social interaction as independent variables and valence and arousal ratings as dependent variables. Results revealed a significant difference in valence ratings between positive and negative conditions. Valence ratings were more extreme for social interaction situations than non-social situations. Arousal ratings also revealed significant differences in responses to negative and positive videos. These patterns were stronger for the old group than the young group. There were significantly greater arousal ratings for social interaction situations than non-social ones. Findings support the theoretical propositions on the importance and impact of social interaction in old age, suggesting the need for further precision studies regarding physiological measures.

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6:00-7:00 PM (3002)

Science Capital Is Related to Understanding the Concepts of Probability, Randomness, and Scientific Method. HANNA JULKU, *University of Helsinki,* MILLA R. PIHLAJAMÄKI, *University of Helsinki,* CAITLIN DAWSON, *University of Helsinki,* JOHANNA K. KAAKINEN, *University of Turku,* JAANA SIMOLA, *University of Helsinki* — The ability to evaluate information quality is essential in this current era of information overload. Higher numeracy skills, like understanding probability and randomness, enhance individuals' ability to evaluate information, resist misinformation, and make informed decisions in their everyday lives. We show here that science capital (SC), which reflects the science related part of cultural capital and resources a person has to interact with scientific knowledge, is related to understanding probability, randomness, and scientific method. The results of the Finnish Science Capital Survey (N=1073) indicate that SC consists of four interrelated factors: activities in free time, science identity, early encouragement to science, and science attitudes. To our knowledge, we are the first to study whether SC is related to understanding numerical concepts. Results from logistic regression tests showed that latent SC factor score predicts increase in total score for normative and decrease in heuristic probability responses and increase in correct responses to randomness and scientific method items. These results indicate that the level of SC is reflected in the cognitive processes underlying comprehension of numerical concepts.

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6:00-7:00 PM (3003)

Political Classification of Others: What Features Are Most Important? SHAYNA R. SOARES, *University of Central Florida,* SEAN HINKLE, *University of Central Florida,* JORDAN SAMMARCO, *University of Central Florida,* COREY BOHIL, *University of Central Florida* — Political polarization stifles productive debate about political topics (e.g., taxes, and gun rights). Classifying others by party may foster oversimplified views of others' beliefs. The classification literature indicates that items in the same category are considered more similar to each other, and this has been observed in the social stereotyping literature. Our goal was to understand if knowing a person's political party resulted in them being viewed as more similar to in-party and less similar to out-party examples. Participants gave pairwise similarity ratings for 9 personas (3 each for Democrat, Republican, and Independent) both with and without knowing political affiliations. Personas summarized each individual's race, gender, number of children, and positions on abortion and government services. Multidimensional scaling (MDS) analysis showed clear grouping of the D, R, and I personas according to party affiliation in a 2D MDS space, regardless of whether party was known. Knowledge of party affiliation significantly increased in-group but not out-group similarity ratings. Regression of persona features onto MDS coordinates revealed that abortion stance was an overwhelmingly strong driver of similarity ratings.

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6:00-7:00 PM (3004)

Risqué Humor May Undermine Early Impressions of Mate Potential. JOHN TAYLOR, *Southern Oregon University,* VERONICA MILLER, *Southern Oregon University,* EMILIO M.A MCCUTCHEON, *Southern Oregon University* — Both men and women indicate preferences for humor in potential romantic partners. However humor is often context-dependent and, in many ways, unique to individual tastes. We sought to explore different kinds of humor in the perception of prospective partners by introducing participants to an unnamed stranger trying out jokes during a chance encounter, with the jokes either consisting of puns or more traditional jokes. Additionally, the jokes were either risqué or not risqué in nature. Heterosexual male and female participants, assessed by self-report, read a scenario which included a single joke (randomly assigned) from the stranger in the encounter. Participants then completed a survey on preferences for humor in potential partners and their perception of the stranger in the scenario. Preliminary results suggest that employing risqué humor lessens potential romantic interest. The nuances of word play and jokes as well as the effects of gender are discussed through an evolutionary lens.

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6:00-7:00 PM (3005)

Nostalgia Across Cultures. KACIE ARMSTRONG, PH.D., *Bowdoin College,* CATALINA IRICINSCHI, PH.D., *Franklin & Marshall College* — Among Westerners, nostalgia is linked to a number of psychological benefits, including improved mood, a bolstered sense of belonging, greater meaning in life, and slower perceived passage of time. This exploratory project investigates the generalizability of these findings by asking participants in nine countries (Australia, Brazil, France, India, Ireland, Israel, Nigeria, Turkey, and Venezuela) to write about a nostalgic memory and then complete

a number of scales. We explore three core questions: 1) Whether the known benefits of nostalgia are experienced across cultures; 2) Whether people in certain countries are more prone to personal nostalgia (i.e., for one's own autobiographical memories) or historical nostalgia (i.e., for events that one has not personally experienced but that are nonetheless relevant to their cultural identity); and 3) Whether the psychological benefits of nostalgia shift as a function of personal vs. historical nostalgic reflection. While adding a cross-cultural richness to the science of nostalgia, this project also speaks to the risks and rewards of possibly utilizing nostalgic reflection as a therapeutic tool in an increasingly globalized world.

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6:00–7:00 PM (3006)

Breeding Hate in the Lab: The Effect of Intergroup Bias on the Emotionality of Language Use. DANIEL SCHMIDTKE, *McMaster University,* VICTOR KUPERMAN, *McMaster University* — Intergroup bias describes the universal human tendency to divide social groups into us and them with a preference for us (the in-group) over them (the out-group). In a series of experiments assessing the relationship between intergroup bias and the emotional positivity of language usage, we (i) tested the prediction that people will verbally evaluate their in-group more positively than the out-group and (ii) examined the dynamics of this effect as it propagates through cultural generations. The linear diffusion chain method was used in an experiment requiring participants to provide verbal evaluations for either an in-group or an out-group based on a set of neutral "seed" words. The verbal evaluations provided by participants served as the input for a next generation of participants completing the same task. In the first generation, we found significant differences in positivity between groups: relative to the seed words there was an inflation in positivity about the in-group. Across all 5 generations, in-group positivity grew significantly stronger and so did the bias toward out-group negativity. The results indicate that intergroup bias and its propagation over cultural generations is reflected in the emotionality of language use.

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6:00–7:00 PM (3007)

Culture and Emotional Valence in Collective Future Thinking. NAZIKE MERT, *Cornell University,* QI WANG, *Cornell University* — People's anticipation of their country's future may be influenced by the present socio-economic-political circumstances in their country. Our recent findings showed that Chinese imagined their country's future to be more positive than Americans. To further test the emotional valence of collective future thinking, we asked American and Chinese participants to list within 1 minute as much as they could positive and negative events that might happen to their country in the near and distant futures. Participants then rated the degree of positivity/negativity of the events. Overall, Americans reported more positive and more negative events than Chinese. Within each culture, participants imagined more negative events than positive events, with the effect stronger for Americans than Chinese. Moreover, Chinese rated positive events more positively than did Americans, while Americans rated negative events more negatively than did Chinese. We discuss the findings in light of the culturally constructive nature of collective future thinking.

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6:00–7:00 PM (3008)

Individual and Cultural Differences in Memory Related to Brain Structure. NICOLETTE BARBER, *Brandeis University,* ANGELA GUTCHESS, *Brandeis University,* JOSHUA OON SOO GOH, *National Taiwan University,* KRYSTAL LEGER, *Brandeis University,* IOANNIS VALOUMAS, *Brandeis University,* ERIN WONG, *Brandeis University* — Memory is a subjective experience that differs across individuals and cultures. Previous research has shown how experiences such as learning can modify brain structure, and culture can be thought of as an immersive set of experiences. In samples of 51 Americans and 57 Taiwanese, we investigated the relationship between individual differences in the volume of prefrontal lobe structures related to memory performance on the California Verbal Learning Test (CVLT), and whether culture impacted these relationships. Across both cultures, we observed that volume in the left rostral anterior cingulate cortex (rACC) predicted higher scores on the 1st learning trial of the CVLT and the long-delayed free recall test, whereas volume in the right rACC was associated with lower scores on the long-delayed free recall test. In terms of cultural differences, a larger right rACC volume was associated with higher scores on the long-delayed free recall for Americans, but lower scores for Taiwanese participants. These findings suggest that the rACC contributes to memory in individuals, though this relationship can differ across cultures.

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6:00–7:00 PM (3009)

Collaborative Recall and the Construction of Collective Memory Organization: The Impact of Group Structure. GARRETT GREELEY, *Stony Brook University,* VANESSA CHAN, *Stony Brook University,* HAE-YOON CHOI, *Stony Brook University,* SUPARNA RAJARAM, *Stony Brook University* — How does collaboration synchronize the way people organize their retrieval (collective memory structure)? We leveraged data from Choi et al. (2014) to assess: 1) Whether collective memory structures emerge for unrelated information; and 2) the impact of group configuration on the emergence of collective memory structures. Participants studied unrelated words and completed three consecutive recalls in one of three conditions: Always recalling alone (III; to yield nominal groups), collaborating with the same partners twice before recalling alone (CCI), or collaborating with different group members during two initial recalls before recalling alone (CRI). Shared organization (indexed by SOMA; Congleton & Rajaram, 2014) increased significantly following any collaboration (CCI or CRI), relative to nominal groups (III). Interestingly, collective retrieval organization did not differ as a function of group

configuration. However, the most recent collaboration tended to produce greater organizational synchrony compared to the earlier collaboration, consistent with research exploring how the individual retrieval depends on earlier collaborations. We discuss the ability of dynamic social interactions to align the influence of many.

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6:00-7:00 PM (3010)

Culture's Influence on Spatial Frequency Processing. YANNAN ZHU, *Brandeis University,* TONG LIN, *Brandeis University,* CHAOMEI WANG, *Brandeis University,* ROBERT SEKULER, *Brandeis University,* ANGELA GUTCHESS, *Brandeis University* — Previous research demonstrates that East Asians rely relatively more on lower spatial frequency (LSF; global and spatially coarse), whereas Americans rely relatively more on higher spatial frequency (HSF; local and corresponding to fine details). However, previous studies focused on judgments of facial expression. To investigate whether culture penetrates low-level perceptual processes, we used highly controlled stimuli that minimized contributions from strategies (e.g., selective attention). 49 East Asian and 53 American participants adjusted the relative contrasts of two different superimposed faces presented in a stereoscope; faces were filtered for different spatial frequencies to compete for conscious perception. We calculated the balance point, representing the shift from perceptual dominance by LSF to dominance by HSF. We found no significant differences between the balance points of East Asian and American participants, indicating no cultural differences in prioritized processing of spatial frequencies. Additional analyses will evaluate individual differences in cultural background and values.

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6:00-7:00 PM (3011)

Assisting Beyond: Support, Individual Differences, & Pandemic Impact Among Students and TAs. MORGAN J. ROBINSON, *The University of Tennessee at Chattanooga,* ANNA PUSSER, *University of Tennessee at Chattanooga,* STEPHANIE WELLS, *The University of Tennessee at Chattanooga,* JILL SHELTON, *University of Tennessee at Chattanooga* (Sponsored by Morgan Robinson) — Student and young adult populations were severely impacted by the onset of the COVID-19 pandemic. Social support is key to well-being and academic success for students, and many young adults lost much of their social support as a result of the pandemic (Longest and Kang, 2022). Using a mixed method approach, this study seeks to demonstrate the interactions between students, teaching assistants (TAs), and individual differences amidst the COVID-19 pandemic. Students and TAs responded to measures assessing need for cognition, perceived stress, resilience, financial well-being, and pandemic impact. Qualitative evidence regarding TA-student interactions suggests TAs provided much needed support for students beyond expectations. Quantitatively, individual differences in pandemic impact, financial well-being, and resilience share key relationships across students and TAs. The findings suggest individual differences in financial well-being, stress, and resilience were most important to pandemic impact. Additionally, TAs support students in dynamic ways and may support students' well-being and academic success.

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6:00-7:00 PM (3012)

The Role of Curiosity in Cybersecurity Practitioner Behavior and Performance. ISABELLA TOTINO, *Rochester Institute of Technology,* TINA M. SUTTON, *Rochester Institute of Technology,* SHANCHIEH YANG, *Rochester Institute of Technology* — The current project expands upon field work examining "hacker" mentality. We explored one component of this mentality, curiosity. Undergraduates with various level of cybersecurity experience completed the five-dimension curiosity scale and the epistemic curiosity scale which measures interest curiosity and deprivation curiosity. Participants also completed a set of anagrams (solvable and unsolvable), as well as a set of coding problems (solvable and unsolvable). As expected, the joyous curiosity sub-scale and deprivation sensitivity sub-scale of the five-dimension curiosity measure were strongly, positively correlated with the interest curiosity and deprivation curiosity measures, respectively. In addition, there was no difference in ability to solve the anagrams based on cybersecurity experience; however, participants with higher levels of reported cybersecurity skills solved more of the coding problems, completed the problems more quickly, and gave up on the unsolvable problems more quickly than those with less experience.

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6:00-7:00 PM (3013)

The Impact of Experience of the Selected Options on Preference Formation and Context Effects in Multi-Alternative, Multi-Attribute Choice. YANJUN LIU, *Vanderbilt University,* JENNIFER S. TRUEBLOOD, *Indiana University* — Experience with options can impact our preferences and future choices. When strong preferences exist, context effects are hypothesized to diminish as relative evaluations are assumed to play less of a role. In this study, we probed the effect of experience with options on the attraction and compromise effects. Participants had the opportunity to choose from simple cognitive tasks (i.e., counting jobs) and then complete it. Using an ecologically valid and incentivized task, we found evidence for the formation of strong preferences with experience, yet context effects did not attenuate. Moreover, the direction of context effects was reversed in all cases. The results were replicated in a pre-registered study, suggesting that our findings are robust to payment schemes and display format. We suspect what was learned from experience in our tasks is the weights for various attributes. As predicted by many models of multi-alternative, multi-attribute choice, context effects can emerge with unequal attribute weights formed through, e.g., experience. Our simulation results affirmed this prediction. These findings suggest that relative evaluation still plays a role in human decision-making, even when inherent preferences are accessible.

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6:00–7:00 PM (3014)

Can Music Make Us More Utilitarian? The Influence of the American National Anthem on Utilitarian Decision-Making Among the Americans. KATARZYNA PYPNO, *University of Silesia in Katowice,* MARIOLA PARUZEL-CZACHURA, *University of Silesia in Katowice,* TUOMAS EEROLA, *University of Durham* — Music is with us every day. At home, in the car, in the doctor's waiting room, while waiting for a phone call. We know that music can affect our mood and thoughts. But what happens to our moral judgments after hearing, for example, the national anthem? There is little empirical evidence that music influences moral decisions. Even though the research showed some relations between music and human morality, the influence of music on utilitarian decisions was never taken into account. In this presentation, we will demonstrate the results of an experimental study that examines the impact of the U.S. national anthem on utilitarianism of Americans (N = 200). The experimental group listened to "The Star-Spangled Banner," the controls listened to neutral music chosen in a pilot study. We measured utilitarianism in three ways: a) traditional, i.e., the trolley dilemma (Foot, 1967) and its modification on the footbridge (Thompson, 1976); b) the CNI model (Körner et al., 2020); and c) The Oxford Utilitarianism Scale (Kahane et al., 2018). By using all three of the best and most comprehensive methods of investigating utilitarianism at the moment, we can understand more deeply how music can influence moral decisions.

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6:00–7:00 PM (3015)

Play to Actually Win: Piloting a Practical Risk Tolerance Measure with Real Payouts. MIRANDA LEVY, *St. John's University,* DANA CHESNEY, *St. John's University,* MARGARITA MANZANO, *St. John's University,* ELLALANDRA ARAKELOW, *St. John's University* (Sponsored by Dana Chesney) — Individuals can have different levels of risk tolerance, being more or less willing to take risks to receive greater rewards. However, the vast majority of risk tolerance measures are hypothetical, with no real payouts, i.e. "Would you rather have $40.00 for certain, or a 50% chance of $100.00." The monetary values involved make paying out these choices impractical, as they are outside the typical researcher's budget. This practice raises the question of whether hypothetical judgements are different than those involving real money. Some studies have attempted to resolve this issue by comparing choices with real payouts to hypothetical scenarios. However, when 'real' payouts are offered, these are typically set up so that only one of many possible items is actually played/paid, rendering the exercise a lottery within a lottery. Inspired by Tanaka et al. (2010), here we develop a 31 item risk tolerance metric for which all items can be played out, designed to have average total payouts within the bounds of normal subject pay. In our pilot study, 48 undergraduate participants had average payouts of $9.34, ranging from $4.24 to $18.24. Future work will compare performance on this task to pure hypotheticals in a broader sample.

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6:00–7:00 PM (3016)

Effects of Evidence-Based Communication of COVID-19 Vaccine on Vaccination Intention. SIAN LEE, *College of Information Sciences and Technology, The Pennsylvania State University, University Park,* AIPING XIONG, *The Pennsylvania State University* (Sponsored by Aiping Xiong) — Evidence-based information on the benefits and risks of vaccines is necessary for informed vaccination decision-making. Leveraging the standards of good risk communication, we proposed evidence-based, complete (benefits and risks) communication of COVID-19 vaccines. We conducted an online survey with a representative sample of U.S. adults (N = 1522), examining the effect of proposed communication relative to the control (i.e., descriptions of benefits and risks of COVID-19 vaccination on CDC web pages) on people's COVID-19 (continuous) vaccination intentions and decision confidence. We also examined participants' knowledge about the benefits and risks of COVID-19 vaccines and their perceived safety of COVID-19 vaccines. We found that communication generally increased participants' COVID-19 (continuous) vaccination intention and confidence and their knowledge of COVID-19 vaccines. Furthermore, the proposed communication increased people's perceived safety of COVID-19 vaccines. In summary, evidence-based information can be effective in mitigating people's vaccine hesitancy and facilitating continuous vaccination uptake, highlighting the importance of informed decision-making.

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6:00–7:00 PM (3017)

Too Hard, Too Easy, or Just Right? The Paradox of Effort and Boredom Aversion. JAKE R. EMBREY, *University of New South Wales,* LUKE GELAGIN, *University of New South Wales,* BEN NEWELL, *University of New South Wales* — Despite effort and boredom existing on opposite ends of the spectrum, both appear to be aversive and subsequently avoided: people prefer less demanding tasks over more demanding alternatives, yet also seek negative stimulation (e.g., electric shock) in order to avoid states of boredom. Following recent research, the work presented here investigates how people trade off their paradoxical aversion to both effort and boredom when presented with a choice between "doing nothing" and a working memory task (one easy and one hard). Our results indicate that while "doing nothing" is preferred to both demanding tasks, people's aversion to the hard working memory task depends on whether the alternative is doing nothing or the easier alternative. Specifically, people are more averse to the hard task when the alternative is the easy working memory task as opposed to when it is doing nothing. We also investigate whether the shift to online experiments is problematic for research interested in mental effort and boredom by contrasting the results between experiments run online and in the laboratory.

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6:00–7:00 PM (3018)

The Role of Eyewitness Identification Speed on Plea Decision Outcomes. ANNMARIE KHAIRALLA, *Ontario Tech University,* RYANNE BERUBE, *Portland State University,* SCARLETT WANG, *Bates College,* MIKO M. WILFORD, *University of Massachusetts Lowell,* AMY B. DOUGLASS, *Bates College* — The current research compares plea acceptance outcomes between innocent and guilty participants, and between participants who are told an eyewitness made a quick or slow identification. This study utilized a novel computer simulation wherein participants (n = 65) are accused of stealing a pair of designer sunglasses, presented with evidence, and asked if they would accept a plea deal. Participants are randomly assigned to be either innocent or guilty and are told there is a highly confident witness eyewitness who identified them either immediately or after some time. Preliminary results show that, as predicted, guilty participants are more likely to accept the plea offer than innocent participants, $X2(1) = .8.13$, $p = .004$. Thus far there is not a significant association between plea decision and eyewitness speed, $X2(1) = .25$, $p = .62$; however, data collection is ongoing.

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6:00–7:00 PM (3019)

Behavioral and Physiological Predictors of Decision-Making Under Stress and Uncertainty in Soldiers. ESTER NAVARRO, *Tufts University Center for Applied Brain and Cognitive Sciences,* GRACE E. GILES, *Tufts University Center for Applied Brain and Cognitive Sciences,* SETH ELKIN-FRANKSTON, *Tufts University Center for Applied Brain and Cognitive Sciences,* JULIE A. CANTELON, *Tufts University Center for Applied Brain and Cognitive Sciences,* MARIANNA D. EDDY, *Tufts University Center for Applied Brain and Cognitive Sciences,* TAD T. BRUNYE, *Tufts University Center for Applied Brain and Cognitive Sciences* — Understanding the correlates of decision-making under stress is vital to improving performance and outcomes. Few studies have examined the relationship between multiple behavioral and physiological outcomes and stressful decision-making in ecologically valid scenarios. 90 active-duty military personnel completed a battery of cognitive, health, social-emotional, and physical tests and a two-session virtual-reality task assessing shoot/don't shoot decision-making in stressful (threat of torso shock) and non-stressful conditions. Preliminary results show composite measures associated with decision-making under stress: a) Selective Attention & Mental Rotation predicted confidence time, b) Eating Habits & Visual Acuity predicted target discriminability (d-prime), c) Sleeping Habits predicted decision criterion and time, and d) Behavioral Regulation predicted confidence and target discriminability. Moreover, shock response variability (i.e., difference in salivary cortisol before and after task) was correlated with cognitive outcomes. Overall, results suggest that multiple trait-level variables can influence decision-making in high-stakes stressful situations, particularly among individuals highly sensitive to stress.

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6:00–7:00 PM (3020)

Risk Preferences Are Affected by Social Information. TEHILLA OSTROVSKY, *University of New South Wales,* SHI XIAN LIEW, *University of New South Wales,* BEN NEWELL, *University of New South Wales* — Several lines of research suggest that people's risky choices are affected by social information, but the extent of such influences and the mechanisms underlying them are not well-understood. We report behavioural and modelling results from a task in which participants made a series of choices between gambles first alone (solo) and then after observing choices made by other (hypothetical) participants (social). In the social condition we manipulated the strength of social information by varying the proportion of risk-seeking and risk-averse individuals. Our results suggest that participants' solo-risk preferences anchor their social choices, but preferences are swayed, particularly toward risk-seeking. We further find that this effect is more pronounced under uncertainty. We compare a model which conceptualises this influence as the distance between solo vs. social preference with one that integrates social information according to Bayesian updating; we find that the former model fits the data better.

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6:00–7:00 PM (3021)

Process Model Analysis for a Gamble Lottery Task. MARIO FIFIC, *Grand Valley State University,* CARA KNEELAND, *Commander, Naval Surface Force, U.S. Pacific Fleet, U.S. Navy,* JOSEPH W. HOUPT, *The University of Texas at San Antonio* — There are two theoretical approaches accounting for how subjects preferentially choose lotteries in the classical gamble task. Following the rationality postulate, the participant chooses according to the utility associated with each lottery (e.g. prospect theory Kahneman & Tversky, 1979). Alternatively, the boundedly rationale, rule-based heuristic may be used to evaluate each gamble's attributes one-at-a-time (e.g. Priority Heuristic, Brandstätter, et al, 2006) in a serial fashion. To validate the core assumptions of these approaches we employed a modular serial-parallel network (MSPN), developed to diagnose the processing order (serial, parallel), the stopping rule (exhaustive, or self-terminating) and the processes dependency. The results indicated that, in a gamble task, some subjects adopted serial and some parallel processing, while some relied on their trial-to-trial mixture. In general, these findings challenge the pure utility-based models in decision making, and invite for revision of the heuristics and on boundedly rational decision models.

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6:00–7:00 PM (3022)

Decision-Making Under Risk: Intuition Is More Advantageous Than Deliberation. AIKATERINI VOUDOURI, *LaPsyDÉ & Université Paris Cité,* MICHAŁ BIAŁEK, *University of Wrocław,* WIM DE NEYS, *Université Paris Cité/LaPsyDÉ/Centre National de Recherche Scientifique (CNRS)* — What makes us take advantageous risks? "Fast-and-slow" theories suggest that, when

faced with a risky decision with potentially positive outcomes (gains), we intuitively avoid taking it; we only decide to do so when reflection is used to correct for this initial "risk aversion" feeling. In the present study, we directly tested this assumption. Participants played two games in which they had to choose between a risky, advantageous option and a safe option. We used a two-response paradigm in which participants provided an initial "fast" response under time-pressure and cognitive load and, immediately after, a final "slow" response where they deliberated. Across both games we found that people made more advantageous risky choices in the "fast" compared to the "slow" stage. Even when their final responses were risky, they had already provided the same response intuitively. These findings suggest that intuition rather than deliberation drives advantageous choices under risk.

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6:00-7:00 PM (3023)

Inoculating Against the Spread of Islamophobic and Radical-Islamist Disinformation. MUHSIN YESILADA, *University of Bristol,* STEPHAN LEWANDOWSKY, *University of Bristol,* SOPHIA WALSH, *University of Bristol* — Disinformation is at the core of Islamophobic and radical-Islamist extremism. Inoculation provides a solution since it gives people the skills to identify the markers of disinformation and thus increase their resistance to disinformation. We report two studies that aimed to inoculate a US sample and a UK sample against the spread of Islamophobic and radical-Islamist disinformation. Participants were randomly shown a video that taught them about three markers of disinformation (hasty generalisations, invoking emotion, and polarisation) or an unrelated control video. Participants then watched an Islamophobic video or a video conduit to radical-Islamist content. Participants answered questions to gauge their views on the content. The UK results showed that individuals who received the inoculation displayed less agreement with the disinformation, less sharing likelihood, less perceived reliability and less support for the disinformation. The US results showed that participants in the inoculation condition demonstrated less perceived reliability and less agreement with the disinformation content than the control group. The study supports the use of inoculation in combatting extremist messages.

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6:00-7:00 PM (3024)

Understanding Factors Affecting Public's COVID-19 Booster Vaccination Intention. ZEKUN CAI, *The Pennsylvania State University,* AIPING XIONG, *The Pennsylvania State University* — The Delta and Omicron variants of SARS-CoV-2 have brought new challenges to the pandemic, resulting in a need for booster doses besides the primary doses of COVID-19 vaccines to preserve the immunity. However, it is unclear how the public view a COVID-19 vaccine booster and their uptake intentions. We conducted an online survey with a representative sample (N=1222) of U.S. adults, investigating the effects of different communication messages on people's acceptance of the booster dose. Other factors such as participants' knowledge of COVID-19 variants were also examined. We found that participants who were strongly hesitant about booster vaccination before the communication increased their booster willingness across all communication conditions. Participants' booster vaccination intention was also positively correlated with their knowledge of the variants. Our results highlight the public's lack of knowledge about COVID-19 variants and suggest the importance of booster communication to those strongly vaccine-hesitant individuals.

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6:00-7:00 PM (3025)

Improving Medical Image Classification Using Wisdom of the Crowds. EESHAN HASAN, *Vanderbilt University,* JENNIFER S. TRUEBLOOD, *Indiana University* — Classification of medical images forms an important step in the diagnosis of several diseases such as cancer. Recently, wisdom of the crowds methods have been proposed for labeling and creating high quality medical image datasets. In this work, we examine different aggregation algorithms for decisions about medical images. In our experiments, participants made decisions on a series of images and classified them into the different cancerous and non cancerous categories. We observe that aggregating the decisions of a group of novice observers can achieve higher accuracy than a single expert. In addition, we examine different aggregation algorithms using subsets of observers (e.g., high performers) as well as different schemes for weighting individual responses. In sum, we observe that a wisdom of the crowds approach can be used to achieve high accuracy in medical image decision-making.

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6:00-7:00 PM (3026)

Artificial Ultimatums: Perceptions of "Intelligent" Virtual Opponents in a Decision Making Task. CHRISTOPHER SANCHEZ, *Oregon State University,* LENA HILDENBRAND, *University of Illinois Chicago,* BRIAN ZHANG, *Oregon State University,* NAOMI FITTER, *Oregon State University* — Previous research has suggested that humans often make irrational economic decisions, especially in situations of perceived unfairness due to the actions of other humans. For example, in the Ultimatum game, participants reject unfair offers from human opponents but not when they come from a random computer algorithm. However, an open question is how human decision makers perceive opponents who are likewise not human but endowed with some aspect of "intelligence"? In the current study, participants played the Ultimatum game versus what they believed were either human opponents, a random number generator, and finally against an artificial intelligence (IBM's WATSON). Results replicated the classic finding that unfair offers from human opponents were rejected at a much higher rate then those of a random computer algorithm. Interestingly, the artificial intelligence, while still a computer, was treated exactly like a human opponent in terms of accepting unfair offers. The results of the current study suggest that human decision makers perceive artificial intelligence similarly to an

actual human intelligence, which may have implications for trust in automation and human interaction with intelligent computer systems.

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6:00–7:00 PM (3027)

Presenting Evidence to Create Belief in Pyramid Power: Influences of Intervention Type and Personality. WILLIAM LANGSTON, *Middle Tennessee State University,* SAMAN KITTANI, *Middle Tennessee State University* — The purpose of the research was to evaluate the influence of intervention type and personality on belief formation. Belief in pyramid power was targeted because that belief was formerly popular (and so might seem reasonable) but is currently rare. We manipulated the type of intervention (read only or read plus demonstration) and measured a number of personality variables to see which might contribute to belief formation. Overall, there was significant belief change. Intervention type had no impact on belief change. There were correlations between belief change and some of the personality variables (schizotypy, private body consciousness, conspiracist ideation), however these relationships were weak. The results may have implications for the development of consequential misbeliefs, but the personality measures provided little leverage for who might be susceptible to belief change.

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6:00–7:00 PM (3028)

Icon Arrays Reduce Concern Over COVID-19 Vaccine Side Effects. MADISON FANSHER, *University of Michigan, Ann Arbor,* ADKINS TYLER, *University of Michigan,* POORTATA LALWANI, AYSECAN BODUROGLU, *Boğaziçi University,* MADISON CARLSON, MADELYN QUIRK, RICHARD L. LEWIS, PRITI SHAH, *University of Michigan,* HAN ZHANG, *University of Michigan,* JOHN JONIDES, *University of Michigan* — On April 13, 2021, the CDC announced that the administration of Johnson and Johnson's COVID-19 vaccine would be paused due to a rare blood clotting side effect in ~0.0001% of people given the vaccine. Most people who are hesitant to get a COVID-19 vaccine list potential side effects as their main concern; thus, it is likely that this announcement increased vaccine hesitancy among the American public. Two days after the CDC's announcement, we administered a survey to a group of 2,046 Americans to assess whether viewing icon arrays of the small side effect risk would prevent potential increases in COVID-19 vaccine hesitancy due to the announcement. We found that using icon arrays to illustrate the small chance of experiencing the blood clotting side effect significantly prevented increases in aversion toward the Johnson and Johnson vaccine as well as all other COVID-19 vaccines.

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6:00–7:00 PM (3030)

Cross-Race Effect in Item and Relational Memory. HUIYU DING, *University of Illinois Urbana-Champaign,* JONATHON WHITLOCK, *University of Illinois Urbana-Champaign,* LILI SAHAKYAN, *University of Illinois Urbana-Champaign* — It is well established that own-race faces are superior in memory and recognition compared to other-race faces, known as Cross-Race Effect (CRE). However, the CRE in relational memory has not received much attention when the task focuses on face-context associations rather than single-item memory for faces. A recent study from our lab (Ding et al., under review) found a reduced CRE in relational memory. In the current study, we further explored CRE in relational memory and conducted a large-scale experiment (N = 286) with four between-subject conditions. All conditions involved presenting participants own-race and other-race faces superimposed on background scenes and subsequently testing memory for faces. Importantly, each condition varied in its encoding instruction (relational vs. item), background scene (uniform vs. unique), or type of memory test (familiarity judgment vs. recollection of associations). Therefore, a set of comparisons between two conditions allowed us to examine whether the magnitude of CRE is moderated in relational memory compared to item memory and identify potential factors responsible for producing a modulated CRE.

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6:00–7:00 PM (3031)

Nothing Else Matters: Stimulus-Response Binding and Retrieval Is Independent of Affective Consequences. JUHI PARMAR, *Friedrich-Schiller-University Jena,* KLAUS ROTHERMUND, *Friedrich-Schiller-University Jena* — Stimulus-response binding and retrieval (SRBR) is a fundamental mechanism driving behaviour automatization. We investigated the modulatory role of performance-dependent and performance-independent affective consequences on SRBR effects within a colour categorisation task in a sequential prime-probe design, using an orthogonal variation of Response relation (colour repetition vs change) by Distractor relation (word repetition vs change). SRBR is measured by an interaction of the two factors, with distractor repetition producing facilitation due to a retrieval of the correct response in response repetition sequences, but producing interference if the response changes from prime to probe. Positive, neutral, or negative events indicating monetary (or "cognitive") consequences were interspersed between primes and probes. In a series of 4 experiments (total n = 329), we did not find any evidence for a "cognitive" affective modulation of SRBR, indicating that these effects are fully automatic and independent of affective consequences. Results are discussed with regard to their implications for theories of learning and habit formation.

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6:00–7:00 PM (3032)

Word Recall in Younger and Older Adulthood: What Role Does Motivation Play? MORGAN K. TAYLOR, *Duke University,* ELIZABETH J. MARSH, *Duke University* — While monetary incentives have been shown to be strong motivators for younger adults, results with older adults have been mixed. In the current study,

younger and older adults viewed a series of word lists and recalled each after a 1-minute distracter task. Critically, at the beginning of each list, participants were told whether they would be able to earn additional money ($0.25 per word) based on how many words they remembered correctly. Participants earned no additional money (control condition), money for themselves (self condition), or money for a charity of their choice (charity condition). Preliminary results found that younger adults outperformed older adults in all conditions. Furthermore, younger adults were more highly motivated when earning money for themselves; they remembered significantly more words in the self condition compared to the control and charity conditions. Additional studies will more closely examine the role prosocial motivation plays in older adults' recall abilities.

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6:00-7:00 PM (3033)

Modulatory Effects of Excitatory Theta-Burst TMS to Prefrontal Cortex on Reward-Motivated Cognitive Control and Subsequent Memory. ALYSSA J. ASMAR, *University of Denver,* LUCAS LATTANZIO, *University of Colorado Anschutz,* BENZI M. KLUGER, *University of Rochester Medical Center,* ISABELLE BUARD, *University of Colorado Anschutz,* KIMBERLY S. CHIEW, *University of Denver* — Reward modulates both cognitive control and memory, potentially via dopaminergic input to prefrontal cortex (PFC) and hippocampus respectively. Given that cognitive control might also modulate memory outcomes via a PFC-hippocampal pathway, we were interested in probing PFC contributions to reward-motivated cognitive control and memory encoding. To explore this, we applied fMRI-guided excitatory theta-burst transcranial magnetic stimulation (TMS) to bilateral PFC and examined alterations in motivated cognitive control performance and subsequent memory for task stimuli as a function of control demand. Preliminary analyses show that reward enhanced both response speed and cognitive control relative to baseline conditions. Real TMS also boosted cognitive control relative to sham but did not increase response speed. Although reward incentives and TMS both enhanced cognitive control, these variables did not interact. These results offer promising causal evidence of the role of the PFC in reward-motivated cognitive control, with analyses examining downstream effects on memory currently ongoing.

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6:00-7:00 PM (3034)

Gradual Stimulus Onset in a Speeded Response Task. BRADLEY HARDING, *Université de Moncton,* MORGAN GARVIE, *Université de Moncton,* VANESSA BOUDREAU, *Université de Moncton* — Static stimuli are the standard for experimental cognitive paradigms. However, human decision processes are certainly more complex. This begs the question: Do we begin our decision-making process when there is the slightest inkling of a stimulus being presented or do we wait for a critical amount of information? In this research, we assess this question by creating a novel cognitive paradigm in which participants are gradually presented strings of 1-4 letters at different rates and asked to respond as fast and as accurately as possible when they judge that the stimulus is discernable (and reporting what they see afterwards). Results of this study indicate that participants' decision-making process begins when a critical amount of on-screen information is "revealed" and is affected by the complexity of the stimulus. Moreover, with the help of higher moment statistics, we can comment on the possible cognitive architecture underlying this new cognitive task.

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6:00-7:00 PM (3035)

The Psychological Study of Demand Curves. JAVIER CORREDOR, *Universidad Nacional de Colombia,* DANIEL MAURICIO JEREZ-GARCIA, *Universidad Nacional de Colombia,* JUAN SEBASTIAN CELY-ACOSTA, *Universidad Nacional de Colombia,* DIXON ARMANDO LUNA-CISNEROS, *Universidad Nacional de Colombia,* INGRITH MILENA URIBE-BARRETO, *Universidad Nacional de Colombia* — This article describes five studies exploring different psychological factors affecting demand curves. In the first study, participants were asked how many items they will buy at different prices. Results show that consumptions decisions are limited by consumption beliefs. In the second study, participants solved the same task in the context of altruist purchases. Results show that participants initial quantities are influenced by altruism. In a third study, a product was presented using neutral or ecological framings. Results show that an ecological framing increases participants' hypothetical purchases. In a fourth study, participants solved the same task and answered a questionnaire evaluating maximizing tendencies (Dalal et al. 2015). Results show no correlation between maximizing tendencies and elasticity. A fifth study included the same task and an impulsivity scale (Whiteside & Lynam, 2003). Results show that impulsivity did not affect the demand curves. Overall, results show that situational factors, such as altruist or ecological framings, affect demand curves, but personality variables do not do so. These psychological factors produce individual demand curves that do not resemble classical economic functions (e.g., CES).

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6:00-7:00 PM (3036)

Assessing Truth Bias in Calibrated Probability Assessments in Relation to Calibrated and Non-Calibrated Individuals. PETER MALLIK, *Hubbard Decision Research,* DOUGLAS HUBBARD, *Hubbard Decision Research,* ANDREW ADAMS, *Hubbard Decision Research,* PHILIP MARTIN, *Hubbard Decision Research,* JON MURPHY, *Hubbard Decision Research,* ROBERT WEANT, *Hubbard Decision Research* — Calibration of probabilities is an essential skill in categorizing one's own uncertainty. Most individuals, prior to any calibration training, tend to underestimate their own uncertainty (i.e., they are overconfident) in relation to a given probability estimate. Calibration training was delivered to individuals using True and False judgements; both individuals who

are calibrated and uncalibrated (prior to training) tended to have a Truth bias. Despite many individuals becoming calibrated, there is a subset of individuals who failed to become calibrated despite training. In order to provide insight as to why individuals do not successfully become calibrated, cognitive bias was compared across Calibrated and Non-Calibrated individuals. Specifically, we assessed Truth bias due to its propensity to cause errors in True or False judgements. Even though most participants end up being successfully calibrated, highlighting traits of those who are not successfully calibrated could improve calibration training, as it is a teachable skill.

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6:00-7:00 PM (3037)

Does COVID-19 Infection Affect Its Risk Estimation? KUNINORI NAKAMURA, *Seijo University* — Existing studies have indicated that availability of risky events affects subjective frequencies and direct and indirect experiences of such events enhance their availability. Thus, it is predicted that COVID-19 infection would enhance the likelihood of its risk perception. Consequently, infected people would estimate higher frequency of COVID-19 than non-infected people. To test this hypothesis, this study included a total of 242 participants who were required to estimate the number of COVID-19 patients in Tokyo, answer whether they had been infected by COVID-19, and state the number of acquaintances they had who had been infected by COVID-19. As a result, this study found that among 242 participants, 30 participants were infected by COVID-19, and their estimates of the number of COVID-19 patients in Tokyo were not significantly different from those of non-infected participants. Additionally, this study found that although the number of infected acquaintances differed between the infected and non-infected participants, they did not correlate to the estimated number of COVID-19 patients. These results suggest a possibility that the higher availability of risky events does not affect risk perception.

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6:00-7:00 PM (3039)

Solutions to the Explore-Exploit Dilemma Vary with Perception of Stress and Intolerance of Uncertainty. KYLE LAFOLLETTE, *Case Western Reserve University,* HEATH A. DEMAREE, *Case Western Reserve University* — Exploration is fundamental to learning. Previous research suggests that the propensity to explore versus exploit varies with how harsh people perceive environments. However, no study has considered differences in exploration strategy in the face of adversity, such as value-directed exploration to reduce relative uncertainty and random exploration to reduce total uncertainty. To elucidate the relationships between perceived adversity and exploration strategy, we manipulated acute stress and observed how uncertainty was affected during decisions over a series of two-armed bandits. We estimated directed and random exploration using a generalized logistic model in a hierarchical Bayesian framework. These strategies were then related to participants' self-reported cognitive and somatic manifestations of anxiety and attitudes toward uncertainty. Directed exploration was attenuated by cognitive manifestations of anxiety, irrespective of whether uncertainty could be reduced. Random exploration increased with somatic anxiety, but only when there was no opportunity to leverage new information. We discuss implications of these maladaptive effects of perceived anxiety and attitudes toward uncertainty on solutions to explore-exploit dilemmas.

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6:00-7:00 PM (3040)

Hindsight Bias and Adaptive Knowledge Updating. BARBARA K. KREIS, *University of Mannheim,* THORSTEN PACHUR, *Max Planck Institute for Human Development,* JULIA GROSS, *University of Mannheim* — When people give a numerical estimate for an object, are provided with the fact and then asked to recall their initial estimate, responses are often biased towards the newly learned fact. It has been proposed that this hindsight bias reflects adaptive knowledge updating. To test this thesis, we provide a framework to conceptualize possible forms of knowledge updating. Integrating hindsight bias with the literature on seeding effects (improved estimates after receiving numerical facts), we distinguish two ways in which knowledge updating could impact estimation performance: updating information for specific items vs. recalibration of metric domain knowledge. Using a novel experimental paradigm that links hindsight bias with seeding effects, in Experiment 1 (N = 208) we demonstrate that the classic approach to elicit hindsight bias also produces a recalibration of the metric domain knowledge, enabling transfer of the learned information to new items. In Experiment 2 (N = 285), we obtain support for a novel prediction from our framework – that hindsight bias can be elicited without providing facts for the specific items, but solely via transfer learning. The results highlight the key role of knowledge updating in hindsight bias.

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6:00-7:00 PM (3041)

Abstract (vs. Concrete) Construals of Intergroup Relations Affect Thinking and Behavior Toward Social Groups. ELENI LIPOURLI, *University of the Aegean,* ANTONIS GARDIKIOTIS, *Aristotle University of Thessaloniki* — An experimental study (N=450) examined whether the level of construing about majority's relations with a minority group (refugees), either within abstract terms (for example, participants read a text on why harmonious relations with refugees are important – abstract construal) or within concrete terms (for example, participants read a text on how harmonious relations can be achieved – concrete construal), differentially affects social thinking (attitudes toward cultural diversity, stereotypes), emotions, and behavioral intentions toward the minority group. Analyses showed that abstract construal (vs. concrete and control conditions) led to more positive attitudes toward cultural diversity and increased intention to help. Path analyses showed that abstract (vs. control) construal predicted attitudes toward cultural diversity, which in turn predicted positive stereotypes and emotions, which in turn predicted help

(all positive relationships). These findings highlight the importance of people's level of construal thinking about intergroup relations in predicting thinking and behavior toward social groups.

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6:00-7:00 PM (3042)

Exploring the Structure of Expertise and Trustworthiness Judgements. RINA HARSCH, *University of Minnesota,* PANAYIOTA KENDEOU, *University of Minnesota* — Previous research suggests that judgements of source credibility are predicted by perceived expertise and trustworthiness (Pornpitakpan, 2004). That is, we judge a source to be credible partly to the extent that we think they have knowledge in the domain and are likely to tell us what they actually believe. While expertise and trustworthiness judgements have traditionally been measured using Likert-type scales, it is unclear whether graded structures are most appropriate for our judgements. In this study, we explored the structure of adults' representations of expertise and trustworthiness. Participants read descriptions of sources which varied in their expertise and trustworthiness. Source descriptions were presented in pairs. For each pair, participants gave two ratings of similarity between the sources, one in terms of their expertise and one in terms of their trustworthiness. Multidimensional scaling was used to visualize participants' judgments on a one-dimensional scale. Results and implications for theory and practice will be discussed.

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6:00-7:00 PM (3043)

The Impact of Ethnicity and Criminal Context on the Authenticity Judgment of Smiles. ADELE GALLANT, *Université de Moncton,* BRANDON NJOMO, *Université de Québec en Outaouais,* ANNIE ROY-CHARLAND, *Université de Moncton* — While it is known that accuracy rates in the judgment of authenticity of smiles are low, the factors responsible for this remain unclear. Manipulating components of the smiles and the surrounding context, are ways to explore underlying perceptual processes. Study 1 measures the perceived authenticity of smiles, while exploring the influence of ethnicity and criminal contexts. Participants from two ethnic groups read a criminal background cue before viewing each smile. They then rated the authenticity of each video that contained a genuine or simulated smile, from a white or black encoder. The black participants perceived smiles from white encoders in a criminal context as less authentic, even when they were truly authentic. Ratings of white participants revealed no interaction with the type of context, the type of smile, or the encoders ethnicity. As opposed to the results from black participants, the lack of in-group preference in white participants could be of the result of social desirability and overcompensation for the implicit biases with black encoders. To explore this claim, study 2 repeats the same task with added measures of reaction times and eye movements to allow the exploration of the potential implicit biases.

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6:00-7:00 PM (3044)

Domain, Graph Format, and Trend Type Effects on Judgmental Forecasting. CEYDA TUMEN, *Koç University,* AYSECAN BODUROGLU, *Boğaziçi University* — Prior work on judgmental time series forecasting has typically confounded bottom-up and top-down effects while trying to identify influences on forecasts. In two experiments, we separately investigated the impact of bottom-up and top-down factors in time series forecasting. We found that forecasts in line and point graphs were less biased than those in bar graphs, and forecasts based on trended bar graphs exhibited mean reversion bias. Additionally, we observed a general positivity bias in forecasts no matter what the trend type or graph format was, i.e., they were above the model forecasts with the exception of upward trending bar graphs. Using sales context did not lead to a significant reversal in upward trending series as per prior studies, but bolstered the reversal in downward trending series, implying that people have an optimism bias or they anticipate precautions when sales are going down.

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6:00-7:00 PM (3045)

The Relationship Between Verbal Working Memory and Prediction Performance in Sentence Processing. YU LU, *Rice University,* RANDI C. MARTIN, *Rice University,* SIMON FISCHER-BAUM, *Rice University,* ANDREW W. TANG, *Rice University* — Language comprehension is rapid and efficient, partially supported by the ability to quickly generate predictions about upcoming content. The current study investigates the mechanisms of prediction, specifically the role of verbal working memory (WM). A sentence completion task was used to examine the prediction performance of four aphasic participants, with selective phonological (UQ) and semantic working memory (EV, XB) deficits or both deficits (LZ). Participants listened to a sentence without its final word and produced the word most appropriate to complete the sentence. The sentences varied in the amount of contextual information, which influenced the WM demand required for making an appropriate prediction. All four participants showed impaired prediction performance compared to age matched older adults, especially for longer, more complex sentences. The participant with both WM deficits (LZ) showed the most extreme impairment. Results suggest both semantic and phonological WM play a role in predictive sentence processing.

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6:00-7:00 PM (3046)

Future Prospects Feel Less Likely in Your Foreign Language. ZEYNEP ASLAN, *University of Chicago,* JANET GEIPEL, *University of Exeter Business School,* WENJIE HAN, *Cornell University Samuel Curtis Johnson Graduate School of Management,* RENDONG CAI, *Guangdong University of Foreign Studies,* BOAZ KEYSAR, *University of Chicago* — How likely are you to break a leg next year? People often assess the probability of future events and use these assessments to guide their decisions and actions.

For example, our willingness to pay for an insurance policy could be influenced by an assessment of our future health. Because probability assessments of future events guide our decisions and behavior, it is important to understand what factors influence them. Here, we investigated the role of language—foreign or native—in subjective probability judgments of future life events. In three preregistered studies (N = 638), we demonstrate that in comparison to native Chinese, foreign English reduced subjective probability judgments of both positive and negative future events. These results were not due to reduced emotional processing in the foreign language. Instead, we suggest that foreign language acted by prompting a subjective feeling of psychological distance, which reduced probability judgments of future events.

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6:00–7:00 PM (3047)

Neurophysiological Mechanisms of Melody Encoding for Pitch-Less Sounds. ALEJANDRA SANTOYO, *University of California, Merced,* MARIEL G. GONZALES, *University of California, Merced,* ZUNAIRA J. IQBAL, *University of California, Merced,* KRISTINA C. BACKER, *University of California, Merced,* RAMESH BALASUBRAMANIAN, *University of California, Merced,* HEATHER BORTFELD, *University of California, Merced,* ANTOINE J. SHAHIN, *University of California, Merced* — Melody encoding is a core process of music perception. Prior neuroimaging work examining melody encoding demonstrated that areas of activation shift anterolaterally from Heschl's gyrus to secondary auditory areas as perception of pitch becomes more melodic. Moreover, melody perception has also been found to trigger stronger phase-locking of neural activity to sounds than in speech perception. Here, we use electroencephalography (EEG) to validate and extend these findings for melodic and non-melodic stimuli, using sounds with no perceived pitch. We constructed these stimuli with seven 200 ms segments of white, brown, and pink noise separated by 50 ms of silence, to form nonmelodic and melodic streams. In the nonmelodic streams, all seven noise segments were of the same type of noise. The melodic streams comprised a patterned sequence with all three types of noise present in each stream. Our preliminary data (n = 5) showed that melody encoding was manifested in: 1) stronger phase-locking to noise bursts at frontocentral sites, indicative of an auditory source, and 2) increased gamma power at lateral frontocentral sites, indicative of engagement of higher-level auditory networks during melody encoding.

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6:00–7:00 PM (3048)

Complementing the Setting: How Video Game Soundtracks Evoke Their Environments. JALEN JACKSON, *Arizona State University,* K. JAKOB PATTEN, *Arizona State University,* TAMIKO AZUMA, *Arizona State University* — Music is known to evoke emotion, time period, and actions. Music's ability to cue geographical location, however, has not been clearly demonstrated. In the current study, participants listened to pairs of musical excerpts from video games (no samples included explicit environmental cues). For each pair, participants rated the overall similarity and assigned environmental adjectives ("wet," "cold," and "bright") to the song most evocative of those qualities. A two-dimensional scaling solution was computed, revealing "wetness" to be a primary dimension (correlation between proportion assigned "wet" and y-axis, $r(18) = .83$). Two acoustic properties of the excerpts, tempo ($r(18) = .57$) and spectral centroid ($r(18) = .54$), also correlated with dimensions of the solution space. They were located 78 degrees offset from one another, which may indicate two orthogonal acoustic dimensions on which the "wetness" perceptual dimension lies. The results indicate that music can convey characteristics of associated geographical locations.

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6:00–7:00 PM (3051)

The Role of Attention for Entrainment: Evidence from Discourse Particles. RACHEL WILLIAMS, *The University of Texas at El Paso,* KYLE WOLFF, *The University of Texas at El Paso,* IVA IVANOVA, *The University of Texas at El Paso* — Conversational partners sometimes reuse—or entrain on—aspects of each other's language. We investigate the role of attention for entrainment during production and comprehension using the discourse particle (words or phrases with an expressive function that do not affect the propositional content of utterances; Schweinberger, 2015) like. We tested two hypotheses—entrainment to like requires some attentional resources, versus that it requires little (if any) attention. Participants read a short story and retold it (baseline retelling phase), then read another short story and listened to a recording of it (priming phase), and then read and retold a third story (target retelling phase). In Experiment 1, half of the participants navigated a pedestrian zone in virtual reality (VR) during their baseline and target retelling phases (high attentional load); the other half did not move in the same VR location (low attentional load). In Experiment 2, participants were placed in VR only while listening to the priming phase recording. If entrainment to like requires attention, during production there should be less entrainment under high load than under low load; during comprehension there should be no effect of attentional load.

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6:00–7:00 PM (3052)

Failures of Lemma Access: Validating the Frequency Distributions of Lexical Substitution and Word Blend Speech Errors. JOHN ALDERETE, *Simon Fraser University,* MELISSA BAESE-BERK, *University of Oregon,* ADRIAN BRASOVEANU, *University of California, Santa Cruz,* JESS H. K. LAW, *University of California, Santa Cruz* — Failures of lemma access in speech errors have been attributed to either conceptual intrusions involving two highly similar meanings (synonyms) or intrusions at the lexical level involving associated words (e.g., antonyms, coordinates, thematically related words). But synonyms and hypernyms are also associative, raising the question of whether they are mis-selected at the lexical

level, and if they are in fact recognized as speech errors by native speakers and human data collectors. We employ Bayesian methods to investigate 1200 semantic errors collected from spontaneous English speech in order to validate the frequency distributions of these and other semantic classes. Both synonyms and hypernyms occur with higher frequency in lexical substitutions than in prior research, but they are still under-represented relative to other semantic classes. These findings raise new questions about how words that share a core meaning can be mis-selected at the lexical level.

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6:00-7:00 PM (3053)

Phoneme Similarity in Distinct Phonological Systems. MO CHEN, *Lehigh University,* PÁDRAIG O'SÉAGHDHA, *Lehigh University* — There is surprisingly little systematic experimental work on the phoneme similarity effect, the tendency for similar phonemes to interact in language production. We comprehensively examined phoneme similarity (voice, place, manner) in parallel English and Mandarin Chinese experiments using a cued AB/BA word order procedure that forced generation of phonology. We hypothesized that phoneme similarity would be manifest in Chinese, as well as English, despite the subordination of phonemes to syllables in Chinese. Participants repeatedly produced (in random order) two monosyllable words that varied in the similarity of their initial phonemes (e.g., mirth knife vs mirth cage) and whether they also shared rhymes (e.g., base pace). For unrhymed words, place was the most influential feature in both languages. For rhymed words, other features were also important, and voicing was the strongest feature in English. Phoneme similarity operates in a syllable-centric (Chinese) as well as a phoneme-centric (English) phonological system.

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6:00-7:00 PM (3054)

Good and Bad Conversations: Balance, Grounding, and Closings. ANDREW J. GUYDISH, *University of California, Santa Cruz,* JEAN E. FOX TREE, *University of California, Santa Cruz* — What factors influence recalling a conversation as being good or bad? Participants viewed transcripts from previous conversations. We predicted that well-balanced conversations, well-grounded conversations, and conversations with well-structured closings would be perceived as better than their ill-formed counterparts, and they were. Participants recalled well-formed interactions 80% of the time when they were asked to recall the best conversation and ill-formed interactions 90% of the time when asked to recall the worst conversation they saw. The main driver of participants' recall judgements was contributional balance, suggesting that contribution balance plays a key role in distinguishing between good and bad conversations. In terms of recognition, participants were faster and more accurate in recognizing well-formed balance, faster and more accurate in recognizing ill-formed grounding, and faster at recognizing ill-formed closings. This work provides initial evidence that individuals viewing previously transcribed conversations encode conversational phenomena during memory formation.

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6:00-7:00 PM (3055)

Use of Spatial Terms in Perceptual Space. MICHAEL LONG, *Florida State University,* MICHAEL KASCHAK, *Florida State University* — In exophoric use, choice between proximal ("this") and distal ("that") spatial demonstratives is determined by whether a referent is in either the peripersonal or extrapersonal perceptual space of the producer, respectively. The distinction line between near and far in spatial demonstrative use depends on the reach of the producer, and this phenomenon is thought to emerge from the frequent use of these terms in combination with pointing gestures to index objects in the environment. However, influence of perceptual space on other spatial terms that indicate near and far and often occur with pointing remains unclear. In a language production task disguised as a memory game, spatial demonstratives and other spatial terms were used to refer to objects in peripersonal or extrapersonal space. Choice between near and far terms were compared to the relative locations of the referents from the speaker.

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6:00-7:00 PM (3056)

Comparison of Acoustic Features in Speech Production Studies Run Online and in the Lab. GIORGIO PIAZZA, *Basque Center on Cognition, Brain and Language (BCBL),* NATALIA KARTUSHINA, *University of Oslo,* JAMES E. FLEGE, *The University of Alabama at Birmingham,* CLARA D. MARTIN, *Basque Center on Cognition, Brain and Language (BCBL) & Ikerbasque* — Recently, the interest in conducting behavioral experiments online has drastically grown. Previous research showed that online experiments can be reliably used in chronometric designs. However, it is unknown whether acoustic measures collected in speech production tasks online are comparable to those in the lab. Here, we aimed to investigate whether speech production research can be moved online by comparing the acoustic features of online and lab recordings. It is known that, in lab settings, low frequency (LF) words are produced with wider extension of vowel space and longer consonant voice onset time (VOT) than high frequency (HF) words. We used this effect to compare acoustic analysis of online and lab recordings during a reading aloud task. We recorded 96 Spanish participants while reading 216 pictures of HF and LF Spanish words. They repeated the task in two counterbalanced sessions, online (from home) and in the lab. Partial analysis on 30 participants with linear mixed models revealed significant frequency effects – wider vowel space and longer VOT for LF than HF words – with no differences between lab/online settings. These pre-results suggest that online studies can be reliably used for speech production research.

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6:00–7:00 PM (3057)

When Does Alignment Make Speaking Easier for Bilinguals? DIANA URIBE, *The University of Texas at El Paso,* IVA IVANOVA, *The University of Texas at El Paso* — Lexical alignment is speakers' tendency to reuse the words of their interlocutor. In the Interactive Alignment theory (Pickering & Garrod, 2004), alignment typically comes from an automatic process, implying lexical access will be faster for aligned responses. We hypothesize that alignment doesn't always facilitate production because it creates lexical competition when the interlocutor's word choice does not match the speaker's preferred word. In the study, English-Spanish bilinguals named and matched pictures with a confederate in Spanish. On critical trials, participants named objects which were previously named by the confederate with either the community-preferred name or with an alternative but acceptable name. We analyzed alignment rates and latencies as a function of participants' own favored names, collected in a preliminary session, and their Spanish proficiency. Pilot results showed that latencies were faster when participants aligned to their own favored name than when they aligned to a disfavored name, as we hypothesized. However, participants with lower Spanish proficiency showed numerically greater alignment, implying that alignment may still mitigate the production difficulties associated with lower proficiency.

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6:00–7:00 PM (3058)

The Language of Trauma. EMILIE ALTMAN, *McMaster University,* VICTOR KUPERMAN, *McMaster University* — How does trauma affect language? Our project aims to answer this question by using data from the Shoah foundation, which has collected over 700 interviews with Holocaust survivors. This data has previously been used only for automated speech-to-text applications. As far as we know, our research is the first to analyze the content of these interviews. Our objective is to improve understanding of the language of trauma by analyzing the transcribed speech of survivors. We will work towards this goal by performing keyword analysis, topic modeling, and sentiment analysis to discover markers of trauma in the data. Beyond providing insights about the reflection of trauma on language, this corpus analysis creates a benchmark for comparison with other accounts from survivors of trauma and atrocities. This benchmark will allow us to discover the linguistic similarities between survivors of different traumas, as well as the unique characteristics exhibited by survivors of a common trauma.

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6:00–7:00 PM (3059)

Linearization Strategies: Revisiting the Network Description Task. MADISON BARKER, *University of California, Davis,* YUJING HUANG, *Boston College,* FERNANDA FERREIRA, *University of California, Davis* — Language production is generally believed to be an incremental process; however, the degree of incrementality is somewhat unclear, especially for production of multiple utterances. In this study, we revisited a network description task with the addition of eyetracking to examine the relationship between fixated regions and the mention of fixated locations to estimate the coupling between the attentional and linguistic systems. Participants were shown network structures that consisted of two branches varying in length (number of nodes) and complexity (number of choice points). Subjects described the network while their eye movements were recorded. As previously reported, subjects tend to first describe the branch that contained fewer nodes or choice points, consistent with the minimal-load principle. Approximately 2.7 fixations were made prior to description onset, and speakers were on average 1.7 nodes ahead of the fixation location. These results are consistent with extensive planning prior to initiation of a complex description.

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6:00–7:00 PM (3060)

Title: Is Syntactic Priming Modulated by Socio-Political Stance? ERIC MARTELL, *University of Michigan Ann Arbor,* JULIE E. BOLAND, *University of Michigan Ann Arbor* — Syntactic priming is thought to be automatic and insensitive to external nonlinguistic factors. Yet a few prior studies found that external social factors can moderate the degree of syntactic priming (Balcetis & Dale, 2005; Weatherholtz et al., 2015). Motivated by these findings, the current study investigated whether socio-political agreement affects the degree of syntactic priming. Participants listened to a pre-recorded speaker, with one of three socio-political stances, explain his beliefs on the topics of climate change, wages, and healthcare. To measure the degree of syntactic priming, we used a picture description priming task: Participants listened to the pre-recorded speaker describe drawings designed to elicit dative sentences, and then described similar novel drawings themselves. Robust syntactic priming effects were found. In contrast to Balcetis & Dale (2005) and Weatherholtz et al. (2015), socio-political agreement did not affect the degree of syntactic priming.

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6:00–7:00 PM (3061)

Adults Learn Phonotactic Constraints Through the Lens of Prior Knowledge: Evidence from Speech Errors. NICOLE I. MIREA, *Northwestern University,* MATTHEW GOLDRICK, *Northwestern University* — How do adults use prior knowledge to help them learn phonotactic constraints? Past production studies have shown that second-order phonotactic constraints—which involve associations between multiple syllable positions (e.g., "if /i/ is the vowel, /s/ must be a coda")—are especially difficult to learn (Warker & Dell, 2006; cf. Smalle & Szmalec, 2022). We tested how prior experience with one constraint type (either from the speaker's native language or pre-training) may help learning of a new, similar constraint. In contrast to previous studies, we trained participants on either an onset-vowel or vowel-coda constraint. We find evidence of influence from both the native language (English, which favors vowel-coda constraints) and transfer from pre-training. Participants successfully associated restricted consonants with the trained vowel, but

over-extended this restriction to another vowel, indicating incomplete learning. However, despite being the largest study of its kind (min. N=21 participants per condition, N=69 total), we found no consistent effect of sleep. Implications for phonotactic learning and consolidation will be discussed.

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6:00–7:00 PM (3062)

Overspecification Effects Are Not Uniform: Featural vs. Taxonomic Overspecification in Referring Expressions. CASEY M. RIEDMANN, *Northwestern University,* WILLIAM S. HORTON, *Northwestern University* — Speakers often overspecify referring expressions (e.g., red car in a singular car context), defying traditional expectations of communicative efficiency. Unclear, however, is whether subordinate-level labels (e.g., convertible for car) resemble other overspecification forms' production/comprehension patterns. In Experiment 1, participants produced referring expressions for target items across different contexts (Competitor vs. Noncompetitor, with competitors varying by color, type, or both). Participants overspecified in 63% of trials, overspecifying color more than subordinates. In Experiment 2, participants read a label followed by a four-item display and selected the corresponding item under time pressure (ongoing experiments are using auditory labels that run concurrently with display images). Labels were either sufficient (CAR) or overspecified via color (RED CAR), type (CONVERTIBLE), or both (RED CONVERTIBLE). Results showed that color but not subordinate overspecifications reduced RT. Together, these experiments suggest production/comprehension differences between the two overspecification forms, challenging assumptions that overspecification is intended solely to aid listeners.

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6:00–7:00 PM (3063)

Event-Related Potentials and Neural Oscillations During Verb-Noun Collocational Processing. YUN RUEI KU, *The University of Alabama* (Sponsored by Yun Ruei Ku) — This study aims to pinpoint the time windows and frequency bands at which the encoding of English verb-noun collocations differs between English monolinguals and Mandarin-English bilinguals. This study aims to investigate the following: (1) To what extent do sequential Mandarin-English bilinguals process English (L2) verb-noun collocations differently than native speakers during sentence comprehension tasks with highly plausible collocations versus less plausible collocations embedded in sentences? (2) To what extent do co-occurrence frequencies, derived from the corpus collocation association index, inform our understanding of the relationship between individual words, and are the frequencies predictive of neurophysiological and behavioral results? (3) To what extent are the neurophysiological results compatible with assumptions of prevalent psycholinguistic models of bilingual word recognition? Understanding the basic combinatorial operations during language processing and which external factors may influence these construction processes will provide a critical bridge to rehabilitation and essential interventions for less proficient L2 readers.

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6:00–7:00 PM (3064)

Behavioral and Neural Signatures of Language Learning at the Earliest Stages. MEGAN NAKAMURA, *University of Florida,* CESAR M. ROSALES, *University of Florida,* GUADALUPE MENDOZA, *University of California, Irvine,* KELLIE WEAST, *University of California, Irvine* — This study investigated the earliest behavioral and electrophysiological (EEG) signatures of novel language learning. Critically, we asked how variability in language experience and language environment modulates these effects. Three groups completed a short-term Dutch learning training (1 hr/day for 10 days) and a linguistic and cognitive battery pre- and post-training. Learning was measured via pre- and post-comparison of an EEG semantic categorization task. Participants included an immersed group of monolingual English speakers in The Netherlands, a non-immersed group of monolingual English speakers in southern California (where the environment is highly Spanish bilingual), and a group of monolingual English speakers in central Florida (where the environment is largely English dominant). Preliminary results reveal that all groups successfully learned Dutch. A significant reduction of the N400 at a post-test reflected ease of lexical access in long-term memory suggesting rapid encoding and consolidation of new linguistic information. Plans for future analysis include a more sensitive assessment at the level of individual variability in language experience and linguistic environment.

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6:00–7:00 PM (3065)

The Influence of Native Language and Sentence Form on Memory of Motion Events. STEPHANIE LOPEZ, *Louisiana State University,* JANET L. MCDONALD, *Louisiana State University* — English is a satellite-framed language, which encodes manner of motion on verbs. This may cause English speakers to attend to manner, particularly in verbal encoding conditions. Native English speakers and Spanish-English bilinguals performed a recognition memory task as well as a similarity judgement task in two different encoding conditions: verbal and verbal suppression. In the recognition memory task, they indicated whether they had viewed videos in a previous session. In the similarity judgement task, participants indicated whether they perceived a manner-matched motion event or a path-matched motion event as being most similar to a target event. As compared to English speakers, Spanish-English bilinguals' verbal descriptions were less likely to encode manner on the verb, and more likely to leave out path, particularly for salient motion events. On the recognition test, the Spanish-English bilinguals were more likely to falsely recognize both manner-matched and path-matched videos than English speakers when the motion events were salient. A second study, which manipulated English speaking participants' descriptions of motion events, attempted to clarify the relationship between description and performance.

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6:00–7:00 PM (3066)

High Rising Terminals as a Function of Gender, Race, and Social Status. CAITLIN R. VOLANTE, *Florida State University,* MICHAEL KASCHAK, *Florida State University,* KATHERINE CHIA, *Florida State University* — High rising terminals (HRTs) occur when speakers raise the pitch of their voice at the end of sentences that would typically use a falling intonation contour. HRTs serve many purposes in conversations, but the use of this prosodic feature is often stigmatized, with speakers being commonly perceived as uncertain or unintelligent. This project examines how the factors of race, gender, and social status influence a listener's impression of speakers who use HRTs. Participants saw pictures of different speakers and rated initial impressions of knowledgeability and trustworthiness. Then, after listening to a recording assigned to the picture, they rated how confident they thought the person was, and answered whether they thought the statement was true or false. Results show race and gender having an interaction affecting first impressions of trustworthiness, and that higher levels of trustworthiness are positively associated with an impression of confidence from the speaker. Results further show women using HRT as a cue for determining the accuracy of statements.

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6:00–7:00 PM (3067)

Discourse Focus Facilitates Processing During Online Sentence Comprehension: A Successful Replication of Cutler and Fodor's (1979) Influential Findings. ELEONORA BEIER, *University of California, Davis,* FERNANDA FERREIRA, *University of California, Davis* — We attempted to replicate a foundational study by Cutler and Fodor (1979). This study sparked several lines of research into the role of information structure in language comprehension, based on the proposal that discourse, prosodic, and syntactic focus all guide the comprehender's attention to new, important information. Using phoneme monitoring, Cutler and Fodor found that word-initial phonemes in acoustically identical sentences were identified faster when the word had been focused, as opposed to defocused, by a preceding question. We replicated this study and compared the results of the original statistical analysis to those of updated analyses following current standards. We found that the critical interaction between focus and target position replicates using both the original and the updated analyses. By establishing that the effect of discourse focus on reaction times is robust, our findings support the idea that cues of information structure dynamically allocate attention towards important information. This successful replication provides a stronger foundation for the many lines of research that have followed Cutler and Fodor, and it is likely to spark new investigations into information structure.

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6:00–7:00 PM (3068)

Sarcasm Use Varies by Country, Gender, and Age. DAWN G. BLASKO, *The Pennsylvania State University, Erie,* VICTORIA A. KAZMERSKI, *The Pennsylvania State University, Erie,* SHARIFFAH SHEIK DAWOOD, *The Pennsylvania State University, Erie* — Sarcastic language is common across the world, but our research suggests that there are meaningful differences based on how often and for what communicative purpose it is used. We conducted an on-line survey of 1136 participants from three countries, the United States, Mexico, and China. Participants ranged in age from 18–86 years. Participants completed a modified version of the Sarcasm Self-Report Scale (SSRS) as part of a larger battery. This measure includes subscales of General Use, Face Saving, Frustration Diffusion, and Embarrassment Diffusion. Responses were analyzed based on participants' Age, Gender, and Country (as a proxy for culture). The analysis by age showed a strong negative relationship between sarcasm and age; older participants reported less sarcasm use overall. The results showed interesting interactions between County, Age, and Gender. For example, the Embarrassment Diffusion subscale was seen as a more important reason to use sarcasm in the US and China than in Mexico. Males in Mexico and the US generally scored higher on sarcasm use than females; however, this pattern was reversed for China.

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6:00–7:00 PM (3069)

Examining Choices of Sarcastic Responses in Dialogue with Virtual Interlocutors. SAMANTHA LANGLEY, *University of South Carolina,* AMIT ALMOR, *University of South Carolina* — Is using sarcasm influenced by a conversation partner's use of sarcasm, by whether a previous dialogue was sarcastic or not, and by whether the previous dialogue was with the same or different partner? In three experiments, each consisting of two 20-turn dialogues, partners started each turn and participants then chose a response from among four choices expressing sincere agreement or disagreement, a neutral response, or sarcasm. Partners were either sincere or sarcastic for the entire dialogue. The second dialogue was with either the same or a different partner. In E1, partners were avatars who communicated through text. In E2&E3, partners in the different partners conditions were two females (E2) or male and female (E3) who communicated through premade video recordings. Overall, participants chose more sarcastic responses when interacting with a sarcastic partner but in E2&E3 choices in the second dialogue were affected by sarcasm use in the first dialogue. In E2&E3 there was also an interaction between the two factors. Changed partner identity did not affect choices. We conclude that recent experience with sarcasm and partner's sarcasm, but not the identity of the conversation partner, increase the likelihood of using sarcasm.

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6:00–7:00 PM (3070)

Elliptical Answers to Requests for Information. KATHERINE CHIA, *Florida State University,* MICHAEL KASCHAK, *Florida State University* — When faced with a simple request for information (e.g., What time did you get up this morning?), a speaker may reply with a full sentence (I got up at 9) or make an elliptical

response (Nine o'clock). Following the proposals of Ginzburg & Sag (2000), we explore the claim that elliptical responses are more likely when speakers make an immediate response to the question. Delayed responses may happen when the speaker responds to the direct component of an indirect request (Q: Can you tell me what time you got up this morning? A: Sure. I got up at 9) or in cases where the speaker does not immediately know the answer to the question (Q: What time did you get up this morning? A: Um…I got up at 9). We present data supporting the claim that elliptical responses are more likely when speakers make immediate responses.

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6:00–7:00 PM (3071)

Retrieval Interference in the Processing of Relative Clauses: Evidence from the Visual-World Paradigm. MATTHEW LOWDER, *University of Richmond,* GWYNNA RYAN, *Northwestern University* — Although a large literature demonstrates that object RCs are harder to process than subject RCs, there is less agreement regarding where during processing this difficulty emerges, as well as how best to account for these effects. For example, the literature is mixed on whether ORC-SRC effects emerge reliably at the matrix verb and what such a pattern might suggest. Whereas the vast majority of previous experiments on RC processing have been conducted in the written domain, the current visual-world eye-tracking experiment was designed to test whether ORC-SRC differences would emerge at the matrix verb during spoken sentence processing. Participants listened to sentences containing ORCs (The cat that the dog watched jumped…) and SRCs (The cat that watched the dog jumped…) while looking at a visual display of four pictures (a cat, a dog, and two distractors). Fixation patterns at the onset of the matrix verb revealed significant differences between ORCs and SRCs in tendency to fixate the two target pictures. The results are most readily explained under a memory-retrieval account of RC processing; that is, retrieval of the matrix subject was easier with less interference from the second noun phrase in the SRC than the ORC sentences.

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6:00–7:00 PM (3072)

The Effect of the Previously Acquired Languages on Third Language Acquisition. XIAOYU LUAN, *Waseda University,* MASAKAZU KUNO, *Waseda University,* AYAKA SUGAWARA, *Waseda University,* YAYOI KAWASAKI, *Waseda University,* ERIKO SUGIMORI, *Waseda University* — Our study explores how previously acquired languages affect third language acquisition. The participants were Native Japanese learners of English and Chinese, and Native Chinese learners of English and Japanese. They were asked to compose adpositional phrases and relative clauses, and judge sentences with strict/sloppy readings, presented in their third language. We found that Native Japanese Learners of Chinese were more influenced by the second language (English) in the adpositional phrase and relative clauses stimuli compared to Native Chinese learners of Japanese, while both groups were more influenced by their native language compared to the second language (English) in the strict/sloppy interpretation stimuli. These results indicate that first, third language acquisition can simultaneously be influenced by all the previously acquired languages; and second, the interrelationship of sub-grammars in sentence structure is likely to be an important factor influencing learners' assessment of the structural similarity of the selected sub-grammars. In addition to this, we found that when learners were confronted with difficult tasks, they were more likely to draw on their experience with the acquired language, but this was accompanied by decreased confidence. The results are consistent with the claims of hybrid transfer models (e.g., Westergaard et al., 2017), opposing the claims of The Typological Primacy Model (Rothman, 2015).

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6:00–7:00 PM (3073)

They Was Giving Accurate Judgments: Speakers of Mainstream American English Show Partial Knowledge of Non-Mainstream Grammar. ZACHARY MAHER, *University of Maryland, College Park,* JAN EDWARDS, *University of Maryland, College Park,* JARED M. NOVICK, *University of Maryland, College Park* — Listeners accommodate anomalous utterances from speakers of other languages or dialects, but whether they know the rules of dialects they do not produce remains unknown. We tested whether speakers of Mainstream American English (MAE) know the subject-verb agreement patterns of African American Language (AAL). Participants listened to audio files that represented MAE and AAL, and rated sentences according to whether a speaker of each variety would likely say them. There were three conditions: grammatical in MAE and AAL (She was eating), ungrammatical in both (She was eat), and grammatical in AAL only (They was eating). Participants gave higher ratings for MAE-ungrammatical sentences when they were attributed to an AAL rather than MAE speaker, and higher ratings to AAL-grammatical sentences than ungrammatical ones. There was an interaction: ratings were higher for AAL-grammatical sentences when they were attributed to an AAL speaker ($p < .001$). This indicates that MAE speakers relax their expectations of grammaticality when hearing AAL, but they also expect specific AAL patterns. In ongoing work, we test the precision of MAE speakers' knowledge of AAL grammatical patterns and how this knowledge affects the processing of spoken input.

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6:00–7:00 PM (3074)

Exact or Approximate? How Is Number Information Represented During Language Comprehension? NIKOLE PATSON, *The Ohio State University,* STEPHANIE R. KARRICK, *The Ohio State University,* MOLLY QUINN, *The Ohio State University* — In this experiment, participants read sentences that contained the plural quantifiers "three" and "ten". After reading a sentence with a quantifier, they saw a picture of dots and were asked to judge whether one dot or more than one dot appeared on the computer

screen. In half of the trials, the number of dots matched the number in the quantifier (3, 10), in the other half of trials, there were more dots than in the quantifier (4, 15). There was a significant interaction between quantifier and picture condition: Participants were faster to judge "one" compared to "more than one" in the "three" condition, and faster to judge "more than one" compared to "one" in the "ten" condition. These data suggest that number information activated during comprehension is exact for small numbers and approximate for large numbers.

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6:00–7:00 PM (3075)

The Learnability of the Morphophonological Distinctions Between Noun-Verb Pairs in American Sign Language. JENNIE PYERS, *Wellesley College,* KATHRYN MARTON, *Wellesley College,* KRISTIANNY RUELAS-VARGAS, *Wellesley College* — Across sign languages, nouns can be derived from verbs through morphophonological changes in movement by movement reduplication and size reduction or size reduction alone. This cross-linguistic pattern does not emerge as a result of cognitive biases to interpret reduplication and reduction as "object-like." Indeed, non-signers overwhelmingly interpret ASL signs with reduced and reduplicated movement as "action-like", especially when reduplicated movement is a contrastive feature. We asked whether these initial cognitive biases would negatively affect learning noun-verb pairs in a sign language. In a 2 x 2 design we randomly assigned 72 non-signing undergraduates to learn noun-verb pairs that either matched the movement patterns used across sign languages (reduplication and size reduction or size reduction alone to mark nouns) or that matched the movement biases held by non-signers (the reverse pattern). We measured speed and accuracy during a sign recall test. We predicted an interactive effect such that non-signers would perform better and faster in the conditions that matched their initial biases, and this effect would be greatest when movement reduplication was contrastive. Analyses are ongoing.

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6:00–7:00 PM (3076)

Reading Behaviour in Bilingual Younger and Older Adults: An Eye-Tracking Investigation of Word Age of Acquisition Effects. NARISSA BYERS, *University of New Brunswick, Fredericton,* COURTNEY STACEY, *University of New Brunswick,* GABRIELLE A. LEVASSEUR, *University of New Brunswick,* DEBRA TITONE, *McGill University,* VERONICA WHITFORD, N/A, *University of New Brunswick* — Although cognitive aging and bilingualism rates are on the rise globally, little experimental research has investigated how they jointly influence neurocognitive skills that are crucial to older adults' daily lives, such as reading (Whitford & Titone, 2016, 2017). Here, we help address this critical gap in the literature by examining both first-language (L1) and second-language (L2) eye movement reading behaviour for naturalistic texts in French-English bilingual younger and older adults (n = 62/age group) as a function of a key lexical property: word age of acquisition (AoA)—the age at which words were learned. Linear mixed-effects models revealed robust word AoA effects across both age groups (and both languages), where words learned earlier in life received shorter fixation durations than those learned later in life. However, the magnitude of these effects was larger in older adults (across both languages) and during L2 reading (across both age groups). Taken together, our findings suggest that word AoA strongly influences eye movement reading behaviour across the adult lifespan, but especially under conditions that involve less extensive semantic networks and/or less efficient access to these networks.

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6:00–7:00 PM (3077)

The Relationship Between Personality Traits and the Processing of Emotion Words. REBECCA L. JOHNSON, *Skidmore College,* MEGAN WOOTTEN, *Skidmore College,* ABBY SPEAR, *Skidmore College,* ASHLEY SMOLENSKY, *Skidmore College* — Previous research shows that fixation times on emotion words (both negative and positive) are shorter than on non-emotional neutral words (Knickerbocker et al., 2014; Scott et al., 2012). There is also evidence that certain personality traits are correlated with variability in emotion processes (Hamann & Canli, 2004). Levels of emotional intelligence have also been shown to be positively correlated with emotion information processing (Austin, 2005). In the current study, we explored how these personality traits (the Big Five and the Trait Emotional Intelligence factors) may further influence the processing of emotion versus non-emotion words in the context of silently reading sentences while eye movements were recorded. Although the emotion effect did not strongly interact with any of the personality traits, there were a number of main effects suggesting that there are overall differences in reading patterns as a function of one's personality.

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6:00–7:00 PM (3080)

Investigating the Relationship Between Language Skill and Semantic vs. Orthographic Processing: Evidence from the N400 ERP Component. BRIAN NESTOR, *University of South Florida,* ELIZABETH R. SCHOTTER, *University of South Florida,* SARA MILLIGAN, *University of South Florida* (Sponsored by Elizabeth Schotter) — Prior work on the N400 ERP component demonstrates that readers use semantic representations generated from context to facilitate word recognition. However, the extent to which individuals vary in their sensitivity to word expectancy and semantic fit is not well described. Previous ERP studies have found that highly proficient readers are more sensitive to the semantic content of words, including cloze probability. Thus, it is possible that good comprehenders are better at constructing supportive semantic representations from sentence context and rely more on prediction. On the other hand, good spellers are adept at discerning bottom-up orthographic input which may make them more efficient at recognizing words in

less constraining contexts. In this study, we investigate whether an individual's language skill (i.e., spelling, vocabulary, reading comprehension) modulates N400 amplitude. Participants read sentences in which the sentence context was manipulated to make the final word either expected, unexpected, or an anomalous orthographic neighbor of an expected word. We collected multiple assessments of language skill. Here we report the relationship between these individual differences variables and the N400 amplitude.

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6:00-7:00 PM (3082)

Parafoveal Processing in Chinese Reading: Further Evidence for the Multi-Constituent Unit (MCU) Hypothesis. CHUANLI ZANG, *University of Central Lancashire,* ZIJIA LU, *Tianjin Normal University,* XUEJUN BAI, *Tianjin Normal University,* GUOLI YAN, *Tianjin Normal University,* SIMON P. LIVERSEDGE, *University of Central Lancashire* — How is lexical processing in natural Chinese reading operationalized across potentially ambiguous adjacent character sequences? We focused on frequently occurring Multi-Constituent Units (MCUs), comprised of more than a single word, that might be accessed lexically as a single unit. Using the boundary paradigm (Rayner, 1975), we manipulated preview of each target string constituent for three-character famous people's names (Experiment 1), place names (Experiment 2), product names (Experiment 3) and modern phonetic borrowings (Experiment 4). The results showed consistent patterns supporting the MCU hypothesis. There were more pronounced preview effects for the second constituent when the first constituent was present than absent in the parafovea, suggesting that parafoveal processing of the second constituent was licensed by the presence of the first. These target strings appear to be lexicalized and processed parafoveally as single units (MCUs) during Chinese reading.

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6:00-7:00 PM (3084)

Temporal Eye-Voice Span in Naming Tasks as an Index of Cascading Efficiency. ANGELIKI ALTANI, *University of Oslo,* ATHANASIOS KATSAMANIS, *Athena Research Center,* THEODOROS KOUZELIS, *Athena Research Center,* DANAI VOUKELATOU, *University of Gothenburg,* DZAN ZELIHIC, *University of Oslo,* KRISTIN SIMONSEN, *University of Oslo,* LAOURA ZIAKA, *University of Oslo,* ATHANASSIOS PROTOPAPAS, *University of Oslo* — In naming tasks a serial advantage is commonly observed, that is, naming rates are higher when items are presented simultaneously in arrays (serial naming) than when presented individually (discrete naming). The serial advantage is thought to reflect partial temporal overlap of processing adjacent stimuli ("cascading"), with greater overlap presumably indexing greater efficiency. To quantify the overlap we recorded eye movements and spoken responses of 70 Grade 2 and 30 Grade 5 Norwegian children to discrete and serial naming of digits and objects. Following gaze-voice alignment, we will calculate the temporal eye-voice span (tEVS; the time lag between fixation onset and articulation onset of an item). The discrete tEVS provides a baseline of the time needed to process an item in isolation, to be compared to the serial tEVS to quantify the cost of cascading for stimuli that are processed more efficiently (digits; mostly automatized) or less efficiently (objects; semantically mediated) in beginner (G2) and more advanced (G5) readers. In addition, the time from fixation offset to articulation onset will provide an index of buffering requirements for items seen but not yet pronounced, expected to covary with efficiency and skill.

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6:00-7:00 PM (3085)

Sticks and Stones: The Bidirectional Relation Between Peer Victimization and Literacy Achievement. ARIEL CHAVERS, *University of Delaware,* STEPHANIE DEL TUFO, *University of Delaware* — Low literacy is well-linked to students' academic achievement (NAEP, 2019). Yet, the consequence of struggling to comprehend and write grade-level texts pervades students' social and emotional well-being. Students with low literacy often display internalizing (negative emotions) and externalizing (aggression) behaviors (e.g., Arnold et al., 2005), increasing students' risk of experiencing peer victimization (Cook et al., 2010). Research has examined the link between peer victimization and academic performance; however, the connection between peer victimization and students' literacy remains less well understood. The current study focused on how peer victimization impacted students' literacy and if poor literacy skills increased the likelihood of peer victimization. Regardless of literacy modality and genre, results indicated a pervasive association between peer victimization and students' literacy achievement, an association that was higher in racial minorities and students at socioeconomic disadvantage. Moreover, poor literacy skills were associated with increased peer victimization, an association exacerbated by gender and age.

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6:00-7:00 PM (3086)

Processing Singular They/Them During Reading: The Moderating Effect of Frequency. MICHAEL A. ESKENAZI, *Stetson University,* MORGAN R. LIPKIN, *Stetson University,* MACKENZIE SHAW, *Stetson University,* LUCAS SURRENCY, *Stetson University,* LOU PAVEK, *Stetson University* — The pronouns they and them are typically considered third person plural pronouns but can also be used in the singular form in two cases: when the gender of the antecedent is unknown or when an individual prefers to use these pronouns. There is some debate as to whether the use of singular they/them causes processing disruptions while reading with some evidence suggesting a cost (Sanford & Filik, 2007) and other suggesting no disruption (Doherty, 2013). The purpose of the current study was to determine whether the presence of a processing cost is influenced by the frequency that the reader uses they/them in a singular form. Participants read sentences with a singular or plural gender-neutral antecedent (someone or some people) followed

by a singular or plural pronoun (she/he or they/them) while their eye movements were monitored. Participants who reported infrequently using they/them in the singular form had significantly longer reading times on they/them when it was preceded by a singular antecedent (someone) compared to a plural antecedent (some people). These findings support a frequency view of grammatical processing (Diessel & Hilpert, 2016) as opposed to the view that they/them is always processed initially as plural.

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6:00–7:00 PM (3087)

Bilinguals' Auditory Imagery During Silent Reading. LAURA P. VALDERRAMA, *University of Illinois Urbana-Champaign,* PEIYUN ZHOU, *Google,* KIEL CHRISTIANSON, *University of Illinois Urbana-Champaign* — Auditory perceptual simulation (APS) during reading is when readers actively mentally simulate a person's voice as they read silently. Inducing APS during silent reading results in observable differences in reading speed and processing patterns among native English speakers. This eye-tracking study investigated effects of APS on reading times and reading comprehension of English non-native (L2) speakers. L2 English speakers were cued to activate APS of native and non-native English speech during silent reading of sentences with manipulations of semantic plausibility and syntactic structure. Results show APS modulated L2 English speakers' reading times and reading comprehension similarly to native speakers. L2 readers' comprehension accuracy was significantly better when cued to activate APS. Participants read faster when imagining a faster native English speaker's voice compared to imagining a slower non-native speaker's voice. Additionally, APS effects may be linked to readers' attitudes towards native and non-native English speech.

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6:00–7:00 PM (3088)

Length, Frequency, and Predictability: Examining the Impact of the Big 3 on Skilled Deaf Readers. FRANCES G. COOLEY, *University of South Florida,* ELIZABETH R. SCHOTTER, *University of South Florida* — Eye-tracking studies have found that skilled Deaf readers take greater advantage of visual information outside of the fixation point in upcoming text than hearing readers. However, relatively little is understood about the specific characteristics of printed language that result in these differences. Both experimental and corpus-based work reveals that the "Big Three" lexical properties of word length, frequency, and predictability exert the strongest influence on reading behaviors for hearing readers and each represent a different aspect of the reading process: visual, lexical, or contextual processing. We compare the influence of the Big Three on Deaf and hearing readers' eye-movements using both an experimental approach where we manipulate target words to be short vs. long, high vs. low frequency, high vs. low predictability, as well as a corpus approach in which we collect data for all words in the sentence and enter all these variables as continuous predictors of reading behavior. Based on whether the length, frequency, or predictability effect shows the biggest difference between deaf and hearing readers, we would conclude that reading is primarily a visual, lexical access, or "good enough" predictive process, respectively.

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6:00–7:00 PM (3089)

Paired-Associate Learning and Statistical Learning as Predictors of Variance in Orthographic Learning. KIMBERLY C. LOUIS-JEAN, *Tufts University,* ARIEL GOLDBERG, *Tufts University* — Reading is a crucial skill for everyday life. As a result, understanding how we learn to read could have a large impact on educational practice. Studies have recently begun to examine the role that domain-general learning mechanisms such as paired associate learning (PAL) and statistical learning (SL) play in reading acquisition. Unfortunately, results have been mixed and have not illuminated what specific components of the reading architecture they may support. The present study investigated this question using 2 artificial orthography tasks to measure adult participants' ability to learn new writing systems. Participants were also administered a visual-visual PAL task and a nonlinguistic visual SL task. Data collection is still ongoing (target n=85) but when complete, performance on these tasks will be correlated in order to examine each learning mechanism's potential involvement in acquisition of grapheme-phoneme mapping and whole word access.

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6:00–7:00 PM (3090)

Development of Two Tests of Reading Comprehension Efficiency. KRISTIN SIMONSEN, *University of Oslo,* ANGELIKI ALTANI, *University of Oslo,* DZAN ZELIHIC, *University of Oslo,* LAOURA ZIAKA, *University of Oslo,* DAVE BRAZE, *Haskins Laboratories, Yale University,* ATHANASSIOS PROTOPAPAS, *University of Oslo* — The efficiency of reading comprehension is rarely considered; we know little about the rate at which readers extract information. Here we aim to develop measurement tools to capture reading comprehension efficiency in beginner and advanced readers and test their additive validity over oral reading fluency in evaluating reading interventions. We designed a sentence verification (SV) task, in which children judge the veracity of single unrelated sentences (as in TOSREC), and a picture selection (PS) task, in which children select the picture that corresponds to a brief passage, in a sequence amounting to a coherent story. In both tasks children read silently, as fast as possible within a fixed amount of time. Pilot data have been collected from Grade 2 children (SV: 70; PS: 93); Grade 5 data collection is ongoing. Children are also tested with word reading efficiency (TOWRE) and reading comprehension (NARA) tests. SV and PS items are excluded if their accuracy or response time is negatively correlated with NARA or with each other. Accuracy and response time limits are applied so that most children will get enough items correct within the allotted time to compute a reliable index (items/minute). Validation data will be reported.

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6:00–7:00 PM (3091)

Reading Fluency Deficits in Schizophrenia: Evidence from Return-Sweep Saccades. ANDRIANA L. CHRISTOFALOS, *University at Albany, SUNY,* MADISON LAKS, *University at Albany, SUNY,* STEPHANIE WOLFER, *Nathan Kline Institute for Psychiatric Research,* ELISA C. DIAS, *New York University Grossman School of Medicine,* DANIEL C. JAVITT, *Columbia University,* HEATHER SHERIDAN, *University at Albany, SUNY* — Return-sweep saccades are eye movements that are made when readers move from the end of one line in a passage to the beginning of the next line. Readers often under-shoot a return-sweep saccade and require a corrective saccade to fixate at the appropriate line-initial location. Given that prior work examining oculomotor deficits in readers with Schizophrenia (Sz) has primarily focused on single-line and single-word reading tasks, return-sweep saccades have not yet been examined in Sz. To assess return-sweep saccades in Sz, we analyzed an existing dataset (Dias et al., 2021) in which participants read multi-line passages in four different line-spacing conditions. The probability of making a corrective saccade following a return-sweep was higher in readers with Sz compared to healthy controls. Because visual acuity constraints do not permit lexical processing of line-initial words when return-sweep saccades are initiated, our findings provide evidence for low-level oculomotor deficits in Sz during reading. Consistent with prior research showing that increased visual crowding disrupts saccade targeting, the probability of making a corrective saccade was higher for condensed passages compared to double- and triple-spaced passages.

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6:00–7:00 PM (3092)

Do Phonological Processing Skills Differentially Modulate Monolingual and Bilingual Children's Reading Behaviour for Naturalistic Texts as a Function of Word Frequency? An Eye-Tracking Investigation. ERIKA L. GUEDEA, *University of New Brunswick,* SARAH MACISAAC, *University of New Brunswick,* MARC F. JOANISSE, *Western University,* VERONICA WHITFORD, N/A, *University of New Brunswick* (Sponsored by Veronica Whitford) — Relatively little experimental research has investigated reading behaviour in children, especially those from bilingual backgrounds, despite its importance to their learning outcomes and academic success. We help address this imbalance in the literature by examining how differences in an important reading-related skill, phonological processing (assessed with the CTOPP), among English monolingual (n = 34) and English-French bilingual (n = 33) school-aged children influence their first-language (L1) and second-language (L2) eye movement reading behaviour for texts containing target words varying in word frequency. Linear mixed-effects models revealed that reduced L1 phonological processing skills related to reduced L1 lexical accessibility (evidenced by larger L1 word frequency effects) in both language groups, but especially so in bilingual children. Further, reduced L2 phonological processing related to reduced L2 vs. L1 lexical accessibility (evidenced by larger L2 word frequency effects) among bilingual children. Our findings suggest that phonological processing skills strongly influence children's online reading behaviour, but particularly under conditions of low lexical entrenchment: among bilinguals and during L2 reading.

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6:00–7:00 PM (3093)

Predictors of Beginning Readers' Comprehension of Cohesive and Less Cohesive Texts. BRENDA A. HANNON, *Texas A&M University-Kingsville* — It is generally accepted that cohesive texts are easier to understand than less cohesive texts. Yet little is known as to why this might be so. In the present study we used structural equation models to identify the source(s) of the differences between cohesive and less cohesive texts. Beginning readers completed multiple measures assessing word decoding (letter-word identification, phonological decoding), working memory, knowledge of syntax, knowledge integration, and working memory, and then their performances on these measures were used to predict their comprehension scores on cohesive and less cohesive texts. The results revealed that all of the component skills influenced cohesive and less cohesive texts. However, cohesive texts also influenced the knowledge integration skills of beginning readers, whereas less cohesive texts did not. In other words, knowledge integration was recursive, inasmuch as knowledge integration influenced cohesive texts and cohesive texts influenced knowledge integration.

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6:00–7:00 PM (3094)

Incidental Lexical Acquisition Among Nonnative English Speakers. ASHLEY N. ABRAHAM, *Grinnell College,* ADRIAN BRADLEY, *Grinnell College,* ABIGAIL SMITH, *Grinnell College,* SHAUNA DE LONG, *Kenyon College* — Previous research demonstrated reciprocal benefits of incidental semantic and orthographic learning of novel words presented in context (de Long & Folk, 2022). To further our understanding of incidental vocabulary acquisition, the current study expands on this work to include nonnative English speakers. Native and non-native speakers were presented with novel words in either a repeated informative sentence context or three different informative sentence contexts. Following three exposures in the learning phase, participants completed surprise recognition tests of spelling and meaning acquisition. An examination of errors by nonnative speakers revealed differences in error type across conditions. Conditional analyses based on spelling and meaning accuracy suggested reciprocal benefits of orthographic and semantic learning for all participants, but this effect was greatest for nonnative speakers. Together the results indicate encoding differences between native and nonnative speakers. These findings suggest that incidental lexical acquisition among nonnative speakers is facilitated by the presentation of new vocabulary words in varied contexts and by learning situations in which both spelling and meaning are presented.

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6:00–7:00 PM (3095)

The Continued Influence Effect of Misinformation: Comparing the Effects of Divided Attention at Both Correction Encoding and Retrieval. COURTNEY A. KURINEC, *Washington State University,* ANTHONY R. STENSON, *Washington State University,* PAUL WHITNEY, *Washington State University,* JOHN M. HINSON, *Washington State University* — Misinformation can continue to influence inferences and decisions after people are given corrections, a phenomenon referred to as the continued influence effect of misinformation (CIEM). The predominant explanations for CIEM attribute this phenomenon to either failure to encode the corrected information, or failure to inhibit misinformation at retrieval, but no studies have directly compared these processes in the same task. To determine whether encoding or retrieval processes more strongly influence CIEM, we used a divided attention task to selectively interfere with encoding or retrieval and tested the subsequent effects on memory and CIEM. Participants read news articles and follow-up articles (which either provided a correction or not), and after a filler task, answered questions about the events. Participants were randomly assigned to one of three groups: divided attention during the follow-up articles, divided attention at test, or control (no divided attention). Preliminary results indicate that divided attention at test leads to lower memory for the event, but misinformation inferences did not differ by condition. The findings from this project may clarify whether one or both processes are essential to CIEM.

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6:00–7:00 PM (3096)

Effects of Attention at Encoding and Retrieval on Short- and Long-Term Emotional False Memories. ELIZABETH M. MARSH, *Illinois State University,* DAWN M. MCBRIDE, *Illinois State University* — Limited research has examined the role of attention in emotional false memories or directly compares these effects in short- and long-term false memories. The current study examined the effect of attention on short- and long-term emotional false memory using a modified DRM paradigm. Attention was manipulated with a concurrent random number memorization task at encoding (Experiment 1) and retrieval (Experiment 2). Four-item positive, negative, and neutral lists were presented. In STM conditions, lists were presented one at a time followed by a one-item recognition test. In LTM conditions, all lists were presented, a 1-min break occurred, then a 36-item recognition test across all lists. Results showed more false memories to emotional (positive and negative) words than neutral words. Higher false memory rates were found under divided attention, but only for emotional lists – false memories decreased for neutral lists. Overall, results suggest different effects of attention on emotional and neutral false memories.

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6:00–7:00 PM (3097)

"I" Versus "They": Processing Inaccurate Information Presented in First vs. Third Person Perspectives. ANYA KIRSCH, *Northwestern University,* NIKITA A. SALOVICH, *Northwestern University,* DAVID N. RAPP, *Northwestern University* — Exposure to false information can influence people's later judgments and actions. Past work suggests that some falsehoods are easier to spot and evaluate than others, causing differences in the degree to which people encode and use those inaccuracies. We examined whether the perspective of false claims affects the extent they influence people's subsequent judgments. Participants viewed well-known accurate and inaccurate assertions phrased in either third-person (e.g., people's blood is blue in their veins) or first-person (e.g., my blood is blue in my veins) perspective. Next they evaluated a set of assertions for accuracy, some of which conveyed ideas they had previously viewed. Participants provided more incorrect accuracy ratings after initial exposure to inaccurate versus accurate assertions. Results also suggest people may be more influenced by inaccuracies conveyed in first- versus third-person. We discuss the potential role perspective plays in the evaluation and influence of inaccurate information.

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6:00–7:00 PM (3098)

The Role of Prediction Error in Reconsolidation of Episodic Memories. DIANE H. MOON, B.A., *Southern Methodist University,* HOLLY E. GRAY, *Southern Methodist University,* MARGARET BOYD, *Furman University,* HOLLY J. BOWEN, PH.D., *Southern Methodist University* — Memory reconsolidation theory states that upon reactivation, our memories become labile and susceptible to modification. Recent research indicates prediction error is a critical component of reactivation. Here I examined whether varying levels of prediction error, quantified as level of surprise (Study 1), differentially update episodic memories with new information. 74 participants underwent a three-day reconsolidation paradigm (Study 2). Day 1: participants viewed 18 videos. Day 2: participants randomized to the experimental group were reminded of the videos using three reminder cues that elicit different amounts of prediction error followed by viewing interference videos overlapping in content. Participants randomized to the control group viewed interference videos first, followed by reminder cues. Day 3: memory for Day 1 videos was tested. While there was a main effect of reminder cue on number of intrusions, indicating a larger prediction error led to more intrusions from interference videos during free recall, interpretation was complicated by the lack of a general reconsolidation effect between experimental and control groups. Prediction error also did not affect errors, or false memories. These findings provide important evidence that prediction error and spatial context are particularly important in reactivating memories for modification, specifically for memory updating and not false memories.

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6:00–7:00 PM (3099)

Individual Differences in Susceptibility to Misinformation: Memory Accuracy Is Related to Trait Mnemonics and Intrinsic Medial Temporal Lobe Connectivity. MATTHEW D. SIEGEL, *Tufts University,* ELIZABETH RACE, *Tufts University,* ALEXANDER S. RATZAN, *Tufts University,* JESSICA M. KARANIAN, *Fairfield University,* AYANNA K. THOMAS, *Tufts University* — Individuals differ in the degree to which they rely on episodic or semantic features when reconstructing autobiographical memories. These biases in mnemonic style ("mnemonic traits") have been linked to variability in performance on laboratory memory tasks as well as resting-state functional connectivity in medial temporal lobe (MTL) networks. The current study explored whether such individual differences in mnemonic style and neural connectivity are also related to an individual's susceptibility to memory distortion in the face of misinformation. Participants performed a memory task in which memory for an original event was tested after exposure to misleading details. Participants also completed the Survey of Autobiographical Memory (SAM), a self-report measure of mnemonic style. Susceptibility to misinformation on the memory task positively correlated with the magnitude of participants' semantic bias as measured by the SAM. In addition, both trait mnemonics and susceptibility to misinformation were related to functional connectivity between the MTL and cortical regions during rest. These findings suggest that individual differences in trait mnemonics and functional brain organization have implications for memory accuracy.

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6:00–7:00 PM (3100)

Seeing Is Rejecting: Comparing Additive and Contradictory Misinformation in Visual and Auditory Modalities. MONIKA A. MAZELA, *The University of Southern Mississippi,* MARK J. HUFF, *The University of Southern Mississippi,* SHARDA UMANATH, *Claremont McKenna College* (Sponsored by Mark Huff) — In three experiments, we assessed suggestibility to misinformation by exposing participants to both contradictory and additive misinformation. After viewing three short videos of household scenes, participants either silently read a narrative (Experiment 1) that contained contradictory misinformation (misleading details that directly contradict details in the original event) and additive misinformation (misleading details that supplement the original event) or were presented with the same narrative auditorily by the experimenter (Experiment 2). Subsequent recall of contradictory misinformation was lower than additive as were source errors to contradictory items, but only when narratives were read silently. We suggest that when presented with visual misinformation, participants may re-read or slow their reading when they detect discrepant misinformation, a process that could not occur with exposure to auditorily presented misinformation. We examine this pattern in a third experiment which assessed reading latencies for both misinformation types. Together, our data may suggest that contradictory misinformation is more likely to be detected and rejected at test, but only when sufficient time is available.

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6:00–7:00 PM (3101)

Does Source Variability of Misinformation Increase Eyewitness Suggestibility Independently of Repetition of Misinformation? RACHEL O'DONNELL, *Iowa State University,* JASON C.K. CHAN, *Iowa State University,* MARYANNE GARRY, *University of Waikato,* JEFFREY L. FOSTER, *Macquarie University* — Two experiments examined whether source variability (e.g., one vs. multiple witnesses) and repetition of misinformation had different effects on eyewitness suggestibility. To date, only Foster et al. (2012) had investigated this question, and they found that three presentations of the same misinformation reduced recognition accuracy compared to one presentation, but having three witnesses present misinformation in written mock interviews vs. one witness had no effect. Our Experiment 1 replicated these findings, but the written nature of the misleading interviews might have created a weak source variability manipulation. In Experiment 2, we increased source saliency by delivering the misinformation via video interviews, such that each witness was clearly and visibly distinct. Despite this, there was no effect of source variability in Experiment 2. In addition, because the effect of repetition was diminished relative to Experiment 1, we report a meta-analysis ($k = 12$) in the wider misinformation literature. Taken together, our results extended those from Foster et al., showing that repetition of misinformation, but not number of witnesses who provide misinformation, influences eyewitness suggestibility.

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6:00–7:00 PM (3103)

Can Coaching Witnesses Mitigate the Deleterious Effect of the Complex Questions on Suggestibility? BLAIR BRAUN, *Kent State University,* MARIA ZARAGOZA, *Kent State University,* QUIN CHROBAK, *University of Wisconsin-Oshkosh* — Studies of the misinformation effect have shown that eyewitnesses will sometimes claim to remember witnessing fictitious events that were merely suggested to them. One factor that can influence eyewitness suggestibility is the circumstances at the time of test. For example, Chrobak et al. (2021) found that participants were better able to correctly reject the suggestion as not witnessed when participants were asked simple questions (where the suggestion was presented in isolation), as compared to when participants were asked complex questions (where the suggestion was presented together with true events that the witness saw). Because attorneys will sometimes use complex questions when interviewing witnesses, the goal of this study was to determine whether participants could be coached to respond more accurately to complex questions. Results showed that a multi-part intervention (education, warning, practice, and feedback) mitigated, but did not eliminate, the deleterious effects of complex questions on testimonial accuracy.

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6:00–7:00 PM (3104)

Survival Processing and False Memory: A Review of Theory and Data. I-AN SU, *Cornell University,* CHARLES J. BRAINERD, *Cornell University* — Since 2007, a large body of studies has manipulated survival processing (SP; Nairne et al., 2007) and demonstrated robust mnemonic benefits on different retention measures, which are called the survival processing advantage (SPA; e.g., Scofield et al., 2017). However, another line of research indicates that the survival processing paradigm also foments false memories (e.g., Otgaar et al., 2010; Howe & Derbish, 2010; Parker et al., 2019), although this is not widely recognized. We reviewed SP studies that (1) examined the effects of SP on false memory and/or (2) reported both true and false memory performances to illustrate (3) individual differences in the effects of SP on false memory, (4) effects of moderator variables on SP's false memory effects, and (5) the consequences of SP's false memory effects for leading theoretical accounts of false memory, such as fuzzy-trace theory and activation-monitoring theory.

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6:00–7:00 PM (3105)

Memory Failure Predicts Belief Regression After the Correction of Misinformation. BRIONY SWIRE-THOMPSON, *Northeastern University,* MITCH DOBBS, *Northeastern University,* AYANNA K. THOMAS, *Tufts University,* JOESEPH DEGUTIS, *Harvard Medical School* — After misinformation has been corrected individuals initially update their belief extremely well. However, this change is rarely sustained over time, with belief returning towards pre-correction levels. The current study aimed to examine the association between memory for the correction and belief regression. Prolific Academic participants (N=612) rated the veracity of misinformation and fact items and were randomly assigned to a correction condition or test-retest control. Both immediately and one month later, participants re-rated their belief in the items and recalled their veracity. We found that belief and memory were highly associated, both immediately (ρ=.51), and after one month (ρ=.82), and memory explained 52% of the variance in belief regression after correcting for measurement reliability. After one month, 57% of participants who believed in the misinformation thought that the items were presented to them as true. The rate of dissenting (accurately remembering that the misinformation was presented as false but still believing in it) remained stable over time, while the rate of forgetting quadrupled. Together, these results clearly indicate that memory plays a fundamental role in belief regression.

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6:00–7:00 PM (3106)

Semantic, Phonological, and Hybrid False Memories as a Function of Language Proficiency: Evidence for Early Emphasis on Phonological Processing. KAI CHANG, *Colby College,* SOFIA LEVINA, *Colby College,* LILY DAVY, *Colby College,* TERRI NWANMA, *Colby College,* JEN H. COANE, *Colby College* — Recent studies using the Deese-Roediger-McDermott paradigm have examined how language proficiency affects intrusion rates using semantic/associative lists. Typically, false memories decrease as language proficiency decreases; a finding consistent with fuzzy trace theory (gist extraction is less effective when items are not as well known), and with activation/monitoring framework (links connecting nodes in the semantic network are less developed). We tested native and non-native speakers using phonological, semantic, and hybrid (half semantic, half phonological) lists to determine whether language proficiency affects errors across different types of associates. Low proficiency non-native English speakers (based on subjective and objective criteria) made more errors with hybrid and phonological lists, whereas high proficiency non-native speakers made more errors with hybrid and semantic lists. In general, high proficiency and native speakers did not differ. These results suggest that less proficient speakers might rely more on phonological than semantic information compared to more proficient speakers.

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6:00–7:00 PM (3108)

Distinctive Sans Forgetica Font Does Not Benefit Memory Accuracy in the DRM Paradigm. NICHOLAS P. MAXWELL, *Midwestern State University,* MARK J. HUFF, *The University of Southern Mississippi,* ANIE MITCHELL, *The University of Southern Mississippi* — A common method used by memory scholars to enhance retention is to make materials more challenging to learn—a benefit termed desirable difficulties. Recently, researchers have investigated the efficacy of Sans Forgetica, a perceptually disfluent/distinctive font that may increase processing effort required at study and enhance memory as a result. We examined the effects of Sans Forgetica relative to a standard control font (Arial) on both correct memory and associative memory errors using the Deese/Roediger-McDermott (DRM) false memory paradigm. Across four experiments, which included nearly 300 participants, Sans Forgetica was found to have no impact on correct or false memory of DRM lists relative to a standard Arial control font, regardless of whether font type was manipulated within- or between-subjects and regardless of whether memory was assessed via free recall or recognition testing. Our results indicate that Sans Forgetica is ineffective for improving memory accuracy even when accounting for associative memory errors.

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6:00–7:00 PM (3109)

Memory Suggestibility on Social Media. EZGI BILGIN, *Cornell University,* QI WANG, *Cornell University* — Memory suggestibility refers to human memory's susceptibility to misinformation. The present study investigated memory suggestibility on social media in terms of central and peripheral information processing. It also examined the role of culture in the effect of misinformation on memory and confidence. In an online survey, after seeing GIFs about daily life events, White and Asian participants (N=200) were presented with Twitter posts exposing them to true and false information about central and peripheral aspects of these events. Later, they

responded to true-false statements about the events and rated their confidence in their response. The results showed that central misinformation was correctly and confidently rejected across cultures more than peripheral misinformation was. However, White participants had higher confidence in their responses than Asian participants overall. The findings suggest that event centrality affects how misinformation on social media can alter memory regardless of culture, but culture influences confidence in memory.

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6:00-7:00 PM (3110)

Tearing Apart the Effect of Associative Strength and Theme Identifiability on False Recognition. MAR SUAREZ, *University of Salamanca,* SARA CADAVID, *Universidad del Rosario,* M. SOLEDAD BEATO, *University of Salamanca* (Sponsored by Sara Cadavid) — Past research has explained the underlying mechanisms of false memory raised with the DRM paradigm in terms of the interplay between error-inflating (e.g., backward and forward associative strength or BAS and FAS) and error-editing processes (e.g., theme identifiability or ID). However, no previous research has torn apart the effect of each of these variables. Also, previous research has relied more on frequentist rather than on Bayesian analyses. We ran three experiments to systematically and independently explore the effect of BAS, FAS, and ID on true and false memory rates. In Experiment 1, participants studied low and high-BAS lists that did not differ in FAS or ID. In Experiment 2, participants encoded low and high-FAS lists with similar BAS and ID values. Finally, in Experiment 3, participants studied low and high-ID lists that did not differ in BAS or FAS. Our Bayesian analyses provided evidence that BAS, FAS, and ID only affected false recognition and had no influence on true recognition. These results align with past research and support the existence of two processes that work in opposition when false memory is elicited.

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6:00-7:00 PM (3111)

Assessing the Effect of Warnings on the Misinformation Effect: Does Salience Matter? JESSICA M. KARANIAN, *Fairfield University,* MATTHEW LAGANZA, *Fairfield University,* LIANA MARINO, *Fairfield University,* ELIZABETH RACE, *Tufts University,* AYANNA K. THOMAS, *Tufts University* — Exposure to misinformation can distort future memory reports. We recently demonstrated that warning mock eyewitnesses either before (pre-warning), after (post-warning), or both before and after (repeated warning) exposure to misinformation significantly reduced the misinformation effect. The present study assessed whether increasing the salience of the warning would further protect memory from misinformation. Mock eyewitnesses watched a crime video, completed an interview about the crime, listened to a misinformation-containing narrative of the crime, and then completed the interview again. A 4 (no warning, pre-warning, post-warning, repeated warning) x 2 (high salience, low salience) design was employed. The high salience condition received the warning via a video recording, while the low salience condition received the warning in the form of written text. Preliminary data from an online sample suggest that participants who received high salience warnings were less susceptible to misinformation during the final interview, as compared to participants who received low salience warnings.

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6:00-7:00 PM (3112)

The Effect of Perceptual Details on True and False Memory in the DRM Paradigm. YAYOI KAWASAKI, *Waseda University,* FERGUS I. CRAIK, *Rotman Research Institute, Baycrest* — Twelve 15-word lists of semantically related words were presented to be studied for a memory test. In Condition 1, each word was presented in the same color (black) in the center of a screen. In Condition 2, each word was presented in the same color (red or blue), but in one of two screen positions (upper/lower). In Condition 3, words were presented in one of two colors (red/blue) and in one of two positions. In Conditions 2 and 3 participants were instructed to remember the color and location of each word. After a 5 min distraction interval, the DRM test for each condition contained list items, new words, and critical lures, presented individually for a yes/no recognition test. Recognition of list items was significantly less for Conditions 2 and 3 than for Condition 1, but false recognition of critical lures did not differ between the conditions. The necessity to remember perceptual details reduces later recognition memory for words, but has no effect on false remembering. Speculatively, the reduction in attention associated with remembering perceptual details reduces specific word memory, but has no effect on memory for the general category from which words are drawn.

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6:00-7:00 PM (3113)

An Instance-Based Model of Directed Forgetting. J. NICK REID, *University of Manitoba,* RANDALL K. JAMIESON, *University of Manitoba* — Recent research in item-method directed forgetting indicates that "forget" instructions not only weaken recognition of targets, but also reduce false recognition of category-related foils. We previously modelled these findings using an instance model of memory based on MINERVA 2 with word representations imported from distributional semantic models (e.g., LSA). To model directed forgetting, we simply encoded a study word's representation into memory worse on forget relative to remember trials. Our model captured the parallel effects of decreased veridical and false recognition for studied targets and unstudied category-related foils. However, the account does not match the dynamic and temporal aspects of encoding in directed forgetting. Here, we incorporate dynamic encoding and forgetting of items both at encoding and over time. The time component allows for predictions based on presentation durations of items and remember/forget cues and can be used to distinguish between active and passive accounts of directed forgetting.

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6:00-7:00 PM (3115)

The Effect of Mood on Short-Term False Memories. AMANDA MARTIN, *Illinois State University,* MARIA COREA, *Illinois State University,* DAWN M. MCBRIDE, *Illinois State University* — Prior research has shown that false alarms for unstudied theme items in the DRM paradigm are produced at higher levels for positive moods than negative moods when tested from long-term memory (Storbeck & Clore, 2005). This study investigated how mood influences the production of short-term false memories and whether list type has an effect. Participants were randomly assigned to either a positive or negative mood-induction group and studied four-item words lists that were either semantically or phonologically related to the theme lures. In Experiment 1, participants listened to the mood-induction music for 6 min continuously; in Experiment 2, a 1-min break took place halfway through the 6 min of music. Overall, significant levels of false memories were found only for phonological lists; there were no effects or interactions with mood. The lack of mood effects contrasts with previous findings that indicated its influence in false alarms in long-term memory. These results suggest that mood may not play a consequential role in the creation of false alarms in short-term memory.

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6:00-7:00 PM (3116)

Working Memory and False Memory: A Multi-Level Meta-Analysis. ELISHEVA BENARTZI, *The Academic Center of Law and Business,* MICHAL RAVEH, *Western Galilee College, Israel* — Working memory plays an integral role in a variety of cognitive functions. Several studies, with varying paradigms, tasks, and populations, have revealed conflicting results regarding the association between working memory and false memory. This study describes a comprehensive multi-level random-effects meta-analysis focusing on the association between working memory and false memory using 33 (randomized and non-randomized) articles describing 129 effect sizes across a total of 16,996 participants. Results from the three-level hierarchical model suggest that working memory and false memory have an overall negative association, $r = -0.15$, 95% CI = [-0.19, -0.10]. Moreover, there was a highly heterogeneous distribution of effect sizes, $Q(128) = 233.06$, $p = .001$. Moderation analyses revealed a moderating effect of age group, $Q(2) = 9.28$, $p = .01$, indicating that the working memory-false memory relationship is significant in children and adults, but not in teenagers. Working memory and false memory tasks, however, did not appear to be significant moderators. Results are discussed within the theoretical framework of false memories and call for further investigation of its underlying processes and implications for real-life settings.

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6:00-7:00 PM (3117)

Spontaneous Trait Inferences: Faces, Races, and the Inferences We Encode Because of Them. ALESHA BOND, *Georgia State University,* ALESHA BOND, *Georgia State University,* DAVID A. WASHBURN, *Covenant College* — Spontaneous trait inferencing is a process by which people infer personality traits about an actor's behavior (that may be diagnostic of future behaviors), generally without any awareness or intention. Research suggests that stereotypes may disrupt the spontaneous inferences process. The purpose of this present research is to investigate the degree to which racial stereotypes may impact the spontaneous trait inferencing process. Using a recognition probe paradigm, participants saw a variety of behavior sentences (stereotypical of African Americans) paired with photographs of people (stereotypical and nonstereotypical African American faces). Participants then saw an implied trait probe word. Memory for these implied traits was indexed via reaction time responses. Results suggest that no matter how stereotypical, African American faces seem to equally disrupt the spontaneous inferencing process. Implications from the research will aid in the development of bias prevention by illustrating the ways in which people encode information about others and their behaviors.

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6:00-7:00 PM (3118)

The Effect of Levels of Processing on the Rates of Forgetting. NAN PENG, *University of Edinburgh,* SERGIO DELLA SALA, *University of Edinburgh,* ROBERT H. LOGIE, *University of Edinburgh* — The levels-of-processing framework has provided an important paradigm for memory research and for improving learning. However, previous studies have focused on an advantage for deep processing in immediate memory performance. It is unclear whether that advantage is maintained over longer delays, or is insensitive to long-term forgetting. Three experiments explored whether items encoded as deep or shallow levels are forgotten at different rates over extended delays. In Experiment 1 depth of processing was within-participants contrasting semantic versus rhyme judgements. Experiment 2 contrasted semantic versus consonant-vowel patterns. Recognition accuracy (hit rates and d prime) was measured for different groups immediately, after 30-minutes, 2-hours, and 24-hours. In Experiment 3 deep (semantic) and shallow (rhyme) processing was between participants, then different groups within each condition were tested immediately, or after 30-minutes, 2-hours, or 6-hours. Results demonstrated a deep processing advantage for immediate test and across all delays, but there was no level × time interaction. Retention curves for deep and shallow encoding were parallel, suggesting that rates of forgetting are independent of levels of processing.

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6:00-7:00 PM (3119)

Try to Forget This Image: The Role of Stimulus Duration in Directed Forgetting for Natural Scenes. DREW SHIVES, *The Graduate Center, CUNY,* PATRICK IHEJIRIKA, *Brooklyn College,* MATTHEW CRUMP, *Brooklyn College & The Graduate Center, CUNY* — The effects of instructions to forget versus remember items in a list are better established for word stimuli than more memorable stimuli like pictures. Ahmad, Tan & Hockley (2019)

showed small directed forgetting effects for perceptual detail rather than gist-based representations of natural scenes. We reproduce their procedure and test a general memory strength account: pictures are difficult to intentionally forget because they are encoded so well that attempts to forget the information are ineffective. We test whether weakening encoding strength would increase directed forgetting effects for pictures. We report variations on experiments that reduce encoding strength by manipulating stimulus duration during encoding. We discuss the implication of our results for the general encoding strength hypothesis.

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6:00-7:00 PM (3120)

Does Multisensory Study Benefit Memory for Pictures and Sounds? RENE ZEELENBERG, *Erasmus University Rotterdam,* DIANE PECHER, *Erasmus University Rotterdam* — Studies have found a multisensory memory benefit: higher recognition accuracy for unimodal test items that were studied as bimodal items than for those studied as unimodal items. This is a surprising finding because the encoding specificity principle predicts that memory performance should be better with greater overlap between processing during study and test. We used Thelen et al.'s (2015) method, who previously found a multisensory memory benefit. Items were presented as unimodal (picture or sound) or bimodal (picture and sound) in a continuous recognition task in which only one modality was task-relevant. In four experiments we obtained little evidence for a difference in memory performance between items studied as unimodal or bimodal stimuli, but there was a benefit of study-test overlap in format if sound was the task-relevant modality. Task-induced attention for the irrelevant modality or response bias may have played a role in previous studies. We conclude that the multisensory memory benefit may not be a general finding, but rather one that is found only under conditions that induce participants to pay attention to the task-irrelevant modality.

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6:00-7:00 PM (3121)

Does Implicit Narrator Reliability Impact the Misinformation Effect During Fiction Reading? ANGEL HOUTS, *University of Arkansas,* WILLIAM LEVINE, *University of Arkansas* — Readers acquire accurate and inaccurate information from fiction. This study examined whether implicit narrator reliability moderated the impact of misinformation. Participants read stories that each contained three assertions. The first two setup assertions were either correct information (e.g., Jupiter is the largest planet) to establish a reliable narrator or implausible misinformation (e.g., Pluto is...) to establish an unreliable narrator. After these assertions, the last, critical assertion was either truthful, implausible, or plausible misinformation (e.g., ostriches/sparrowhawks/emus are the largest nonflying birds). Answers on a subsequent general-knowledge test to questions associated with critical assertions showed that misinformation led to lower accuracy and plausible misinformation led to higher production of misinformation. The setup assertion did not interact with the critical assertion. The implications of these results for theories of comprehension and memory will be discussed.

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6:00-7:00 PM (3122)

Reactive Inhibition Explains Post-Rest Improvements in Motor Sequence Learning, Not Consolidation. MOHAN GUPTA, *University of California, San Diego,* TIMOTHY RICKARD, *University of California, San Diego* — The prevailing hypothesis is that motor sequence learning occurs exclusively during breaks between performance trials (i.e., facilitating offline consolidation). In the current study, we present evidence for a diametrically opposing model in which learning occurs concurrently with performance, with no facilitating offline consolidation. Four groups of participants (N=160) performed a finger tapping task involving either 5 or 15 correct sequences per trial and either 10 or 30 second breaks between trials. A final test was administered 5 minutes after the last training trial. The data was well described by a quantitative model that included only (1) an online learning component yielding monotonically decelerating response time over cumulative sequences, (2) a linear slowing component over sequences within each trial due to reactive inhibition, and (3) linear accumulation of residual reactive inhibition between trials that fully resolved prior to the final test. We discuss implications for motor learning and sleep research.

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6:00-7:00 PM (3123)

Implicit Learning of Regularities Followed by Realistic Body Movements in Virtual Reality. RAZVAN JURCHIS, *Babeș-Bolyai University,* ZOLTAN DIENES, *University of Sussex* — Researchers have often suggested that impicit (unconscious) learning plays a role in complex real-life human activities. Still, it is difficult to make inferences about the involvement of implicit learning in realistic contexts, given that this phenomenon has been studied using simple artificial stimuli (e.g., structured patterns of letters). In addition, recent analyses show that the amount of unconscious knowledge learned in these tasks has been overestimated by measurement error. To overcome these limitations, we adapted the Artificial Grammar Learning (AGL) task, and exposed participants (N = 93), in virtual reality, to a realistic agent that executed combinations of boxing punches. Unknown to participants, the combinations were structured by a complex artificial grammar. Subsequently, participants accurately discriminated novel grammatical from non-grammatical combinations, showing they had acquired the grammar. A novel Bayesian method showed strong evidence for implicit learning, while accounting for emasurement error. We conclude that humans can implicitly learn, in VR, knowledge about realistic body movements, and, further, that implicit knowledge extracted in AGL is robust when accounting for random measurement error.

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6:00–7:00 PM (3124)

Cognitive Consequences of Auditory Task-Elicited Eye Movements. MORGAN EIBNER, *Towson University,* SAMUEL W. BENNETT, *Towson University,* JARED J. MCGINLEY, *Towson University,* LAURA K. HICKEN, *Towson University,* BLAIRE J. WEIDLER, *Towson University* (Sponsored by Blaire Weidler) — Prior research has established that during a purely auditory task, participants' visual gaze is biased in the direction of auditory focus (e.g., gaze shifts left as participants focus on a melody presented to their left ear). The goal of the present investigation was to examine the subsequent cognitive consequences for task-irrelevant visual stimuli present during that gaze shift – specifically whether the stimuli were more strongly encoded in implicit memory. Participants listened to two different melodies being played simultaneously, one in each ear, for an auditory oddball on a specific side (side of focus cued across trials). At an unpredictable time during the auditory detection task, two anagrams, words comprised of the same letters (e.g., LEAP and PALE), simultaneously appeared on the left and right side of the screen. Next, participants solved anagrams (e.g., APLE) for which possible solutions appeared during the auditory task. Participants were no more likely to solve the anagram with a word that had been on the cued side during the auditory task than a word that appeared the opposite side, suggesting that items subject to non-task-directed visual attention are not more strongly implicitly remembered.

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6:00–7:00 PM (3125)

Possible Constraints on the Implicit Learning of Melodic Structure. DANIEL BYRNES, *Kent State University,* CHRISTOPHER A. WAS, *Kent State University,* PHILLIP HAMRICK, *Kent State University* (Sponsored by Christopher Was) — Evidence suggests that pitch influences musical processing, with melodic processing being enhanced in higher and rhythmic processing being enhanced in lower pitches. As such, pitch may constitute a constraint on musical learning mechanisms. One such learning mechanism is implicit learning. We investigated implicit learning of melodies under varying pitch conditions. Using a 2 (between: training vs. control) x 2 (within: low pitch vs. high pitch) x 2 (within: grammatical vs. ungrammatical) factorial design, 35 participants were assigned to either low pitch training (n = 17), high pitch training (n =18) or control (n =16) conditions. Mixed linear modeling indicated a main effect of pitch condition. Low melodies were rated as less enjoyable on average than high melodies. Modeling also revealed a main effect of group: participants in training conditions provided lower ratings for all melodies on average. A marginal three-way interaction suggests that low pitch training led to better discrimination of grammatical vs. ungrammatical melodies.

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6:00–7:00 PM (3126)

Cross-Modal Sequence Learning of Letters and Speech Sounds. FERENC KEMÉNY, *University of Graz* — Statistical learning is the ability to extract and utilize distributional information. Whether statistical learning is specific to or independent of the different domains has been debated. The current study is aimed at identifying whether and how statistical sequence learning takes place across modalities. We used the classical Serial Reaction-Time Task with letters and corresponding speech sounds to assess how well-elaborated cross-modal information can build higher sequences and how individuals can discount modality specific information. A sequential training was carried out using 1) unimodally presented speech sounds, 2) unimodally presented letters, 3) randomly changing letters and speech sounds. Test of sequential knowledge was done using only visual stimuli (letters). Results showed an identical performance across the three conditions. The current study provides evidence for the modality-independence of statistical learning, at least in the case of integrated letter-speech sound stimuli.

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6:00–7:00 PM (3127)

Hebb Repetition Effects Are Transferable Between Simple and Complex Span Tasks. CLAUDIA ARAYA, *Kyoto University,* KLAUS OBERAUER, *University of Zurich,* SATORU SAITO, *Kyoto University* — The Hebb repetition (HR) effect shows improvement in serial recall of repeated lists compared to random non-repeated lists. Previous research using simple span tasks found that the HR effect is limited to constant uninterrupted lists, suggesting chunking as the mechanism of list learning. However, the HR effect has been found in complex span tasks, which challenges the chunking explanation, as successive list items are separated by distractor processing, possibly interfering with the unified representations. We tested the possibility that HR learning arises from chunking in simple span, but from position-item associations in complex span. Three experiments testing transfer of HR learning contradict this hypothesis. Results show: a) HR learning in a complex span task can be transferred to a simple span task; b) HR learning from a simple span task can be transferred to a complex span task; c) HR learning from a complex span task cannot be transferred to a partially repeated simple span task. These results suggest a shared mechanism between the HR effects in simple and complex span tasks, and lead us to the question: Are participants completely removing distractors from working memory while creating chunks?

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6:00–7:00 PM (3128)

The Interplay Between Pattern Separation and Cognitive Inhibition in Memory Specificity in Young and Older Adults. JESSIE CHIEN, *University of Southern California,* TEAL EICH, *University of Southern California* — Pattern separation studies suggest a critical role of discriminating between a newly and a previously experienced stimuli in memory specificity. However, similar experiences may also occur at the same time. To resolve both temporal and feature based overlap, inhibition of competitors may be necessary to maintain memory specificity. Here, we developed a novel pattern separation task in which we varied the similarity between

contemporaneously encoded items (target and lure). This allowed us to examine the interplay between pattern separation and inhibition in memory specificity in young and older adults. Despite no age-related differences for our online sample of participants, we found that when target and lure were highly similar, false alarm rates for the lure and control items did not significantly differ, illustrating a forgetting effect elicited by inhibition to resolve interference. When target and lure were less similar, participants false alarmed more to lures than controls, potentially because the lure provided less competition and thus did not necessitate inhibitory control. These results shed light on how inhibition and pattern separation may differentially contribute to memory specificity depending on item similarity.

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6:00-7:00 PM (3129)

Impact of Time Perspective on Positivity Effect and Episodic Memory in Aging. JULIE FERREIRA, *Laboratoire d'Etude de l'Apprentissage et du Développement (LEAD)-Centre National de Recherche Scientifique (CNRS) UMR5022,* AURÉLIA BUGAÏSKA, *Laboratoire d'Etude de l'Apprentissage et du Développement (LEAD)-Centre National de Recherche Scientifique (CNRS) UMR5022* — Older adults have a preference to remember positive information: 'positivity effect'. This effect is linked to socioemotional selectivity theory (SST). Theory explain that when people get older, they oriented their goals to emotional gratification, because they perceive their time perspective as limited. Findings from previous studies indicated that this effect is not static. Expansive time perspective decrease positivity effect in a recognition task (emotional pictures) and limited time perspective increase this effect. The goal of the current research was to investigate positivity effect in an emotional word task, in older adults, by manipulating an expansive time perspective. Results indicated a link between time perspective and positivity effect. Finally, we showed an increase in performance on recognition task. To conclude, our study provides empirical evidence in favor of the SST and its influence on the positivity effect in aging.

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6:00-7:00 PM (3130)

The Limitations of Memory for Value Following Value Directed Encoding. GIZEM FILIZ, *Washington University in St. Louis,* IAN DOBBINS, *Washington University in St. Louis* — We investigated value-directed encoding (VDE) effects in three recognition experiments that also queried source memory for value. In Experiment 1 encoding values were 15 or 5 points and the instructions did not mention the selective encoding of high-value words as desirable. VDE effects were unreliable. Experiments 2a and 2b increased incentives using $10 gift cards versus 10 cents via a lottery manipulation. This produced reliable VDE recognition memory effects in 2a, and reliable source memory for high but not low-value words. Experiment 2b additionally emphasized the utility of selectively encoding high-value words, and produced larger VDE recognition effects, with the same pattern of source memory for value. In all three experiments, increased recognition confidence led to claims of higher probe value. These findings suggest that when sufficiently motivated, subjects selectively elaborate on high-value items and then use the strength of subsequent recognition to infer value during testing.

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6:00-7:00 PM (3131)

Differential Effects of Arousal and Valence on Post-Stimulus Elaboration and Emotional Memory Enhancement. BRITTNEY M. BISHOP-CHRZANOWSKI, *University of Missouri,* JEFFREY D. JOHNSON, *University of Missouri* (Sponsored by Jeffrey Johnson) — Research on emotional memory largely focuses on inherent stimulus characteristics, whereas less focus has been on the general encoding processes that may differentially operate on stimuli. Here, an online study was conducted to examine the role of immediate post-encoding elaboration in the episodic memory enhancement for emotional information. Participants encoded four categories of word stimuli, based on crossing high/low arousal with negative/neutral valence. A math problem followed each word in attempt to terminate elaborative encoding, with the word-math delay (1.5 vs. 3.5 secs) being the primary manipulation. Participants' memories were tested 48 hours later using a "remember/know" procedure, with our expectation that greater recollection-based responding would be evident for words of high arousal and negative valence. Our main result was that the shorter word-math delay mitigated the effect of arousal on memory, consistent with several prior studies. We also tested but failed to support the novel hypothesis that the memory enhancement for negative valence would be reduced. The findings are discussed in relation to how various encoding processes might be distinctly engaged by different stimulus qualities.

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6:00-7:00 PM (3132)

Importance of Octave Generalization in Assessing Absolute Pitch Ability. SHANNON HEALD, *University of Chicago,* NOAH BONGIOVANNI, *University of Notre Dame,* HOWARD NUSBAUM, *University of Chicago,* STEPHEN C. VAN HEDGER, *Huron University College at Western* — There is still debate over what factors lead to the development of absolute pitch (AP), the rare ability to name any musical note without the aid of a reference note. We argue that this debate lingers, in part, due to inconsistencies in training and testing, particularly with respect to timbre and octave generalization. Here, we examined the effect of tonal context on participants' success at a single-note identification training paradigm, including how well learning generalized to an untested instrument and octave. We find that participants were able to learn to distinguish C4 from other notes and were also able to generalize to an untrained instrument. Notably however, participants were unable to generalize this learning to another octave. These results indicate that testing for octave generalization is critical to include in assessing AP ability in order to ensure that participants are not simply attending to pitch height rather than pitch chroma.

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6:00–7:00 PM (3133)

Where Do I Remember This? Recognition Memory for Low-Level Visual Stimuli. NATASHA M. DE LA ROSA-RIVERA, *University of Massachusetts Amherst,* DAVID HUBER, *University of Massachusetts Amherst,* ROSEMARY COWELL, *University of Massachusetts Amherst* — Traditionally, long-term, declarative memory has been assumed to rely on the medial temporal lobes (MTL). But representational accounts of cognition predict that long-term, declarative memory for purely visual stimuli should recruit regions outside of MTL, in visual cortex. In this study, participants received 10-20 days of exposure to visual stimuli built from conjunctions of shape and fill pattern. In the MRI scanner, we tested recognition memory via three types of item: Novel, Studied and Recombination (novel combinations of features of studied items). Using multivariate classifier analyses, we asked which brain regions permit recognition memory of visual conjunctions and visual features. We examined the classifier's ability to discriminate Studied vs. Recombination items (a conjunction memory discrimination) and Studied vs. New items (a combined feature-conjunction memory discrimination). Joint consideration of these measures suggested that early visual regions (V1-V3) house feature memory, while anterior and dorsal regions, e.g., lateral occipital (LO) cortex and parietal sites (IPS, SPL), represent conjunction memory. In sum, "sensory" brain regions posterior to MTL hold information capable of supporting recognition memory.

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6:00–7:00 PM (3135)

Are Old? and New? Judgments the Same in Pictures? DANIEL M. BIALER, *Cornell University,* CHARLES J. BRAINERD, *Cornell University,* HIRA MIRZA, *Cornell University* — In recognition studies, it is standard to ask if a test item is an old, previously presented item. Logically, asking whether an item is new should produce complementary results. We previously found, however, that old and new recognition tests for words did not produce complementary findings. Instead, we found a pattern in which old? judgments produced higher accuracy for new items and new? judgments produced higher accuracy for old items. As this has implications for showups, we aimed to replicate this finding using both picture stimuli and a showup procedure. In Study 1, we presented subjects with pictures from the IAPS. Half the subjects completed old? judgments and half the subjects completed new? judgments. We found that old? and new? judgments were not complementary. Old? judgments produced higher accuracy for new pictures. In Study 2, we presented subjects with crime videos. Half the subjects completed showups in which they were asked to identify if the showup member was guilty and half the subjects were asked to identify if the showup member was innocent. Unlike Study 1, we did not find significant differences between the two judgments. Fuzzy-trace theory can explain why this effect may be stronger in words than pictures.

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6:00–7:00 PM (3136)

How Interacting with Photos Online Influences Subsequent Memory. BRITTANY JEYE, *Worcester State University,* LAGNAJITA CHATTERJEE, *Worcester State University* — Building off prior work examining how taking, editing and viewing photos can shape memory, the current project investigates whether the ways in which people interact with photos online (such as on social media) influence what they subsequently remember. Participants (n = 51) were first shown a series of photos and asked to either comment on the image, provide a hashtag for the image or select an emoji for the image. Participants' memories for the photos were then tested using an old-new recognition paradigm. If participants remembered seeing the images (i.e., provided an "old" response), follow-up questions were asked about how they initially interacted with the photos and specific photo details. Preliminary analyses suggest that commenting and providing a hashtag for photos significantly improves memory over choosing an emoji for a photo. These results indicate that different ways of interacting with images online can impact later memory.

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6:00–7:00 PM (3137)

Fake News and Other Tall Tales: An Investigation of the Continued Influence Effect. CHELSEA M. KRYDER, *Villanova University,* ANNA DRUMMEY, *Villanova University,* IRENE P. KAN, *Villanova University* — The term "continued influence effect" (CIE) refers to the phenomenon that information continues to affect behavior even when that information is later discredited. Although the CIE is well documented, the underlying processes that support it is less clear. In recent work, we found that the memory trace for outdated misinformation lingers and competes with newly encoded correct information. Here, we sought additional evidence of memory representation competition. We adapted a paradigm developed by Gordon et al., 2019. On each trial, participants viewed an initial headline (e.g., bridge destroyed by fire) and then a second headline that either verified (e.g., bridge destroyed by flames) or discredited (e.g., bridge destroyed by heavy rain) the initial information. At test, participants encountered three options for each headline (e.g., fire, heavy rain, high winds) and were asked to provide an endorsement rating for each option. We found that participants endorsed both outdated and corrected options, suggesting competing representations. We also examined the neural bases of the CIE using functional near infrared spectroscopy and investigated the role of the left inferior frontal gyrus in memory representation competition.

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6:00–7:00 PM (3138)

Are There Relationships Among Perfectionism, Mindfulness, and Memory Errors? MARIANNE LLOYD, *Seton Hall University,* STEFANI MORGAN, *Florida State University,* AMANDA CAPRIGLIONE, *Seton Hall University* (Sponsored by Marianne Lloyd) — One experiment was conducted to determine whether a brief mindfulness exercise would reduce conjunction error

rates (e.g., incorrectly endorsing "basement" on a recognition memory test after studying "baseball" and "pavement") and whether these reductions would be related to the subscales of perfectionism: striving and concern. Although participants were susceptible to making conjunction errors, the magnitude of the effect was not shifted by a mindfulness exercise, perhaps because of a weak manipulation of mindfulness. There was some evidence that those high in perfectionistic striving had higher hit rates. Future research on the relationship between the subscales of perfectionism and memory performance may reveal further ways that individual differences impact memory performance.

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6:00-7:00 PM (3139)

Does the Survival Advantage Aid in the Memory of Faces? DONALD F. GRAVES, *Russell Sage College* — Memory for information is enhanced when processed for its survival relevance (Nairne, 2007). The survival advantage promotes recall and recognition memory in several situations including relevance ratings, location memory, and pictures (Kazanas & Altarriba, 2015); but it does not appear to aid with facial recognition (Savine et al., 2011). This study expands upon Savine et al.'s research by using a facial recognition task that includes distinctive faces that reflect normal variation seen in life. Participants read a survival scenario or a control and were asked to rate a series of faces for their predicted helpfulness in the scenario's task. In addition, the race of the face presented and that of the observer were considered to determine if the survival advantage is moderated by that relationship. These procedural changes will further our understanding of the boundary conditions of the survival advantage.

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6:00-7:00 PM (3140)

Detecting a Familiar Person Behind the Surgical Mask: Recognition Without Identification Among Masked vs. Sunglasses-Covered Faces. BROOKE N. CARLAW, *Colorado State University,* ANDREW M. HUEBERT, *Colorado State University,* KATHERINE L. MCNEELY-WHITE, *University of California, Davis,* MATTHEW G. RHODES, *Colorado State University,* ANNE M. CLEARY, *Colorado State University* — The COVID-19 pandemic generated interest in how surgical masks impact face processing. In Experiment 1, we searched for a face recognition without identification (RWI) effect (an ability to discriminate known from novel faces despite an inability to consciously identify the known faces in question) when participants' ability to discern the identity of famous people was prevented by the presence of a surgical mask on the face. Though surgical masks significantly impaired the ability to identify the famous people relative to if they had not been wearing a mask, RWI was shown by higher familiarity ratings to unidentified famous faces than to non-famous faces. In Experiment 2, we compared surgical masks vs. sunglasses. Both types of occlusion impaired the ability to identify known famous faces, though sunglasses were more impairing to identification than masks. Despite the different levels of identification impairment, the RWI effect was present to the same degree in both cases. The overall pattern suggests that familiarity-detection can remain intact when face identification is impaired by an occlusion and that different facial feature-types can contribute.

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6:00-7:00 PM (3141)

Recent Experience and Recognition Decisions: Investigating the Temporal Dynamics of the Effects of Prior Response and Item Similarity. MICHELLE A. DOLLOIS, *University of Guelph,* CHRIS M. FIACCONI, *University of Guelph* (Sponsored by Chris Fiacconi) — Recognition memory decisions are dependent on factors beyond the memory traces linked to the item being evaluated. In addition to the impact of an individual's overall response bias increasing the likelihood of an "old" or "new" response on any given trial, there is evidence that memory decisions exhibit serial dependencies. Though limited, previous research has demonstrated that the response given on the previous trial often predicts the response made to the current trial, such that responses are likely to repeat. Here we present work that examines the temporal dynamics of the serial dependencies in recognition memory. Using extant data, we replicate the finding that responses tend to repeat, and expand upon it by considering the role of item-level similarity between consecutive trials. Regardless of old/new item status, perceptual similarity between trials increased the odds of a repeat response. In both cases, these effects dissipated with decision time, where slow decisions were less dependent on the previous trial. Results are discussed in the context of the diffusion model for recognition decision making.

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6:00-7:00 PM (3142)

Evaluating the Effectiveness of Scientifically-Worded Phrases for Correcting Health Misconceptions. RENEE HUNSBERGER, *University of Massachusetts Lowell,* LISA GERACI, *University of Massachusetts Lowell* — Holding misconceptions about health can have negative consequences for people. Research suggests that direct refutations are effective in correcting various types of misconceptions. However, these types of refutations may not be used by health officials. Instead, health officials may communicate information using more nuanced, scientific phrases, such as "evidence suggests." In two experiments, we investigated the effectiveness of refutations that included these types of common scientific phrases for updating health misconceptions. We examined simple and enhanced versions of scientifically-worded refutations using best practices from the literature and compared these types of refutations to direct refutations containing more definitive, yet unscientific, phrases. Results showed that enhanced and simple refutations containing scientific phrases were effective for improving accuracy of health knowledge, relative to a no refutation condition. However, direct, unscientifically-worded, refutations were the most effective for updating health knowledge. Results have implications for best practices for correcting health misconceptions.

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6:00–7:00 PM (3143)

Differing Effects of Divided Attention on Visual and Auditory Recognition. SHARICA LEE, *University of Nevada, Las Vegas,* LAURA WERNER, N/A, *The University of Texas at Austin,* KEVIN MOHAWK, *University of Nevada, Las Vegas,* MARGARET A. MCMULLIN, *University of Nevada, Las Vegas,* JOEL S. SNYDER, *University of Nevada, Las Vegas,* COLLEEN M. PARKS, N/A, *University of Nevada, Las Vegas* — We have previously found that dividing attention (DA) during study affects visual object recollection more than auditory object recollection. However, the modalities began at differing levels of baseline memory performance, with visual memory far exceeding auditory memory in full attention (FA) conditions. The primary objective of these studies was to attempt to equate the modalities in a full attention condition in order to investigate whether the DA results are attributable to differing levels of baseline performance. In Experiment 1, we reduced visual memory performance to the level of auditory recollection in an FA condition by speeding up encoding time and using greyscale images. Despite lower visual memory performance, we still found visual recollection to be uniquely sensitive to DA, unlike auditory memory. In Experiment 2, we increased auditory performance to the level of visual performance in an FA condition by repeating audio stimuli, with the visual stimuli presented once. Preliminary results show a nonsignificant trend toward an effect of DA on auditory recollection, whereas it has large effects on visual recollection.

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6:00–7:00 PM (3144)

Strategic and Implicitly Reinforced Criterion Shifting in Recognition Memory: An Individual Differences Perspective. LUNA LI, *University of California, Santa Barbara,* EVAN LAYHER, *University of California, Santa Barbara,* MICHAEL MILLER, *University of California, Santa Barbara* — There are considerable individual differences in how much people change their memory decision criterion when motivated to do so. A more implicit form of criterion manipulation, the false positive feedback (FPF) paradigm, can also induce adaptive criterion shifts via selective reinforcement of false feedback to memory judgments. FPF-induced criterion shifting was proposed to be a distinct process compared to a strategic one, but no published studies to date have directly compared the two while accounting for individual differences. In two experiments carrying out a direct, within-persons comparison, we found that strategic and FPF-induced criterion shifting are moderately correlated within the same individuals. Results suggest that both strategic and FPF-induced criterion shifting may have been similarly driven by stable individual differences in criterion shifting tendencies, and that a between-subjects design may be insufficient for future studies comparing the efficacy of different criterion shifting paradigms. Possible sources of dissociation are discussed on the basis of effortfulness, (false) familiarity, and recollection during the memory decision-making process.

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6:00–7:00 PM (3145)

Forgetting in Item Recognition and Pattern Separation. RHIANNON N. SORIANO SMITH, *University of Nevada, Las Vegas,* COLLEEN M. PARKS, N/A, *University of Nevada, Las Vegas* — Recent theories of forgetting posit that hippocampally-based memory representations are more prone to be forgotten via decay, while extra-hippocampal representations are more likely to be forgotten due to interference. The current study examined this hypothesis by looking at a process based in the hippocampus (pattern separation) and a process that is more reliant on extra-hippocampal regions (item recognition). Participants were tested at five time points using the Mnemonic Similarity Task, an object recognition task that yields estimates of pattern separation and item recognition. Additionally, a quantitative model was fit to the data to estimate forgetting rate due to decay and interference. Preliminary results indicate that item recognition shows more forgetting due to interference while pattern separation shows more forgetting due to decay.

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6:00–7:00 PM (3146)

Does Better Memory Render Faster Retrieval? Investigating the Speed of Memory Processes in Source Monitoring. HILAL TANYAS, *University of Mannheim,* BEATRICE G. KUHLMANN, *University of Mannheim,* EDGAR ERDFELDER, *University of Mannheim* — Past research has revealed experimental manipulations that selectively influence either memory for an item (e.g., a statement itself) or for its source (e.g., the agent of the statement), supporting their dissociation. We tested whether these manipulations also selectively influence the speed of item and source retrieval. In Experiment 1, item encoding (i.e., generating versus reading the study items; Mulligan et al., 2006) and source similarity (i.e., dissimilar versus similar sources; Bayen et al., 1996) were manipulated in a fully crossed between-subjects factorial design (N = 128 participants). Participants showed better source memory and faster source retrieval when the statements were presented by the dissimilar sources compared to the similar sources. Further, generating led to better item memory than mere reading as expected, but this effect did not extend to item retrieval speed. In a currently ongoing second experiment, we examine the potential impact of encoding-retrieval-context match on the initial item latency findings. If we observe a selective influence on item latency, we will apply Sternberg's (1969) additive factor method to test the seriality of item and source retrieval.

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6:00–7:00 PM (3147)

The Effects of Variable Encoding Contexts on Item and Source Recognition. MENGTING ZHANG, *Lehigh University,* ALMUT HUPBACH, *Lehigh University* — How repeated encoding affects retention of item details is an unresolved question. The Competitive Trace theory (Yassa & Reagh, 2013) assumes that even slight

variations in encoding contexts across item repetitions induce competition among non-overlapping contextual traces, leading to semanticization. However, empirical support for this assumption is mixed. The current study attempted to enhance the competition between contextual traces by increasing encoding context variability. In two experiments we tested how repeated encoding in the same context or different contexts affect target recognition, similar lure discrimination (Exp. 1) and source memory (Exp. 2). Participants viewed images of objects either once, three times in the same or three times in different contexts. Repeated encoding improved memory for item details, independent of context variability. In contrast, repetitions across varied encoding tasks impaired source recollection. Our findings show that variable encoding contexts enhance memory for perceptual details but impair memory for contextual elements.

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6:00–7:00 PM (3148)

Effects on Recognition Memory of Attention Selecting Sparse Subsets of Features. JEREMY CAPLAN, *University of Alberta* — Knowledge about an item such as a word is vast, implying representations are very high-dimensional. I argue it is plausible that only a handful of those features are attended. Moreover, the sparse subset of features attended during the study phase of a task will be quite similar to that during the test phase. For example, if the participant forms a visual image of a word, turtle, during study, the chances are the features of that image will be similar if recreated on the fly at test. This very simple principle applied to the matched filter model (Anderson, 1970) gives the model the benefits of effectively sparse working representations without losing the benefits of high-dimensional knowledge. Simple analytic derivations show how various assumptions about the relationship between attentional subsets in different item-processing conditions can lead to differences in old/new recognition performance (d') that sometimes does and sometimes does not differ for pure and mixed lists (so-called list-strength effects). Because sparseness is caused by attention to particular features, the model suggests some new explanations of strong (reading aloud versus silently) and weak (repeated versus single presentations) list-strength effects.

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6:00–7:00 PM (3149)

The Effect of Sleep and Emotion on Pattern Separation. ALANNA OSMANSKI, *University of Nevada, Las Vegas,* COLLEEN M. PARKS, N/A, *University of Nevada, Las Vegas* — During slow wave sleep, newly encoded information in the hippocampus is repeatedly activated, driven by slow oscillations that originate in the neocortex. This process facilitates the consolidation and long-term storage of memories. One widely accepted view is that emotional memories are preferentially consolidated during sleep so that they are easily accessible for retrieval, whereas neutral memories tend to be less accessible. However, recent meta-analyses of sleep, emotion, and memory have suggested that this effect may not be as robust as we once thought. To address this issue, the current study investigates the influence of sleep on the consolidation of emotional and neutral memories in a pattern separation task, which relies heavily on the ability to form non-overlapping representations from similar stimulus inputs, often measured using the mnemonic similarity task. Preliminary results show no effect of sleep or emotion on recognition memory or pattern separation.

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6:00–7:00 PM (3150)

Using Dynamic Stimuli in Face Recognition: A Video-Based Face Memory Test. SONIA AMADO, *Ege University,* MURAT CAN KARATAŞ, *Ege University,* ELIF YÜVRÜK, *Ege University,* AYCAN KAPUCU, *Ege University* — The newly developed Video-Based Face Memory Test (VFMT) has three main distinctive features from the current face memory tests: static/dynamic face stimuli are used in the learning and test phases, stimuli are presented within a context, and face recognition algorithms are used to calculate the similarity of the faces to each other to adjust difficulty levels across the study-test blocks. The VFMT consists of a total of 80 items in 3 blocks of increasing difficulty. 110 participants were recruited for data collection. Reliability analyses confirmed the reliability of the target-present (α=.76) as well as the target-absent items (α= 81). The data revealed that participants performed better when the learning and the test phases were both static or both dynamic. Specifically, best performance was seen when both phases included dynamic stimuli. Therefore, we concluded that presenting face stimuli dynamically is an important addition in a test evaluating face recognition ability, resembling real life situations. The VFMT is a promising tool to evaluate face recognition ability while more data are being collected to support its validity and existing evidence.

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6:00–7:00 PM (3151)

Modelling Orthographic Similarity Effects in Recognition Memory. LYULEI ZHANG, *The University of Melbourne,* ADAM OSTH, *The University of Melbourne* — Global matching models posit that recognition strength is derived from the global similarity of the probe item to each item stored in memory. However, to date many model have not adopted principled representations of word similarity. The present work is concerned with developing representations of perceptual similarity between words based on orthographic representations. Empirically, we established three key orthographic similarity effects in recognition memory, namely the replacement effect, exterior-letter effect, and transposition effect. Subsequently, we compared a number of different orthographic representations within a global matching model, namely slot-coding, closed-bigrams, open-bigrams, and the overlap model, which were compared in a hierarchical Bayesian framework. Results showed clear evidence for a replacement effect, adjacent, and non-adjacent transposition effects, and start-letter importance in recognition memory. Model selection results support the open-bigram representation.

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6:00-7:00 PM (3152)

Thought Probes as a Source of Mind Wandering Depend on Attention Control Demands. MAREN GREVE, *Kent State University,* CHRISTOPHER A. WAS, *Kent State University* — Mind wandering is a topic of great interest in many areas, but the interpretation of experimental results might depend on the way it is measured. A common way of measuring mind wandering in experiments is with self-report thought probes, which researchers have done in a variety of tasks. An important question with this methodology is if the probes themselves may be influencing mind wandering. What is missing in the current literature is a comparison of the effect the number of thought probes has on mind wandering. In three experiments, we randomly assigned participants to receive varying amounts of thought probes during two different tasks. In Experiment 1, we found that participants who received fewer probes mind wandered less during an operation span task. In the Experiment 2, we found that participants who received fewer probes mind wandered more during a video lecture. In the Experiment 3, conducted as a within-subjects design, we found that participants mind wandered more during the operation span task compared to the video and mind wandered more when they received more probes compared to fewer probes. The results suggest that thought probes interact with attentional control demands to influence mind wandering.

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6:00-7:00 PM (3153)

Mechanisms Underlying Directed Forgetting in Working Memory. HANNAH DAMES, *University of Zurich,* VENCISLAV POPOV, *University of Zurich,* KLAUS OBERAUER, *University of Zurich* — Our working memory (WM) is remarkably efficient in removing outdated information, as evident in directed forgetting (DF) effects: When we asked participants to remember or forget sequentially presented words in short lists, memory for words that were cued to-be-forgotten (TBF) was much poorer than for to-be-remembered (TBR) words. In the present study (n=371), increasing the time between the offset of a memory cue and the onset of the next word did not result in larger DF effects but instead enhanced memory for both TBR and TBF words. We conclude that not selective rehearsal but instead a rapid boosting mechanism strengthens memory for TBR items. Hence, DF is not amplified with additional free time. Further, the encoding of items into WM depletes a limited resource. Because larger post-cue durations give the resource more time to replenish, the encoding of all new items is enhanced, regardless of the memory cue. To study the time-courses of DF in the short and long-term, at the end of Experiment 2 (n=386) we added a surprise long-term memory (LTM) test. Memory for TBF information declined in neither WM nor LTM as a function of time, speaking against time-based decay of TBF information.

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6:00-7:00 PM (3154)

Memory Retrieval When Responsible Remembering Fails: An Individual Differences Approach. MYLES ALUCARD, *Arizona State University,* DILLON H. MURPHY, *University of California, Los Angeles,* GENE BREWER, *Arizona State University* — When overloaded with to-be-remembered information, capacity limitations in cognition require valuable information to be prioritized for attentional selection, memory encoding, and retrieval. Offloading to an external store can enhance information accessibility and decrease cognitive effort, but if the external store becomes inaccessible, learners tend to forget the offloaded information. Individual differences in recovering offloaded, valuable information may lie in the general ability to encode information or differences in strategy implementation to maintain information in working memory. In the current study, we collected multiple working memory and value-directed remembering measures to test whether individual differences in working memory capacity predict differences in item memory selectivity, offloading behavior, and recall performance. Additionally, we investigated whether working memory capacity predicts the retrievability of offloaded information when the external store becomes inaccessible.

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6:00-7:00 PM (3155)

Working Memory and ADHD: Do Trial Numbers Affect Performance Estimates? CAITLIN BULLARD, *Oklahoma State University,* DELANIE K. ROBERTS, *Oklahoma State University,* MATT ALDERSON, *Oklahoma State University,* MIHO TATSUKI, *Oklahoma State University*— Findings from previous studies suggest methodological variability moderates between-group (ADHD vs. control) differences in WM performance. This study is the first to examine this effect with varying task trial numbers. Children with and without ADHD, ages 8-12 years (n = 120), completed phonological (PH) and visuospatial (VS) WM tasks of 24 trials each. Two mixed-model ANOVAs examined the effects of group and condition (first 12 vs. last 12 trials) on PH and VS WM performance. Significant main effects for group and PH condition, but no interaction, indicate the ADHD group recalled fewer PH stimuli, and both groups performed better on the first 12 trials, compared to the last 12 trials. In contrast, the significant interaction between group and condition on VS task performance suggests the control group exhibited a decline in performance during the last 12 trials, whereas the ADHD group's performance remained relatively stable. This suggests that variability in trial numbers significantly affects estimates of ADHD-related PH and VS impairments. Moreover, internal validity of the metrics appears to be diminished, perhaps due to fatigue, frustration, or diminished attention.

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6:00–7:00 PM (3156)

An Analysis of Working Memory Errors in Individuals with Attention-Deficit Hyperactivity Disorder. ANDY L. FORDYCE, *Purdue University,* LAUREN A. SCHIRO, *Louisiana State University,* THOMAS S. REDICK, *Purdue University* — Working memory impairments are a core deficit of Attention-Deficit Hyperactivity Disorder (ADHD). A recent working memory framework suggests that individual differences in working memory and fluid intelligence are due to deficits in the maintenance and disengagement systems in attention control. The present study investigated whether individuals with ADHD perform worse on complex span and fluid intelligence tasks due to impairments in maintaining task-relevant information or disengaging from information that is no longer relevant. Two hundred seventy undergraduate students, including both ADHD and non-ADHD groups identified via self-report and questionnaire cutoff criteria, completed two complex span working memory tasks (reading and symmetry span) and the Raven's Progressive Matrices task to measure fluid intelligence. Results did not support the hypothesis that individuals would perform worse on working memory and surprisingly, there was better performance by the ADHD group on the fluid intelligence measure. In-depth error analyses indicated that output omissions and transpositions were more common in reading versus symmetry span, but intrusions did not differ.

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6:00–7:00 PM (3157)

Cognitive Consequences of Nature and Urban Stimuli: An Intervention Study Controlling for Practice Effects. JACOB K. STRACHAN, *Purdue University,* ALEXA K. BUSHINSKI, *Purdue University,* THOMAS S. REDICK, *Purdue University* — Numerous studies have observed cognitive benefits when individuals are exposed to nature instead of urban environments. However, much of the research in this field has had limitations due to small sample sizes and experimental design oversights. In addition, some studies have not produced the purported cognitive benefits. In the current pre-registered study, we tested undergraduate students to examine the effects of nature versus urban images and sounds on cognitive processes, specifically working memory. We also aimed to address the problem of potential practice effects in the outcome measures and added a control group in our experimental design. Results indicate a practice effect for the working memory tasks, but critically no evidence of a differential effect of natural or urban exposure during the pretest-to-posttest interval. Our findings are discussed in relation to Attention Restoration Theory and the existing literature.

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6:00–7:00 PM (3158)

Putting the "Return" Back in the Inhibition-of-Return-Like Effect in Working Memory. CARO HAUTEKIET, *University of Geneva,* NAOMI LANGEROCK, *University of Geneva,* EVIE VERGAUWE, *University of Geneva* — Over the years, several researchers have investigated whether effects typically observed in perception research can also be found in working memory. For example, Johnson et al. (2013) demonstrated that, in working memory, attending to an item that was recently attended to is more costly than attending to another item, that was not attended right before. This finding is very similar to the well-known inhibition of return (IOR) effect in perception research, which showed that attending to a location that was recently attended is more costly than attending to another location, that was not attended right before. However, in the paradigm of Johnson et al. (2013), attention is never explicitly disengaged from the cued item, while this is the case in the original perceptual paradigm. So strictly speaking, it remains unsure whether we can speak about inhibition of "return" in the working memory paradigm. Here, we tested the presence of an IOR-like effect in working memory in a paradigm in which attention is explicitly disengaged from the refreshed item before examining its accessibility. The results seem to point in the direction of a small IOR-like effect in working memory.

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6:00–7:00 PM (3159)

Feature Binding and Working Memory in Children with ADHD: Evidence of Episodic Buffer Impairment. DELANIE K. ROBERTS, *Oklahoma State University,* MATT ALDERSON, *Oklahoma State University,* CAITLIN BULLARD, *Oklahoma State University,* MIHO TATSUKI, *Oklahoma State University* — The episodic buffer (EB) component of working memory (WM), a neurocognitive process that allows for temporary storage and maintenance of bound episodes/features of information, is understudied in ADHD and initial findings have been equivocal. Heterogeneity in previous findings may reflect between-study methodological variability, floor effects unrelated to EB processes, and limitations associated with previous investigations' use of novel paradigms. The present study examined ADHD-related EB processing in children with ADHD and typically developing peers (TD). Seventy-one children (ADHD n = 34, TD n = 37) aged 8-12 years (M = 9.81, SD = 1.50) completed two conditions of a computerized working memory task that presented single feature stimuli (color and shape), and a third condition that presented dual-feature stimuli (color/shape binding). Overall, the ADHD group exhibited a large-magnitude deficit during the color/shape binding condition (d = .77), and both groups evinced worse performance accuracy in the color/shape binding condition compared to the single feature color and shape conditions. Findings suggest variance associated with the EB construct may serve as a strong predictor of phenotypical ADHD-related negative outcomes.

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6:00–7:00 PM (3160)

A Dual Mechanisms of Cognitive Control Account of Age Differences in WM. CHENLINGXI XU, *University of Notre Dame,* CHANG-MAO CHAO, *University of Notre Dame,* NATHAN ROSE, *University of Notre Dame* — The source of age-related declines in working memory (WM) is unclear. For this

preregistered study (https://osf.io/ztqx8/), we tested the hypothesis that older adults perform worse than young adults on WM tasks due to their tendency to rely on the strength of a familiarity signal to make memory decisions. We used a two-item, double-retrocue WM task that cued participants to the item that would be tested first and then second on each trial. Results showed that there was an exaggerated error rate for lure probes that were familiar/repeated (vs. unfamiliar/non-repeated) in both older adults and young adults with divided attention during the delays, relative to young adults with full attention (n=30 per group). In a second experiment using the same design (n=30 per group), we manipulated stimulus familiarity by repeating all stimuli across trials; this eliminated the age difference in errors to repeated lures. We suggest that this was because older adults were forced to discount the familiarity signal and use a more proactive than a reactive mode of attentional control on the WM task, consistent with a dual mechanisms of cognitive control account of age differences in WM.

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6:00-7:00 PM (3161)

Children's Spontaneous Recruitment of Phonological Memory Strategies as a Function of Age and Capacity. REBECCA WAGNER, *The Pennsylvania State University,* ANGELA AUBUCHON, *Boys Town National Research Hospital* (Sponsored by Angela AuBuchon) — Recent developmental studies highlight the need to differentiate phonological recoding and rehearsal in children. Eighty children, ages 4 to 7 years, completed delayed serial recall of 3- and 6-item lists of digits. Overt phonological recoding (i.e. repetition of the just-presented digit) and rehearsal (i.e. verbalization of previously presented digits) were coded for both encoding and delay. The number of children displaying phonological recoding and rehearsal differed across age groups, but even children as young as 4 spontaneously engaged these strategies. Children's use of phonological recoding was consistent across list lengths, regardless of age. However, rehearsal was observed more often on the short than the long lists, but only in the younger age groups. Therefore, spontaneous recruitment of phonological strategies is tightly associated with age and children's short-term memory capacity. These results reinforce prior research that most 7-year-olds consistently rehearse. However, considerable individual differences exist in the age-of-emergence and efficiency of these strategies. Thus, children's phonological recoding and rehearsal strategies should be examined separately and discussed relative to the task demands.

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6:00-7:00 PM (3162)

A Compressibility Account of the Developmental Abilities to Reorganize Information in Working Memory. MIRIAM DEBRAISE, *Université Côte d'Azur,* MICHAEL FARTOUKH, *Université Côte d'Azur,* ORI FRIEDMAN, *Waterloo University,* LAURENT VANNI, *Université Côte d'Azur,* FABIEN MATHY, *Université Côte d'Azur* — Both children and adults can expand their limited working memory capacity by recoding information into interconnected items. This chunking process is related to the reorganization of information based on either prior knowledge or perceptual characteristics. Recently, the data compression approach has proven useful to account for how chunks can be formed without reliance on long-term memory. Compressibility refers to the recoding of information in a more compact representation. The aim of the present study was to examine whether a compressibility metric could predict working memory performance of children aged 3–5 years. We present one experiment in which the level of compressibility of a sequence of colors to remember was manipulated in an immediate serial recall task. Results from a large sample of 536 children suggest that young children have a primitive ability to reorganize information on the fly, but not entirely as predicted by the compressibility metric. We discuss alternative metrics to account for our results based on the perceptual characteristics of the material to memorize.

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6:00-7:00 PM (3163)

Effect of Task Ludification on Subjective Responses to Mental Workload During Digitalized Cognitive Task. LINA-ESTELLE LOUIS, *Centre National de Recherche Scientifique (CNRS)/Laboratoire des Sciences du Numérique de Nantes (LS2N),* AURÉLIEN VAN LANGHENHOVE, *Centre Hospitalier Universitaire de Nantes,* VINCENT ROUALDES, *Centre Hospitalier Universitaire de Nantes,,* SAÏD MOUSSAOUI, *Centrale Nantes,* ISABELLE MILLEVILLE-PENNEL, *Laboratoire des Sciences du Numérique de Nantes (LS2N)/Centre National de Recherche Scientifique (CNRS)* — Cognitive tasks usually used in rehabilitation or evaluation of cognitive functions are viewed as effortful or frustrating, which often leads to participant disengagement and high mental workload (MWL). The challenge is to increase the task's commitment while decreasing MWL and maintaining similar impact on cognitive functions. Introducing playfulness could decrease the part of MWL due to endogenous factors (like demotivation) without affecting the task's cognitive aspect. Nevertheless, there is no study investigating the link between ludification, commitment, and MWL and the performance's repercussions. Therefore, we developed a protocol to compare the subjective MWL for three conditions of a cognitive task that differed depending on the degree of ludification. Overall, our results showed that performances were not influenced by ludification, confirming that it did not reduce the effects on cognitive functions solicited during the task. Regarding the impact on engagement and MWL, it will be discussed in light of different models of MWL.

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6:00-7:00 PM (3164)

Retrieval-Induced Forgetting of Induced Fixation in Creative Problem Solving. PAULA GAUSELMANN, *Pädagogische Hochschule Ludwigsburg,* TOBIAS TEMPEL, *Pädagogische Hochschule Ludwigsburg* — Creative problem solving can be hindered by fixation on strongly associated, yet inappropriate solutions.

In two experiments, we investigated whether retrieval-induced forgetting (RIF) of induced fixation can positively affect subsequent problem-solving performance in a Compound Remote Associate (CRA) test. Fixation was induced by letting participants memorize a word list that, among neutral words, contained misleading associations. Half of the participants then selectively retrieved the neutral words in a cued recall test, thus temporarily weakening the activation level of the non-retrieved misleading associations. In both experiments, this resulted in enhanced subsequent performance in early problem-solving stages (0-30s). Further results revealed that RIF of induced fixation changed subjective perception of gaining access to a solution: participants who had engaged in prior selective retrieval reported an increased feeling of having had immediate access to fixated CRA problems. These findings support the assumption of inhibitory processes being involved in both RIF and creative problem solving and provide new insight into how strongly problem solving performance is influenced by the activation level of misleading information.

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6:00-7:00 PM (3165)

Tokenism and Stereotype Threat Effects: Exploring Differences in Group Composition During Testing Situations. AUSTIN ASHLEY, *University Of Memphis,* GABRIEL TANENBAUM, *University of Illinois Urbana-Champaign,* RACHEL CONNOR, *Rutgers University,* LATASHA R. HOLDEN, *University of Illinois Urbana-Champaign* — Stereotype Threat (ST) occurs when stigmatized individuals are primed with a negative stereotype and underperform relative to a control group (Steele & Aronson, 1995). Here, we use secondary data to explore ST effects for Black students based on differences in racial/ethnic representation in group testing situations. We use tokenism theory (Kanter, 1977) to classify groups for minority proportion based on numerical representation. We expect that groups with lower minority proportions (e.g., skewed and tilted groups) will have the largest ST effects, exhibiting worse test performance and greatest levels of anxiety. Also, based on prior research (Holden, Goodwin & Conway, 2020; Regner et al., 2010), we predicted that the ST and numerical representation effects would be moderated by working memory (WM) capacity. We found evidence to support only the latter hypothesis in that higher WM students exhibited enhanced performance in the face of ST, but only under conditions of greater minority representation (opposite from what we expected). Future research should recruit larger samples and experimentally manipulate group composition to further investigate these questions.

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6:00-7:00 PM (3166)

Examining Working Memory Precision Estimates as an Individual Difference. STEPHEN A. CAMPBELL, *The University of Texas at Arlington,* MATTHEW ROBISON, *The University of Texas at Arlington* — Continuous report tasks (CRTs) used in visual working memory (VWM) research are characterized by their ability to provide estimates for both the quantitative and qualitative aspects of VWM. While individual differences in working memory capacity (WMC) are associated with a variety of cognitive constructs, it remains unclear as to whether precision, as measured by CRTs using a mixture model analysis, shares the same relations. The present study assesses the psychometrics of VWM precision estimates and their relationship with a known associate of WMC, fluid intelligence (gF). Participants completed three CRT and change detection tasks which differed in stimulus property (i.e., color, spatial location, orientation) in addition to three gF tasks. Within-task reliability estimates for precision were low for all three stimulus types. Latent variable analyses assessed the relationship among capacity, precision, and gF factors. Consistent with prior research, capacity estimates from both change detection and CRT were positively associated with gF. We found no association between precision and gF. However, the poor psychometrics of precision estimates may mean they are not suitable as an individual difference.

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6:00-7:00 PM (3167)

How Does Stress Affect Working Memory Consolidation? KELLY COTTON, *City University of New York Graduate Center,* TIMOTHY J. RICKER, *University of South Dakota* — Stress has a complex relationship with memory. Working memory performance may be improved by, impaired by, or exhibit no effects of stress. However, previous research has not explored the effects of stress on specific working memory processes such as consolidation. The present research aims to clarify the impact of stress on working memory performance by investigating its impact on working memory consolidation. Participants completed either a stressful or non-stressful task immediately before a working memory task. During the working memory procedure, participants were presented with three colored objects followed by a variable delay interval. They then completed a secondary parity judgment task before recalling the colors of the previously presented objects. Performance across stress conditions and delay conditions were compared. Understanding how stress impacts the processes underlying working memory will improve models of human cognition, providing the groundwork for identifying ways to mitigate harmful impacts and embrace the benefits of stress on memory function.

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6:00-7:00 PM (3168)

Intersubject Correlation of Physiological Responses to Discrete Emotional Videos. INIK KIM, *Jeonbuk National University,* JONGWAN KIM, *Jeonbuk National University* — Intersubject correlation (ISC) has been used to find how similarly participants respond to a given stimulus in a natural setting environment. In addition, researchers have elucidated how the brain response synchrony is related to emotional ratings with the ISC analysis (Nummenmaa et al., 2012). However, little is known about how individuals' physiological responses correspond with each other to emotion-eliciting stimuli. In

this study, we used Sharma et al.'s (2019) physiological data of continuously annotated signals of emotion. Eight physiological recordings (electroencephalogram, blood volume pulse, galvanic skin response, respiration, skin temperature, electromyography zygomaticus, corrugator supercilii, and trapezius) were obtained while viewing eight videos of four different emotions (amusing, boring, relaxing, and fearful). We computed each participant's seven physiological ISCs for each of the videos, which is submitted to repeated-measures ANOVAs. Mostly, results indicated higher ISCs in scary conditions than in boring and relaxing conditions. Our findings revealed that ISC can be utilized to confirm the participants' physiological synchrony in emotion research fields.

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Poster Session IV

Saturday, November 19, 2022

Viewing 11:00 AM–1:00 PM US EST, Authors Present 12:00–1:00 PM US EST, Hynes Convention Center Ballroom

Note: All in-person posters are also available for viewing for the duration of the conference in the virtual posters on the conference website.

12:00–1:00 PM (4001)

Examining the "Relatedness Halo" in Predictions of Learning. XINYI LU, *University of Waterloo,* EVAN F. RISKO, *University of Waterloo* — The relatedness benefit in metamemory (that related words are predicted to be better remembered than unrelated words in an item memory task) has been repeatedly demonstrated and is metacognitively accurate (corresponds with actual item memory performance). We examined whether individuals make a similar prediction in a context where there is a cost associated with relatedness. Participants learned words that were presented within grid displays; one display contained words that were from the same category, and another contained words from different categories. Participants predicted how many words they would be able to recall (item memory condition) or remember the locations of (location memory condition). In both conditions, participants predicted that their performance would be better in the related words display. In the item memory condition, performance was indeed better with a related word list, but in the location memory condition, performance was actually worse with a related word list. These results are consistent with the idea that individuals have a general belief that relatedness enhances memory performance (i.e., a "relatedness halo") that is applied even in a case where it does not appear to be accurate.

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12:00–1:00 PM (4002)

Can Less Ever Be More? Consequences of a Decision to Stop Studying New Material in an Associative Learning Task. ALEKSANDRA KROGULSKA, *Warwick University,* VANESSA CIEPLIŃSKA, *Warwick University,* ELIZABETH C. MORAN-MORBEY, *Warwick University,* LEAH M. POYNER, *Warwick University,* ELIZABETH A. MAYLOR, *Warwick University* — Stopping learning often has negative consequences for memory performance. This research examined one condition under which learning termination might be beneficial for memory retention: A "stop" decision may ease the learning process when there is a lot of information associated with one concept (the fan effect). In Experiment 1, participants learned a list of 50 unrelated cue-target pairs (e.g., rice-door, bush-dirt). There were five cues, and each cue was associated with ten targets. In the control condition, participants studied all 50 cue-target pairs one-by-one, whereas in the stop condition they were allowed to stop learning. In Experiment 2, participants read only a description of Experiment 1 and on that basis decided whether they would stop. The vast majority of participants decided to stop in Experiment 1; as a result, their cued-recall test performance was worse than in the control condition. In Experiment 2, participants were significantly less inclined to stop learning than those who actually did the experiment, but in forecasting their performance, stoppers predicted worse memory performance than those who would refrain from stopping. Thus, the negative consequences of learning termination are difficult to eliminate.

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12:00–1:00 PM (4003)

Do Metacomprehension Judgments Enhance Reading Comprehension? HANNAH TRILLO, *University of California, Santa Cruz,* HANNAH HAUSMAN, *University of California, Santa Cruz,* VEIT KUBIK, *Bielefeld University* — There have been many studies showing how retrieval practices enhance our memory, and recently, researchers have been looking at how metacomprehension judgments may do so as well. In the recent study, researchers Ariel and colleagues (2020) showed that neither aggregate nor term-specific metacomprehension judgments enhanced immediate text comprehension above and beyond reading the texts; however, when instructing participants to retrieve the text information beforehand, metacomprehension judgments enhanced immediate text comprehension compared to reading and, surprisingly, even compared to retrieval practice alone. Term-specific metacomprehension judgments elicit covert retrieval attempts and thereby have direct effects on text comprehension. In the present studies, we investigated the direct memory effects of term-specific metacomprehension judgments on text comprehension following either a 2-day delay or 1-week delay. So far we have not seen metacomprehension judgments or retrieval tasks having an effect on text comprehension, although our analysis and data collection are not complete.

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12:00–1:00 PM (4004)

The Impact of Prior Knowledge on Students' Study Choices. AMBER WITHERBY, *Creighton University,* SHANA CARPENTER, *Iowa State University* — Prior knowledge is an important individual difference variable that can influence students' learning and monitoring of learning. Currently, it is unclear how students' prior knowledge relates to the study decisions they make when learning new information. In the present research, we investigated this issue. Students completed prior knowledge tests over two domains. Next, they learned new information from those domains. For each item, students made a judgment of learning and decided whether they wanted to restudy it. Students either selected half of the items for restudy (Experiment 1) or as many items as they wanted (Experiment 2). Finally, students completed a test over the new information. Most important, students frequently chose to study items from the domain for which they had low, rather than high, prior knowledge. Thus, students appear to strategically use their prior knowledge when making study decisions, focusing on items that are least likely to be remembered.

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12:00–1:00 PM (4005)

Meaning Mediates the Predicted Memorability of Objects. ROY SHOVAL, *The Open University of Israel,* NURIT GRONAU, *The Open University of Israel,* YAEL SIDI, *The Open University of Israel,* TAL MAKOVSKI, *The Open University of Israel* — Memorability studies indicate that the ability to predict which images are memorable is very poor. Metacognitive research, in contrast, indicates that people can judge their cognitive performance reliably pending the validity of the cues underlying these judgments. Here, we used a Metacognitive framework to test predicted memorability and its potential underlying cues. Participants viewed hundreds of images of real-world objects and estimated how likely they were to remember each image if seen in a subsequent test. Then, they completed an old/new memory recognition test. Indices of subjective 'meaningfulness' and 'visual complexity' were additionally collected for each image, in an independent survey. The results indicated that memorability judgments partially predicted memory performance, with image meaning serving as an important factor explaining both predicted memorability and actual memory performance. Additionally, participants demonstrated a fairly good metacognitive resolution, i.e., they were able to distinguish between well-remembered and less-remembered images. Taken together, our findings suggest that people have a subjective sense of images' memorability, which is at least partially mediated by objects' meaning.

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12:00–1:00 PM (4007)

Exploring the Reactivity of Metamemory Judgments Through Order Memory Performance. KATHERINE R. CHUREY, *University of Guelph,* SKYLAR J. LAURSEN, *University of Guelph,* CHRIS M. FIACCONI, *University of Guelph* — The Temporal Contiguity Effect (TCE) arises when memory search during free recall follows the temporal order of experiences, such that experiences that originally occurred close in time are more likely to be recalled together than those that occurred further apart. The strength of this effect depends on how information – particularly the temporal relationship between experiences – is processed at the time of encoding. Interestingly, some encoding task manipulations, including those used when studying metamemory, can promote encoding of item-specific information over relational information; suggesting that they may weaken the TCE through the processing trade-off proposed within the item-order framework. Indeed, we recently found that metacognitive control tasks (e.g., making re-study decisions) during encoding resulted in a reduced TCE. Our current study suggests that metacognitive monitoring tasks (e.g., making judgments of learning; JOLs) may have a similar effect. Importantly, these findings question the default assumption that metacognitive judgments merely probe metamemory processes without affecting memory performance itself.

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12:00–1:00 PM (4008)

Do Individuals Modulate Study Effort in Accordance with Expected Environmental Support? MEGAN O. KELLY, *University of Waterloo,* EVAN F. RISKO, *University of Waterloo* — Remembering occurs under various levels of environmental support—or the degree to which test stimuli and retrieval context share features of those at encoding. We examined how expected environmental support influences memorial behavior in two preregistered experiments. We manipulated the degree of support between-participants by varying the amount that items at test reflected original study items. We tested memory both in the presence and absence of the expected support (i.e., aided and unaided recall, respectively), obtained global memory predictions, and indexed study effort using study time, global effort rating, and strategy use. More expected support led to better aided recall and poorer unaided recall. Predictions of aided recall and study time were fairly consistent with the effect of support on aided recall. Yet, individuals seemed less able to predict the effect of support on unaided recall, suggesting that losing the expected support hinders accurate memory prediction. Individuals appear generally metacognitively sensitive to the effect of environmental support on future memory and can control present study effort accordingly, but a violation of expected environmental support may hinder these abilities.

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12:00–1:00 PM (4009)

Beliefs Versus Fluency: Investigating the Identical Effect for Metamemory Through Pictorial Stimuli. MIRI BESKEN, *Bilkent University,* GIZEM FILIZ, *Washington University in St. Louis,* CEREN BAL, *Bilkent University* — Participants typically predict their memory performance to be higher for identical word pairs (e.g., DOG-DOG) than related pairs (e.g., DOG-CAT), even though they remember related word pairs more than identical ones.

In three experiments, we tested whether the same illusion also generalizes to pictorial materials. At encoding, participants were asked to identify and remember picture pairs that were either identical, exemplars, related or unrelated, followed by judgments of learning (JOLs) after each pair. At test, participants were asked to retrieve one of the pictures when presented with the other. In line with previous findings, identical picture pairs produced higher JOLs and lower memory performance than related ones. Moreover, identification latencies at encoding did not always correlate with the JOLs, ruling out the fluency accounts of the identical effect and giving more credence to the role of beliefs about the manipulation.

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12:00–1:00 PM (4010)

The Impact of Judgments of Learning on Item-Specific and Relational Processing. SARAH J. MYERS, *Colorado State University,* VANESSA M. LOAIZA, *University of Essex,* NICHOLAS SODERSTROM, *Montana State University,* MATTHEW G. RHODES, *Colorado State University* — Making judgments of learning (JOLs) while studying can change learners' memory for the studied material, a finding referred to as JOL reactivity. Senkova and Otani (2021) suggest that JOLs improve item-specific processing but reduce relational processing among words in a study list, which results in reactivity. In the present study, Deese-Roediger-McDermott (DRM) word lists were used to disentangle the impact of JOLs on relational and item-specific processes. DRM lists consist of items that are semantically related to an unpresented item (i.e., critical lure), and participants often incorrectly endorse that the critical lure was presented during study. Due to the relational nature of DRM lists, item-specific processing reduces false memory for critical lures as well as serial recall, whereas relational processing increases false memory. Making JOLs reduced participants' likelihood of recalling words in a serial order compared to not making JOLs, suggesting that JOLs do reduce relational processing. However, the impact of JOLs on later false recognition of critical lures provided mixed evidence of the impact of JOLs on item-specific and relational processing.

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12:00–1:00 PM (4011)

Does Processing Fluency Underlie Higher Judgments of Learning for Emotional Words? BENTON H. PIERCE, *Texas A&M University-Commerce,* JASON MCCAIN, *Northwest Missouri State University,* AMANDA R. STEVENS, *Texas A&M University-Commerce,* DAVID FRANK, *Texas A&M University–Commerce* — Pierce and McCain (2016) found that higher judgments of learning (JOLs) given for positively- and negatively-valenced words compared to neutral words are due in part to peoples' inherent beliefs that such words should be more memorable. In addition, the authors found that reaction times (RTs) on a lexical decision task were faster for positive than neutral words but equivalent for negative and neutral words, suggesting that processing fluency may also play a role in making JOLs for positive but not for negative words. We return to this issue in the current study by examining whether lower RTs predict higher JOLs at the item level and whether individual differences in beliefs also relate to individual differences in item-level JOLs. In a series of moderation analyses, we assessed the relative contributions of fluency and beliefs to JOLs by measuring both factors in the same participants. Our results showed that RTs made no significant contribution to JOLs for either positive or negative words. These findings suggest that although positive words may be more fluently processed than neutral words, memory beliefs are the primary factor underlying higher JOLs for both positive and negative words.

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12:00–1:00 PM (4012)

From Inaccessibility to Unavailability: Partitioning the Phenomenology of Knowledge-Based Retrieval Failures in Younger and Older Adults. SHARDA UMANATH, *Claremont McKenna College,* JEN H. COANE, *Colby College,* ALEXIS LEE, *Claremont McKenna College,* JOANNA HWANG, *Claremont McKenna College,* KARA M. HOOVER, *Claremont McKenna College* — In two studies, we sought to subjectively validate whether phenomenological experiences of knowledge-based retrieval failures can be separated into distinct categories, using 5 potentially different states. They ranged from inaccessibility (A: It's on the tip of my tongue) to unavailability (E: I have never known or seen this information). In Study 1A, older and younger participants rated the frequency with which they experienced each state, rated pairs from 1 (exactly the same) to 7 (extremely different), and if each was best represented by "I don't know" (DK) or "I don't remember" (DR). Study 1B was identical with one addition: Participants first answered 10 general knowledge questions (37% average proportion correct from age-specific norms) to prime experiences of retrieval failures. Across age groups and studies, all states appeared to be commonly experienced. Retrieval failures due to temporary inaccessibility (A, B, C) generally clustered together and were consistently categorized as IDR. Though separated, D (I knew or learned it but have forgotten) was still considered IDR. Failure due to unavailability (E) was consistently distinct and categorized as DK. Behavioral validation of these subjectively distinct states follows.

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12:00–1:00 PM (4013)

Abstract Relational Bindings Last Long Enough to Influence Hierarchical Action Control. SELENA TRAN, *University of Michigan,* LAUREN D. GRANT, *Washington University in St. Louis,* DANIEL H. WEISSMAN, *University of Michigan Ann Arbor* — Responding to a stimulus feature (e.g., form, color) leads to the creation of an event file that stores the feature-response binding. Interestingly, responding to each of two stimulus features in rapid succession integrates the two event files, allowing the encoding and retrieval of abstract relational bindings (e.g., similar vs. dissimilar) between stimuli or responses in those files. It is unclear, however, which relational bindings are stored and whether such bindings last

long enough to influence hierarchical action control. To find out, we used a prime-probe task wherein only the retrieval of one or more relational bindings between two stimuli and/or two responses in the prime trial can produce sequential effects in the probe trial. We found that varying the abstract perceptual and/or categorical similarity between two stimuli (Experiments 1 and 2) or the spatial similarity between two non-homologous finger responses on different hands (Experiment 3) led to sequential effects. Furthermore, these effects remained stable for 5 seconds (Experiment 4). These findings suggest that integrated event files store a variety of abstract relational bindings that last long enough to influence hierarchical action control.

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12:00–1:00 PM (4014)

Can Participants Accurately Touch Endogenously Cued Targets or Distractors While Multiple-Object Tracking? MALLORY E. TERRY, *University of Guelph,* LANA M. TRICK, *University of Guelph* (Sponsored by Lana Trick) — In everyday life many tasks require performing coordinated actions towards specific moving items among others according to our attentional goals (e.g., pointing, grasping, touching). Interestingly, multiple-object tracking, the ability to keep track of positions of specific items (targets) among others, has been proposed to employ cognitive mechanisms that are also required to execute coordinated actions (Pylyshyn, 2001). In support of this, touching items in MOT that changed colour interfered with tracking the targets in MOT, especially when the touched item was a distractor (Terry & Trick, 2021). Here we sought out to extend this initial finding and investigate if participants could accurately track and touch items in MOT if touch was endogenously directed. In a series of experiments, participants tracked targets in MOT while touching what they believed was a target or distractor at the sound of a tone.

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12:00–1:00 PM (4015)

Aging Alters Virtual Action-Boundary Perception in 2D-Cyberspace. ERIC LAURENT, *Université Bourgogne Franche-Comté,* LAURIANNE CICHON, *Korian,* COLIN VEGAS, *Centre Hospitalier de Novillars* — Perceiving that which is "doable" is a fundamental adaptive process. However, little is known about i) action boundary perception in numerical environments and ii) the potential role of age in the modification of these abilities. Participants performed the Action-Boundary Perception Online Task (ABP-OT), a fully computerized and web-based adaptation of Smith & Pepping's (2010) task. They were asked to launch a mouse movement in order to click on "yes" or "no" buttons, thereby indicating whether a gray virtual ball having a fixed diameter could pass through a white virtual aperture of variable diameter. Data from 127 participants were analyzed. Results showed that older participants (Mage = 68.36, SDage = 5.48) had a lower accuracy level (correct trial percentage) than younger adult participants (Mage = 26.63, SDage = 11.69) only when the action boundary was near (i.e., when the ratio ball diameter/aperture diameter was close to 1). The results also revealed that as age increased, the initiation time (recorded from stimulus presentation to mouse movement initiation) increased, regardless of action boundary proximity. Several interpretations related to different levels and speeds of processing will be discussed.

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12:00–1:00 PM (4016)

The Effect of Shape and Modality on Affordance Perception of Feelies. CATHERINE DOWELL, *The University of Southern Mississippi,* ALEN HAJNAL, *The University of Southern Mississippi* — In Dowell et al. (2020), participants identified possible uses for novel, unfamiliar objects called feelies through visual and haptic exploration. Visual exploration produced responses focused on object identification, while haptic exploration resulted in more action-oriented responses. The present study aimed to determine if the information underlying these responses could be attributed to object shape. Participants explored feelies in a visual, haptic, or combined visual-haptic condition, and selected the best possible use from a list of 7 responses. Responses were categorized as either action-oriented or object-oriented. Cube-likeness (but not sphere-likeness) contributed significantly to explaining variance in responses and interacted with modality to affect the predicted probability of action-oriented responses in all conditions except the haptic condition. Mass distribution (radial inertial symmetry) was also a significant predictor irrespective of perceptual modalities. These results suggest that exploration is governed by shape information, but affordance perception uses invariant information from an object's inertial properties.

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12:00–1:00 PM (4017)

Calibration of Passability Judgments in Virtual Reality Transfers to Augmented Reality. HOLLY C. GAGNON, *University of Utah,* HUNTER FINNEY, *University of Utah,* ROBERT BODENHEIMER, *Vanderbilt University,* JEANINE K. STEFANUCCI, *University of Utah,* SARAH H. CREEM-REGEHR, *University of Utah* — It is important to understand how actions are perceived in virtual reality (VR) and augmented reality (AR) as the technologies become more accessible and more prevalent for training. Prior work shows that, in VR, feedback about collisions calibrates judgments of walking through an aperture (passability) while holding a wide object. In the current study, we asked whether collision-based feedback could calibrate passability judgments for holding an object at 45 degrees in VR and if that calibration transfers to AR. Participants made baseline (pretest) judgments about whether they could walk through doorways of varying widths in AR and VR holding the pole. Next, participants walked through the apertures and received feedback about collisions completely in VR, and then completed posttest judgments in VR and AR. Results indicate that feedback calibrated judgments in VR, improving accuracy. The change from pretest to posttest was correlated across VR and AR, suggesting that calibration also transferred from VR to AR. These results have

implications for training actions in extended reality as well as understanding how to calibrate actions in these types of displays.

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12:00-1:00 PM (4018)

Reliably Inducing an Illusory Sense of Agency Over Electrically-Actuated Movements. JOHN P. VEILLETTE, *University of Chicago,* PEDRO LOPES, *University of Chicago,* HOWARD NUSBAUM, *University of Chicago* — Sense of agency (SoA) is the conscious experience of directing movement. While SoA over one's own bodily movements is considered fundamental to self-awareness, SoA is rarely studied in an embodied setting since subjects' control of their muscles is normally unimpeachable. In this work, we present a paradigm in which we preempt subjects' own movements during a reaction time task using electrical muscular stimulation (EMS). On each trial, subjects' movements can be intended (self-directed) or they can be caused exogenously by EMS. By adjusting stimulation timing using a Bayesian Optimization procedure, we cause subjects to experience an illusion of agency over EMS-actuated movements (i.e. erroneously attribute such movements to themselves). By generating two sets of trials with matched distributions of stimulation latencies but different experiences of control, this enables previously intractable neuroimaging investigations of bodily agency. We report EEG responses to EMS-actuated movements contingent upon self-reported SoA.

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12:00-1:00 PM (4019)

Oculomotor System Quickly Responds to Change of Müller–Lyer Illusion, But Not Due to Perception. YINGYING BEI, *East China Normal University,* ZHONGTING CHEN, *East China Normal University* — Whether the oculomotor system is immune to perceptual illusions is yet controversial. One potential reason is that previous studies did not affirmatively exclude delayed saccade initiations which allow influences from back-propagated perceptual information. The current study adapted an online perturbation procedure, in which time gaps between newest configuration onset and saccade initiation were limited in a small range (-115 ~ 300ms, 95% CI). Throughout three experiments, we consistently found bimodal distributions of time gaps when perturbations occurred, and perturbation effects were only observed in the later clusters (i.e. time gap > 130ms), indicating that influences from updated configuration relied on a short latency before saccades. Experiments 2 and 3 further matched physical and perceptual effects of Müller–Lyer configurations, respectively, and found that the perturbation effects were mainly due to physical change of stimuli rather than illusory perception. We conclude that the oculomotor system can quickly respond to visual updates, but is immune to Müller–Lyer illusions at early stages.

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12:00-1:00 PM (4020)

Active Explorations in Visual Material Perception. LISA P.Y. LIN, *Justus Liebig University Giessen,* KNUT DREWING, PROF. DR., *Justus Liebig University Giessen,* KATJA DOERSCHNER, PROF. DR., *Justus Liebig University Giessen* — Visual material properties such as gloss and lightness can only be perceived visually, and a wealth of empirical work has been successful in identifying the visual cues, such as image motion, that contribute to the perception of visual material properties across various contexts. Motion signals are generated, for example, when we explore and manipulate objects with our hands. However, to what extent active exploration plays a role in the perception of visual material properties has received little attention until recently. Using virtual reality and motion capture technologies, we compared observers' judgements of visual material properties in two viewing conditions: active explorations and static presentation. We tested two types of visual material properties (gloss vs. lightness), and we assessed whether observers generate different exploratory movements to produce visual cues about the specific visual material properties. Overall, we found that each type of visual material property evokes different exploratory hand movements that are linked to the acquisition of specific visual material properties, and our findings suggest that there could be a connection between visual feature genesis through active explorations and the utility of a particular visual cue to the material.

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12:00-1:00 PM (4022)

Investigating Effects of Visual and Auditory Mental Workload on UAS Pilots During Flight. COLLIN SCARINCE, *Texas A&M University–Corpus Christi,* MIGUEL MORENO, *Texas A&M University–Corpus Christi,* MADISON CLAUSEN, *Texas A&M University–Corpus Christi,* TYE PAYNE, *Texas A&M University–Corpus Christi* — Unmanned aircraft system (UAS) pilots monitor multiple channels of mission-critical information while carrying out operations. This includes processing verbal information, such as commands and warnings, and visual information, such as payload targets. A single subjects reversal design was implemented to investigate the effect of divided attention on UAS pilot performance during flights when combined with working memory tasks. The tasks included a standardized UAS flight-assessment course, the forward digit span test, and a visual change detection task (similar to Luck & Vogel, 1997). Participants (four certified UAS pilots) first completed baseline measures of the flight course and cognitive tasks. Participants then completed two divided attention flights—one combined with the digit span task and one with the change detection task. Participants than completed another baseline flight, a second set of combined tasks, and finally baseline measure of the cognitive tasks. We hypothesized that flight scores and performance on the cognitive tasks, on average, would degrade in the combined tasks compared to the baseline tasks. We also expected a stronger decrease in performance in the visual task compared to the auditory task.

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12:00-1:00 PM (4023)

Cognitive Correlates of Action Video Gaming: A Cross-sectional Study of Habitual and Professional Counter-Strike Players. ELEANOR R. A HYDE, *University of Sheffield,* CLAUDIA VON BASTIAN, *University of Sheffield* — Previous research on the relationship between action video gaming (AVG) and cognitive performance has yielded mixed results, possibly due to methodological limitations such as short training periods, small sample sizes of novice gamers, and varying definitions of AVGs. In this online study, we examined the association between AVG expertise and processing speed, task mixing, and switching performance in a large sample of N = 273 Counter-Strike (CS) players. Participants completed a CS expertise questionnaire, and using k-means cluster analysis, participants were allocated into four clusters of expertise: casual (n = 105), experienced (n = 107), aspiring (n = 28), and semi/professional (n = 33) players. A colour/shape switching task was also administered to measure processing speed and task mixing and switching. Significant main effects of the expertise cluster group were observed for processing speed. However, no significant effects were found for mixing and switching costs. Our findings demonstrate that processing speed, but not task mixing or switching performance, was enhanced in CS players with higher expertise. Further modelling and analysis of the response time distributions are currently underway.

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12:00-1:00 PM (4024)

The Frequency of Online Learners' Off-Task Behavior. MATTHEW HAYS, *Amplifire,* CHARLES J. SMITH, *Amplifire* — The COVID-19 pandemic eliminated most in-person scientific experimentation, forcing universities' research participant pools online. Cognitive psychologists have long expressed concerns about learners' off-task behavior without the watchful eye of a research assistant. Are these concerns justified? Did the pandemic itself have an effect? We define off-task behavior and report its frequency in an online learning platform used by millions of university students both before and during the pandemic.

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12:00-1:00 PM (4025)

Finger Tapping as a Behavioral Indicator of Spatial Presence in VR. SEAN HINKLE, *University of Central Florida,* SHAYNA R. SOARES, *University of Central Florida,* JORDAN SAMMARCO, *University of Central Florida,* RAFAEL LEITE, *University of Central Florida,* COREY BOHIL, *University of Central Florida* — The sense of spatial presence in virtual environments (VEs) is typically measured using self-report after task completion. Recent years have seen efforts to measure presence via physiological markers, with mixed results. Behavioral indicators might better track variations in presence over time. We propose finger tapping as an indicator of changing attentional demands corresponding to low and high presence conditions in VEs. Participants completed "virtual plank" (raised vs lowered to reflect high or low presence) and VR video (90- vs 360-degrees) conditions while attempting to tap fingers at a specified rate. Participants wore a data glove to measure finger taps, and we analyzed variations in inter-tap interval. We trained a neural net classifier to distinguish between low and high presence conditions using features derived from the finger-tap time series (e.g., power spectral density, autocorrelation). The trained network classified test epochs with a success rate between approximately 70%-90%.

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12:00-1:00 PM (4026)

Using the Internet to Generate Ideas Leads to an Impairment in Memory for Those Ideas. MERCEDES T. OLIVA, *University of California, Santa Cruz,* BENJAMIN C. STORM, *University of California, Santa Cruz* (Sponsored by Benjamin Storm) — Cognitive offloading can be a powerful mechanism for enhancing performance on a variety of tasks, but it can also cause information to become less recallable than it would have been otherwise (e.g., Kelly & Risko, 2019; Sparrow et al., 2011). In the current study, we examine the consequences of offloading the processes involved in idea generation to the Internet. Specifically, we examine whether people are less likely to remember the ideas they generate with the Internet than the ideas they generate on their own. Participants completed a version of the Alternative Uses Task in which they generated creative uses for eight common objects. For four of the objects, they used the Internet. For the other four objects, they did not. When participants were tested on their ability to remember the uses they had generated, they demonstrated a substantial impairment effect such that they recalled the uses they generated with the Internet significantly less well than the uses they generated on their own. This effect was replicated in two additional experiments even when participants were explicitly told to remember the uses, and even when they were instructed to type out the uses rather than copy and paste them from the Internet.

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12:00-1:00 PM (4027)

Texting for Help: Using GIFs Increases Empathic Concern. MONICA RIORDAN, *Chatham University,* ELLA GLIKSON, *Bar-Ilan University* — According to the empathy-altruism hypothesis, perceiving someone in need increases empathic concern, which (dependent on cost) increases likelihood of helping. This effect may be based in facial expression; Neuroscientific research suggests that viewing faces of people in need activates empathic concern, which increases likelihood of helping, likely via mirror neurons. GIFs are short animations of facial expressions and therefore may have this same effect. However, research has shown that GIFs are interpreted with a positivity bias, which may decrease the level of empathic concern that results from viewing facial expressions of people in need. In this study, participants view one of three text messages asking for help, either with or without a GIF of a person with a pleading facial expression, and are asked about the perceived emotionality of the message, their empathic concern for the sender, the perceived cost of helping, and their likelihood of helping. A regression model shows

inclusion of a GIF increases perceived emotionality of the message, which increases empathic concern for the sender, which in turn increases likelihood of helping. Perceived cost decreases likelihood of helping, as expected by the E-A hypothesis.

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12:00-1:00 PM (4028)

Webcam Use Improves Learning in Online Lectures, But Only in Mixed-Webcam Classrooms. OSCAR D. RAMIREZ-PEREZ, *Mississippi State University,* ANNIE S. DITTA, *University of California, Riverside,* JULIA S. SOARES, *Mississippi State University* — COVID-19 campus closures led to an exponential increase in prevalence of synchronous online classes. As such, instructor webcam policies have been the topic of much debate. In two experiments, participants watched live lectures administered by an experimenter through WebEx and took a test on the lectured material after a brief delay. Experiment 1 examined the effects of webcam use and interpolated quizzing on learning using a 2 (quizzes vs. no quizzes) x 2 (webcam-on vs. webcam-off) mixed design. Participants in the webcam-on condition performed significantly better than those in the webcam-off condition, and participants remembered significantly more material in lectures with quizzes than without, but these factors did not interact. Experiment 2 further investigated the mechanism of the webcam effect using a 2 (webcam-on vs. webcam-off) x 2 (Class Composition: uniform vs. mixed) mixed design. In the uniform condition, the whole class had their webcam on or off for the duration of the lecture, while in the mixed condition only half of the class had their webcams on. Webcam use and class composition interacted such that webcam-on participants performed significantly better but only in the mixed class condition.

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12:00-1:00 PM (4029)

Internet-Use Induced Forgetting: Investigating Whether Looking for More Information Online Can Make You Forget What You Already Know. DANA-LIS BITTNER, *University of California, Santa Cruz,* BENJAMIN C. STORM, *University of California, Santa Cruz* — Students often learn about a topic in class and then go online to search for additional information on that topic. Chances are there is some overlap of information between the two learning contexts, but not all information is repeated. How does the selective new learning provided by access to the Internet affect memory for information learned previously? Based on theories related to context-dependent memory, reinstating the mental context of a learning event at the time of test can aid memory. If people preferentially reinstate the online context over other contexts (e.g., the classroom), however, then using the Internet could make people more likely to forget the subset of information that is not repeated online. In the current poster, we present preliminary evidence that this sort of internet-use induced forgetting effect can occur, and discuss the potential practical and theoretical implications

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12:00-1:00 PM (4030)

Saving-Enhanced Memory: The Role of Test Order and Confidence. CHHAVI SACHDEVA, *University College London,* CHIARA SCARAMPI, *University of Geneva,* PEI-CHUN TSAI, *University College London,* SAM GILBERT, *University College London* — People often rely on external tools and resources to support their cognitive processes. This is known as cognitive offloading (Risko & Gilbert, 2016). Previous research has found that saving the contents of List-1 improves recall for a subsequently learned List-2. A previous study conducted in our lab found that saving List-1 led to a memory enhancement for List-2 when it was recalled first but saving List-2 did not enhance recall for the List-1 items. The current study aims to extend on this previous finding by investigating whether and when given free choice, participants choose to save and restudy the most effective list, i.e., List-1. We will also manipulate the order in which participants get tested on both lists and ask them to predict their performance according to the different possible strategies (i.e., using internal memory, saving List-1, and saving List-2). The findings help our understanding of how we can better use offloading strategies to supplement our memory.

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12:00-1:00 PM (4032)

Physiological and Perceived Processing and Recall of Information from Social Media Scrolling Feeds. ZOE LOH, *University of California, Merced,* HELIA HOSSEINPOUR, *University of California, Merced,* LACE PADILLA, *University of California, Merced,* SPENCER CASTRO, *University of California, Merced* — As the popularity of social media has increased, it is essential to understand how people process these social media information feeds. The present study assesses how the format of different digital displays of visual information impacts how people process and remember this information. Participants read one section of a climate change report in the form of a PDF in one block and another section of the report in the form of a simulated social media scrolling feed in another block. At the end of each block, participants answered multiple-choice questions about information from that section and completed the NASA Task Load index as a measure of perceived effort. We recorded participant eye movements and pupil sizes (a physiological measure of mental demand) using eye-tracking when participants were viewing both the PDF and the scrolling feed. We found that participants respond more accurately to the multiple-choice recall questions for the scrolling feed compared to the PDF. Participants also reported greater mental demand for the PDF compared to the scrolling feed. Information processing and recall from scrolling feeds may shift the types of information we remember as well as the efficacy with which we remember it.

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12:00-1:00 PM (4033)

Memory for Tweets Versus Headlines: Does Message Consistency Matter? TORI PEÑA, *Stony Brook University,* RAEYA MASWOOD, *Stony Brook University,* MELISSA CHEN, *Stony Brook University,* SUPARNA RAJARAM, *Stony Brook University* — We interface with informational sources every day to keep up with recent events. These sources, such as social media and news outlets, often present conflicting messaging which can potentially impair memory. Studies have shown a mnemonic advantage for social media information such that people remember information from social media over and above information from news sources. We examined memorability for tweets and news headlines not only when the two sources provided consistent messaging but also when they provided inconsistent messaging. We tested these conditions both in-person in the lab (Experiment 1) and in an online environment (Experiment 2). In each experiment, participants studied tweets and news headlines. Findings were generally consistent across experiments and across memory tasks: Participants had better memory for tweets than news headlines, replicating past research. Novel findings showed that the mnemonic advantage for tweets persisted even when tweets and news headlines conveyed inconsistent messages. We will discuss the implications of these findings for memory in the digital age where use of social media is widespread and messaging across sources can be inconsistent.

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12:00-1:00 PM (4034)

The Effects of Omnidirectional Image Presentation on Psychological and Economic Evaluation of Landscapes. MICHIKO ASANO, *The University of Tokyo,* KAZUHIKO YOKOSAWA, *Tsukuba Gakuin University,* DAISUKE ICHINOSE, *Rikkyo University,* KAYO TAJIMA, *Rikkyo University* — This study investigated the effects of the quality of the visual information of landscapes provided to participants on the psychological and economic evaluation of these landscapes. In each trial of the experiment, through a virtual reality (VR) headset, participants were presented with a static omnidirectional image or two-dimensional images (i.e., a slide show of five two-dimensional images extracted from the omnidirectional image's horizontal rotation at 72-degree intervals) of a scene from an urban park. Participants were asked how much they liked the park, were willing to pay (WTP) for using it, and were willing to visit (WTV), along with the degree of the sense of presence and VR sickness during the observation. The results showed that preference, WTP, and WTV were higher in the omnidirectional presentation than in the two-dimensional presentation, which seemed to be largely due to the increased sense of presence in the former. These findings suggest the importance of the quality of the information provided to participants in environmental valuations, which are often conducted to apply them to the creation of environmental conservation policies.

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12:00-1:00 PM (4035)

The Effect of Drone Dimensions and Speed on Perceived Human Safety. JAZMYNE ROSS, *University of Illinois Urbana-Champaign,* RANXIAO FRANCES WANG, *University of Illinois Urbana-Champaign* — Delivery drones are a new form of technology that companies are seeking to use in the future. Though engineers are able to design drones that are technically safe, it is important to implement drones into society that can be accepted by people. There are many competing theories about how to design drones and how they should behave. This study seeks to identify the features of drones that can maximize human comfort and perceived safety. Participants (N= 62) in this study observed a quadrotor approach them in an online experiment and were instructed to indicate when the drone reached a distance that caused the participant to feel unsafe. The quadrotor's characteristics were manipulated in terms of speed and size to examine their effect on perceived safety. Discomfort was greater for drones of larger dimensions and higher speeds, suggesting new approaches must be developed to incorporate these features. Future work should also consider physiological measures and more realistic displays such as virtual reality for examining human-robot interaction.

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12:00-1:00 PM (4036)

Effects of Emotion on Cognitive Control. SARAH B. MALYKKE, *The George Washington University,* REBEKA C. ALMASI, *The George Washington University,* JINI TAE, *Gwangju Institute of Science and Technology,* YOONHYOUNG LEE, *Yeungnam University,* MYEONG-HO SOHN, *The George Washington University* — Previous studies adopting immediate priming paradigms show that cognitive conflict has task-specific effects on emotion: perceiving conflict is negative, but this valence disappears or reverses for resolving conflict. We investigated whether emotional valence (i.e., positive or negative) has bi-directional effects on cognitive control. If either positive or negative emotion facilitates cognitive control (e.g., detection or resolving conflict), the response time cost of cognitive conflict (e.g., the Stroop effect) should be reduced. In two experiments, participants were primed through viewing a smiling (positive emotion) or angry (negative emotion) face before they performed the typical color Stroop task (Experiment 1) or explicitly identified the congruency of a color Stroop stimulus without necessarily resolving the conflict (Experiment 2). Stroop effect magnitude (i.e., the difference between congruent and incongruent conditions) was not modulated by prime valence in either experiment. These results are inconsistent with a previous study that showed that stimuli associated with positive emotion facilitated cognitive control. We argue that the emotion-to-cognitive control transfer may be stimulus-specific than stimulus-general.

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12:00-1:00 PM (4037)

Retrospective Revaluation of Non-Social Stimuli Associated with High Cognitive Effort. MYEONG-HO SOHN, *The George Washington University,* LILY RECK, *The George Washington University,* REBEKA C. ALMASI, *The George Washington University,* JINI TAE, *Gwangju Institute of Science and Technology,* YOONHYOUNG LEE, *Yeungnam University* — Previous research shows that social stimuli (e.g., human faces) associated with high cognitive effort can acquire positive valence. Emotion with human faces involves both the emotion recognition of stimuli and the reaction of the self, while emotion from non-social stimuli (e.g., scenes, words) relies on the retrieval of emotional appraisal. For example, seeing a carousel is only positive when we retrieve the fun memory associated with it. The current study examined whether effort-based valence evaluation is generalizable to non-social stimuli. Participants performed the color Stroop task with item-specifically manipulated proportion congruency, where some colors were frequently (80%) presented as incongruent and effortful, while others as congruent and low-effort. Later, using these colors as primes, participants rated valence of neutral stimuli (Experiment 1) or recognized emotion of human faces (Experiment 2). The results show that high effort primes produced numerically higher positive responses, and that high effort primes produced faster reaction time to positive than negative emotion. These results suggest that expending effort can lead to positive valence regardless of stimulus "socialness."

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12:00-1:00 PM (4038)

Effort Is Relatively Costly: Evidence for Reference-Dependent Effort Costs. DAVID BRAUN, *Lehigh University,* CATHERINE ARRINGTON, *Lehigh University* — A dominant perspective in cognitive psychology is that effort is viewed as a cost that discounts rewards in decision making. However, work investigating prospect theory demonstrates that how people view outcomes depends on expectations. When making risky choices about numbers of switches in a task switching context, people have been shown to choose opposite prospect theory in that they were risk averse for switching outcomes framed as losses and risk seeking for those framed as gains. We followed up on this finding in three experiments (N = 150) using a visual search task instead of task switching, where participants made gambles about how many distractors would be present in a search array. Experiment 1 replicated the effect that participants were risk averse for gamble outcomes framed as losses and risk seeking for those framed as gains. Experiment 2 showed moderate evidence that this effect persisted when controlling for time costs; Experiment 3 revealed the effect was robust to changes in how effort information was presented in the display. Together these results build on our previous work to suggest conditions under which people think about effort costs differently from other costs, such as money.

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12:00-1:00 PM (4039)

Increasing Reward Prospect Prompts Flexible Responding in a Problem Solving Task. JULIETTE BARAN, *Lehigh University,* KERSTIN FROEBER, *University of Regensburg,* CATHERINE ARRINGTON, *Lehigh University* — Increasing reward prospect prompts cognitive flexibility resulting in more task switching (Fröber & Dreisbach, 2016). We explore whether reward sequence effects on cognitive flexibility extend to problem solving tasks that require flexibility. The water jug task establishes mental set on a series of problems involving the same complex solution (B - A - 2C), followed by a critical problem where participants could either maintain mental set and use the same complex solution, or break set and use a simple solution with fewer steps (A - C). We manipulated the sequence of reward prospect from the last mental set to the first critical problem, creating two groups: the increasing (Low/High) and remain high (High/High) reward conditions. In line with predictions of a model where increasing reward prospect results in greater cognitive flexibility, more participants broke mental set in the increasing condition compared to the remain high condition. Additionally, solution times for the simple solution were faster for participants in the increasing compared to the remain high condition. The demonstration of reward sequence effects on problem solving has implications for educational and work settings.

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12:00-1:00 PM (4040)

Which Labor Leads to Love? Conditions Facilitating Positive Associations with Cognitive Conflict. REBEKA C. ALMASI, *The George Washington University,* MYEONG-HO SOHN, *The George Washington University,* JINI TAE, *Gwangju Institute of Science and Technology,* YOONHYOUNG LEE, *Yeungnam University* — Cognitive conflict arises when distractors provide information incongruent with a task-relevant target. Ignoring these distractors is effortful; this effort can be positive or negative depending on time and task. Previous research shows that stimuli associated with high effort in conflict resolution (successful ignoring of distractor) can acquire positive valence. The present study explores whether such positivity emerges for passive viewing or explicit identification (responding "congruent" or "incongruent") of conflict. During the association phase, participants identified the age of the actor (Experiment 1) or the gender congruency (Experiment 2) of emotionless gender Stroop stimuli. In both experiments, some actors mostly appeared with an incongruent gender word, others mostly congruent. In the transfer phase, participants identified the emotion that actors displayed. The actors associated with incongruency were more quickly identified as positive than negative in Experiment 2 but not in Experiment 1. Expanding on the previous research showing that high-effort stimuli in conflict resolution tasks later induce positive valence, we conclude that conflict identification, but not viewing, is sufficient to produce the same effect.

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12:00–1:00 PM (4041)

Is Proactive or Reactive Support More Critical for Eliminating Working Memory Capacity Differences in the Stroop Task? BROOKE CHARBONNEAU, *Montana State University,* AUDREY V.B. HOOD, *Montana State University,* KEITH A. HUTCHISON, *Montana State University* — Individuals lower in working memory capacity (WMC) show larger Stroop effects when given lists that are mostly congruent (MC) compared to mostly incongruent (MI). However, this impairment could occur at either the list or item level and most past research examining WMC and proportion congruency (PC) has confounded the two. MI lists can provide proactive support through reminding participants to suppress the word, whereas MI items can provide reactive support by automatically directing attention away from word reading. The current study examined the isolated and combined effects of proactive support (MI list) and reactive support (MI items) in reducing the influence of WMC on Stroop performance. First, a re-examination of Hutchison (2011), in which list PC and item PC were unconfounded, suggests lower WMC individuals' Stroop accuracy benefits from both proactive and reactive support, whereas their reaction time benefits more strongly from proactive support. In the current conceptual replication, results show lower WMC individuals benefit as much from reactive support as they do from proactive support, which is counter to most current assumptions.

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12:00–1:00 PM (4042)

Working Memory Capacity and Dual Mechanisms of Cognitive Control: Measuring Eye Gaze Behavior During the AX-CPT. JASON F. REIMER, *California State University, San Bernardino,* ANDREW S. RIVERA, *California State University, San Bernardino,* MIRIAM G. FENTON, *California State University, San Bernardino,* GUADALUPE ROMERO, *California State University, San Bernardino* — The Dual Mechanisms of Control framework (Braver, 2011) identifies two distinct modes of cognitive control: reactive and proactive. Multiple studies have examined whether these two modes of control are associated with individual differences working memory capacity (WMC). Specifically, these studies examined whether the use of proactive control is associated with increased WMC. While some studies have found support for this relationship (e.g., Redick & Engle, 2011; Richmond et al., 2015), other studies have not (e.g., Rosales et al., 2022). The purpose of the present study was to further examine this relationship by measuring participants' WMC, as well as their eye movements during a modified version of the AX-CPT. Importantly, by using this version of the AX-CPT, previous studies have established specific patterns of eye movements that are associated with the use of reactive vs. proactive control (Reimer et al., 2022). The results of the present study demonstrated that while measures of eye movements predicted WMC, these eye movements were distinct from those that predicted the degree proactivity utilized by participants. These results suggest that an increased use of proactive cognitive control is not directly related to WMC.

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12:00–1:00 PM (4043)

Investigating Dissociable Mechanisms of Concurrent Stability and Flexibility Adaptations with Drift Diffusion Modeling. RAPHAEL GEDDERT, *Duke University,* TOBIAS EGNER, *Duke University* — Adaptive behavior requires the ability to focus on a current task while avoiding distraction (cognitive stability), and also to switch tasks when circumstances change (cognitive flexibility). Stability and flexibility are typically viewed as opposing endpoints on a continuum, but we have recently demonstrated that humans can maintain stability levels (ability to ignore distractors) while increasing their flexibility (ability to task switch), and vice versa, suggesting that stability and flexibility are independent. To elucidate the underlying mechanisms, we here employed drift diffusion modeling (DDM) to identify the parameters mediating adaptations in task switching and distractor avoidance in a cued task-switching experiment with independent block-wise manipulations of the proportion of incongruent and switch trials. Stability and flexibility adaptations were dissociable as parameterized in the DDM: drift rates were uniquely related to stimulus congruency, while non-decision time was uniquely related to switch type. These components were additionally uniquely modulated by the block-wise proportion of incongruent and switch trials, respectively. These results clarify the independence of stability and flexibility adaptations.

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12:00–1:00 PM (4044)

The Inverted U-Shape Relationship Between Task Difficulty and Conflict Adaptation. MIKLOS BOGNAR, *Eötvös Loránd University (ELTE) Institute of Psychology,* BALAZS ACZEL, *Eötvös Loránd University (ELTE) Institute of Psychology,* HENK VAN STEENBERGEN, *Leiden University* — The sequential modulation of congruency effect is an indicator of our flexibility to adapt to conflicting stimuli. Studies in the past have shown that task difficulty can directly influence the extent of conflict adaptation. In this work, we investigated the effect of parametric difficulty manipulations on conflict adaptation: based on recent evidence, we hypothesized an inverted-U shape relationship between task difficulty and conflict adaptation. In two mixed design experiments, we used a prime-probe task with parametrically changing levels of difficulty by increasing stimulus complexity. We have found evidence that conflict adaptation increases with perceived and objective difficulty until the point where the task difficulty becomes too high and conflict adaptation decreases. This new finding is in line with the inverted-U shape hypothesis and provides the first direct evidence for this pattern in the relationship between cognitive control and task difficulty.

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12:00–1:00 PM (4045)

The Congruency Sequence Effect Across Different Sensory Modalities in Stimulus-Based Conflict Tasks. YOON SEO LEE, *Korea University,* YANG SEOK CHO, *Korea University* (Sponsored by Yang Seok Cho) — It has been suggested that a single

control mechanism can regulate conflicts from two different tasks if the representations of the tasks are indistinguishable. The purpose of the present study was to examine whether features that increase the distinction of task boundaries, such as stimulus sensory modality, determine the presence of the congruency sequence effect (CSE) in Stroop tasks (Experiment 1) or flanker tasks (Experiment 2). Participants were asked to perform horizontal auditory and vertical visual tasks alternatively in a trial-by-trial manner. Responses were taken through a unimanual aimed movement method. CSEs were obtained between the horizontal auditory and vertical visual tasks in both experiments. These results indicate that although the boundary of the tasks was salient enough to form different task representations, the same control process transferred across tasks. Therefore, we propose that the control mechanism specifically exerts their influence on stimulus and/or response dimensions rather than task representation.

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12:00-1:00 PM (4046)

The Congruency Sequence Effect Indexes Both Relaxation and Tightening of Control. MATTHEW DUNAWAY, *University of Michigan Ann Arbor,* DANIEL H. WEISSMAN, *University of Michigan Ann Arbor* — The congruency effect in Stroop-like tasks—a popular measure of distraction—is larger after congruent trials than after incongruent trials. It is unclear, though, if this sequential effect indexes control processes that relax control after congruent trials, tighten control after incongruent trials, or both. To find out, we added neutral trials to a standard temporal flanker task and manipulated—across four experiments—the response deadline (900 ms or 1567 ms), the distractor-target interval (33 ms or 800 ms), and the relative size of the distractor and target (same or different). We found that control processes always relax control after congruent (vs. neutral) trials but also tighten control after incongruent (vs. neutral) trials with a short response deadline. We also found that whether the negative (i.e., reverse) congruency effect after incongruent trials, which appears with a long distractor-target interval, indexes (a) inhibition of the distractor response or (b) activation of the opposite response depends on whether the distractor and target appear in the same size or in different sizes, respectively. We conclude that control processes adapt flexibly to changing task conditions to cope with distracting stimuli.

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12:00-1:00 PM (4047)

The Generality of Parallel Processing: Task-Specific Versus Task-General Parallel Processing in Dual-Tasking. INGA MÖGLING, *University of Greifswald,* VICTOR MITTELSTÄDT, *University of Tübingen,* IAN GRANT MACKENZIE, *University of Tübingen,* RICO FISCHER, *University of Greifswald* — Although humans often multitask, we still know little about how processing resources are divided between concurrent tasks. In the present study, we examined how resources were allocated in multitasking with varied task probability and whether resource adjustments generalized across tasks. In three experiments, participants only performed one of two background tasks if the primary task was a no-go (i.e., prioritized processing paradigm). In Experiment 1, the two background tasks were equally likely in blocks of high/low frequency of background tasks. In Experiments 2 and 3, only one background task conveyed the high or low frequency of background tasks (inducer task), while the other task appeared equally often and served to check for transfer effects (diagnostic task). In Experiment 1, crosstalk effects increased with a higher probability of background task trials (see Miller & Tang, 2021), suggesting that more resources were deployed to the background task when it was frequent. These adjustments transferred from the inducer to the unbiased diagnostic task (Experiment 2). With conceptually and visually distinct tasks, the bias was only obtained in the inducer task trials (Experiment 3). Results indicate that a transfer of task-frequency induced bias in resource allocation seems to be limited to conceptually similar tasks.

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12:00-1:00 PM (4048)

Evaluating the Effects of Mindfulness Practice on Attentional Control and Episodic Memory. JACOB M. NAMIAS, *The University of Southern Mississippi,* MARK J. HUFF, *The University of Southern Mississippi* — In two experiments we assessed the relationship between engagement in mindfulness practice and attentional control and episodic memory. Experiment 1 examined the relationship between trait mindfulness and the frequency of practice to a battery of attentional control and episodic memory tasks. Experiment 2 evaluated the effects of a brief mindfulness intervention by having participants complete two 5 min sessions of mindfulness meditation followed by a battery of attention and memory tasks. This mindfulness group was then compared to a control group who completed a task that did not involve self-reflection and present awareness (listening to Bob Ross describe painting a nature scene). Overall, trait mindfulness ratings and frequency of mindfulness practice were not associated to either attentional control or episodic memory performance. Further, completion of a brief mindfulness session did not benefit attentional control and episodic memory relative to the control intervention. Our results indicate that although there is limited evidence for mindfulness benefits on cognitive tasks following long-term repeated mindfulness practice, these benefits are not found with casual practitioners and are not found with brief interventions.

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12:00-1:00 PM (4049)

Response-Repetition Costs Reflect Changes to the Representation of an Action. JONATHAN SCHACHERER, *Washington & Lee University,* ELIOT HAZELTINE, *University of Iowa* — Repeating a response from the previous trial typically leads to performance benefits. However, these benefits are eliminated, and usually reversed, when switching to a new task (i.e., response-repetition costs). Here, we test the proposal that response-repetition costs reflect changes in the representation of an action. To investigate this, we

designed tasks that required participants to switch between color and shape judgments with experimentally-induced outcomes. Critically, the stimuli and responses were constant across conditions; what differed was the number of outcomes associated with the responses. For both response time and error rate, response-repetition costs on task-switch trials were significantly reduced when response repetitions led to outcome repetitions relative to when response repetitions led to outcome switches. Moreover, response repetitions that led to outcome repetitions showed an advantage in response time (but not error rate) compared with when no outcomes were experimentally induced. We conclude that response-repetition costs reflect a change in the representation of an action and that action selection is largely grounded in the anticipation of the response-related outcomes.

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12:00-1:00 PM (4050)

Effects of Goal-Setting on Sustained Attention & Attention Lapses. DEANNA L. STRAYER, *University of Oregon,* MATTHEW ROBISON, *The University of Texas at Arlington,* NASH UNSWORTH, *University of Oregon* — The ability to sustain attention during tasks is vital to everyday life, but sometimes we experience attention lapses: shifts of focus away from the task at hand that can lead to failures in completing intended actions. Goal-setting theory posits that setting specific, difficult goals leads to optimum task performance. The current study extends Robison, Unsworth, & Brewer (2021) and examines how goal-setting techniques affect attention lapses. Across 3 experiments, we measured task performance and subjective attentional states during a 4-choice reaction time task. E1 broadly replicated prior research: the specific goal condition had fewer behavioral attention lapses, but subjective task-unrelated thoughts (TUTs) were not impacted. In E2 & E3, the goal condition became progressively harder over the course of the task in an attempt to further manipulate performance. The goal conditions in both E2 & E3 displayed fewer behavioral lapses, but subjective TUTs remained unimpacted. This study corresponds with recent research showing that behavioral and subjective measures are distinct and capture different aspects of attention lapses and provides evidence for the utility of goal-setting techniques in reducing attention lapses.

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12:00-1:00 PM (4051)

Does RIF Keep the Doctor Away? Evaluating Health Relevant Cognitive Biases via Retrieval-Induced Forgetting. MADDISON M. BALDWIN, *Memorial University of Newfoundland,* KELSI HALL, *Memorial University of Newfoundland,* BROOKE HISCOCK, *Memorial University of Newfoundland,* EMILY FAWCETT, *Memorial University of Newfoundland,* JOSHUA RASH, *Memorial University of Newfoundland,* JONATHAN FAWCETT, PH.D., *Memorial University of Newfoundland,* MADISON LASAGA, *Memorial University of Newfoundland* — Retrieval Induced Forgetting (RIF) is a cognitive paradigm demonstrating that retrieval processes can lead to subsequent forgetting of related information. The present experiment used this phenomenon to evaluate whether those with self-reported health anxiety exhibit impaired memory control for health-related and/or neutral material. In the initial phase, participants studied category-word pairs (e.g., HEART-break), after which they practiced retrieving half of the targets from half of the categories when provided with a word-stem (e.g., HEART-br) generated from the preceding phase. Finally, they were presented with each category (e.g., HEART) and asked to recall as many target words associated with that category as possible. In this context, a RIF effect is defined as worse memory for unpracticed items from practiced categories than for items from unpracticed categories. A reduced RIF effect was observed for health-related (e.g., HEART-blockage) word pairs compared to neutral (e.g., CARD-letter) word pairs. However, this difference was not significantly correlated with scores from a validated measure of health anxiety.

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12:00-1:00 PM (4052)

Revisiting the Components of Priming of Location (PoL). DOMINIQUE LAMY, *Tel Aviv University,* DANIEL TOLEDANO, *Tel Aviv University* — Maljkovic and Nakayama (1996) showed that search is faster when the target location happens to repeat on successive trials, an effect called priming of location (PoL). They found PoL to include both a target-activation and a distractor-inhibition component, and to decay as the spatial distance and temporal interval between current and previous targets increase. Although highly cited, this study relied on the data of only 3 observers and generated scarce follow-up research. Here, we re-analyzed a recently published large-scale dataset of 8 visual search experiments. We found that (1) target activation alone underlies PoL, as the distractor-inhibition effect originally reported resulted from a confound, (2) search mode modulates PoL's spatial profile, (3) both passive decay and interference from intervening trials account for its temporal profile, and (4) PoL includes both an attentional and a response-related component. Although random variations in search difficulty strongly affected PoL, suggesting that PoL is reactive, the results of a follow-up experiment using a probe-report task, showed that PoL also has a proactive component.

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12:00-1:00 PM (4053)

Selection History vs. Optimality in the Choice of Attentional Control Strategy. DAVID S. LEE, *Texas A&M University,* HARIS KHAN, *Texas A&M University,* BRIAN A. ANDERSON, *Texas A&M University* — Attentional control balances the competing drives of performance maximization and effort minimization. One way the attention system minimizes effort is through a bias to persist in the use of attentional control strategies that have been useful in the past. In the present study, we asked whether such selection history can result in the persistence of an attentional control strategy that is counterproductive, effectively competing with a more optimal strategy. Participants first completed a training phase in which only one color

target was present on each trial, which was more frequently red than blue or vice versa. In a subsequent test phase, both a red and a blue target were presented on each trial and there were sometimes more red and sometimes more blue non-targets to search through. Participants exhibited a robust tendency to find the target rendered in the less abundant color, reflecting performance maximization. Importantly, participants also exhibited a tendency to report the target rendered in the previously more frequent target color, even when the distribution of non-target colors made it suboptimal to do so. Our findings help contextualize the role of selection history in the strategic control of attention.

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12:00-1:00 PM (4054)

Pooling-Mediated Processing in Peripheral Vision Is Responsible for Conjunction Search Difficulty. ANDREA YAOYUN CUI, *University of Illinois Urbana-Champaign,* ALEJANDRO LLERAS, *University of Illinois Urbana-Champaign,* JOHN E. HUMMEL, *University of Illinois Urbana-Champaign,* SIMONA BUETTI, *University of Illinois Urbana-Champaign* — In conjunction search, where a target is displayed with two kinds of distractors, each sharing one feature with it, response times increase linearly with setsizes. Traditional visual search literature believes attention is required to focus serially so that it can bind features from different dimensions into coherent representations. In this study, we tested an alternative hypothesis – the inefficient search performance observed in conjunction search lies in different distractors falling within the same pooling region in peripheral vision. The partially lost information makes the visual system hard to distinguish between pooling regions with and without the target. We did two experiments. Experiment 1 used homogeneous displays with rectangular or circular grids. Experiment 2 used conjunction search displays with rectangular, spatially intermixed circular or segregated circular grids. The results supported our hypothesis, and we well predicted conjunction search performance based on the parameters in homogeneous displays. Sequential Parallel Model was best at accounting for variability in the observed data, which indicates the rejection of distractors is sequential by type, and distractors within one type are rejected in parallel.

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12:00-1:00 PM (4055)

What Can the P-N Flip Tell Us About Proactive Suppression? JOYCE TAM, *The Pennsylvania State University,* CHLOE CALLAHAN-FLINTOFT, *U.S. Army Research Laboratory,* BRAD WYBLE, *The Pennsylvania State University* — Our attentional system can select relevant information and suppress irrelevant information in under half a second. Given this short time scale, EEG has proved particularly revealing of the time course of these attentional processes. ERPs have been correlated with selection (N2pc) and suppression (Pd) respectively, but the interpretation of these ERPs is not always straightforward. An example is the "P-N flip" (an early Pd followed by a N2pc): The P-N flip is thought to be elicited by a singleton distractor, and at face value, this means that the distractor was first suppressed quickly, but then re-attended to. This seems counterproductive and inconsistent with predictions from any theories. In this project, we simulated the P-N flip with the computational model RAGNAROC. We argued against the face value interpretation and illustrated how the P-N flip can instead result from an interplay between proactive and reactive suppression, where proactive suppression reveals an EEG difference waveform between a weakly attended-to nonsingleton distractor and an ignored singleton distractor. We were then able to further highlight the computational distinction between proactive and reactive suppression, and generate novel, unique predictions.

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12:00-1:00 PM (4056)

How Are Visual Search Templates Represented for Complex, Real-World Objects? BRETT BAHLE, *University of California, Davis,* STEVEN J. LUCK, *University of California, Davis* — Visual attention is guided during search by a template corresponding to the features of the target. This template is thought to be represented in the brain as a working memory representation, particularly when searching for a frequently changing target. But what features are represented in the search template, especially when the target is a complex, real-world object? Here, we utilized both computational approaches (such as ConceptNet) and crowd-sourced data (Hebart, et al. (2020)) to quantitatively model multiple levels of representational abstraction for search targets (and, correspondingly, search distractors). Specifically, we propose that the search template is defined as a vector of feature values at different levels of abstraction, from low-level, image-based features to high-level, semantic features. Across different search tasks, we found evidence that the level of abstraction of a given representational space selectively explained variance in search behavior. Our approach provides a new quantitative model for predicting attentional allocation during visual search.

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12:00-1:00 PM (4057)

Statistical Learning Facilitates Search for Multiple Targets. ANDREW CLEMENT, *Texas A&M University,* BRIAN A. ANDERSON, *Texas A&M University* — Searching for multiple targets is often less efficient than searching for a single target. However, statistical learning has been found to compress object representations in memory, enabling more efficient storage of information. Here, we tested whether statistical learning can also facilitate search for multiple targets. Participants searched for one of two targets that were cued on each trial. In an initial training phase, specific pairs of targets always co-occurred with each other. In a subsequent test phase, participants searched for previously associated or unassociated pairs of targets. Participants were faster and more accurate at detecting the target when they searched for a previously associated pair of targets. Participants were also more likely to initially fixate the target when

they searched for a previously associated pair of targets, suggesting that statistical learning facilitated search guidance. However, similar findings were not observed for dwell times on the target, suggesting that these findings were not due to differences in target identification. Together, these findings suggest that statistical learning can facilitate search for multiple targets, possibly by compressing target representations in memory.

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12:00-1:00 PM (4058)

Top-Down Attention Control Does Not Imply Voluntary Attention Control for All Individuals. BRADLEY S. GIBSON, *University of Notre Dame,* JAMIE M. TROST, *University of Notre Dame,* SCOTT E. MAXWELL, *University of Notre Dame* — Top-down information is known to play an important role in the control of visual attention. Often, evidence for top-down attention control is also interpreted as evidence for voluntary attention control. However, this latter theoretical interpretation is not warranted because willful volition is typically defined in terms of a conscious feeling that prior intentions led to a subsequent action, but this aspect of performance has not been assessed in previous studies. Accordingly, the present study used the construct of "agency" within the context of the spatial cueing paradigm to examine the relation between top-down and voluntary attention control. The results of two experiments consistently showed using growth-curve modeling that standard manipulations of top-down information in the spatial cueing paradigm do not have the same effect on all participants. We conclude that the relation between top-down and voluntary attention control is not straightforward and must be studied using methods that are sensitive to individual differences.

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12:00-1:00 PM (4059)

Exploration Bias When Foraging in Patchy Versus Homogeneous Target Repartitions Environments. CHARLOTTE VAN DEN DRIESSCHE, *École Normale Supérieure/Université Libre de Bruxelles,* EMILIA TURC, *École Polytechnique,* ARTHUR BECERIL, *École Polytechnique,* TATIANA ZEMKOVA, *École Polytechnique,* JÉRÔME SACKUR, *École des Hautes Études en Sciences Sociales/École Normale Supérieure/École Polytechnique* — We previously reported that inattentive or Hyperactive traits were associated with exploring bias in foraging tasks (Van den Driessche et al., 2019), with performance dissociations depending on target distribution: whereas in homogenous distribution ADHD traits were associated with performance decreases, they were associated with increases when targets come in burst, as in semantic fluency tasks. Yet, there are indications in the literature that behaviours could be different when searching in 3D from a first person perspective (FPP). Here we present the results from an FPP video game-like experiment, where participants searched and collected mushrooms in a forest. Participants were assessed on an attentional scale and performed two blocks, one with a uniform distribution of targets, the other with a patchy distribution. Several models of the trajectories and strategies are consistent with an exploratory bias associated with ADHD traits as well as a modulation of performance depending on the "patchiness" of the environment.

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12:00-1:00 PM (4060)

Using ERPs to Evaluate Covert Attentional Processes That Occur Before Eye Movements. TRAVIS N. TALCOTT, *Binghamton University SUNY,* STEVEN J. LUCK, *University of California, Davis,* NICHOLAS GASPELIN, *Binghamton University SUNY* — In vision, researchers distinguish between two forms of attentional selection: covert and overt attention. Overt attention refers to eye movements, whereas covert attention refers to perceptual enhancement that occurs without a shift of gaze. A common assumption is that covert attention mandatorily precedes overt eye movements, acting as a "scout" to inspect target-like objects before eye movements are generated. The current study directly evaluated this assumption by concurrently measuring shifts of covert attention (via event-related potentials; ERPs) and overt attention (via eye tracking). Interestingly, overt eye movements were not preceded by the N2pc component, a putative index of covert attention. In addition, ERP decoding suggested that targets were localized, but not identified, before first eye movements. These results indicate covert attentional processes that occur before eye movements may only be limited to enhancement of simple features (e.g., color and location).

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12:00-1:00 PM (4061)

Highly Representative Category Members Are Less Susceptible to the Low Prevalence Effect. RYAN E. O'DONNELL, *The Pennsylvania State University,* BRAD WYBLE, *The Pennsylvania State University* — Visual search is greatly impacted by the appearance rate of given target types, with low prevalent items being harder to detect. This has consequences for real world search tasks where target frequency cannot be balanced. However, highly-representative targets of a categorically-defined task set are easier to find. We hypothesized that highly-representative targets are less vulnerable to low prevalence effects because a searcher's attentional set prioritizes guidance toward them even when rare. We tested this by determining the categorical structure of "prohibited carry-ons" via an exemplar naming task and selecting a commonly named (knives) and rarely named (gas cans) target for a mock airport screening task where one of the two appeared rarely. As predicted, highly-representative targets were found more easily than less representative targets and were less affected by prevalence manipulations. This result replicated with targets matched for emotional valence (water bottles and fireworks). Our findings demonstrate the explanatory power of attentional guidance theories that combine the impact of recent experience with the knowledge gained from life experience to better predict outcomes in high-stakes search settings.

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12:00-1:00 PM (4062)

Attentional Control Reflects Loss Aversion. SUNGHYUN KIM, *Korea University,* YANG SEOK CHO, *Korea University* — Loss aversion is the psychological propensity that changes of losses loom larger than equivalent changes of gains. The present study explored if attentional control reflects loss aversion. Participants performed a visual search task. On each trial, a red target and a green target were presented simultaneously, and participants were free to search for either one. Participants always gained points when they searched for red (green) targets. However, they gained or lost points when they searched for green (red) targets. Importantly, the expected values of the gain color and the gain-loss color were equal. Therefore, for maximizing the reward, participants did not need to preferably search for a particular color. However, results showed that participants searched for the gain color more than the gain-loss color, suggesting stronger attentional control for the gain color than the gain-loss color. Thus, attentional control operates based on the loss aversion principle.

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12:00-1:00 PM (4063)

Hybrid Foraging in ADHD: A New Approach to Studying Attentional Problems in Development. BEATRIZ GIL-GOMEZ DE LIANO, *Universidad Autónoma de Madrid,* JEREMY M. WOLFE, *Brigham and Women's Hospital/Harvard Medical School* — Attention Deficit with Hyperactivity Disorder (ADHD) is one of the most common developmental disorders, affecting about 5% of children and 2.5% of adults worldwide. It is characterized by complex cognitive symptoms in which attentional processes are particularly compromised. In the present work, 15 ADHD (7-15 years old) children and 15 age-matched typically-developing children performed a Hybrid Foraging task where observers must look for and collect multiple instances of multiple targets held in memory. Observers looked for instances of 7 different stuffed animals within a video game-like task. Observers could switch to a new patch/screen at will. We measured the picking rate, run length (the same target type picked repeatedly), and errors. We found that ADHD observers were faster to leave one patch for the next. Interestingly, however, rate, run length, and error metrics did not differ between groups. Our foraging video game seems to rely on several attentional processes that, if correctly rewarded, seem to be essentially intact in ADHD children. Our foraging game represents a novel way to investigate attentional regulation in attentional developmental disorders like ADHD.

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12:00-1:00 PM (4064)

Individual Differences in Eye Movements During Visual Search for Digits May Reflect an Influence of Semantic Information on Attentional Selection. CAROLINE S. DANFORTH, *University of Central Arkansas,* NICKOLAS J. PATERNOSTER, *University of Central Arkansas,* NATHANIEL T. WILSON, *University of Central Arkansas,* KENITH V. SOBEL, *University of Central Arkansas,* AMRITA M. PURI, *University of Central Arkansas* (Sponsored by Amrita Puri) — The size congruity effect (SCE) in visual search refers to a delay in localizing target digits when their semantic (numerical) and perceptual (physical) size conflict (e.g., a physically large 2 among small 8s and 9s). Previous reaction time (RT) and mouse trajectory data suggest that semantic and perceptual information interact at a decision-related stage, after attentional deployment. Here, we recorded eye movements while participants searched for digits that were congruent or incongruent with respect to numerical and physical size. We predicted that if the SCE occurs at a decision stage, the time to first fixation (TFF) on targets would be similar across congruity conditions, and that delays for incongruent targets would be linked to a greater number or duration of fixations on incongruent targets. Instead, TFF was greater for incongruent compared to congruent targets, and across participants, these target TFF differences were positively correlated with RT differences between conditions. A greater number of fixations to incongruent compared to congruent distractors was also correlated with RT differences. These eye movement patterns suggest that semantic information may influence attentional selection during visual search.

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12:00-1:00 PM (4066)

Enhancement and Suppression of Category Exemplars: Long-Term Memory Consequences. Y. ISABELLA LIM, *University of Toronto,* JAY PRATT, *University of Toronto* — Knowledge of object categories is accumulated over long periods of time. When increasing numbers of category exemplars are memorized, this may induce interference within the category, subsequently impairing memory. Prior work has found that after encoding categories with specific perceptual features, attention is drawn to exemplars matching those features in later search. However, it is unclear whether this is due to categorical search templates being drawn to certain features or away from other ones, which we examined in this study. Participants first underwent an exposure phase where they viewed two streams of images. They were instructed to attend to objects in one stream by sorting these objects as "natural" or "artificial" while suppressing attention from objects in the other stream. After several blocks of these trials, they performed a search phase where they searched for objects belonging to a category label among an array of different objects. We found that suppressed exemplars were searched for slower than attended exemplars in later search, suggesting that attending to or suppressing certain exemplars shape categorical search templates held in long-term memory.

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12:00-1:00 PM (4067)

How Does Searching for Multiple Faces Among Similar-Looking Distractors Affect Search Performance and Distractor Memory? GEOFFREY MCKINLEY, *Skidmore College,* DANIEL PETERSON, *Skidmore College,* MICHAEL HOUT, *New Mexico State University* — Prior research has shown that

searching for multiple targets during visual search enhances subsequent recognition memory for the distractors presented. We examine whether this phenomenon is due to greater overlap in features between target(s) and distractors, or if this effect can be explained more simply by an increase in the number of mental comparisons required. We examined these hypotheses by manipulating visual working memory (VWM) load and target-distractor similarity of AI-generated faces using an RSVP task. Similarity was manipulated via a multidimensional scaling model constructed from facial landmarks and category predictions of each face. If a greater featural overlap between target(s) and distractors enhances distractor memory, then similar distractors should be better recognized than dissimilar distractors. As predicted by both hypotheses, high-distractor similarity and VWM load hurt search performance. However, only VWM load enhanced distractor memory. These data suggest that during search for faces, the effect of search difficulty on distractor memory may be observed only when a greater number of mental comparisons are required, and is not due to greater encoding intensity given to distractors.

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12:00–1:00 PM (4070)

The Role of Accent and Input Modality When Processing Language Switches in Bilingual Language Comprehension. MARION COUMEL, *University of York,* CONG LIU, *Qingdao University,* DANIJELA TRENKIĆ, *University of York,* ANGELA DE BRUIN, *University of York* — We examine how bilinguals process language switches between their first (L1) and second language (L2). Language switching costs (slower responses to language switch than non-switch trials) arise more systematically in production than in comprehension, possibly because the latter elicits less language co-activation (Declerck et al., 2019). Yet, such co-activation may depend on variables such as accents and input modality. In Experiment 1 (auditory comprehension switching task, with 57 Mandarin-English bilinguals judging animacy), participants showed switching costs from English to Mandarin. The English words were pronounced with a Mandarin accent, which could have increased Mandarin activation and might consequently have required more Mandarin suppression and increased switching costs. To test how accents influence these costs, Experiment 2 will manipulate whether L2 (English) words have a Mandarin or an English accent. Moreover, Experiment 3 will examine the effect of input modality (auditory or visual), another factor that could modulate co-activation (Orfanidou & Sumner, 2005). Together, these experiments will shed more light on lexical co-activation when processing language switches during comprehension.

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12:00–1:00 PM (4071)

The Relationship Between Attention and Memory in Single-Language and Code-Switched Contexts. LAUREN K. SALIG, *University of Maryland, College Park,* JORGE R. VALDÉS KROFF, *University of Florida,* JARED M. NOVICK, *University of Maryland, College Park,* L. ROBERT SLEVC, PHD, *University of Maryland, College Park* — Bilinguals sometimes code-switch between languages, which can be costly to comprehend (e.g., longer reading times than unswitched input; Altarriba et al., 1996). But other data suggest that switches modulate listeners' attention (Beatty-Martínez et al., 2021). We propose that code-switches may boost attention—due to changes in acoustic quality or because switches orient listeners to upcoming information (Tomić & Valdés Kroff, 2022). In an ongoing study, Spanish-English bilinguals listen to one code-switched and one single-language story while periodically reporting their attention level on a 100-point scale. We predict a code-switched context will produce higher attention responses and better recall for information. First, to validate our remote data collection method, 48 monolinguals completed an English-only version. Reported attention to information predicted comprehension question accuracy on that information ($p < 0.01$), replicating in-person studies (e.g., Boudewyn & Carter, 2018). Thus, the link between attention and memory holds in a remote environment. While data collection with bilinguals is ongoing, preliminary results show the predicted trend: higher self-reported attention in code-switched than single-language contexts.

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12:00–1:00 PM (4072)

Bilingual Vocabulary Learning in a Context Variability Framework. JUSTIN LAURO, *Barry University,* PAMELA TOASSI, *Universidade Federal do Ceará* — Each time a learner encounters a new word, features of that word, that experience, are encoded in memory. Research on word learning has demonstrated a clear advantage in recall of new words studied in a variety of contexts compared to words studied in the same context. This finding has been observed in monolinguals, and in bilinguals' first (L1) and second (L2) languages. Research has exclusively focused on the impact of variation in semantic context. Nevertheless, each encounter with a word includes non-semantic, episodic information. For example, font size and color of words have been observed to impact reading times. This study examines the effects of semantic and non-semantic variation across novel word encounters in bilinguals. Previous research has failed to detect an impact of language variation on bilingual recall. We hypothesize that that the impact of a non-semantic language variation during studying will result in greater recall for language pairs with a higher degree of phonological similarity (e.g. Portuguese-Spanish) compared to language pairs with a lesser degree of phonological similarity (e.g. English-Spanish).

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12:00–1:00 PM (4074)

Language Coactivation for Interlingual Homographs During Bilingual Reading: The Impact of Semantic and Individual Differences in Language Entropy. KARLA TARÍN-MURILLO, *McGill University,* ESTEBAN HERNÁNDEZ-RIVERA, *McGill University,* VERONICA WHITFORD, N/A, *University of New Brunswick,* DEBRA TITONE, *McGill*

University — Bilingual adult readers fixate longer on words that straddle two languages (interlingual homographs, ILHs; e.g., CHAT in French/English) indicating language coactivation (Libben & Titone, 2009; Pivneva et al., 2014). Interestingly coactivation decreases when contexts biases target-language ILH meanings (English sentence about conversations). Unclear is whether contexts biasing other-language meanings (English sentence about cats) increase coactivation, and whether reading habits play a role. Across two studies, bilinguals read ILHs in English sentences. In Study 1, 87 bilinguals read ILHs when contexts biased target language meanings (CHAT=talking). Here, global ILH interference (i.e., coactivation) emerged across contexts for late-, but not early-stage measures, irrespective of reading habits (language entropy). In Study 2, 80 bilinguals read ILHs when contexts biased non-target language meanings (CHAT=cat). Here, language entropy increased ILH interference globally for early but not late measures, only for L2-readers. These results suggest that language coactivation is multidetermined by text- and person-related factors.

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12:00–1:00 PM (4075)

Spanish/English Bilingual Judgement Norms for Spanish Adjectives. NATASHA VERNOOIJ, *University of Michigan Ann Arbor,* JULIE E. BOLAND, *University of Michigan Ann Arbor* — We investigated how bilinguals perceive different types of Spanish adjectives when they appear before or after the noun. Spanish adjectives vary in their position relative to the noun and whether they change meaning based on their position (Zagona, 2002). Prenominal quantifiers must go before the noun, postnominal adjectives must go after the noun, change adjectives can go before or after the noun and change meaning based on their location, and no change adjectives predominately appear before the noun but do not change meaning. 38 Spanish/English bilinguals rated 80 Spanish sentences on a scale of 1 to 7 (1=bad, 7=good). Sentences varied in the type of adjective (prenominal, postnominal, change, no change) and position of the adjective (pre- or post-nominal). Prenominal and change adjectives were preferred before the noun ($t(37)=11.81$, $p<.001$; $t(37)=3.14$, $p<.01$) and postnominal and no change adjectives were preferred after the noun ($t(37)=-7.52$, $p<.001$; $t(37)=-7.13$, $p<.001$). Thus, these classes are accurate descriptive categories of Spanish adjectives for bilingual speakers in El Paso, TX. Normative data for each of the 40 adjectives are available from the first author.

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12:00–1:00 PM (4076)

Sources of Top-Down Processing in Recognition of Repeated Speech in Noise. LIAM J. GLEASON, *The University of Texas at El Paso,* WENDY S. FRANCIS, *The University of Texas at El Paso* — Prior research has shown that repetition facilitates speech recognition in difficult listening environments, as indicated by more accurate reporting and lower subjective noise ratings. Both effects were found even when sentences were read at encoding, suggesting that the top-down processing involved comes from a modality-general level of representation (Gleason & Francis, 2021). We investigated whether this top-down processing comes from the semantic or lemma level of language representation. Bilingual participants listened to sentences in English and Spanish. At test, these sentences and new sentences were presented auditorily in English with background noise. After listening to each sentence, participants reported the final word and rated the noise level. In the English encoding condition, results replicated previous priming effects in repetition accuracy and noise ratings. However, these repetition effects did not transfer across language conditions, which suggests that the top-down processing originates at the lemma level and not the semantic level.

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6:00–7:00 PM (4077)

Does Learning Context Modulate the Roles of Long-Term Memory in Adult Second Language Learning? MARYNA RIDCHENKO, *University of Illinois Chicago,* ALEXIS BERLES, *University of Illinois Chicago,* JOSHUA BUFFINGTON, *University of Illinois Chicago,* KARA MORGAN-SHORT, *University of Illinois Chicago* — Research suggests that individual differences in declarative and procedural memory contribute to varying levels of success in adult second language (L2) learning (Morgan-Short et al., 2022). However, it is hypothesized that their role may be modulated by learning context. This study investigates the relationship between declarative and procedural memory learning abilities and L2 grammar learning under two learning conditions. Participants learn an artificial L2 under an explicit (with metalinguistic information) or implicit (without metalinguistic information) condition, complete a grammaticality judgment task at early and late stages of learning, and complete cognitive assessments of both declarative (Declearn, Hedenius et al., 2013) and procedural (Serial Reaction Time, Nissen & Bullemer, 1987) memory learning ability. Preliminary results ($N = 18$; data collection ongoing) show that declarative memory is positively associated with L2 learning in the explicit condition, whereas procedural memory is positively associated with L2 learning in the implicit condition, at a later learning stage. The implications of results for theories of L2 learning, particularly for the Declarative/Procedural Model (Ullman, 2020), will be discussed.

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12:00–1:00 PM (4078)

Age-Invariant Cognitive Reappraisal Is Associated with Emotional Memory for Moral Dilemmas. MARISA HALLER, *Boston College* — Older adults rate first-person sacrificial moral dilemmas more negatively than younger adults (McNair et al., 2019). Additionally, older and younger adults demonstrate emotional memory biases for morally neutral content (Carstensen et al., 2003). It is unclear how age-related differences in negative affective ratings of moral dilemmas are associated with subsequent emotional memory for those dilemmas. Relatedly, it is unclear whether subjective emotional regulatory processes impact emotional memory in the moral

domain. In this study, older and younger adults made valence ratings on a series of moral dilemmas. They were then asked to rate their emotional memory for the dilemmas. They also completed a subjective emotion regulation questionnaire. Although significant age differences in valence ratings for the moral dilemmas were observed, these differences were not associated with emotional memory. Age-invariant subjective emotional regulatory abilities, however, were associated with emotional memory. Higher cognitive reappraisal was associated with higher emotional memory scores, highlighting the importance of future work examining the role of emotional regulatory processes in the context of memory for moral content.

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12:00-1:00 PM (4079)

Metacognitive Self-Assessment and the Role of Belief in Search Termination. DAVID A. ILLINGWORTH, *California State University, Long Beach,* RICK THOMAS, *Georgia Institute of Technology* — Our empirical hypothesis was that search termination behavior is influenced by participants' underlying beliefs in hypotheses, specifically the participant's internal confidence that the correct answer is known. A sample of college students completed a hypothesis testing medical diagnosis task. The experiment used medical tests with equal objective, informative value before unveiling a presenting symptom. The relation between the underlying beliefs in the hypotheses and search termination was measured by the predictive validity of judgment-of-knowing (JOK) estimates and the subsequent decision whether to continue testing in the sequential search task. The observed patterns of test selection and the relation between the elicited JOKs and patterns of search termination provide strong evidence that changes in beliefs about disease hypotheses resulted in systematic and predictable changes in test preference, and search termination behavior—consistent with a notion we refer to as the principle of hypothesis-guided search.

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12:00-1:00 PM (4080)

Introducing a New USB Response Pad with Slider for Likert Scale Measurement and JDM Studies. RICHARD R. PLANT, *The Black Box Toolkit Ltd* — Often researchers need to measure more than simple button presses in Judgement and Decision Making studies, e.g. subjective scale measurements. Currently there are no easy to use response pads for measuring Response Times and finite judgements using a Likert Scale via means of moveable sliders like those used in music recording studios. In this paper we outline a new USB response pad with up to four buttons and slider that allows for up to 2048 positions over a 15cm track. Slider position is reported as either a series of standard keystrokes or as a number between 0 and 2047 followed by return after a stationary interval. For EEG studies TTL Event Marking lines allow for the position of the sider to be reported alongside button status.

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12:00-1:00 PM (4081)

Using QTest to Identify the Context Effect . ELIZABETH PETTIT, *Miami University,* YU HUANG, *University of Illinois Urbana-Champaign,* JOSEPH JOHNSON, *Miami University,* MICHEL REGENWETTER, *University of Illinois Urbana-Champaign,* DANIEL CAVAGNARO, *California State University, Fullerton* — Context effects are irrational decision making patterns that have intrigued psychologists for the last 50 years. They operate by changing a decision maker's preferences among two options through placement of a third, decoy option. Although described as universal, few studies have invoked these preference reversals jointly and consistently in the same participants. Past research statistical analyses have also added unstated constraints and left out important nuances specified in published theories surrounding context effects. The current study reanalyzes data from Dumbalska et al., (2020) using QTEST, a modeling and data analytics software that allows for testing verbal theories by translating them into order-constrained hypotheses. With this method we constructed a map of the decision space that identifies where a decoy option will either increase, decrease, or fail to change a choice probability among two options that a person is indifferent between when presented without the decoy.

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12:00-1:00 PM (4082)

Do Children Show Hot Hand Thinking? ANDREAS WILKE, *Clarkson University,* GRACIE DELABRUERE, *Clarkson University,* NIA BROWN, *Clarkson University,* HANNAH M. SPILMAN, *Clarkson University,* YADHIRA GARCIA, *Clarkson University,* STEVEN PEDERSEN, *Clarkson University,* BANG-GEUL HAN, *College of Staten Island of the City University of New York,* H. CLARK BARRETT, *University of California, Los Angeles,* PETER TODD, *Indiana University,* ANNIE WERTZ, *Max Planck Institute for Human Development* — A tendency to perceive illusory streaks or clumps in random sequences of data—the hot hand phenomenon—has been identified as a human universal tied to our evolutionary history of foraging for clumpy resources. The current research investigates how misperception of randomness and ecologically relevant statistical thinking develop ontogenetically. Based on our work with adults, we developed three iPad-based decision-making tasks to assess how 3- to 10-year-old children decide that sequential events will continue in a streak or not, their understanding of randomness, and their ability to reason in spatially dependent terms. Our study collects data at research sites in the United States and in Germany and is run in collaboration with the SUNY Potsdam Child Care Center (SPCCC), the North Country Children's Museum (NCCM), and FRÖBEL Kindergartens around Berlin.

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12:00-1:00 PM (4083)

The Effects of Value and Probability on the Utilization of the Perceptual Decision Strategy. CHING-HUI CHUNG, *National Cheng Kung University,* HAO-LUN FU, *National Cheng*

Kung University, CHENG-TA YANG, *Taipei Medical University Graduate Institute of Mind, Brain and Consciousness & National Cheng Kung University* — We investigated how people's decision strategies are affected by the payoff and probability manipulations. Systems Factorial Technology was adopted and eight participants were recruited to perform a double-dot detection task while the stimulus salience of each dot was varied. To test the effects on attention and subsequent decision processes, we varied the amount of payoff and probability at one of the single-target locations across two conditions: 1) low payoff and high probability and 2) high payoff and low probability while keeping the expected values the same across the trial types. Our results showed individual differences: 3 participants maintained the parallel self-terminating strategy and the rest participants alternated between serial and parallel processing across conditions. In addition, most participants were more sensitive to the stimulus saliency at the high target probability location. Although the preliminary findings were inconclusive to provide a mechanistic explanation about the individual differences, the shift between parallel and serial processing implied a potential interaction between payoff and probability processing on the perceptual decision process.

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12:00–1:00 PM (4084)

Reward Anticipation Effects on Cognitive Control and Memory Encoding: A Meta-Analysis. KYLE E. THURMANN, *University of Denver,* DIANE H. MOON, B.A., *Southern Methodist University,* HOLLY E. GRAY, *Southern Methodist University,* AUDREY NG, *University of Denver,* HOLLY J. BOWEN, PH.D., *Southern Methodist University,* KIMBERLY S. CHIEW, *University of Denver* — Reward anticipation influences both cognitive control and memory encoding outcomes, but how effect magnitude varies across these cognitive domains and with elements of task design is unclear. We conducted a meta-analysis to systematically investigate effects of reward anticipation across the two domains, and the influence of task paradigms and design elements within these domains. Following initial literature searches and an extensive screening process, we identified 161 studies meeting our inclusion criteria (98 studies examining cognitive control, 63 studies examining memory). Effect size analyses will be conducted in R (using the meta package), enabling evaluation of whether reward anticipation effects vary between cognitive control and memory performance outcomes as well as potential modulation by factors including stimulus timing, response window, incentive contingency and reward outcome. This analysis will provide a comprehensive understanding of how reward anticipation affects cognition as well as clarifying potential effects of variable task parameters.

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12:00–1:00 PM (4085)

Beyond Dual Systems: Neural Activity and Connectivity in Monitoring, Control, and Valuation Networks Predict Real-Life Self-Control Failures. THOMAS GOSCHKE, *Technische Universität Dresden,* MAX WOLFF, *MIND Foundation,* HOLGER MOHR, *Technische Universität Dresden,* ANJA KRÄPLIN, *Technische Universität Dresden,* MICHAEL SMOLKA, *Technische Universität Dresden,* GERHARD BÜHRINGER, *Technische Universität Dresden,* KLAUS-MARTIN KRÖNKE, *Technische Universität Dresden* — Deficient self-control increases the risk for maladaptive behaviors and incurs severe personal and societal costs. We tested a process model of neurocognitive mechanisms underlying real-life self-control failures (SCFs), i.e., enactments of desires that conflict with long-term goals. In a large multilevel study, we combined task batteries assessing cognitive control, functional and resting state fMRI, and ecological momentary assessments. Proneness to commit daily SCFs was reliably predicted by reduced error-related activity and connectivity in brain networks mediating performance-monitoring (dACC, preSMA, anterior insula) and inhibitory control (right inferior frontal gyrus). Moreover, SCFs were reliably associated with reduced top-down modulation of neural value signals in the ventromedial prefrontal cortex by long-term goals. Results indicate that SCFs reflect neither competition between impulsive and reflective systems nor impaired control competencies. Rather, they result from deficient performance-monitoring, leading to an insufficient mobilization of control in response to goal-desire-conflicts, which in turn attenuates the impact of long-term goals on computation of a common value signal determining behavioral choice.

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12:00–1:00 PM (4086)

Blocked and Trial-by-Trial Manipulations of Proactive Effort Investment. NICOLETA PRUTEAN, *Ghent University,* TABITHA STEENDAM, *Ghent University,* NICO BOEHLER, *Ghent University,* WIM NOTEBAERT, *Ghent University* — Neuroeconomic theories suggest that mental effort is driven by a cost/benefit analysis, in which prospected benefits (e.g., reward) are weighed against prospected costs (e.g., difficulty). Reward typically improves performance, and this is usually more pronounced when costs are larger. In this project, we wanted to investigate how proactive preparation influences this interaction. Therefore, we either blocked the reward manipulation (and difficulty varied trial by trial) or we blocked the difficulty manipulation (and reward varied trial by trial). We used a classic (i.e., simultaneous stimulus and response display, N=63) and a modified (i.e., separate stimulus and response displays, N=60) Random Dot Kinematogram (RDK) task with different stimulus durations, and observed an unexpected reward effect (slower responses for large vs. small reward) only in the classic RDK with a longer trial duration. Results are discussed in terms of the specific characteristics of the RDK task and participants' reward optimisation strategies.

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12:00-1:00 PM (4087)

Take a Load Off: Examining Partial and Complete Cognitive Offloading of Medication Information. JULIA R. KEARLEY, *McGill University,* LAUREN L. RICHMOND, *Stony Brook University,* SHAWN T. SCHWARTZ, *Stanford University,* MARY B. HARGIS, *Texas Christian University* — Cognitive offloading (the use of physical action to reduce internal cognitive demand) is a common memory support strategy, but little is known about the impact of offloading on internal memory. In two experiments, participants encoded medication names and interactions. Experiment 1 tested participants' memory by presenting two of three elements ("Macrobid + [blank] = itching") and probing memory for the missing element. No differences were observed as a function of item type (medication, interaction) or location (medication 1, medication 2; all ps < .230). Experiment 2 tested memory in three blocks, including an internal memory block, a partial offloading block where two of the three item elements could be chosen for offloading, and a full offloading block where entire items could be chosen for offloading. Performance was better in the offloading blocks than the internal memory block (full vs internal: $F(1, 75) = 202.803$, $p < .001$; partial vs internal: $F(1, 75) = 77.684$, $p < .001$), and full offloading benefitted performance more than partial offloading ($F(1, 75) = 106.971$, $p < .001$). Results suggest that offloading benefits performance most when offloaded information is directly available at test.

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12:00-1:00 PM (4088)

The Effect of Attentional Template Disruption on the Detection of Low Prevalence Fake ID Cards. DAWN R. WEATHERFORD, *Texas A&M University-San Antonio,* AMY DICKE-BOHMANN, *Texas A&M University-San Antonio* — ID card screening is one of many routinized tasks for which low-frequency items, such as valid IDs presented by an imposter, often go undetected. We sought to disrupt the attentional template cemented by repeatedly making the same decision in response to high-frequency items by instituting a low-frequency burst approach like others that have shown modest success. Participants completed 100 ID screening trials and were randomly assigned to either answer whether the ID presented by a genuine or imposter person. In addition to manipulating the frequency of imposter and genuine IDs, half of participants switched their question frame (from genuine to imposter, or vice versa) in the middle 20 trials. Experiment 1 involved trial-by-trial feedback. Experiment 2 did not. Results revealed participants were relatively unaware of frequency imbalances unless explicitly told via feedback. Further, the burst imposed different effects in Experiment 1 than Experiment 2. As our burst approach is practicable in real-world settings, unlike bursts that rely upon a sudden influx of imposter IDs, future research should apply this method to real screening scenarios in order to identify its possible value in reducing the passage of fake IDs.

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12:00-1:00 PM (4089)

Creative Problem Solving, Fluid Intelligence, and Their Relationship. DAVID MARTINEZ, *University of Maryland, College Park,* MITCHELL KOFF, *University of Maryland, College Park* — Prior research suggests that the relationship between creative problem solving and fluid intelligence is quite strong, though not perfect. There are, however, a number of measurement issues that may have affected observed correlations, such as the use of convenience samples and a limited set of tasks with poor psychometric properties. Here we report interim results from an ongoing study that suggests creative problem solving and fluid intelligence may be one and the same. We discuss why creative problem solving and fluid intelligence should be strongly related (if not isomorphic), possible next steps to better understand these constructs, and limitations of our approach.

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12:00-1:00 PM (4090)

Differential Psychophysiological Responses to Working Memory Loads Related to the Currently Active Versus Withheld Tasks. BERHAN FARUK AKGÜR, *Bilkent University,* AUSAF A. FAROOQUI, *Bilkent University,* TAMER GEZICI, *Bilkent University* — Working memory load is usually seen as a unitary construct. Pupil diameter (PD) – a well-known measure of cognitive load – typically increases with increased working memory load. Here we show that effect of load related to the concurrent task on pupil diameter is categorically different from that of the load related to task that is withheld to use later on. Participants executed a long task made up of two subtasks. They first saw one or two oblique lines (subtask B lines) and were to remember their orientations. They then saw two different lines (subtask A lines), memorized their orientations, and were immediately asked to configure the orientation of a probe to one of these lines. After finishing this subtask A, they were to recall the subtask B lines and configure the orientation of a (second) probe to one of these lines. We found that having to remember two versus one subtask B line decreased PD. In contrast, recalling from two versus one subtask B line, or having to remember subtask A lines with increased subtask B load, increased PD.

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12:00-1:00 PM (4091)

Not All Who Wander Are Lost: Mind Wandering and Creativity. BERNA ALTUNISIK, *Mississippi State University,* ANDREW F. JAROSZ, *Mississippi State University* (Sponsored by Andrew Jarosz) — One reason that incubation may help in creative problem solving is that it provides opportunity for mind wandering, allowing remote associations to form and provide a path to solution. However, mind wandering can be measured in multiple ways with different theoretical implications. In the present study, participants completed the Remote Associates Task (RAT) twice with an incubation interval between attempts, during which participants completed a lexical decision task and watched part of a documentary. During these tasks, off task thought and freely moving thought levels were

measured via probes. Deliberate and spontaneous mind wandering were measured by a post-task survey. Results showed that initial RAT performance was negatively predicted by freely moving thought and positively predicted by deliberate mind wandering, whereas off task and spontaneous thought were not predictive of performance.

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12:00-1:00 PM (4092)

The Eternal Busyness of the Creative Mind: Resting State Cognition of Original Thinkers. QUENTIN RAFFAELLI, *University of Arizona,* RUDY MALUSA, *University of Arizona,* NADIA-ANAIS DE STEFANO, *University of Arizona,* SURYA FITZGERALD, *University of Arizona,* ALEX KEENEY, *University of Arizona,* DARYA ZABELINA, *University of Arkansas,* JESSICA ANDREWS-HANNA, *University of Arizona* — Recent research suggests behavioral and neural associations between creative thinking and daydreaming, yet it remains unclear how creative individuals think when otherwise not prompted with a task at hand (i.e. "resting state" cognition). To explore the thought characteristics of individuals varying in their objectively-assessed creativity, we recorded, transcribed, and rated the real-time conscious experiences of 81 adults as they voiced aloud the content of their mind moment-by-moment across a 10-minute rest period. Metrics assessing content and dynamics, as well as participants' ratings of their subjective experience during the rest period, were used as predictors of participants' originality scores on an adapted version of an Alternate Uses Task. Higher originality was associated with more trait curiosity, as well as less boredom over the 10-minute rest period, more freely moving thoughts, more words spoken overall, and more loosely-associative (as opposed to sharp) transitions during resting state cognition. Overall, these results suggest a tendency for creative individuals to be more engaged and more explorative at rest, complementing findings from resting state functional connectivity.

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12:00-1:00 PM (4093)

The Role of Active Perception and Naming in Sameness Comparison. MARINA DUBOVA, *Indiana University,* ARSENY MOSKVICHEV, *University of California, Irvine* — Humans have an exceptional ability to notice relations between different entities and situations and to transfer their relational knowledge across a variety of contexts. It remains unclear which cognitive resources and grounded operations underlie human ability to acquire and use generalizable relational concepts. Here, in a set of three experiments (N=40, N=40, N=155), we investigate the grounded strategies that human adults use to determine if two compound items are visually identical. We found that people tend to offload the comparison process onto their active perception by revealing perceptual information in the order that minimizes memory involvement and a possibility of relational misclassification. However, when we prevent participants from using these perceptual routines, they switch to a naming strategy: they name the features of the items being compared mentally or out loud. When the items compared do not have clear labels associated with them and the use of active perception strategies is prohibited, adults are slower, less accurate, and use more effort when making a relational judgment. Thus, humans use active perception and naming as adaptive resources when determining visual sameness of the objects.

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12:00-1:00 PM (4094)

Partitioning Problem Solving into Its Component Parts and Its Effect on Learning. ENOCH SUMAKPOYAA, *Syracuse University,* DANIEL CORRAL, *Syracuse University* — We report two experiments that investigate the different components of problem solving and how they affect the transfer of learning to novel problems. These experiments included five conditions: identification, category-mapping, problem-solving practice, worked examples, and control. Subjects in the training conditions (i.e., non-control subjects) first completed a learning phase, wherein they were presented problems that corresponded to three problem types from physics, and then a posttest with novel, analogous problems; control subjects only completed the posttest. During the learning phase, the identification condition involved identifying each problem; the category-mapping condition involved selecting the correct solution strategy for each problem; the problem-solving practice condition involved solving each problem and receiving correct-answer feedback; and the worked examples condition involved studying a worked example for each problem. Although no posttest differences were found among the training conditions, subjects in these conditions outperformed control subjects. Thus, all training conditions facilitated the transfer of learning, but to a similar extent.

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12:00-1:00 PM (4095)

Boosting Debiasing with Repeated Training. NINA FRANIATTE, *LaPsyDÉ & Université Paris Cité,* ESTHER BOISSIN, *LaPsyDÉ & Université Paris Cité,* WIM DE NEYS, *Université Paris Cité/LaPsyDÉ/Centre National de Recherche Scientifique (CNRS)* — Decades of research in reasoning have shown that human judgment is sometimes biased and illogical. Within the framework of dual-process theories, the intuitive system (System 1) has been described as the one that often cues an unwarranted heuristic response. However, recent work has shown that a short training in which correct answers are explained can boost logical performance. We wanted to test the critical effect of a debiasing training repetition: does it further boost intuitive and deliberate reasoning performance? We combined 3 different debias tasks in a test battery (namely bat-and-ball, base-rate, and conjunction fallacy), repeating the training 3 times, out of 120 participants. The first training and its repetition took place in the same week. Then, we retested them two months later. We used the two-response paradigm in which reasoners have to give two responses in each trial, one intuitive and the other deliberate. Results showed that the repetition reduced the number of biased reasoners beyond the first training. More interestingly, it would protect participants from forgetting when

they are retested 2 months later. This sheds light on the effects of an immediate second learning, compared to a single debiasing training.

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12:00-1:00 PM (4096)

Training Sensitivity to Biased Samples in Inductive Reasoning. SPRIHA GOSWAMI, *University of New South Wales,* BRETT K. HAYES, *University of New South Wales* — How we generalize a property from a known sample of instances to novel targets depends on how the data were sampled ("sampling frames"). Category sampling refers to the selection of instances based on their category membership, whereas property sampling refers to the selection of instances based on their possession of a particular property. Previous work has found individual differences in sensitivity to the effects of sampling frames on property induction. Some learners show a robust "frames effect", with narrower property generalisation under a property frame than a category frame, while others show no such effect. In two experiments, we sought to augment the frames effect via a novel training paradigm, in which participants observed a worked example of analogous sampling scenarios and received feedback about appropriate generalizations. In Experiment 1, those who received this training showed a larger frames effect than those who did not. In Experiment 2, when training was manipulated within-participants, the frames effect was augmented by training for those who did not show the effect at baseline.

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12:00-1:00 PM (4098)

Reasoning About Effect Size Information in Everyday Contexts. AUDREY MICHAL, *University of Michigan,* PRITI SHAH, *University of Michigan* — Media reports on scientific findings rarely include effect size information, despite their potential usefulness. One challenge is that the lay public may not have sufficient domain expertise to accurately interpret effect size information. Additionally, people rarely spontaneously notice when strong claims are based on tiny effect sizes (Burrage, 2008). Here we asked whether people are sensitive to effect size when the context is familiar and they are explicitly asked whether a finding shows a 'meaningful difference.' In a between-subjects design, participants viewed scenarios in which characters experienced a small or large change as the result of an intervention that was likely familiar (calorie loss, test scores, etc.). Participants who viewed large versus small effect size information were more likely to judge that the intervention led to meaningful improvements, recommend the intervention to other people, and try the intervention themselves, suggesting that people are sensitive to effect sizes in everyday contexts.

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12:00-1:00 PM (4099)

Analytical Thinking and the Generation of Disablers and Alternative Antecedents in Conditional Reasoning. JAY VON R. MONTEZA, *University of Denver,* JASMINE BONSEL, *California State University, San Bernardino,* ALANIS R. PEREZ, *California State University, San Bernardino,* RONNIE A. DE LEON, *California State University, San Bernardino,* HIDEYA KOSHINO, *California State University, San Bernardino,* ROBERT RICCO, *California State University, San Bernardino* — Dual process (DP) theory maintains that everyday reasoning and decision-making is based in two distinct types of processes – intuitive (type 1) and analytical (type 2). We tested a claim that individuals with a greater proclivity to engage in analytical thinking would have greater sensitivity to the logical properties of conditional statements. These properties were: 1. The antecedent of the conditional is a purely sufficient condition for the consequent. That is, there are alternative antecedents that also make the consequent true. 2. Conditional statements hold true in some respects and not others. Cases where the antecedent is true and the consequent is false represent disablers that define the limits of the conditional. Participants were identified as intuitive or analytical based on their responses to the Actively Open-Minded Thinking scale. As expected, we found that on a generation task, analytical thinkers generated more alternative antecedents and more disabling conditions than intuitive thinkers.

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12:00-1:00 PM (4100)

Teaching Bayesian Reasoning in the Classroom: Successful Estimations of a Challenging Concept. JOHN VARGAS, *University of Massachusetts Amherst,* JEFFREY J. STARNS, *University of Massachusetts Amherst,* ANDREW COHEN, *University of Massachusetts Amherst* — Bayesian reasoning--the process of optimally updating a hypothesis or belief with the acquisition of additional information--is a critical aspect of both everyday decision-making and statistics education, but strategies for effectively teaching the topic in the classroom remain elusive. Prior research has demonstrated the facilitatory effects of accompanying visual aids when solving Bayesian problems; however, it remains uncertain if such effects translate to better understanding when taught as part of a class. This project compares the learning outcomes of students taught Bayesian concepts with a traditional equation-based curriculum to students taught utilizing a unique visualization method. The results suggest that students taught with the bar visualization defer to the visual for accurate estimations on Bayesian problems, but such estimations may not represent deeper mathematical or conceptual understanding of Bayesian concepts. Further educational suggestions are discussed.

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12:00–1:00 PM (4101)

The Development of Continuous Reasoning in an Ambiguous Situation. ROBERT RALSTON, *The Ohio State University,* VLADIMIR SLOUTSKY, *The Ohio State University* — Humans can make surprisingly accurate inferences about unknown properties of objects and organisms using inductive reasoning. One popular view of inductive reasoning is that inferences are mediated by discrete representations: participants first determine the probability that an item is in several classes, then use knowledge about classes to infer the unknown property. Alternatively, inferences may be mediated by processes which retain continuous representations of stimulus features, such as function learning. To assess these differing mechanistic accounts, this study examines whether reasoning in an ambiguous situation is mediated by discrete or continuous representations across development. To create an ambiguous situation, we used stimuli where, during learning, the target dimension (motion amplitude) was equally predicted by both category membership and by correlation with a visual dimension (stimulus width). By analyzing participant responses to ambiguous items, we found that the use of continuous representations emerged from 4 to 8 years old, and that both strategies were used in equal amounts into adulthood. These results support a pluralistic (multi-mechanism) account of inductive reasoning for older children and adults.

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12:00–1:00 PM (4103)

The Effect of Implicit Hints on Solution Rates and Aha! Experiences for Matchstick Arithmetic Problems. TAYLOR MILLER, *University of Illinois Chicago,* JENNIFER WILEY, *University of Illinois Chicago* — Insight problems lead individuals to start with incorrect initial problem representations. The present work tested whether implicit hints intended to prompt two mechanisms, constraint relaxation (CR) and chunk decomposition (CD), would impact solution rates and Aha! experiences. Some participants attempted matchstick arithmetic problems presented in a standard font (no hint condition), whereas others saw problems presented with images of matchsticks (intended to enable CD), or with the solution stick slightly skewed (intended to cue both CD and CR). Implicit hints led to better solution rates than the standard font condition, and higher rates of self-reported Aha! experiences. Finally, the Aha-accuracy effect was present across conditions and did not seem to vary due to implicit hints, which stands in contrast to some findings with more explicit hints.

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12:00–1:00 PM (4104)

Investigating the Effect of Isolated-Focus on Relational Preference. MERCURY MASON, *Binghamton University SUNY,* KENNETH J. KURTZ, *Binghamton University SUNY* — Previous work has demonstrated that relational responding in the Relational Match-to-Sample (RMTS) task can be improved compared to baseline by providing people with the opportunity to consider individual problem elements in isolation prior to receiving the full problem. However, it remains unclear whether the benefits of this intervention persist in its absence, or can be observed when a prior strategy has already been established to complete the task. To this end, we deployed a 2x2 mixed design, where presentation type was the within-subjects factor and order of presentation type was the between-subjects factor. The aims of this work were to gain further insight into the utility of isolated-focus as a means of promoting relational responding, and better understanding how processing of problem elements changes as a consequence of isolated-focus. We discuss the implications for pedagogical practices and extensions of this work to other materials and tasks.

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12:00–1:00 PM (4105)

Perceptions of Completeness and Accuracy Help Decrease Knowledge Overestimation. JULIANNE WILSON, *Lehigh University,* JESSECAE K. MARSH, *Lehigh University* — The tendency to overestimate one's knowledge has been shown in many domains including understanding of how everyday objects work. This Illusion of Explanatory Depth (IOED) can be broken through the act of generating a causal explanation. We explored how both subjective and objective features of generated explanations drive changes in perceived understanding. Participants completed a typical IOED paradigm for devices, and then rated the perceived completeness and accuracy for the explanations they generated. We found that lower ratings of overall completeness and a sense of incomplete big explanatory components, along with higher ratings of inaccuracy for big explanatory components, predicted a larger decrease in perceived understanding ratings post explanation. We coded participants' explanations to determine whether their subjective sense of completeness objectively matched what they produced. Fewer causal connections within an explanation predicted a larger decrease in understanding ratings, suggesting that participants' subjective ratings of completeness were reflected objectively in their explanations. We discuss the implications of these results in relation to what may lead a person's illusion of understanding to break.

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12:00–1:00 PM (4106)

Tessio, Tu Triches? In Search of the Cheater Detection Module in Deductive Reasoning. KIMIHIKO YAMAGISHI, *Tokyo Institute of Technology* — We focused on the theoretical dispute among influential theories regarding the nature of deductive reasoning competency. The disagreement lies between Cheng and Holyoak (1985) and Cosmides (1989). In explaining the problem solving performances in Wason's (1960) 4-card problem, Cheng and Holyoak posit that the familiarity with the choice context dictates problem solving effectiveness. In contrast, Cosmides (1989) postulates that a standard human mindset, namely the cheater detection module, explains the choice among the 4 cards. We created a task in a social exchange context in a geographic context. In Japan, many

employers have been criticized for paying less-than minimum wage, and the mass media coined the term "Dirty employers" to describe the custom. We came up with a Japanese social exchange task, namely "if an employer requested extra amount of worktime, the employee can receive the wage in the contract." Cosmides' (1989) task, wherein the norm was that married community members are exclusively allowed a precious type of food, was used as the benchmark. Results favored the Cheng & Holyoak's argument. The results pose questions over the use of the casaba problem as a global tool to assess the nature of reasoning skills.

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12:00–1:00 PM (4107)

How Cognitive Demand Influences the Incubation Effect Within Groups During a Divergent Thinking Task. QICHEN ZHAO, *The University of Alabama,* BEVERLY ROSKOS, *The University of Alabama* — The incubation effect, which refers to an unanticipated improvement in creativity after a respite, has piqued researchers' interest. We're particularly interested in the incubation effect in group settings, given the increasing relevance of both teamwork and creativity, as well as the fact that most past research findings come from individual participants. The current study used groups (dyads) as participants and measured their creative task performance as a function of interpolated tasks with different cognitive demand levels: low demand, high demand, rest, and no incubation to examine the possible effect of cognitive demand of interpolated task (aka task during the break) on the incubation effect and to explore mechanisms that underpin the incubation effect. The Consequences Task, a divergent thinking task, was used as the creativity task. The fluency score, one of the creativity indices, demonstrated no significant differences in the magnitude of the incubation effect across conditions. However, there was a substantial and consistent stage effect: following the break, participants reported significantly fewer answers. Other creative indices are being analyzed, and some condition variations are expected.

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12:00–1:00 PM (4108)

Verbal Descriptions and Graph-Reading Skills Predict Climate Graph Interpretation Accuracy. RISHI KRISHNAMURTHY, *Reed College,* KEVIN J. HOLMES, *Reed College* — Time-series graphs are effective for depicting climate change but may be misinterpreted by viewers who are unfamiliar with graphical conventions or ideologically motivated to emphasize short-term variability over long-term trends. For example, conservative viewers—who are generally more skeptical of climate change—have been found to estimate future climate outcomes less accurately. In two preregistered studies, we explored whether this ideological difference is driven by differential attention to graphical features. In Study 1, viewers who mentioned trends more often and variability less often when describing climate graphs made more accurate estimates, but accuracy did not differ by ideology—likely because the description task facilitated attention to trends. In Study 2, conservative viewers made less accurate estimates than liberal viewers despite being similarly sensitive to subtle changes in graphical features. However, ideology did not explain unique variance in accuracy when controlling for numeracy and graph literacy. These findings suggest that verbal descriptions of graphs are an index of graph interpretation ability and that this ability is better explained by graph-reading skills than by prior ideological commitments.

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12:00–1:00 PM (4109)

Anchoring Effect Induces False Memories. ANDRE DIDIERJEAN, *Université Bourgogne Franche-Comté,* AGLAE NAVARRE, *Université Bourgogne Franche-Comté,* CYRIL THOMAS, *Université de Paris* — While many studies have highlighted the existence of the anchoring effect in a wide variety of domains, no study to date has investigated its impact on memory. The present study aims to test whether an irrelevant numerical anchor not only influences an estimate but also modifies the memory of the associated event. Two experiments (total N = 259) were conducted, combining the methodology used by Loftus & Palmer (1974) and a classic anchoring paradigm. The results show that an irrelevant numerical anchor can modify the estimate of a car's speed and produce false memories of the event. We discuss the link between the processes underlying the anchoring effect and the false memory phenomenon.

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12:00–1:00 PM (4110)

Mechanisms and Implications of Retest Effects in Raven's Advanced Progressive Matrices. ERIN R. NEATON, *Michigan State University,* DAVID Z. HAMBRICK, *Michigan State University,* ERIK M. ALTMANN, *Michigan State University* — Retest effects are common in higher order cognitive tasks, reflecting the effects of practice. One such task is Raven's Advanced Progressive Matrices (RAPM), the gold standard for tests of fluid intelligence. This study examines two questions concerning retest effects in RAPM: whether the underlying mechanisms include item memory, strategy learning, or both, and whether learning on RAPM affects its validity as a predictive test. We conducted a two-session, remotely administered study in which participants performed either identical RAPM forms in each session, alternate RAPM forms in each session, or a control task in session 1 and RAPM in session 2. RAPM form was fully counterbalanced. At the end of session 2 participants completed Number Series and Letter Sets as criterion tasks. Preliminary results suggest strategy learning, not item memory, is responsible for retest effects. Additionally, correlations between RAPM and the criterion tasks increased between sessions. The experimental results suggest strategy learning may be responsible for this increase, although a decrease in intraindividual variability between sessions may also play a role. This implies practice or instructions could improve cognitive assessment.

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12:00-1:00 PM (4111)

The Relationship Between Individual Differences in Working Memory Capacity, Interactive Problem Solving, and the Aha! Experience. TRINA KERSHAW, *University of Massachusetts Dartmouth,* OLIVIA CLARK, *University of Massachusetts Dartmouth* — Past research has had conflicting results about how individual differences in working memory capacity affect solving insight problems. These conflicting results could be due to how problems are solved (in an interactive or non-interactive way) and if an Aha! moment is experienced. Participants solved problems using objects or via paper-and-pencil, completed complex span tasks, and rated multiple Aha! experience dimensions. Preliminary results indicated that more problems were solved in the interactive (objects) condition. WMC was correlated with the number of solutions in the non-interactive condition, but not in the interactive condition. Correct solutions had higher Aha!, pleasure, relief, and certainty ratings. The interactive condition had higher ratings of pleasure, relief, and certainty, but the conditions did not differ in their Aha! ratings. WMC scores were higher for correct than incorrect solutions regardless of whether participants experienced an Aha! moment. Implications for theories of insight problem solving will be discussed.

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12:00-1:00 PM (4112)

Aha Moments Are Incidental to Analogical Transfer. CHRISTINE CHESEBROUGH, *Drexel University,* EVANGELIA G. CHRYSIKOU, *Drexel University,* JOHN KOUNIOS, *Drexel University,* TIM GEORGE, *Union College* — Research has suggested that the processes involved in analogical transfer are not unlike those involved in insightful problem-solving. The notion that feelings of insight may be incidental to analogical problem-solving suggests that the same conditions that produce insight may also enhance far transfer. On each trial in the present study, subjects induced a conceptual relationship from a set of three verbal analogy pairs (30 trials). Half of the trials included a semantically distant final pair (calculated using word2vec), and half of the trials included a semantically close final pair. Subsequently, they attempted to solve a novel far analogy for each of the previously learned relations. Transfer accuracy was predicted by the semantic distance between the pairs in the original relations. Although aha moments during encoding did not predict transfer performance, aha moments reported during problem-solving were significantly related to transfer accuracy, implying that such moments may provide metacognitive information about solution accuracy. These results provide empirical evidence for the observation that insight experiences can occur as a result of spontaneous analogical transfer.

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12:00-1:00 PM (4113)

The Effects of Constraints and Cognitive Load on the Novelty and Usefulness of Ideas. TIM GEORGE, *Union College* — Generating creative ideas in response to open-ended prompts is very challenging. Prior research suggests that constraints on idea generation can increase creativity by narrowing an otherwise large search space and forcing people off default approaches. However, it is unclear whether constraints impose an additional cognitive load. The present study manipulated constraint and cognitive load in a modified Alternate Uses Task (AUT). Participants produced one idea for a series of common objects either with no constraint or with various context constraints (e.g., must be relevant for children). Additionally, load was manipulated by presenting a single digit (low load) or six digits (high load) before each idea generation prompt. Ideas were scored for novelty and usefulness. Constraints improved the novelty of ideas equally in the low and high load conditions. However, under high load, constraints led to a decrease in idea usefulness. This suggests that although constraints create little cognitive demand in finding novel ideas, reaching ideas that are both novel and useful requires additional cognitive resources.

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12:00-1:00 PM (4114)

Optimization Under External Constraints During Problem Solving. REBA KOENEN, *Georgia Institute of Technology,* SASHANK VARMA, *Georgia Institute of Technology* — Optimization under constraints is an important topic in both cognitive problem solving and economic decision making. We investigated variation in individuals' strategies under external time and material constraints. Young adults (N=45) attempted three tower-building problems three times each, for a total of nine trials. They used colored blocks to build three-block towers with various costs and benefits (i.e., values), aiming for the combination of towers representing the highest net value. There were no constraints in the least difficult problem, a time constraint in the moderately difficult problem (i.e., participants waited a varying number of seconds to access blocks of different colors), and a material constraint in the most difficult problem (i.e., participants were limited to ten blocks of each color). Preliminary results show that participants tend to reach the optimal solution for all three problems, finding it fastest for the least difficult problem and slowest for the most difficult problem. Surprisingly, the prediction that people would achieve near-optimal performance when given access to external resources (e.g., paper, pen, and colored markers) was not supported. Participants who chose to utilize these resources for their computations performed comparably to those who chose not to. We are conducting a follow up study to further investigate the effect of offloading when optimizing under external constraints.

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12:00-1:00 PM (4115)

Moral Foundations in Supreme Court Oral Arguments. EYAL SAGI, *University of St. Francis* — The legal system is concerned with interpreting and applying existing laws to real world circumstances. In the U.S., the final arbiters of these laws are the nine Justices of the U.S. Supreme Court. Over the past few decades, political leanings have played an increasing role in how these justices are

appointed. As such, it seems apt to investigate the role that moral reasoning plays in their world views and their decision making. The present study uses corpus statistics and moral foundation theory to explore the types of arguments brought up by different justices during the 2004-06 terms. More importantly, the study investigates how the use of moral language by advocates arguing in front of the court influences the vote of the justices. The results show that increased use of moral language and rhetoric affects the outcome of the case.

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12:00-1:00 PM (4116)

Investigating the Durability of Our Manipulations: Two Experiments Showing Minds May Not Be Changed Long-Term. JOHN PROTZKO, *Central Connecticut State University* — Experimental psychology is characterized by exposing people to manipulations to change behavior or mental life. Research into the durability of our lab manipulations is relatively limited. The present work shows 2 preregistered research projects testing how long experimental manipulations last. The first set of studies looks at the durability of altering people's belief in free will and determinism. The second study looks at the durability of writing a counter-attitudinal essay on attitudes. Reading an article about how free will is an illusion increases beliefs in determinism and reduces belief in free will; writing a counter-attitudinal essay alters people's attitudes,. 1-2 weeks later, people's belief in free will and determinism start to fade back. 1 month later, belief in free will largely reverts back to pre-intervention levels, while people's belief in a deterministic universe remain unchanged. Also, 1-2 months later, people's attitudes largely revert back to their pre-intervention levels. These results provide preliminary evidence of fadeout from short experimental manipulations over 1-2 months. Our experimental manipulations have effects that last outside of the lab, but experience fadeout over time.

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12:00-1:00 PM (4117)

Eye-Tracking Evidence for Reinstatement of Emotionally Negative and Neutral Memories. PAULA BROOKS, *Princeton University/Boston College,* MELISSA MAO, *Boston College,* MARIA NOYES, *Boston College,* HAE YOUNG H. YI, *Boston College,* SAMANTHA P. HUTCHINSON, *Boston College,* ELIZABETH A. KENSINGER, *Boston College,* KENNETH A. NORMAN, *Princeton University,* MAUREEN RITCHEY, *Boston College* — Recent eye-tracking studies have linked gaze reinstatement—when eye movements from encoding are reinstated during retrieval—with memory performance. Here, we aimed to replicate and extend these studies using the emotional memory trade-off paradigm. Participants learned word-scene pairs, where scenes were composed of negative or neutral objects on the left or right of neutral backgrounds. This allowed us to measure gaze reinstatement in terms of whether people looked at the side of the screen that had the object during scene memory tests. We were able to behaviorally replicate the emotional memory trade-off effect, where negative object memory was better than neutral object memory at the expense of background memory. We found evidence for gaze reinstatement when background images were shown without the presence of objects learned at encoding, but we did not see an effect of object emotion. Also, we did not see evidence of gaze reinstatement when participants were told to vividly visualize the object-background scene in response to only the word cue. These results suggest that, although emotion influences the memorability of objects and scenes, it may not affect gaze reinstatement during retrieval.

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12:00-1:00 PM (4118)

The Participant's Voice: Participants' Understanding of and Preferences for Consent (Risk) Information in Psychological Research. NADINE STIRLING, *Flinders University,* MELANIE TAKARANGI, *Flinders University* — Although informed consent is critical to psychological research, debate ensues—between researchers, ethicists, and Institutional Review Boards—about the best way to communicate consent information, including risks of participation (e.g., Loftus & Fries, 2008). Despite participants being key stakeholders in the consent process—and the very people who enable psychological research to occur—there is little evidence about their understanding of, or preferences for, current consent processes. To address this gap, we gathered qualitative and quantitative data from psychological research participants—including those with prior trauma exposure—to examine their understanding of, and preferences for, consent processes, including how risk information is presented. Our results suggest that while participants understand current consent guidelines, they want improvements (e.g., more transparency regarding deception, risks, and confidentiality). Moreover, people who had previously experienced a traumatic event (vs. those who had not) did not differ in their preferences for consent/risks. Our findings have implications for researchers and IRBs.

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12:00-1:00 PM (4119)

A Reason to Smile: Stimuli with Concurrent Positive Emotion Can Facilitate Cognitive Control. JINI TAE, *Gwangju Institute of Science and Technology,* REBEKA C. ALMASI, *The George Washington University,* YOONHYOUNG LEE, *Yeungnam University,* MYEONG-HO SOHN, *The George Washington University* — Emotion recognition is critical in deciding the course of action in social interaction, regardless of the relevance of emotion to the task at hand. Previous research shows that stimuli associated with task-relevant positive emotion subsequently facilitate cognitive control (e.g., reducing the Stroop effect and the task switch cost), despite the stimuli no longer carrying emotional information. We examined whether concurrently available task-irrelevant valence can affect cognitive control. In Experiment 1, participants performed the gender Stroop task with a congruent or incongruent gender word. Other participants performed task switching between age and gender identification tasks with emotion information simultaneously available with the task cue

(Experiment 2) or with emotion preceding the task cue (Experiment 3). In all experiments, half of actors appeared always smiling and the others always angry. The Stroop effect was smaller with happy than with angry faces, and the switch cost was smaller with happy faces only when emotion preceded the task cue. These results suggest that even irrelevant emotion can affect cognitive control, with different temporal precision depending on the task.

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12:00-1:00 PM (4120)

Effect of Acetaminophen on Aversive Conditioning and Attentional Bias. MING-RAY LIAO, *Texas A&M University,* CHLOE GARCIA, *Texas A&M University,* VALERIE VIERKANT, *Texas A&M University,* FELICITY R. WOODSON, *Texas A&M University,* VANESSA LULO, *Texas A&M University,* CAMERON KOTEK, *Texas A&M University,* BRIAN A. ANDERSON, *Texas A&M University* — Beyond pain relief, acetaminophen has been shown to induce a blunting effect on evaluative and emotional processing; this cognitive side effect has been linked to the dorsal anterior cingulate cortex and anterior insula, which make up the salience network. The salience network is known to guide attention to relevant stimuli and may play a larger role in the acquisition of attentional biases. Here, we randomly assigned participants to treatment (acetaminophen) and control (placebo) groups in a double-blind manner (Experiment 1). Participants then performed a training phase in which one color was associated with shock (CS+) and another with no shock (CS-), followed by a test phase where each color could appear as either the target or distractor. We observed a blunting of attentional bias for the CS+ in the treatment group during both phases. We then moved our manipulation to after training (Experiment 2) and observed no differences between groups. Our findings suggest that acetaminophen prior to training blunts the influence of aversive conditioning on attention, but acetaminophen after learning does not. It appears that acetaminophen influences learning and attention similarly to physiological states like hunger and thirst.

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12:00-1:00 PM (4121)

Does Intensity Modulate the Effects of Exercise on Mood and Executive Functioning? MICHAEL CERVANTES, *University of Illinois Chicago,* JENNIFER WILEY, *University of Illinois Chicago* (Sponsored by Jennifer Wiley) — Exercise has been linked to changes in mood and cognition. Regular exercise has been shown to improve executive functioning and reduce losses due to aging. Less is known about effects from individual sessions of exercise. They have been linked to improvements on inhibitory control tasks, but there is less consensus in results for updating or working memory capacity tasks. The current study examined the effects of aerobic exercise on mood and multiple measures of executive functioning. Preliminary results suggest that the intensity of an exercise session is important to consider and that increases in mood and cognitive performance are more likely following low-intensity versus high-intensity exercise.

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12:00-1:00 PM (4122)

Enhanced Empathy for Dementia Through a Dementia Simulation Game. VICTORIA A. KAZMERSKI, *The Pennsylvania State University, Erie,* OMAR ASHOUR, *The Pennsylvania State University, Erie,* DANIEL EATON, *The Pennsylvania State University, Erie,* REBECCA ABRAHAM, *The Pennsylvania State University, Erie,* EMILY POLLARD, *The Pennsylvania State University, Erie,* DIONEL CABAN CORDERO, *The Pennsylvania State University, Erie,* MCKENZIE WASLOSKY, *The Pennsylvania State University, Erie* — There is an increasing proportion of the population over the age of 65 and an associated increasing number of individuals with dementia. For caretakers to provide the best care for these individuals, it is important to better understand and empathize with their clients. There are some tools and training techniques to aid in increasing dementia empathy, but most are expensive and require extensive certification to use. Our team has developed a brief computer simulation of dementia using the Twine platform. This simulation has participants experience many events as they walk through a story as a selected avatar. They experience forgetting to complete tasks, getting lost, confusing family members, and struggling with daily tasks. We assessed participants' knowledge of dementia, dementia empathy, and general empathy before and after playing the game. Participants showed improved dementia empathy after playing the game. Knowledge of dementia and general empathy did not show a change. These data suggest the Dementia Twine game could provide a low-cost, easily accessible tool for enhancing empathy for caretakers and loved ones of those with dementia.

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12:00-1:00 PM (4123)

Evaluation of Valenced Stimuli Is Associated with Anxiety and Avoidance in Close Relationships. REBECCA WELDON, *SUNY Polytechnic Institute,* KAZUKO BEHRENS, *SUNY Polytechnic Institute,* DANIEL K. JONES, *SUNY Polytechnic Institute,* ERIN DRAKE, *SUNY Polytechnic Institute,* JUSTINE FRAGETTA, *Boston University* — Humans assign valence to objects, people, and events in the environment, but there are individual differences in the evaluation of these stimuli. This study examined how individual differences in anxiety and avoidance in close relationships are associated with the emotional appraisal of valenced and neutral stimuli. Participants evaluated negative, neutral, and positive stimuli for emotional valence. There was a positivity offset overall (i.e., neutral stimuli were evaluated as more positive than negative). Individuals higher on the Experiences in Close Relationships (ECR)-Anxiety subscale showed a negativity bias in reaction times and ratings (i.e., responding faster to negative than to positive stimuli and evaluating positive stimuli as more "negative"). Individuals higher on the ECR-Avoidance subscale gave more positive ratings of negative stimuli and more negative ratings of positive stimuli,

which may suggest a blunted response to emotional stimuli. Findings are discussed in the context of individual differences and emotional appraisal of stimuli.

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12:00-1:00 PM (4124)

Does Duration of Valenced Experiences Impact Affective and Evaluative Reactions? JORDAN MARTIN, *University of South Florida,* ZOE RITCHOTTE, *University of South Florida,* REILLY R. ORMAN, *University of South Florida,* MARCUS CUMBERBATCH, *University of South Florida,* SANDRA L. SCHNEIDER, *University of South Florida* — This study explores how duration of positive and negative experiences can influence predicted emotions and evaluations of those experiences. We tested (a) whether affective feelings predict willingness to pay to experience positive or avoid negative hypothetical situations and (b) whether longer durations of positive experiences are treated differently than longer durations of negative experiences. The satiation-escalation hypothesis postulates that subjective responses to positive experiences tend to peak and plateau, whereas subjective responses to negative experiences tend to intensify. Participants were randomly assigned to valence conditions in the online experiment involving 8 scenarios presented at 7 durations (e.g., spending 3 hours at a theme park). Participants reported their willingness to pay to engage in or avoid the experience, and they rated how they would feel about spending time in that scenario. Results explore whether responses to positive events satiate at longer durations and whether responses to negative events escalate at longer durations. The results call attention to how one type of valence asymmetry may be related to affective and evaluative reactions to experiences.

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12:00-1:00 PM (4125)

The Role of Perceptual Difficulty in Visual Hindsight Bias for Emotional Faces. EMILY BURGESS, *Oregon State University,* MEI-CHING LIEN, *Oregon State University* — Visual hindsight bias, also known as the "saw-it-all-along" effect, is the tendency to overestimate one's perceptual abilities with the aid of outcome knowledge. Recently, Giroux et al. (2022) reported robust visual hindsight bias for several emotional faces except for happy. We examined whether the difficulty of emotional processing could explain their finding. Participants first saw a blurred image of an emotional face that progressed to clear and were instructed to stop the clearing process when they were able to identify the emotion. They then were shown the clearest image of each face and were asked to adjust the blur levels to indicate the point at which they had first identified the emotion. Experiment 1 replicated Giroux et al.'s finding, observing a visual hindsight bias for all emotions except happy faces. Experiment 2 manipulated the perceptual difficulty and replicated the results of Experiment 1 in the easy condition, but both angry and happy faces produced strong bias in the difficult condition. A multinomial processing tree model suggests that visual hindsight bias for emotional faces, while robust, is sensitive to perceptual difficulties across emotions.

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12:00-1:00 PM (4126)

Subjective Stress in a Full-Information 2D Wayfinding Task Under Time Pressure. PAUL E. PLONSKI, *Tufts University,* PRSNI PATEL, *Tufts University,* KATHRYN L. OSSENFORT, *Tufts University,* HOLLY A. TAYLOR, *Tufts University,* TAD T. BRUNYÉ, *U.S .Army Combat Capabilities Development Command (DEVCOM) Soldier Center,* HEATHER L. URRY, *Tufts University* — Subjective stress can change during spatial tasks on average. However, people vary in their propensity to be stressed, thus individual differences in stress states may affect and/or be affected by spatial performance. We explored this possibility in an online, mildly stressful route planning task. We measured three distinct subjective stress states (engagement, distress, and worry) at baseline and post-task. On each trial, participants (N = 300) planned and traced a route on a novel map (after exclusions, N = 226). Pre to post, distress ($t = 2.85$, $p = .005$) and engagement ($t = 9.45$, $p < .001$) increased while worry ($t = -5.29$, $p < .001$) decreased. Controlling for the other states, baseline worry (OR = 0.86, $p = .033$) predicted less planning time. Baseline ($b = -0.082$, $p = .016$) and post-task ($b = 0.072$, $p = .008$) distress had opposite associations with route length. Threat-related feelings (i.e., distress) and thoughts (i.e., worry) at baseline predicted different outcomes. Furthermore, distress prior to and distress after wayfinding had different associations with route length. In sum, individual differences in subjective stress affect and are affected by spatial performance under time pressure, sometimes in opposite directions.

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12:00-1:00 PM (4127)

Estimation Biases in Emotion Perception Vary as Function of Race. MARIE-PIER PLOUFFE-DEMERS, *Université du Québec à Montréal,* DANIEL FISET, *Université du Québec en Outaouais,* FRANCIS GINGRAS, *Université du Québec à Montréal,* CAROLINE BLAIS, *Université du Québec en Outaouais* (Sponsored by Caroline Blais) — Facial expressions of emotion play a key role in social interactions. In order to exhibit the appropriate behavior, one must not only detect emotions in others but also evaluate their intensity. Nonetheless, estimation biases (e.g. pain underestimation and anger overestimation) are often observed and are even worse for emotions expressed by racial minority groups. The extent to which such racial biases in emotion recognition rely on perceptual processes remain ill-understood. This study compared the emotion intensity perceived in white, asian and black faces using the method of serial reproduction. 20 chains of 10 Caucasian participants were created and one by one, 6 face avatars (2 gender x 3 ethnicity) displaying an emotion of medium intensity (60%) were briefly presented to the first participant of each chain. The participant then had to reproduce the perceived intensity using a slider along a continuum of the same identity presenting different intensity levels (from 0% to 100%). Its response was then used as the emotion intensity for the

next participant and so on down the line in each chain. The results suggest that viewers are influenced by race when evaluating the intensity of facial expression of emotions.

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12:00–1:00 PM (4128)

Individual Differences in Emotion and Emotion-Laden Word Associations. SARAH JONES, *Tennessee Technological University,* STEPHANIE KAZANAS, *Tennessee Technological University* (Sponsored by Stephanie Kazanas) — Researchers have begun to distinguish differences between emotion (i.e., cheer, grief) and emotion-laden (i.e., puppy, devil) words, for example, finding stronger effects to emotion words using various cognitive tasks (e.g., Kazanas & Altarriba, 2015, 2016). However, ongoing interest in individual differences prompts new research. Typical reaction time and retrieval data suggest anxiety reduces reaction time (e.g., Hainaut & Bolmont, 2005), while depression seems to do the opposite by increasing reaction time (e.g., Siegle et al., 2001). The present study examined word associations to these word types, while also factoring in participants' mood. Reaction time differences were also assessed across these comparisons. Participants' mood was assessed with the Depression, Anxiety, and Stress Scale (Parkitny & McAuley, 2010); we also used the Toronto Alexithymia Scale (Bagby et al., 1994) to control for alexithymia in our sample. Together, these results help us better understand how mood affects word associations, while also adding to the cognitive literature examining word type differences across emotion and emotion-laden words.

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12:00–1:00 PM (4129)

Prediction Error Shapes Emotion and Information-Seeking Behaviors Following the 2020 U.S. Presidential Election. KIMBERLY S. CHIEW, *University of Denver,* SLOAN E. FERRON, *Philadelphia VA Medical Center,* NAOMI K. SELLERS, *University of Connecticut* — Discrepancies between anticipated and actual outcomes have been described as 'prediction errors' (PEs), with documented effects on emotion, memory, and adaptive behavior. However, characterization of these effects in naturalistic contexts has been limited. We applied this framework to characterize emotion, memory, and media information-seeking behaviors in the aftermath of a consequential real-life public event (the 2020 U.S. Election). A politically diverse American sample prospectively reported election outcome preference and expectation, which were used to calculate a PE score for each individual. PEs robustly predicted changes in both positive and negative affect pre- to post-election, but did not modulate memories of election outcome. Additionally, negative PEs were specifically associated with both a post-election shift to more politically conservative media as well as consuming media from a broader range of the political spectrum. These results suggest PEs can modulate real-life emotion and media consumption, with potential implications for civic behavior and polarization.

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12:00–1:00 PM (4130)

(Mis)Remembering Disgust vs. Fear. LUCY A. MATSON, *Flinders University,* ELLA MOECK, *University of Melbourne,* TYLA MOLYNEUX, *Flinders University,* MELANIE TAKARANGI, *Flinders University* — People are more likely to recall disgusting images relative to fearful images (e.g., Chapman, 2018; Moeck et al., 2021), but is their memory for disgust more accurate? The extant research shows that participants rarely falsely recognise disgusting and fearful images (i.e., possible floor effects; Chapman et al., 2013; Croucher et al., 2011; Marchewka et al., 2016), perhaps because the "lure" images are unrelated to the images at encoding. We investigated whether people are more likely to falsely remember disgusting images over fear images when those images are related vs. unrelated to the encoded images. We presented 112 participants with disgusting and fearful images. Following a 24-48 hour delay, participants viewed six previously seen, six related, and six unrelated disgust and fear images and indicated whether each image was old or new. Participants had higher correct recognition rates for disgust relative to fear images and similar false recognition rates for disgust and fear lures. Participants had higher rates of false recognition for related lures compared to unrelated lures, suggesting related test lures likely increase source monitoring errors. We conclude disgust's memory enhancement extends to accurate memory.

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12:00–1:00 PM (4131)

Facial Expression and Behavior Valence Congruency in Memory for Social Targets. ALLISON SKLENAR, *University of Illinois Chicago,* ANDREA FRANKENSTEIN, *University of Illinois Chicago,* PAULINE URBAN LEVY, *University of Illinois Chicago,* ERIC LESHIKAR, *University of Illinois Chicago* — A person's facial expression may be incongruent with the valence of the behavior being performed (e.g., scowling while standing up for someone). The current study investigated whether memory for social targets is influenced by congruency of facial expression valence and behavior valence. Participants were shown pictures of social targets with angry or happy expressions along with a positive or negative behavior, with sentences designed so expressions made sense with the behavior even when valences were incongruent. Participants formed impressions and were later tested on memory for impressions, behaviors, and expressions associated with each target. Although there were no effects on impression or behavior memory, results showed an impression x congruency interaction on expression memory accuracy, driven by worse expression memory on congruent than incongruent trial types when the impression was negative (i.e., worse memory for negative than positive expressions when the behavior was also negative, given that impressions were almost exclusively based on behaviors). Results will be discussed related to congruency vs. incongruency advantages and how impression memory work may allow for a different way of testing congruency effects.

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12:00–1:00 PM (4132)

Emotion vs. Survival: An Examination of Word Processing in the Survival Paradigm. DAILYN Q. CLARK, *University at Albany, SUNY,* JEANETTE ALTARRIBA, PHD, *University at Albany, SUNY* — Nairne and colleagues (2007) reported a mnemonic advantage for words rated in terms of their survival relevance. Participants read passages related to survival or a control (i.e., moving) and then engaged in word rating. Previous work on adaptive memory has focused on altering the emotionality of the presented passages (Bell et al., 2013; Kazanas & Altarriba, 2017). However, no work has focused on systematically manipulating the emotional valence and arousal of the words. The aim of the current study was to examine how emotion-laden words (e.g., knife, butterfly) are processed in the survival paradigm. Based on both the emotion processing and survival literatures, an overall survival advantage is expected, such that regardless of word type participants in the survival condition would demonstrate better recall than those in the moving condition. Given the emotion processing advantage, we expect emotion-laden words to show better recall than neutral, non-emotion-laden words across both the survival and moving conditions. Findings will be discussed from the perspective of both the survival and emotion processing literature.

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12:00–1:00 PM (4133)

The Effect of Negative Stimuli in Incidental Learning: The Case of VSL. MEITAL FRIEDMAN-OSKAR, *University of Haifa,* TAL MAKOVSKI, *The Open University of Israel,* TOMER SAHAR, *The Open University of Israel & University of Haifa,* HADAS OKON-SINGER, *University of Haifa* — People are extremely efficient in learning regularities embedded in the environment, yet little is known about how this learning is affected by the valence of the stimuli. The current study examined Visual Statistical Learning (VSL) for negative stimuli triplets using a modification of the paradigmatic task. Participants viewed a stream of stimuli, presented one at a time, composed of triplets of spiders and triplets of butterflies. We found better incidental learning for the aversive spider triplets than for the neutral butterfly triplets. In Experiment 2, we further examined the learning of negative stimuli by changing the number of negative elements in each triplet. In Experiment 3 we tested memory for every single item within the presented triplet. We analyzed participants' familiarity ratings for each item depending on the number of negative elements and their position in the triplet. We found no significant advantage in negative-item recognition in this case. This is the first study exploring how emotional objects influence the learning of regularities and the recall of the elements in the VSL units.

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12:00–1:00 PM (4134)

Cognitive Load Hurts but Emotional Load Helps Memory Selectivity. MIRELA DUBRAVAC, *University of Bern,* BRANDON J. SCHMEICHEL, *Texas A&M University* — People remember more task-relevant information than task-irrelevant information. This difference can be conceptualized as memory selectivity. Previous research found that cognitive load—induced by having to switch between tasks—reduces memory selectivity. In the present study we compared and contrasted the effects of cognitive load and emotional load—induced by negative emotional content. Participants performed one of two classification tasks on a series of picture-word pairs. The task determined whether the picture or the word was task-relevant. The words were either negative emotion words or neutral. In a subsequent recognition test, we tested participants' memories for pictures that had been task-relevant or task-irrelevant. We replicated the task switching effect: Memory selectivity was lower for pictures presented on switch (versus repeat) trials. In contrast, memory selectivity was higher for pictures presented along with negative (versus neutral) words. The interaction between cognitive load and emotional load was non-significant. In conclusion, cognitive load draws on resources necessary for selective encoding, whereas emotional load boosts selective encoding potentially through arousal induced by negative emotional stimuli

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12:00–1:00 PM (4135)

Using Bayesian Parameters to Characterise Individual Differences in Pain Perception. AADYA SINGH, MPHIL, UNIVERSITY OF CAMBRIDGE, *Cornell University,* ARIANE DELGADO-SANCHEZ, *University of Manchester,* FLAVIA MANCINI, *University of Cambridge,* ROI TREISTER, *University of Haifa,* DEBORAH TALMI, *University of Cambridge* — It is important to be able to quantify individual differences in response to placebo analgesia in order to optimise randomised control trials of pharmacological pain treatments. The magnitude of placebo analgesia is known to positively correlate with variability in pain reporting, both in and outside the lab, but a computational understanding of this relationship is lacking. We hypothesized that variability in pain scores is a proxy measure of the precision of central representation of ascending sensory pain signals, such that more variability would indicate less precision. Variability in pain scores was measured using the Focused Analgesia Selection Test (FAST), and individual differences in sensory precision were extracted from an independent task, using a Hierarchical Bayesian model. As predicted, sensory precision estimates from the model significantly correlated with FAST estimates for variability in pain reports. Further, we tested the modality independence of this phenomenon and found that the results replicated across heat and electric pain. These findings open up possibilities for future research to examine factors contributing to the placebo response via assessment and manipulation of the Bayesian likelihood function.

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12:00–1:00 PM (4136)

Cognitive Effects of Olfactory Stimulation. BRYCE LUND, *Towson University,* BLAIRE J. WEIDLER, *Towson University* — Past research has demonstrated the facilitative effects of AromaStick

Focus nasal inhalers on sustained visual discrimination. The present study seeks to extend on these findings by testing Focus inhalers against empty Placebo inhalers in a Stroop task. This experiment also explores whether these inhalers are able to affect word recognition and how memory may be influenced by encoding and retrieval states. During the encoding phase, participants completed an intentional word exposure activity and a Stroop task while applying either Focus or Placebo inhalers. At retrieval, participants completed an Old-New recognition task while applying either the same inhaler as at encoding or the other. Application of Focus inhalers did not significantly influence Stroop interference on the Stroop task, nor did it affect word recognition. Results are explained in light of the emotional nature of the scent manipulation. These findings suggest that Focus inhalers may enhance early attentional visual scanning, but not inhibition of irrelevant information. Additionally, it remains open to possibility that Focus inhalers can enhance performance on free-recall measures, although further testing is required to confirm this idea.

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12:00-1:00 PM (4137)

Validating 360 Videos for Emotional Elicitation with Physiological and Psychological Emotional Responses. VALENTINA MANCUSO, *eCampus University,* FRANCESCA MALANDRONE, *University of Turin,* FRANCESCA BORGHESI, *IRCCS Istituto Auxologico Italiano,* SARA CARLETTO, *University of Turin,* GIUSEPPE RIVA, *IRCCS Istituto Auxologico Italiano & Università Cattolica del Sacro Cuore,* LUCA OSTACOLI, *University of Turin,* ELISA PEDROLI, *eCampus University,* PIETRO CIPRESSO, *University of Turin & IRCCS Istituto Auxologico Italiano* — Virtual reality has been emerging as a powerful tool for eliciting emotions, often defined as complex modifications that result in physical and psychological changes that affect thoughts and behaviors. Here, the aim is to obtain validated 360° videos for emotional elicitation, by collecting physiological and psychological responses. 50 participants were exposed to 360° videos with positive, negative, and neutral content. They rated arousal and valence, as well as the sense of presence and which emotion they had experienced the most, after each video. Participants' psychophysiological responses (Heart Rate Variability and Eye Tracking Measures) were recorded as well. The results are being collected and will be presented at the conference. These findings may provide a better understanding of the relationship between expressed emotions and autonomic nervous system function, as well as develop a set of virtual reality stimuli that can elicit specific emotions which could be relevant in emotion research.

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12:00-1:00 PM (4138)

Faking Good on Self-Reports Versus Informant-Reports of Emotional Intelligence. SARAH A. WALKER, *The University of Sydney,* CAROLYN MACCANN, *The University of Sydney* — Research demonstrates that people can fake on self-rated emotional intelligence scales. However, most emotional intelligence ratings scales use informant-ratings (where a knowledgeable informant rates a target's emotional intelligence) as well as self-ratings. As yet, no studies have investigated whether informants can also fake on emotional intelligence inventories. This study compares mean scores differences for a simulated job selection instruction set versus a standard instructed set for both self-ratings and informant-ratings on the Trait Emotional Intelligence Questionnaire–short form (TEIQue-SF). In a 2x2 between-person design, participants (N=81 community, 151 university students) completed the TEIQue-SF as either self-report or informant-report in one of two instruction conditions (answer honestly, job simulation). Both self-reports (d=1.47) and informant-reports (d=1.56) were significantly higher for job simulation than 'answer honestly' instructions, indicating substantial faking. We conclude that people fake emotional intelligence for both themselves (self-report), and on behalf of someone else (informant-report). We discuss the relevance of our findings for self- and informant-report assessment in applied contexts.

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12:00-1:00 PM (4139)

Does Boundary Ownership Affect Scene Construction? BANJIT SINGH, *University of Delaware,* HELENE INTRAUB, *University of Delaware* — Boundaries of scene-views may be owned by the edges of a "window" -- a hole through which one sees the world. Scene construction beyond the window causes boundary extension (BE). Would scene construction be curtailed if boundary-ownership changed (see Nelson & Palmer, 2001)? To create ambiguous boundary ownership, we cut scenes into meaningful object-shapes (e.g., hand, shield, heart). Attention instructions in the Scene Group promoted "window-boundary" ownership, whereas in the Shape Group they promoted "object-boundary" ownership. Each group's instructions were supported by a post-stimulus question (scene-related vs. shape-related) and notification that screen-location of each "scene" or "shape" would be tested. After all 20 stimuli and associated questions were presented, a BE rating test was given. Rather than curtailing scene construction, the Shape Group exhibited greater BE than the Scene Group, whether stimulus duration was 3 s (perhaps allowing boundary reinterpretation: Experiment 1, n=208) or only 340 ms (Experiment 2, n=208). Scene construction may be insensitive to boundary ownership; it may be elicited solely by the presence of scene properties. We discuss alternative explanations and implications.

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12:00-1:00 PM (4140)

Cognitive, Affective, and Spatial Perspective-Taking: Shared or Distinct Processes? MARIA G. BRUCATO, *Temple University,* JASON CHEIN, *Temple University,* NORA S. NEWCOMBE, *Temple University* — Understanding others' perspectives–what they believe (cognitive PT), feel (affective PT), and see (spatial PT)–is central to maintaining social relationships and planning future actions. However, it is not yet clear whether PT in cognitive, affective, and spatial domains form a single behavioral

dimension. Common mechanisms theory of PT posits that attentional control underlies performance on complex PT problems regardless of domain (Sun & Wang, 2014). Alternatively, distinct mechanisms theory of PT suggests that cognitive and affective PT tap a unique system for belief representation and attribution, distinct from processes that support spatial PT (e.g., Saxe & Wexler, 2005). To investigate the tenability of these two competing hypotheses, we assessed the behavioral performance of 122 young adults on measures of spatial, cognitive, and affective PT, attentional orienting, and attentional inhibition. Performance on spatial PT tasks did not significantly covary with cognitive PT, attention, or two of the three affective PT measures, offering support for distinct mechanisms theory of PT.

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12:00–1:00 PM (4141)

Navigational Agency Modulates Hippocampal Responses to Nodes in Spatial Environments. YI-CHUANG LIN, *National Taiwan University,* YA-TING CHANG, *National Taiwan University,* CHARLOTTE MASCHKE, *Technische Universität Dresden,* WAN-RUE LIN, *National Taiwan University,* JOSHUA OON SOO GOH, *National Taiwan University* — Grid and place cells in the hippocampus (HC) instantiate cognitive map representations of space. We theorized that agency in movement decision-making (DM) enhances navigation by emphasizing decision events at landmarks as spatial nodes, providing HC neurons with weighting signals to encode plain space into structured node maps. In a functional magnetic resonance imaging (fMRI) experiment, we evaluated neural responses in 21 participants learning landmark locations and paths in virtual mazes via freely generating navigation movements (Free) compared to via viewing guided videos touring the mazes (Tour). Navigational agency enhanced space comprehension as reflected in faster and less erroneous retrieval navigation to goal landmarks in Free relative to Tour conditions. Critically, the DM circuits and the HC collectively exhibited higher activation during Free navigation at spatial nodes, and such node labeling positively predicted navigational performances. Moreover, HC representations reflected more reduced field size and timescale planning in Free relative to Tour conditions, especially in the posterior HC. These findings reflect that movement decisions enhance the formation of spatial node representations of cognitive maps in the HC.

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12:00–1:00 PM (4142)

Relations Between Mental Rotation Tests and Perspective-Taking/Spatial Orientation Tasks Performance with STEM Interest and Achievement. CARLOS J. DESME, *Florida International University,* SHANNON M. PRUDEN, *Florida International University* — Spatial ability is defined as a cognitive skill used to represent, transform, generate, and recall environmental information. Differences across small-scale or intrinsic (mental rotation test; MRT) and large-scale or extrinsic (perspective-taking/spatial orientation task; PTSOT) spatial ability are linked with declaring entry into science, technology, engineering, and mathematics (STEM). However, relations between individual performance on both intrinsic and extrinsic spatial ability with STEM interest and achievement remain unknown. The current study examined relations between performance on the MRT, PTSOT, and responses towards STEM interest and achievement in 80 undergraduate STEM majors. Participants completed an online survey that included a 24-item MRT, 12-item PTSOT, and 2 questions regarding STEM interest. STEM achievement was analyzed through self-report of grades received in Biology, Calculus, Chemistry, and Physics courses. Results demonstrated MRT performance predicted STEM achievement, while PTSOT performance predicted STEM interest. Identifying which spatial ability affects STEM outcomes is important for designing interventions encouraging STEM interest and achievement amongst underrepresented groups (e.g., females).

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12:00–1:00 PM (4143)

Detecting Spatial Gist While Locomoting in an Immersive Virtual Environment: The Role of Speed of Travel and Urban Design. BRENT CHAMBERLAIN, *Utah State University,* EMILY TIGHE, *University of Utah,* MORGAN SAXON, *University of Utah,* PHILLIP FERNBERG, *Utah State University,* CHARISSE SPENCER, *Utah State University,* SCOTT JOHNSON, *Utah State University,* SARAH H. CREEM-REGEHR, *University of Utah,* JEANINE K. STEFANUCCI, *University of Utah* — Gist is the understanding, or meaning, assigned to a scene. We developed a modular urban virtual environment with 10 distinct building architectures and sizes to test if and when viewers perceive a change in gist while moving through a dynamic scene. Our goal was to test if viewers of 3D spaces perceive changes in their environment. We evaluated how varying architecture style, building size, and speed through an environment influenced individuals' perception of change in gist. Participants were assigned to either a fast or slow speed and guided along a linear road through a sequence of 40 blocks, with each block having one of five architectural styles and either small or large buildings. Participants indicated when they experienced a change in gist and provided their perceived magnitude of that change. We found frequency of detecting a change was greatest when both style and size changed together, replicating a previous study. We also found individuals moving at a faster speed had different criteria for identifying changes in gist. Our findings suggest people can experience changes in gist spatially in a dynamic immersive 3D virtual environment and provide a framework for future studies examining the concept of spatial gist.

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12:00–1:00 PM (4144)

The Stimulus Attributes That Drive Human Visual Clustering. VIJAY MARUPUDI, *Georgia Institute of Technology,* SASHANK VARMA, *Georgia Institute of Technology* (Sponsored by Sashank Varma) — Visual clustering is important for categorization,

enumerating sets via subitizing, understanding information visualizations, and other higher-level cognitive abilities. However, little is known about the attributes that drive human visual clustering. In Experiment 1, 47 participants drew clusters on 56 dot clouds. We investigated whether five attributes of cluster—area, numerosity, proportion of points on the convex hull, linearity, and density—drive the sequence of clusters people draw. Across each trial, participants tended to draw clusters that decreased in area, decreased in numerosity, and increased in the proportion of points belonging to the convex hull. In addition, the last cluster participants drew was their most linear cluster on 31% of all trials. We found no evidence that density impacted clustering behavior. Experiment 2, currently in-progress, will attempt to replicate these findings using more stimuli and more participants, and also will investigate the effects of statistically clustered versus statistically random points clouds.

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12:00–1:00 PM (4145)

Sources of Systematic Errors in Human Path Integration. YAFEI QI, *University of Alberta,* WEIMIN MOU, *University of Alberta* — Triangle completion is a task widely used to study human path integration, an important navigation method relying on idiothetic cues. Systematic biases (compression patterns in the inbound responses) have been well documented in human triangle completion. We used cross-validation modeling to compare three plausible theoretical models that assume that systematic errors occur in the encoding outbound path solely (encoding-error model), executing the inbound responses solely (execution-error model), and both (bi-component model), respectively. The modeling algorithm used one inbound response (i.e., response to the home) or multiple inbound responses (i.e., responses to two non-home locations and the home) for each outbound path. The algorithm of using multiple inbound responses demonstrated that the bi-component model performed best in accounting for the systematic errors, suggesting that both encoding the outbound path and executing the inbound responses contribute to the systematic biases in path integration. Additionally, using only the home response cannot distinguish among these three models, suggesting that the typical triangle-completion task with only the home response cannot determine the sources of the systematic biases.

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12:00–1:00 PM (4146)

Graphical Insight: Transitions in Understanding a Novel Coordinate System. AMY R. FOX, *University of California, San Diego,* CAREN WALKER, *University of California, San Diego,* JAMES HOLLAN, *University of California, San Diego* — How do you make sense of an unfamiliar coordinate system? Building on recent work demonstrating that prior knowledge of conventional data visualizations is extraordinarily difficult to overcome, we explore the use of implicit scaffolding to reconstruct graph reading as an insight problem. We hypothesize that constructing a mental impasse will improve learner performance on an unconventional graph reading task by increasing the probability learners will reconsider their default strategy and recognize alternative interpretations of novel graphical forms. We find support for this hypothesis in a between-subjects laboratory experiment testing comprehension of a statistical graph with an unconventional coordinate system. Subsequent analyses of mouse-tracking data suggest promising directions for understanding primitives of graphical intuitions.

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12:00–1:00 PM (4147)

The Effect of the Construct of Gender on Mental Rotation. HAILEY C. SMITH, *Arcadia University,* KATHERINE S. MOORE, *Arcadia University* — Mental rotation (MR) ability has been associated with spatial skills and can predict achievement in science, technology, engineering, and mathematics careers. Men tend to perform better than women on MR, demonstrating a cognitive sex difference. The current study's purpose is to assess whether motivational interventions are effective for MR performance in the presence of a stereotype threat or the possibility of confirming a self characteristic of a negative stereotype about one's group. Undergraduate students were randomly assigned to one of two possible Stereotype conditions (threat or no threat) and one of two possible Strategies (motivation or active control). Participants then completed the Mental Rotation task. The MR results were replicated and consistent with the literature. However, there was a statistically significant inverse relationship between the stereotype condition and the intervention. Participants performed better in the threat than in the no threat condition and in the active control condition than in the motivation condition. These findings could suggest the importance of motivational factors in explaining the gender gap in mental rotation and in STEM careers.

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12:00–1:00 PM (4148)

Lost in the Details: How Environmental Features and Graphical Fidelity Impact Spatial Orienting in 3D Terrain Applications. AARON L. GARDONY, *U.S. Army Combat Capabilities Development Command (DEVCOM) Soldier Center & Tufts Center for Applied Brain and Cognitive Sciences,* ALEX J. KIM, *Tufts Center for Applied Brain and Cognitive Sciences,* KATE J. POWELL, *Tufts Center for Applied Brain and Cognitive Sciences,* HANNAH HART-POMERANTZ, *Tufts Center for Applied Brain and Cognitive Sciences,* KANA OKANO, *Tufts Center for Applied Brain and Cognitive Sciences* — Hardware processing capacities and network bandwidth limitations constrain how effectively users can visualize photogrammetry-derived 3D terrain data in software applications. In the present study, we examined how varying graphical level of detail (LOD) impacts spatial orientation across multiple terrain types in an interactive 3D geo-visualization application. Soldier participants (n = 150) used a 3D geo-visualization to localize their ground location and orient and point towards a distant objective. Importantly, we manipulated the LOD of the visualized model and tracked geo-visualization behavior and spatial orienting performance

metrics. Experiments 1 and 2 examined task performance in natural and urban environments, respectively. Results demonstrated moderate (rather than maximum) LOD is sufficient overall, with urban environments benefitting slightly from higher detail. Experiment 3 examined land classification-aware mesh decimation techniques that selectively manipulated LOD for building vs ground features in mixed environments. Results point to the importance of quantitative assessments of task performance in guiding the implementation of 3D terrain compression for geo-visualization applications.

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12:00–1:00 PM (4149)

Relations Between Spatial Ability and Uses of GPS. ALEXIS KUNZ, *University of California, Santa Barbara,* CHUANXIUYUE HE, *University of California, Santa Barbara,* JOHN PROTZKO, *Central Connecticut State University,* JONATHAN SCHOOLER, *University of California, Santa Barbara,* MARY HEGARTY, *University of California, Santa Barbara* — GPS technology is a newer advancement in society, but when it comes to studying its impact on spatial cognition, the research is relatively limited. The present study aims to delve into the specific ways GPS is used in various navigational scenarios by people with different levels of spatial ability. Additionally, we assess whether people alter their GPS use depending on the familiarity of a navigation scenario. Generally, we find that using GPS more often for turn-by-turn directions is most strongly associated with lower perceived sense of direction (SOD) and higher spatial anxiety. However, people use GPS most frequently for time and traffic estimation, which augments navigation ability. An objective measure of navigation performance is significantly negatively associated with overall GPS dependence. Finally, people use GPS less in more familiar environments (regardless of SOD). These results provide preliminary evidence of overall adaptive GPS use in the general population, giving insights into aspects of GPS use that may be associated with detriments in spatial ability.

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12:00–1:00 PM (4150)

Integration of Artifactual Cues During Spatial Navigation. PHILLIP NEWMAN, *Vanderbilt University,* TIMOTHY P. MCNAMARA, *Vanderbilt University,* ROBERT BODENHEIMER, *Vanderbilt University* — Mobile organisms use spatial cues to navigate effectively in the world. Recent work has demonstrated that humans can optimally combine visual and body-based cues during homing. However, new technologies (e.g., virtual and augmented reality) provide additional cues to navigation, such as digital over-head maps (artifactual cues), which are increasingly relevant with the advent of GPS and assisted navigation. Human navigators performed a homing task in immersive virtual reality with three cues: landmarks, body-based, and overhead map. Navigators walked a three-legged outbound path before attempting to return to the first waypoint. The number and consistency of cues available during the return path was manipulated. Statistically optimal cue combination was predicted from response variability in the single-cue conditions. In most conditions, homing with all three cues available showed reduced variability relative to single-cue conditions. However, cue combination was suboptimal relative to the maximum-likelihood estimation model.

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12:00–1:00 PM (4151)

The Influence of Working Memory Capacity on Interactions Between Space and Time Perception. JIM FAULKNER, *University of Utah,* MIRINDA WHITAKER, *University of Utah,* KRISTINA RAND, *University of Utah* — Research shows that the mind's perception of magnitude in one dimension can influence perception of another dimension (e.g., spatial magnitudes influence temporal magnitudes). Many studies have shown varying strengths of this connection across multiple modalities, but the mechanisms behind these interactions are not well understood. Recent work has shown support for these interactions occurring due to interference during working memory processing (Cai et al., 2018). In this study, we attempted to replicate the results from Cai and Colleagues' 2018 experiment in an online environment, while also measuring respondents' performance on a visuospatial working memory (VSWM) task. Our online study successfully replicated cross-dimensional interference of space on time, yet did not reveal a significant interaction between this interference and VSWM ability. These findings support a robust interference effect that arises during memory processing, but the effect may not be influenced by differences in VSWM.

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12:00–1:00 PM (4152)

Routes and Locations: How Conflicting Task Demands Impact Metamemory and Memory. LAUREN A. MASON, *Tufts University,* AYANNA K. THOMAS, *Tufts University,* GEORGE L. WOLFORD, *Dartmouth College,* HOLLY A. TAYLOR, *Tufts University* — Metacognitive monitoring during map learning is understudied. Maps display both routes and relative locations (RLLs) between landmarks, and people's reasons for learning maps vary. Yet, how conflicting map task demands impact metacognitive monitoring judgments (JOLs) is unknown. We examined whether aligning learning goals and JOLs (Exp 1) or monitoring prompts and tests of map memory (Exp 2) impacts memory and metamemory accuracy. Participants were tasked with learning routes or RLLs on maps with animated routes between landmarks. After each map, they provided a judgment of learning (JOL) about the route or the RLL. A 2AFC test measured memory and confidence for routes or RLLs. People rated themselves less likely to remember more complex maps. Also, JOLs decreased as learning progressed. Finally, JOLs during learning positively related to memory. These findings provide novel insights on the cues people use to monitor complex spatial learning.

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12:00–1:00 PM (4153)

Different Patterns of the Delta Function in Mouse-Tracking Measures: The Location-, Arrow- and Word-Based Simon Tasks. NAHYUN LEE, *Korea University,* MINWOO KIM, *Seoul National University,* YANG SEOK CHO, *Korea University* — It has been demonstrated that different patterns of delta functions of the Simon effect with different spatial modes lie on earlier stimulus activation stages while the sign of cognitive control (e.g., congruency sequence effect, CSE) is found in later response execution stages. In the current study, the distributional analyses were conducted on mouse-tracking measures to further investigate the time-course of the location-, arrow- and word-based Simon effect in comparing the processing of different spatial codes. Each mouse-tracking data were divided into four bins based on reaction time (RT). The results indicated that separate measures reflect stimulus-activation and response-execution aspects. The CSE was found in a variety of motoric measures including movement time, RT, trajectory length, area under curve, x/y flip, maximum velocity, and entropy. In contrast, differential patterns of delta function among the spatial modes were found only in the initiation time data. Consistent with the previous findings, the delta functions show high relevance with the activation of spatial information in the earlier mouse-tracking measure, while the control mechanism regarding the CSE is reflected only in the later stages of motor execution.

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12:00–1:00 PM (4154)

When Foot Meets Hand: Effector-Specificity in a Simon Task with Multiple Spatial Reference Frames. PAMELA BAESS, *University of Hildesheim,* CHRISTINA BERMEITINGER, *University of Hildesheim, Germany* — When using stick-figure manikins holding a colored ball in their hands as stimuli, previous research found evidence for two simultaneously occurring Simon effects, i.e. one based on global stimulus position features with respect to the presentation side of the screen and one based on local stimulus position features with respect to the stick-figure manikin. The present study investigated in two experiments whether the simultaneously occurring Simon effects are further modulated by the type of effector (hand vs. foot) used for responding. In Experiment 1, the task-relevant colored ball was placed in the manikin's hand. In contrast, Experiment 2 positioned the colored ball at the manikin's feet. Participants used their hand or feet to response in both experiments. Results showed that the global and local Simon effects were differently effected by the response effector used.

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12:00–1:00 PM (4155)

Use of Absolute Distance in 2-Dimensional Configural Memory. GORDON G. MCINTIRE, *The George Washington University,* STEPHEN DOPKINS, *The George Washington University* — Configural memory is important to remembering element locations. The location of each element in a configuration is defined by its relative and absolute distance and direction from each other element. Past studies have claimed that humans remember element locations based on their relative, not absolute, distances from the other locations, but fail to predict the remembered locations based on absolute distance and direction. This study tested memory for configurations of two or four landmarks and a target by presenting the landmarks and target together in a study phase and asking participants to find the target location from the landmarks in a test phase. It separated the predictions of absolute distance, absolute direction, and both relative distance and relative direction via changing the configuration of the landmarks from study to test. The configuration was displayed before participants on a screen. Between study and test participants cleared their working memory with a distractor task. Participants recalled target locations largely closest to the locations predicted by absolute distance, providing evidence that absolute rather than relative distance is the main basis for human configural memory.

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12:00–1:00 PM (4156)

Linking Spatial Relations: Spatial Information Processing at Different Scales. REYYAN BILGE, *Northeastern University* — Spatial information is processed at different scales. Mentally configuring objects and visualizing them are tasks that we do at smaller scale. Locating yourself and navigating within an environment are at a larger scale. To examine spatial processing at both scales, the current study tested 109 participants in 2 sessions. In Session 1 undergraduates navigated within the campus of Istanbul Sehir University, tasked to find the optimal paths between 4 locations. Their step numbers, walking rate, distance covered, and routes were recorded via Sports Tracker app. Their deviations from the optimal path were quantified. They also completed Mental Representation Questionnaire (Pazzaglia & DeBeni, 2001) and Sense-of-Direction Scale (Hegarty et al., 2001), which are reliable self-reports in spatial cognition literature. In Session 2, they took a common spatial aptitude test, DAT, which assesses participants' 3-D visualization ability. We analyzed the interconnections between different spatial abilities at varying scales using this novel data.

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12:00–1:00 PM (4157)

Virtual Copetown: Integrating Spatial Relations Across Separately Learned Routes. MERVE TANSAN, *Temple University,* THOMAS SHIPLEY, *Temple University,* NORA S. NEWCOMBE, *Temple University* — The idea that successful navigation depends on cognitive maps is controversial. One view is that the ability to generate detours and shortcuts demonstrates retention of direction and distance information integrated within a common frame of reference. Another view is that spatial representations are not Euclidean, given biases, distortions, and lack of recognition of impossible spaces in VR. A compromise comes from an individual-differences perspective, suggesting that some people may integrate across routes, but not everyone, as shown by experiments involving "Virtual

SILCton", a virtual environment paradigm with two routes joined by connecting routes. However, so far there has been no examination of whether at least some people can make inferences across routes not ever connected directly, using a common framework. We created a Virtual Copetown to examine within-route knowledge, integration between routes joined by connections and integration requiring inference. We also examine cognitive correlates to understand how people differ in their ability to infer spatial relations in the absence of connecting routes.

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12:00-1:00 PM (4158)

Measures of Visualizing Cross Sections of 3D Objects: An Assessment Using Item Response Theory. MITCHELL E. MUNNS, *University of California, Santa Barbara,* ALEXIS KUNZ, *University of California, Santa Barbara,* CHUANXIUYUE HE, *University of California, Santa Barbara,* MARY HEGARTY, *University of California, Santa Barbara* — Spatial ability is widely accepted as an important aspect of intelligence that impacts success in STEM fields and daily life alike. However, it is typically measured by a limited number of tasks (notably, mental rotation). Whereas other spatial thinking tasks have been developed in recent years, we know little about the psychometric properties of these measures. One spatial thinking skill -- ability to visualize cross sections of 3D objects -- is important in STEM disciplines, but there is no single, agreed-upon measure of this ability. Here, we compare three different measures of visualizing cross sections; the Santa Barbara Solids test, the Planes of Reference test, and the Crystal Slicing test. We administered these measures online to 498 participants (256 female, aged 18-20), and evaluated their psychometric properties using item response theory (IRT). Correlations among the measures indicate that they measure a common ability; however, they differ in reliability, item difficulty, and discriminability. Based on item-level statistics we developed refined versions of each of the tests and compared these to a combined measure using the most informative items from all three tests.

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12:00-1:00 PM (4159)

The Intersection of Space and Time in Navigation and Episodic Memory. EVA MARIE ROBINSON, *University of Arizona,* ANDREW MCAVAN, *University of Arizona,* MICHAEL J. STARRETT, *University of California, Irvine,* KATE CHAMBERS, *University of Arizona,* EVE A. ISHAM, *University of Arizona,* ARNE EKSTROM, *University of Arizona* — The ability to navigate through an environment is a crucial skill needed for our everyday experiences. An integral component of navigation includes the ability to integrate spatial and temporal information to form memories of our environments. Additionally, the way environments are encoded in episodic memory regarding space and time remains unclear. We designed a task to assess how episodic memory, spatial knowledge, and temporal perception evolve during exploration of virtual reality environments with varying access to body-based cues. Subjects were assigned to an immersive or stationary navigation condition and later completed a temporal reproduction task, a judgments of relative direction task and a verbal episodic memory recall. These verbal responses were recorded and scored using a method that allowed us to determine the richness of episodic memories. Preliminary findings suggest subjects optimized their paths more rapidly in the immersive compared to the stationary condition. In contrast, temporal error was numerically higher in the immersive compared to the stationary condition. These findings suggest a dissociation between spatial and temporal judgments based on the availability of body-based cues in the environment.

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12:00-1:00 PM (4160)

Active and Visually-Guided Navigation Benefit Route Memory. YADURSHANA SIVASHANKAR, *University of Waterloo,* HÉLÈNE SAUZÉON, *University of Bordeaux,* MYRAA. FERNANDES, *University of Waterloo* — We compared memory for routes travelled, encoded using different navigation strategies. Participants explored virtual reality (VR) environments, created based on real-world map layouts of cities, and were asked to explore each for 40 secs with the goal of finding a gold star. Navigation strategy was manipulated within-subjects randomly and required either actively self-initiating decision-making about the route of travel or following a visually-guided route with volitional control of movements using VR paddles, relative to passive viewing of a pre-selected route. Following encoding, participants re-entered each map and were asked to "re-trace" the exact route they had traveled. We found an effect of Navigation-type on route overlap accuracy such that actively self-initiated and visually-guided navigation benefited accuracy significantly more than passively-guided. A regression showed that total time spent at intersections at encoding predicted route overlap following active navigation, whereas number of stops and total intersections traversed were predictive following guided navigation. Findings suggest that control of movements and pausing at intersections during initial exploration maximize memory for routes travelled.

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Poster Session V

Saturday, November 19, 2022

Viewing 5:00-7:00 PM US EST, Authors Present 6:00-7:00 PM US EST, Hynes Convention Center Ballroom

Note: All in-person posters are also available for viewing for the duration of the conference in the virtual posters on the conference website.

6:00-7:00 PM (5001)

Learning Window Width: A Cognitive Basis of Psychopathology? CAROLINE MOUL, *The University of Sydney,* EVAN

J. LIVESEY, *The University of Sydney,* OLIVER ROBINSON, *University College London* — The relationship between individual differences and associative learning is a rocky one. In most of the associative learning research, inter-individual variation is necessarily ignored or regarded as error. When individual-differences are considered in the context of associative learning they are typically thought about in terms of the impact they might have on those basic cognitive processes. Here we suggest the reverse; that some personality traits and features of psychopathology originate from stable inter-individual differences in the way in which outcome expectancies are formed. The mechanism we put forward to explain these differences is variation in an index we have called, "learning window width". Here we describe how variation in this index could result in different outcome expectations which, in turn, would lead to differences in behaviour. We then show preliminary results from an experiment designed to measure learning window width in healthy young adults. Finally, we suggest how inter-individual differences in an index like learning window width has important implications for how we conceptualise associative learning.

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6:00–7:00 PM (5002)

Test-Retest Reliability of Behavioral Responses and Eye-Tracking in Associative Learning Tasks. ARTHUR KARY, *The University of Sydney,* TOM BEESLEY, *Lancaster University,* CAROLINE MOUL, *The University of Sydney* — Individual differences in associative learning task performance have previously been demonstrated to relate to individual differences in several psychiatric and personality variables. However, the psychometric properties of these associative learning tasks have only recently begun to be indexed, making the strength of relationship between these tasks and the personality measures difficult to interpret. In this study, we investigate the test-retest reliability of behavioral measures from a simple associative learning task, an extinction-and-renewal task, and a response reversal task within the same undergraduate individuals across a two-week interval. We also look at test-retest reliability of eye-tracking measures in the associative learning task and assess associative learning performance against dimensional measures of callous-unemotional traits, anxiety, and impulsivity. Research funded by an ARC grant to Dr. Caroline Moul, Dr. Thomas Beesley, and Prof. Mark Dadds.

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6:00–7:00 PM (5003)

Learning to Represent: The Relation Between Reinforcement Learning and Category Learning. DANIEL WURGAFT, *University of Toronto,* MICHAEL MACK, *University of Toronto* — Reinforcement learning (RL) models rely on predefined state representations, yet do not explain how humans learn these representations. Category learning (CL) models have been suggested as a mechanism underlying the learning of state representations used in RL. Investigations of representation learning in the RL literature often use multidimensional RL tasks, which share strong conceptual similarities to CL tasks. Thus, we attempted to examine the relation between RL and CL, and the plausibility of CL mechanisms forming task representations that aid RL. To our knowledge, this study was the first direct experimental examination of the relation between RL and CL. Participants performed a CL task and a multidimensional RL task. Surprisingly, a lack of relation (controlling for working memory) between performance on the tasks was moderately supported by Bayesian tests using behavioral measures and computational model parameters. The divergence in performance between the tasks is suggested to occur largely due to the difference in the type of representations employed in each task: the RL task required adopting feature-based representations, whereas the CL task required object-based representations, known to have distinct neural substrates.

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6:00–7:00 PM (5004)

Using Transitional Probabilities in Adjacent Pairs Is the Most Efficient Way to Learn Associations. LAURA LAZARTIGUES, *Université Côte d'Azur,* FABIEN MATHY, *Université Côte d'Azur,* FRÉDÉRIC LAVIGNE, *Université Côte d'Azur* — The ability to learn sequences depends on different factors, such as transitional probability (TP, probability of a stimulus given a previous stimulus) and dependency (adjacent or nonadjacent stimuli in a sequence). Current evidence indicates differences in learnability of adjacent and nonadjacent pairs as well as of first-order and second-order TPs (based on a single stimulus or a combination of two stimuli, respectively). However, the relative importance of these factors on statistical learning remains poorly understood. The present experiment tested the effects of TP (first vs. second-order) and dependency (adjacent vs. nonadjacent) on statistical learning. Participants were exposed to a set of repeated sequences on a touchscreen and were asked to touch the stimuli as fast as possible. The results showed higher performance for first-order TP in adjacent pairs marked by a decrease of response times during learning. An opposite pattern emerged for learning second-order TP and nonadjacent dependency.

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6:00–7:00 PM (5005)

One Link to Link Them All: A Test for Indirect Response Retrieval by an Associated Stimulus Using Contingency Learning. MRUDULA ARUNKUMAR, *Friedrich-Schiller-University Jena,* KLAUS ROTHERMUND, *Friedrich-Schiller-University Jena,* CARINA G. GIESEN, *Friedrich-Schiller-University Jena* — Contingent pairings of a stimulus and a response result in contingency learning, which can be explained by episodic stimulus-based response retrieval. However, it is yet unresolved whether response retrieval can also be triggered by another stimulus that was never directly paired with the response but was only associated with the former stimulus (like sensory preconditioning). We investigated the phenomenon of indirect retrieval in a contingency learning paradigm using an observation task to learn S1-S2 associations, forced

choice task to establish S2-R contingency and a free choice task to test whether S1 indirectly retrieves the response contingent with the paired S2. Indirect retrieval effects are assessed (1) in contingency learning and (2) at the level of transient stimulus-response bindings to test whether such a learning phenomenon can be traced back to transient episodic stimulus-response bindings, which in turn help to extend our understanding of the cognitive mechanisms underlying learning effects.

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6:00-7:00 PM (5006)

The Effect of Domain Knowledge on Learning Varying Numbers of Associations Across Trials. TRAVIS RICKS, *Bemidji State University,* LAYLA BERG, *Bemidji State University* — This study investigates the learning of baseball-related concepts with varying numbers of associations. The concepts were baseball player positions (e.g., pitcher) and locations (e.g., first base) on a baseball field. These baseball concepts were presented to participants in sentences with one baseball player position associated with one location on a baseball field (e.g., The right fielder is at third base.). The baseball related concepts had either one, two, or three other baseball concepts associated with it. These varying number of associations between baseball concepts were presented to participants after which they were asked to remember them. No differences in learning between the number of associations was observed after the first presentation. In learning trials that followed, the concepts with more associations had small learning gains compared to concepts with only one association. Having more baseball knowledge was related to better learning, especially for concepts with multiple associations.

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6:00-7:00 PM (5007)

Does the Temporal Contiguity Effect Require Intentional Retrieval? ABIGAIL MUNDORF, *Michigan State University,* MITCHELL UITVLUGT, *Michigan State University,* KARL HEALEY, *Michigan State University* — Remembering one event tends to cue recall of other events that occurred nearby in time, regardless of encoding intentionality. This is the temporal contiguity effect. But do temporally proximal events cue each other even when retrieval is implicit? We utilized repetition priming to address this question. Across 30 trials, subjects (n = 602) read words aloud as they appeared onscreen. In each trial, two words were repeated (the prime and the target). On their first presentation, the repeated words were separated by |lag| = 1, 2, or 5. On their second presentation, the prime was always presented first, immediately followed by the target. We found temporal contiguity in surprise final free recall, replicating previous work with incidental encoding and explicit retrieval. To test for temporal effects in implicit memory, we compared repetition priming for prime and target words, asking if repeating the prime facilitated processing of the target and if this facilitation varied depending on initial lag. The repetition priming effect was overall greater for targets than primes, demonstrating an implicit contiguity effect whose magnitude differed depending on initial lag.

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6:00-7:00 PM (5008)

Paired-Associate vs. Cross-Situational: How Do Ambiguity and Word Familiarity Affect Word Learning? ANNE NEVEU, *University of Wisconsin-Madison,* MARGARITA KAUSHANSKAYA, *University of Wisconsin-Madison* — Word learning is the first entry into language, and vocabulary knowledge predicts reading, speaking, and writing ability. There are several pathways to word learning and little is known about how they differ. Previous research has investigated paired-associate (PAL) and cross-situational word learning (CSWL) separately, limiting the understanding of how the learning process compares across the two. In PAL, the roles of word familiarity and working memory have been thoroughly examined, but these same factors have received very little attention in CSWL. We randomly assigned 126 monolingual adults to PAL or CSWL. In each task, names of 12 novel objects were learned (6 familiar words, 6 unfamiliar words). Logistic mixed-effects models examined whether word learning paradigm, word type and working memory (measured with a backward digit-span task) predicted learning. Results suggest better learning performance in PAL and on familiar words. Working memory predicted word learning across paradigms, but no interactions were found between any of the predictors. This suggests that PAL is easier than CSWL, likely because of reduced ambiguity between the word and the referent, but that learning across both paradigms is equally enhanced by word familiarity, and similarly supported by working memory.

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6:00-7:00 PM (5009)

A Direct Comparison of Updating from Semantic and Episodic Memory. SYDNEY M. GARLITCH, *Millikin University,* CHRISTOPHER N. WAHLHEIM, *University of North Carolina at Greensboro* — Memory updating after retrieving semantic or episodic memories has been examined in separate literatures. We bridge this gap by directly comparing these types of updating. Participants first studied a list of word triplets (prevent-hamper-stop) then saw a list of cue-word-fragment triplets (prevent-hamper-st_p). They completed fragments with previous targets (episodic retrieval) or by generating a related word (semantic retrieval). A new related (halt) or unrelated (shirt) target appeared after each retrieval. On a final test, participants attempted to recall the new then earlier target. Recall of both targets was higher after episodic than semantic retrieval and for related than unrelated targets. Regardless of retrieval type, new target recall was higher when earlier targets were recalled, especially for related targets. These results implicate similar integrative encoding in episodic and semantic memory updating that depends on success in recalling earlier retrievals and how semantic features support episodic binding with new information.

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6:00-7:00 PM (5010)

Modeling Double-Meaning Words in Associative Memory. SERGIO R. BARRA RODRIGUEZ, *University of Alberta,* JEREMY CAPLAN, *University of Alberta* — Although items may be represented in memory as vectors of high total dimensionality, only a small subset of these dimensions (which we call a "mask") may be attended at any given time. Although the nature of an item's features may differ, a mask should consist of those characteristics that are central to the item and those that are at the current focus of attention (Caplan et al., in press). Nowhere is the impact of masks more apparent as it is in double-meaning words, words that have two unrelated meanings for the same spelling and pronunciation. We incorporated into models the idea that one meaning might be dominant and the other contextually cued. Simulations show that associative recognition (matrix model) is enhanced for double-meaning words that were studied with contextual cues that deviate from their primary meaning, whereas item recognition (matched filter model) and cued recall (matrix model) suffer under this same condition. This indicates that the effect that attention to certain item features has on memory may be exaggerated by the double-meaning properties of ambiguous words.

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6:00-7:00 PM (5011)

Are Negative Values and Directed Forget Cues the Same? YI-PEI LO, *University of Illinois Urbana-Champaign,* LILI SAHAKYAN, *University of Illinois Urbana-Champaign* — Both Value-Directed Remembering (VDR) and the Directed Forgetting (DF) paradigm implement memory cues during encoding to manipulate later memory outcome. The current studies aim to evaluate whether negative value cues and directed forgetting instructions affect memory through the same or the different mechanisms. Object-scene pairings were shown at encoding and were followed by the Remember/Forget cues or positive/zero/negative value cues. Subsequent memory was assessed with associative recognition. In Experiment 1, the encoding strategy was controlled, whereas in Experiment 2, it was left open to participants. There was no effect of value manipulation in either of the studies, although the DF manipulation was successful with Remember and Forget cues in both studies. In Experiment 3, half of the participants were discouraged from endorsing the negative value or Forget items at the time of the test, whereas the remaining participants were encouraged to select as many studied items as possible regardless of the memory cue. The results suggest differences between the underlying mechanisms of VDR and DF paradigms, indicating that the negative value cues and the forget cues are not treated the same way.

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6:00-7:00 PM (5012)

Memory for Sports Logos: The Influence of Familiarity. BRADY R.T ROBERTS, *University of Waterloo,* COLIN M. MACLEOD, *University of Waterloo,* MYRA A. FERNANDES, *University of Waterloo* — Pictures typically are better remembered than words—the picture superiority effect. An obvious yet understudied application of picture superiority is to logos. We compared memory for professional sports teams presented in three encoding conditions: team names only, team logos without names, and team logos with integrated names. Across two experiments, we found that while memory was often best for logos relative to team names, familiarity moderated this relation. When assessing memory for team names, the magnitude of the benefit for the logos-only condition depended on whether participants knew what the logos represented. These experiments emphasize familiarity as an undervalued factor influencing memory for pictures. We suggest that brand logos should be accompanied by text labels to maximize memorability, especially for those unfamiliar with the brand.

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6:00-7:00 PM (5013)

The Effect of Humor on Paired Associates Learning. ERIKA PAGES, *Arizona State University,* GENE BREWER, *Arizona State University* — There exist mixed results regarding the effect of humor on memory (Schmidt & Williams, 2001; Bolkan et al., 2018). The current work explores the effect of perceived funniness on memory for word pairs. Across 3 experiments, all within-subjects (N=222), participants read and rated for funniness both humor (puns) and control stimuli (non-humorous versions of puns), followed by cued recall testing of word pairs within the sentences. Experiment 1 utilized a pure list design, finding no effect of humor on paired associates learning relative to control. Experiment 2 used a mixed-list design, previously shown to produce memory effects in research on bizarreness (McDaniel et al., 2005), and found a small effect of humor at the subject-level, as well as an interaction between Funny Rating and type of stimuli at the item-level. Experiment 3 also used mixed-lists and added a novel component by introducing a 3-second delay between "set up" and "punchline" of the sentences to explore the effect of anticipation on funny ratings and subsequent cued recall performance. Results indicated a small effect of humor and, interestingly, the delay enhanced memory for word pairs in humorous versions of puns regardless of subjective Funny Rating.

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6:00-7:00 PM (5014)

Direct Learning, But Not Transfer, Declines with Adult Aging: Evidence from a Large-Scale, Online, Cognitive Training Dataset. ALLEN M. OSMAN, *Lumos Labs,* PAUL I. JAFFE, *Lumos Labs,* NICOLE F. NG, *Lumos Labs,* KELSEY R. KERLAN, *Lumos Labs,* KEVIN P. MADORE, *Lumos Labs,* ROBERT J. SCHAFER, *Lumos Labs* — One might expect identical learning mechanisms to underlie both direct practice of a task and transfer of training to the task from others. Contrary to such expectations, we report a dissociation between these two forms of learning involving their stability over cognitive aging. This dissociation was observed in a large online study involving 93,562 users aged 18-89 of Lumosity, a commercial program comprising computer games

that provide cognitive training. Besides training with Lumosity, these users took an online battery of neurocognitive assessments on two occasions. By examining changes on the assessments as a function of the amount of intervening gameplay, it was possible to measure separately the effects of 1) direct practice on the assessments from repeated testing and 2) transfer from cognitive training. The former diminished with age, while the latter remained constant. Implications for taxonomies of learning and which cognitive abilities are preserved with age will be discussed.

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6:00–7:00 PM (5015)

An Inductive Approach to Improving Critical Thinking. TAYLOR P. GUBA, *University of Delaware,* EMILY R. FYFE, *Indiana University,* BENJAMIN MOTZ, *Indiana University* (Sponsored by Emily Fyfe) — In two studies we investigated a specific facet of critical thinking – the ability to identify flawed claims, incomplete evidence, and faulty arguments – by building on theories of inductive learning. In an era of mass information and mass uncertainty, it is important that people can analyze others' claims and identify common fallacies. Study 1 (N = 360) was conducted in an online psychology course and examined improvements in critical thinking after training over the course of the semester. Study 2 (N = 253) was a randomized experiment conducted on Mturk. Participants who were trained through repeated and contextualized practice to identify fallacies scored higher on an open-ended validated measure of critical thinking skills than participants who were trained on general psychological knowledge and participants who received no training. These results can pave the way for educators to use induction techniques to foster critical thinking skills in students.

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6:00–7:00 PM (5016)

Neural Markers of Sleep Dependent Generalized Learning During an Afternoon Nap. KATHERINE REIS, *University of Chicago,* SHANNON HEALD, *University of Chicago,* KIMBERLY FENN, *Michigan State University,* SOPHIA UDDIN, *University of Maryland Medical Center,* HOWARD NUSBAUM, *University of Chicago* — Previous research has demonstrated that a night's sleep consolidates generalized perceptual learning. After a waking period, performance significantly declines, but sleep can restore performance after this degradation or protect against future memory loss. Other research has reported consolidation of declarative memory after a night's sleep or a nap, suggesting that rote learning can be consolidated by a relatively brief nap. We investigated whether consolidation of generalized synthetic speech learning takes place after a brief afternoon nap that could include a full sleep cycle of REM and NREM. We found that participants who napped during the day performed better on an evening posttest and showed maintenance of learning across the day. In contrast, those who remained awake showed significant loss of learning at the evening posttest, replicating prior findings. This demonstrates that a generalized skill can also benefit from sleep-dependent consolidation even from short durations of sleep. Using physiological measures, we analyzed which features of sleep and neural responses (e.g., sleep spindles) are correlated with consolidation. The results have implications for understanding the basic neural mechanisms that underlie sleep consolidation of learning and how generalized and rote learning may differ.

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6:00–7:00 PM (5017)

Drawing from the Mind's Eye: The Development of Drawing in Sight-Restored Children. SHARON GILAD-GUTNICK, *Massachusetts Institute of Technology,* ANNA MUSSER, *Massachusetts Institute of Technology,* MATT GROTH, *Massachusetts Institute of Technology,* MICHAL FUX, *Massachusetts Institute of Technology,* PRAGYA SHAH, *Project Prakash,* PRITI GUPTA, *Indian Institute of Technology Delhi,* PAWAN SINHA, *Massachusetts Institute of Technology* — Drawing provides a useful window into aspects of visual representation and the crosstalk between perceptual and motor systems. One challenge in studying how these skills develop lies in the temporally staggered timelines of visual versus fine motoric development in typically developing infants. Babies acquire significant visual sophistication within the first year, but begin to engage in drawing only at toddlerhood. However, our work with a unique group of children born blind and left to languish without treatment for several years allows for a closer merging of these two timelines. In our scientific and humanitarian initiative, Project Prakash, we identify and provide surgical sight treatment to such children. Here, we describe our work with longitudinal tests to track the developmental trajectory of basic tracing, copying, and drawing skill via both the haptic and visual domains. Overall, we find that while children's drawings become more recognizable as they gain visual experiences, specific representational dimensions continue to show impairments. Our data provide novel insights into cognitive models of drawing and their importance for understanding the development of internal representations.

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6:00–7:00 PM (5018)

Spatial Working Memory Capacity Modulates the Association Between Cognitive Effort and Performance in Visuomotor Adaptation. SEAN R. O'BRYAN, *Brown University,* JOSHUA LIDDY, *University of Massachusetts Amherst,* JOO-HYUN SONG, *Brown University* — Previous studies show that higher spatial working memory capacity (WMc) predicts faster visuomotor adaptation (VMA). However, the mechanisms underlying this association are unclear. We hypothesized that spatial WMc supports VMA by modulating the cognitive load associated with explicit strategy use, and that pupil diameter (PD) may track variability in cognitive load. We also tested whether VMA is supported more generally by object WMc. Participants completed matched spatial and object WM tasks, followed by a VMA task where they reached to targets while a 45° cursor rotation was applied. The cursor rotation initially

evoked large PDs, but these responses decreased over time, consistent with a shift in the relative contributions of explicit and implicit processes. In line with recent work, higher spatial WMc predicted faster adaptation; object WMc did not, suggesting a domain-specific benefit of WMc. Higher task-evoked PD was similarly associated with faster adaptation, and this relationship was stronger among participants with low spatial WMc. We conclude that PD may index strategic contributions to VMA, and that those with lower WMc may engage in more effortful cognitive control to improve performance.

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6:00-7:00 PM (5019)

The Effect of Sleep on Emotional Memory from Young Adulthood to Middle Age. KRISTIN SANDERS, *University of Notre Dame,* DAN DENIS, *University of York,* ELIZABETH A. KENSINGER, *Boston College,* JESSICA PAYNE, *University of Notre Dame* — Compared to a day awake, sleep enhances memory for emotional objects at the expense of the neutral backgrounds they are presented on, known as the emotional memory trade-off effect. However, most of the research on sleep and the emotional memory trade-off focuses on only negative stimuli in small samples of young adult, university populations. To address this discrepancy, we tested the effect of sleep on both the negative and positive emotional memory trade-off effect in a broader participant sample. For each of three experiments, we recruited over 200 participants (aged 18-59) from across the United States to examine the sleep effect's generalizability and whether it is preserved into middle age. We found that sleep enhanced the negative trade-off effect but did not confer a similar benefit on positive stimuli. Further, when negative and positive stimuli were used in the same experimental session, we found sleep benefitted memory for the entire scene rather than just the object, and primarily for positive and neutral scenes rather than negative ones. Finally, these effects did not interact with age, suggesting they generalized across a broad age range.

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6:00-7:00 PM (5020)

Dynamic Emotional Fluctuations Induced by Music Shape the Structure of Episodic Memory. MASON GRAHAM MCCLAY, *University of California, Los Angeles,* MATTHEW SACHS, *Columbia University,* DAVID CLEWETT, *University of California, Los Angeles* — Time unfolds continuously, yet our memories are stored as discrete and meaningful episodes. Prior work shows that the temporal stability of external contextual features, such as space, supports this memory-structuring process. Here, we tested if dynamic emotional states also influence the temporal organization of events in long-term memory. To this end, we created novel musical stimuli and a dynamic emotion tracking tool to elicit and measure temporal fluctuations in subjective valence and arousal. Analyses of our pre-registered sample (n=81) demonstrate that experiencing a significant shift in emotional valence while listening to music relates to significant separation effects in memory, including worse temporal order memory and distorted retrospective estimates of time. These findings shed light on how affective states influence the encoding of emotional episodes and may inform new treatments for affective disorders characterized by memory dysfunction.

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6:00-7:00 PM (5022)

Early and Late Rewards Bias Value Memory and Preferences over Different Timescales. ALYSSA H. SINCLAIR, *Duke University,* YUXI CANDICE WANG, *Duke University,* R. ALISON ADCOCK, *Duke University* — How do we summarize rewarding experiences in memory? We tested two competing intuitions: Are first impressions most important, or should we save the best for last? In our "garage sale" task, participants opened boxes and viewed sequences of 20 objects associated with values. We manipulated the distribution of reward; each box had rewards clustered at the beginning (Early), clustered at the end (Late), clustered in the middle (Middle), or evenly distributed (Even). Across nine experiments (N = 394), we found that participants preferred Early boxes and overestimated their value; this bias was evident immediately and persisted after a 24-hour delay. However, memory for object-value associations was impaired for Early boxes, suggesting that rewards were linked to boxes instead of objects. A preference for Late boxes emerged only after a 24-hour delay, suggesting a consolidation mechanism as opposed to a recency bias. In several control experiments, we showed that our results replicated and did not depend on perceived agency or reward expectations. Overall, we show that clustering rewards at the beginning or end of an episode biases preferences and value memory, and the effects of early and late rewards emerge over distinct timescales.

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6:00-7:00 PM (5023)

Instructed Motivational States Bias Reinforcement Learning and Memory Formation. YUXI CANDICE WANG, *Duke University,* ALYSSA H. SINCLAIR, *Duke University,* R. ALISON ADCOCK, *Duke University* — Motivation influences goals, decisions, and memory formation. Imperative motivation links urgent goals to actions, whereas interrogative motivation integrates goals over time and space, thus supporting broader learning. We induced motivational states by manipulating only the cover stories for a reinforcement learning task: The Imperative group imagined executing a museum heist, whereas the Interrogative group imagined planning a future heist. Participants repeatedly chose from four "doors" to sample trial-unique paintings with variable rewards, then performed a surprise next-day memory test. During reinforcement learning, the Interrogative group showed more directed (but not random) exploration and less exploitation relative to the Imperative group. At test, the Interrogative group showed superior recognition of paintings, metamemory sensitivity, and reward modulation of memory relative to the Imperative group. We show that a subtle instructional manipulation can modulate motivational states to simultaneously bias

reinforcement learning and memory formation, bearing implications for education, behavior change, and clinical interventions.

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6:00-7:00 PM (5024)

Ambiguity and Confirmation Bias in Reward Learning. RAHUL BHUI, *Massachusetts Institute of Technology,* HAYLEY DORFMAN, *Harvard University,* SAMUEL GERSHMAN, *Harvard University* — We tend to interpret feedback in ways that confirm our pre-existing beliefs. This confirmation bias is often treated as irrational but may have adaptive foundations. In this project, we propose a new Bayesian computational model of confirmation bias and a novel experimental paradigm to study its impact on learning. When faced with an ambiguous outcome, we must form the most accurate interpretation we can by making use of all available information, which includes our pre-existing beliefs. Confirmation bias may thus constitute an inductive bias that speeds up learning, analogous to missing data imputation. We test this theory using a reward learning task in which participants are only provided partial information about outcomes, allowing more leeway for subjective interpretation. We find that our Bayesian model better explains the dynamics of behavior and stated beliefs compared to more traditional learning models, supporting an adaptive basis for confirmation biased learning from repeated feedback

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6:00-7:00 PM (5025)

Investigating the Relative Influence of Reward Throughout the Motivated Memory Process. JOSHUA D. WENGER, *Eastern Mennonite University,* ALLISON M. WILCK, *Eastern Mennonite University* (Sponsored by Allison Wilck) — Extrinsic reward offered for adequate memory performance is consistently shown to improve said memory performance. Such rewards are thought to direct attention and memory search towards the reward-salient information. However, whether the enhanced memory ability comes primarily from motivated encoding, retrieval, or both, remains unclear. This study sought to isolate the effects of reward (receiving a lottery ticket) on encoding and retrieval of high frequency noun word lists by randomly dividing undergraduate participants into three groups: a control group where no reward was offered, a group made aware of the performance-contingent reward prior to memory encoding, and a group made aware of the reward just prior to memory retrieval. Novel findings explore the relative importance of motivation's effect on encoding versus retrieval and suggest that engaging in a goal-directed task may inherently increase motivation, regardless of the presence or absence of a reward. Students, employers, and health care providers can use these findings to inform motivation-based interventions that encourage successful cognitive changes.

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6:00-7:00 PM (5026)

Rewarding Cognitive Effort Increases the Intrinsic Value of Mental Labor. VERONIKA JOB, *University of Vienna,* GEORGIA CLAY, *Technische Universität Dresden,* CHRISTOPHER MLYNSKI, *University of Vienna,* FRANZISKA KORB, *Technische Universität Dresden,* THOMAS GOSCHKE, *Technische Universität Dresden* — The aim of this research was to challenge this view that cognitive effort is generally aversive and show that people can learn to value and seek effort intrinsically. Our experiments tested the hypothesis that effort-contingent reward in a working-memory task will induce a preference for more demanding math tasks in a transfer phase. In laboratory Experiment 1 (N = 121), we made reward directly contingent on mobilized cognitive effort as assessed via cardiovascular measures (β-adrenergic sympathetic activity) during the training task. Experiments 2a-2e (N = 1.457) were conducted online to examine whether effects of effort-contingent reward on subsequent demand seeking replicate. Taken together the studies yielded reliable evidence that effort-contingent reward increased participants' demand seeking and preference for the exertion of cognitive effort. Our findings provide first evidence that people can learn to assign positive value to mental effort.

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6:00-7:00 PM (5027)

Proactive Interference for High-Value and Low-Value Verbal Information Within Working Memory. SARA B. FESTINI, *University of Tampa* — Proactive interference (PI) occurs when previously learned information disrupts new learning. Prior research has shown that participants exhibit lengthened response times and worse accuracy when probed with recent memoranda that originated from the prior WM trial as opposed to the current trial. The present research examined whether there were differences in relative susceptibility to PI for high-value versus low-value information within WM. Participants (N = 57) completed a recent probes WM task, where verbal memoranda were arbitrarily assigned either 10 points or 1 point after encoding. Results revealed similar magnitudes of PI for both high- and low-value memoranda, as measured by response time (correct trials only). However, accuracy data indicated significantly larger PI for high-value than low-value items in WM. Thus, participants mistakenly endorsed recent high-value items more often than recent low-value items, but, when they responded correctly, it took them similarly longer to reject recent probes than new probes, regardless of the value of the recent items. These data inform theories of value-directed memory and removal of information from WM, including how directed forgetting differs from prioritization based on value.

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6:00-7:00 PM (5028)

Three Types of Garden-Paths: Reading, Rereading, and Revision. KIEL CHRISTIANSON, *University of Illinois Urbana-Champaign,* SARAH-ELIZABETH DESHAIES, *University of*

Illinois, JACK DEMPSEY*, University of Illinois,* ANNA TSIOLA*, University of Illinois Chicago,* LAURA P. VALDERRAMA*, University of Illinois Urbana-Champaign* — A large-scale eye-tracking study (N=130) examined how or if rereading patterns are connected to offline comprehension probe responses following three types of garden-path sentences (GPs): DO/S, RR-Subject, and Coordination ambiguities. Previous research suggests that neither the location nor duration of fixations during rereading predict comprehension accuracy as measured by comprehension probes. This study sought to determine whether the magnitude of this observed resistance to interpretation revision is similar for different types of GPs, as well as whether rereading behaviors influence response accuracy to questions about thematic and structural relations not involved in the temporary ambiguity. Although results reveal some differences between structures, they largely confirm the claim that rereading is generally confirmatory rather than revisionary. The interpretation derived on first-pass reading is usually maintained, even if not compatible with the syntactic structure.

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6:00–7:00 PM (5029)

Effects of Semantic Satiation on Metaphor Interpretation. SHEILA BLACK*, The University of Alabama,* HEAVEN CAUBLE*, The University of Alabama,* TEAIRRA EVANS*, The University of Alabama,* BARBARA-SHAE JACKSON*, The University of Alabama* — Semantic satiation refers to the finding that concepts become less meaningful after prolonged exposure. Previous work has examined semantic satiation within word judgment paradigms. The current study examined semantic satiation within a more complex linguistic structure. Specifically, this study examined the possibility that semantic satiation could affect the interpretation of metaphorical sentences. The participants received a prime that was either related to the literal meaning of the sentence, the figurative meaning of the sentence, or a word that was unrelated to the meaning of the sentence. Semantic satiation was induced by varying the repetition of the prime. The prime was repeated for 2, 12, or 22 repetitions. After receiving the repeated prime, participants received a metaphorical sentence that was either sensible or nonsensical. Participants had to decide whether the sentence made sense. This study did yield evidence that the satiation manipulation affected the ease with which participants made sensibility judgments about the sentences.

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6:00–7:00 PM (5030)

Do Individual Differences in Lexical Reliance Reflect States or Traits? NIKOLE GIOVANNONE*, University of Connecticut,* RACHEL M. THEODORE*, University of Connecticut* — Research suggests that individuals differ in reliance on lexical information for speech perception. However, the locus of these differences is not yet known, nor is it known whether these individual differences reflect a context-dependent "state" or a stable listener "trait." Here we test the hypothesis that individual differences in lexical reliance are a stable trait that is linked to relative weighting of acoustic-phonetic information. Listeners (n = 73) completed three purported measures of lexical processing at each of two sessions. For all three measures, individual differences in lexical reliance were stable across sessions, suggesting that performance in these tasks may reflect stable traits. However, relationships among the three tasks in each session were weak, perhaps indicative of poor construct validity across tasks. A strong relationship between reliance on lexical versus acoustic-phonetic information was observed in each task; however, the direction of the relationship differed by task. Collectively, these results suggest that individual differences in lexical reliance are stable traits that reflect relative weighting of acoustic-phonetic and lexical cues for speech perception, but that cue use is task-dependent.

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6:00–7:00 PM (5031)

Processing and Learning from Speech Disfluencies: Effects of Testing Delay and Bilingualism. EMMA LIBERSKY, *University of Wisconsin-Madison,* MARGARITA KAUSHANSKAYA*, University of Wisconsin-Madison* — Fillers (e.g., "uh" and "um") are reliable cues to upcoming novelty in the speech stream, and listeners can use these cues to make predictions. Listener predictions, in turn, affect word learning, though no prior studies have specifically examined the role of prediction in learning from a disfluent speaker. Here, we assessed the impact of fillers on monolingual (Experiment 1, N=113) and bilingual (Experiment 2, N=118) adults' ability to predict and recall novel words. Adults (all tested remotely) were exposed to novel and familiar words and asked to predict sentence-final referents within fluent or disfluent sentence contexts. Participants were then tested for word recall either immediately or after a 5-minute delay, in a between-subjects design. We found that all adults used fillers to predict upcoming novelty, whereas the impact of fillers on recall was more nuanced. For monolinguals, immediate recall was similar across conditions, but delayed recall was better for fluent stimuli. Bilinguals demonstrated better recall for words that they failed to predict at exposure, across conditions. These findings indicate that effects of fillers on processing do not cleanly translate to learning and may be modulated by bilingual experience.

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6:00–7:00 PM (5032)

Can Sentence Generation Eliminate the Translation-Ambiguity Disadvantage? ANDREA TOVAR*, University of Pittsburgh,* NATASHA TOKOWICZ*, University of Pittsburgh* — When learning a new language, individuals face the challenge of learning words with more than one translation. For example, the Dutch word "jas" has two English translations ("coat" and "jacket"). These words are processed more slowly and less accurately than words with a single translation; this processing difficulty is known as the translation-ambiguity disadvantage. The present study attempted to diminish the translation-ambiguity disadvantage using sentence generation with a multi-session training paradigm; sentence generation

was compared to a yoked control condition in which participants read sentences that were generated by individuals in the generation condition. 44 native English speakers with no prior exposure to Dutch were taught Dutch vocabulary and tested using a translation recognition task. The translation-ambiguity disadvantage did not emerge, and generation was a useful tool in learning novel words. We relate findings to the revised Distributed Conceptual Model, the Two Factor Model, and The Levels of Processing Framework.

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6:00-7:00 PM (5033)

Valence Effects in Language Learning Apps: Evidence from Spanish-Speaking Learners of English and English-Speaking Learners of Spanish. HEATHER WILD, *McMaster University,* VICTOR KUPERMAN, *McMaster University* — One of the nagging questions in applied linguistics is how to make language learning easier. Previous studies found that words with positive emotional valence like vacation are easier to learn than negative words like flu. New words were also learned better in positive sentences than in negative sentences. However, these findings were based on highly controlled experiments and often using one language, English, to learn novel non-words. We analysed data from a popular language learning app, Lingvist (https://lingvist.com/), to determine how valence impacts word learning in two language pairings: English speakers learning Spanish, and Spanish speakers learning English. Initial results show that valence of the word and valence of the context sentence are significant predictors of successful learning in both language pairings. The more positive the conditions the more likely learners are to succeed. The finding that positivity boosts language performance can be directly applied to improving language apps. Additionally, by replicating the effects found in previous studies, we conclude that valence effects do indeed survive outside of highly controlled experiments.

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6:00-7:00 PM (5034)

High or Low? Revisiting Syntactic Ambiguity Resolution in Bilinguals: Evidence from Online Measures. BEVERLY COTTER, *University of California, Davis,* FERNANDA FERREIRA, *University of California, Davis* — Domain-general and domain-specific working memory (WM) capacity has been shown to influence how readers make decisions about syntactic ambiguity. However, such studies have only examined offline, post-interpretive decisions. In the present study, we examined whether there were processing differences between online and offline measures. Across two samples (Experiment 1: Spanish-English bilinguals, N = 32; English monolinguals, N = 42; Experiment 2: Spanish-English bilinguals, N = 45; English monolinguals, N = 41), we conducted two experiments: an eye-movement-monitoring experiment and a self-paced reading experiment. Participants completed two WM span tasks (reading span and spatial span), a sentence reading task, and a language history questionnaire. Consistent with the offline results, mixed-effects analyses demonstrated that domain-specific (reading span) was associated with a preference to attach ambiguous RCs higher in the syntactic structure. However, there was little indication that domain-general WM (reading + spatial span) modulated the relationship, contrary to offline results. Analyses also demonstrated that determinedly attached sentences were harder to process than globally ambiguous sentences.

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6:00-7:00 PM (5035)

ERPs Reveal That Lexical Familiarity Only Matters in the Absence of Expectations. NESLIHAN CALISKAN, *University of South Florida,* SARA MILLIGAN, *University of South Florida,* ELIZABETH R. SCHOTTER, *University of South Florida* — Readers generate predictions about the meaning of an upcoming word, after reading a constraining sentence, as evidenced by reduced N400 ERP amplitudes for expected compared to unexpected words. These semantic predictions feed down to predictions about orthographic form because orthographic neighbors of predicted words yield reduced N400 amplitudes compared to non-neighbors (Laszlo & Federmeier, 2009). This pattern is observed regardless of lexical status (i.e., whether the stimulus is a real word or pseudoword), suggesting that readers were not paying much attention to the perceived stimulus. We asked whether the same pattern would be observed in low constraint contexts when readers must scrutinize the perceptual input more closely in order to perform word recognition. In a replication and extension of Laszlo and Federmeier (2009), we observed similar patterns as the original study in high constraint sentences and a lexicality effect in the form of a left lateralized anterior negativity in low constraint sentences. This suggests that the strength of expectations that readers have about the text determines the degree to which they pay attention to the lexical input.

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6:00-7:00 PM (5036)

Metaphor Is a Two-Way Street: The Predication Algorithm Supports Bidirectionality in Metaphor Processing. HAMAD AL-AZARY, *Lawrence Technological University,* J. NICK REID, *University of Manitoba,* ALBERT N. KATZ, *The University of Western Ontario* — Metaphors (e.g., "Lawyers are sharks") seem incomprehensible when reversed (i.e. "Sharks are lawyers"). Kintsch (2000) argued that computational models of metaphor processing must account for the non-reversibility of metaphors, and put forth his model, the 'predication algorithm', which is an ostensibly directional algorithm because its equation is asymmetric such that semantic properties of the vehicle (e.g., sharks) are added to the topic, (e.g., lawyers) rather than vice versa. Although predication is considered a viable algorithm for simulating metaphor processing, one of its core assumptions – that metaphor processing is directional – has not been systematically tested. We tested the algorithm's performance on distinguishing between 80 canonical (e.g., "Lawyers are sharks") and reversed (e.g., "Sharks are lawyers") metaphors. Our results show that, despite its asymmetric equation, the predication algorithm

produces virtually equivalent results for canonical and reversed metaphors. Thus, contrary to Kintsch's assumptions, the predication algorithm captures a bidirectional semantic process.

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6:00-7:00 PM (5037)

How Important Is the Consonant-Vowel Structure of a Letter String in Prelexical Processing? A Re-Examination Using the Masked-Priming Same-Different Task. STEPHEN J. LUPKER, *University of Western Ontario,* GIACOMO SPINELLI, *University of Milano-Bicocca,* LUCIA COLOMBO, *University of Padua* — The early (i.e., prelexical) visual word recognition process is often assumed to involve parsing words into groups of multiple letters (e.g., bigrams). Chetail et al. (2014) proposed that this parsing mechanism is sensitive to the Consonant-Vowel (CV) structure of words, with each cluster of adjacent vowels forming a core processing unit. This idea gained support from the finding that, in conventional same-different tasks, people take longer to determine that a referent letter string (e.g., modello, 'model') is different from a target letter string when the target is a Transposed-Letter (TL) version of the referent which preserves the number of clusters in the referent (e.g., modlelo, 3 clusters) vs. changes that number (e.g., moedllo, 2 clusters). While this difference was interpreted as a prelexical effect, prelexical processing is typically examined by observing the influence of a masked prime on target processing. In two masked-priming same-different tasks (in Italian), we found no difference between the TL priming effects produced by primes preserving vs. changing the number of clusters in the referent. These results suggest that the CV structure of a letter string becomes relevant at a later stage than the prelexical stage.

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6:00-7:00 PM (5038)

Driving Under the Influence of Misperception: The Effects of Speech Perception and False Hearing on Driving Performance. JACK SILCOX, *University of Utah,* AMY MCDONNELL, *University of Utah,* DAVID STRAYER, *University of Utah,* BRENNAN PAYNE, *University of Utah* (Sponsored by Brennan Payne) — Speech perception is a ubiquitous experience while driving (e.g., listening to a passenger or podcast). But how does effortful speech perception interact with driving performance? We report results from a pre-registered dual-task speech perception and driving experiment. The speech recognition task involved hearing sentences that ended with a target word in background noise (0 dB SNR) that was expected, incongruent, or an incongruent phonological lure for the expected word. The driving task involved following a pace car in a driving simulator. Expected words were recognized better than either incongruent word. For 70% of lures, participants reported hearing the expected word instead (i.e., false hearing). Speech recognition was not influenced by simultaneous driving. In contrast, driving performance was negatively impacted, and cognitive load (i.e., detection response task RT & miss rate) was increased by engagement in speech recognition. This suggests that drivers may prioritize effortful speech perception over driving, even if this impairs driving performance.

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6:00-7:00 PM (5039)

Neural Responses to Attention Demands in Speech. LETITIA HO, *University of Chicago,* HOWARD NUSBAUM, *University of Chicago* — Although listening to speech seems subjectively automatic, different situations can increase the use of attention. Violations of expectations in speech can increase attention to stimulus properties. For example, previous behavioral and neuroimaging studies have demonstrated that unexpected changes in talker can increase demands on attention. Some theories of neural mechanisms of attention suggest that there are attention control networks engaged in changes in attention and some suggest that increased attention is reflected in increased neural activity. The present study tested the idea that certain violations of expectations change the level of attention to speech by increasing neural tracking of the speech signal itself. Unexpected changes in talker may cause listeners to shift attention to the speech signal which could be reflected in an increased periodic representation of low-level speech features in the patterns of neural activity recorded by electroencephalography (EEG).

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6:00-7:00 PM (5040)

Speech Rhythm Is Important for Selective Attention to Target Speech Amidst Noise. TONI SMITH, *Michigan State University,* SHEN YI, *University of Washington,* GARY KIDD, *Indiana University,* J. DEVIN MCAULEY, *Michigan State University* — Three experiments investigated the role of speech rhythm in understanding speech in noise using sentences from the Coordinate Response Measure corpus. In Experiment 1, target rhythmic context was altered while to-be-reported keywords were left intact. Results show reduced performance with rhythmic alteration of the sentence context. Experiments 2 and 3 manipulated the target rhythmic context preceding the target keywords while systematically varying the onset asynchrony between target keywords and a single set of background keywords. Whether the speech was presented in quiet (Experiment 2) or a broadband noise was added (Experiment 3), a substantial effect of onset asynchrony was observed. However, an effect of target rhythm was only observed when there was noise present, and no significant interaction between onset asynchrony and rhythm alteration was found. These results build on past work from our lab in support of a role for speech rhythm in selective attention to target speech, by eliminating several confounds that may have contributed to the detrimental effects of target rhythm alteration in past experiments: the intelligibility of target keywords and the amount of temporal overlap between target and background keywords.

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6:00-7:00 PM (5041)

Time-Course of Identifying a Code-Switch While Listening. ERIKA EXTON, *University of Maryland, College Park,* ROCHELLE S. NEWMAN, *University of Maryland, College Park* — Infants, children, and adults in bilingual settings are regularly exposed to code-switching. By 20 months, bilinguals recognize when the language they are hearing has switched and may incur a "cost" to code-switching (though whether a switch is truly costly for comprehension is debatable). Bilingual adults likely rely on lexical access, with language identification as a byproduct of comprehension, but the extent to which listeners without access to lexical knowledge register a language switch is less clear. However, infants and adults have been shown to discriminate between passages of languages that have different rhythmic properties. In this study, English monolingual adults and 5-8 year-old children listened to a Mandarin-English (experiment 1) or Mandarin-French (experiment 2) bilingual speaker tell stories while code-switching. While listening, participants moved their mouse to indicate which language was being spoken. Results from experiment 1 indicate that both adults and children are faster to recognize a switch into a familiar language than into an unfamiliar language; experiment 2 will examine listeners' use of voice-onset time as a phonetic cue to identify a switch between two unknown languages.

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6:00-7:00 PM (5042)

Age Effects on Lexical Competition are External to the Mental Lexicon: Evidence from Eye Movements. SPYRIDOULA CHEIMARIOU, *The University of Alabama,* EFTHYMIA KAPNOULA, *Basque Center on Cognition, Brain and Language (BCBL) & Ikerbasque* — Recent work has examined the role of cognitive resources in the time course of lexical competition (Zhang & Samuel, 2018; Zhao et al., 2020). It is well established that aging limits the available resources due to cognitive declines (Salthouse, 1988; 2009). We thus hypothesized that, if lexical competition relies on domain-general resources, it should differ between younger and older adults. Participants heard target words (e.g., NET) that were edited to manipulate the degree of competitor activation (e.g., NECK). Target activation was assessed using the visual world paradigm, allowing us to track lexical competition in real time (Dahan et al., 2001). Eye-movement analyses showed evidence for lexical competition across participants and no significant interaction with age; however, an interaction was seen in reaction time analyses reflecting larger competition effects in older listeners. This pattern suggests that while lexical competition build-up and resolution remain stable with age, the cascaded outputs of these processes may be handled differently downstream. Thus, aging effects in speech recognition tasks are likely related to differences external to the mental lexicon such as in decision making and/or motor control.

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6:00-7:00 PM (5043)

Listeners Find Speech Produced with Real-Time Visual Feedback Less Intelligible Despite Minimal Acoustic or Visual Phonetic Change. ELIZABETH CASSERLY, *Trinity College, Hartford,* ALEXANDER SUSHON, *Trinity College, Hartford,* KAITLYN SIEDMAN, *Trinity College, Hartford* — We explored the impact of a relatively novel source of real-time visual speech feedback by having talkers (n = 14) produce a set of 139 isolated English words in front of a large mirror, both covered and uncovered. Audiovisual recordings of speech across conditions were analyzed three ways: (1) Auditory intelligibility discrimination. Naïve listeners (n = 38) judged speech from the mirror condition as "harder to understand" than the reverse in a 2AFC task. (2) Acoustic phonetic analysis. No differences across conditions were found in mean token duration or intensity, or in F1/F2 of five vowels from a subset of the most discriminable talkers. (3) Visual intelligibility. Naïve observers (n = 11) showed no difference in their lipreading discrimination accuracy between the visual speech produced in the mirror vs no-mirror conditions. The combination of these analyses shows that listeners' intelligibility judgments are in response to an aspect of self-visible speech that remains elusive.

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6:00-7:00 PM (5044)

Beyond Intelligibility: Perceived Listening Effort as an Outcome Measure for Foreign-Accented English. KATHLEEN F. NAGLE, *Seton Hall University,* SEAN RUNKLE, *Seton Hall University,* JACQUELINE DOWD, *Seton Hall University* — Evaluating the speech of non-native speakers of English (NNSE) is challenging; measures of intelligibility and accentedness often fail to capture the relative ease of understanding a NNSE. Perceived listening effort (PLE) is a listener-focused outcome measure that may complement these measures. This study examines the effects of intelligibility and accentedness on PLE for foreign-accented speech. Audio recordings of sentences produced by NNSE were selected from the Northwestern University ALLSSTAR corpus (Bradlow, n.d.). Speakers were at least 90% intelligible and represent a range of accentedness. Recordings are presented online to 4 groups of 10 listeners, who hear one set of recordings (n=46). They rate PLE on a 100mm visual analog scale and transcribe what they heard. Measures of inter- and intra-rate reliability and agreement will be calculated. Standard multiple linear regression will be performed to examine the relative contributions of speech intelligibility and accentedness to perceived listening effort. Data collection is ongoing, but we expect to find that 1) less intelligible and more accented speech will receive higher PLE ratings; but 2) ratings of PLE will vary for NNSE recordings that are 100% intelligible.

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6:00–7:00 PM (5045)

Auditory Processing of Speech and Non-Speech in People Who Stutter. MATTHEW C. PHILLIPS, *University of Connecticut,* EMILY MYERS, *University of Connecticut* — Stuttering is a complex neurodevelopmental speech disorder with many factors contributing to its onset, recovery, and persistence. Recent research has investigated speech perception in people who stutter (PWS), including categorical perception, although there is little convergence as to whether and how PWS differ from people who do not stutter (PWNS) in auditory processing. This study compared PWS and PWNS in processing speech and non-speech sounds across two cue dimensions: spectral and temporal. Participants completed two phonetic rating tasks on speech continua differing in voice onset time (VOT) or F2 frequency as well as two non-speech discrimination tasks differing in frequency or duration. Overall, results suggest that while there were only significant group differences in the VOT task and pitch discrimination tasks, PWS performed in the predicted directions on all tasks, such that they demonstrated shallower categorization slopes (suggesting less stable phoneme representations) and lower discrimination accuracy than did PWNS. Clinical implications of these findings regarding stuttering chronicity are discussed.

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6:00–7:00 PM (5046)

Distributional Speech Regularities Maintained Across Long Delays Influence Perceptual Weighting of Speech Input. JENAH BLACK, *Carnegie Mellon University,* NAZBANOU NOZARI, *Carnegie Mellon University,* TIMOTHY MURPHY, *Carnegie Mellon University,* LORI HOLT, *Carnegie Mellon University* — Exposure to short-term distributional speech regularities like a foreign accent can flexibly reweight mappings between acoustic inputs and speech categories. However, it is unclear if reweighting reflects a short-lived or lasting change to the perceptual space. To address this, listeners were exposed to a sequence of words ("beer" and "pier") in which the initial phoneme paired voice onset time (VOT) and fundamental frequency (F0) in the manner of English (short VOT with low F0 and vice versa) or a reversed correlation to create an accent (short VOT with a high F0 and vice versa), with VOT signaling the category. After exposure and a silent delay period, listeners categorized one of two test stimuli as "beer" or "pier," each with an ambiguous VOT and a high or low F0. Consistent with previous work, F0 informed categorization when short-term regularities matched English norms. Its influence was greatly weakened with exposure to the reversed VOTxF0 correlation accent. This influence of the reversed distribution on F0 reweighting persisted at the longest delay periods, up to at least 10 seconds. Thus, short-term distributional speech regularities exert a robust and lasting influence on the perceptual space.

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6:00–7:00 PM (5047)

Effects of Speaker Voice and Language of Background Speech on Spoken Word Recall. AMIRA EL-DINARY, *The Pennsylvania State University,* AMANDA GRYSKEVICZ, *The Pennsylvania State University,* SUSANNE BROUWER, *Radboud University,* JANET G. VAN HELL, *The Pennsylvania State University,* NAVIN VISWANATHAN, *The Pennsylvania State University* — Previous studies have shown that recall accuracy improves when words are repeatedly spoken by a "known voice." It has also been found that listeners recognize speech better when the background babble is in a different language than the target speech. Using an exposure-test design, we evaluated whether these effects interact. During exposure, English words embedded in English or Dutch background babble were presented to monolingual English and Dutch-English bilingual listeners. During test, words from the exposure phase were repeated (old) or not repeated (new). Participants' task is to recognize words as "old" or "new" as quickly as possible. We predict additive effects of known voices and different maskers such that the same speaker and a target-masker mismatch will yield better performance (higher accuracy and faster response times). This effect is expected to be stronger for the monolingual group. Data collection is ongoing, and data will be analyzed well before the conference.

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6:00–7:00 PM (5048)

Size-Sound Iconicity in Word Form and Prosody. LEONARDO MICHELINI, *Emory University,* LYNNE NYGAARD, *Emory University* — Both the speech sounds that comprise an utterance and prosody have been shown to communicate perceptual information about visual referents via cross-modal iconicity; that is, a relationship of shared resemblance. In a series of experiments, we used size-sound iconicity to investigate how analogy between word form and visual features would affect the production of object labels. We created "small," "medium," and "big" pseudowords with distinct phonological properties. In a pseudoword-referent matching task, participants were presented with pseudowords and asked to label creatures varying in size. "Small-sounding" pseudowords were more likely to be assigned to small animals, and "big-sounding" pseudowords to big animals. In a speech production experiment, participants pronounced pseudowords that were pre-assigned to different-sized animals. Individuals modulated the fundamental frequency of their voice (but not amplitude or duration) to emulate characteristics of the label's referent, conveying size information through both prosody and phonological form.

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6:00–7:00 PM (5049)

Failure to Elicit Lexically-Guided Perceptual Learning of Vowels in "Male" Voices But Not Female. DAVID SALTZMAN, *University of Connecticut,* EMILY MYERS, *University of Connecticut* — In Lexically-Guided Perceptual Learning (LGPL), listeners adjust phonetic categories in response to idiolectic differences

in speech. If LGPL is the mechanism listeners use in the real world, it must work across phonemic contrasts and voices. However, the majority of LGPL studies have used fricatives; stop consonants showed much smaller learning effects (Kraljic & Samuel (2006), and vowels have only been used in one study (Colby, Clayards, & Baum, 2019). In the present study, three talkers (one female, two male) were recorded to create LGPL stimulus sets, which biased listeners on a /ɛ/-/ɪ/ contrast. Robust LGPL was observed with the female voice but not with the male voices, nor with a manipulated version of the female voice that approximated male F0 and formant ratios. Acoustic measurements were made and for both male voices, the F1/F2 space of the ambiguous vowel tokens critical to elicit LGPL was nearly identical to the clear productions of the opposing vowel, despite piloting indicating these tokens were perceptually ambiguous. These results indicate that vowel perception is particularly conditioned upon inferred vocal tract length, and therefore may be resistant to LGPL.

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6:00-7:00 PM (5050)

Second-Language Speech Recognition in Noise: The Interplay Between Talker Intelligibility and Linguistic Complexity in Second-Language Listeners. DORINA STRORI, *Northwestern University,* ANN R. BRADLOW, *Northwestern University* — Previous work (Strori, Bradlow, & Souza, 2020, JASA) has demonstrated an interaction between talker intelligibility and sentence complexity in second-language (L2) sentence-in-noise recognition by first-language (L1) listeners. Increasing sentence complexity led to decreasing recognition accuracy for the L1 and high intelligibility L2 English talkers, but not for the low intelligibility L2 talker. This study examined this talker-sentence interplay for L2 listeners of varying L2 proficiency and whose L1 was either the same as that of the L2 talkers or different. Similar to L1 listeners, the L2 listeners revealed an interaction between talker intelligibility and sentence complexity, and this interaction was not modulated by the signal-to-noise ratio, listeners' L1 or their L2 proficiency. These findings show that speech stimuli with different levels of overall intelligibility can elicit different listening strategies for both L1 and L2 listeners. Moreover, both L1 and L2 listeners displayed higher variability for complex versus simple sentence recognition. Together these results add important information about talker-sentence-listener interactions for speech intelligibility by L1 and L2 talkers and for L1 and L2 listeners.

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6:00-7:00 PM (5051)

L2 Listeners' Comprehension of Accented Speech in Quiet and Noisy Environments. GREGORY P. COSTANZO, *The Pennsylvania State University,* YUSHUANG LIU, *The Pennsylvania State University,* HOLLY ZAHARCHUK, *The Pennsylvania State University,* JANET G. VAN HELL, *The Pennsylvania State University* — We examined how listeners with Dutch as their native language (L1) and English as their second language (L2) comprehend English sentences produced in Dutch-accented English, Southern-American English, Chinese-accented English, and unmarked American English in quiet and noisy conditions. Forty sentences were presented in each accent condition, half of which were embedded in background noise and half were presented in quiet. After the sentence was presented, participants were asked to type in the sentence they just heard. According to preliminary data, participants showed highly accurate transcription scores in the quiet condition for the Dutch-, Southern-, and American-accented sentences and slightly lower scores for the Chinese-accent sentences. In the noisy condition, transcription scores for the American and Southern accented sentences were high while the Chinese-accented sentences and, surprisingly, the Dutch-accented sentences showed the lowest scores. Findings will be discussed in light of speech perception theories and interlanguage speech intelligibility.

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6:00-7:00 PM (5052)

Does It Matter? A Comparison of Rapid Learning Protocols for Time-Compressed Speech. KAREN BANAI, *University of Haifa,* JUNA SUSSAN, *University of Haifa,* LIMOR LAVIE, *University of Haifa* — Perceptual learning (PL) for speech can be rapid and long-lasting, but it is also stimulus specific. We ask how changes to task demands during brief training affect rapid learning and its stimulus specificity. 90 participants completed a time-compressed speech pre-test followed by brief training with one of six protocols: a coloring no-audio protocol and five protocols in which 60 time-compressed speech sentences of the test talker were presented with different tasks: passive listening, passive listening + coloring, sentence transcription, semantic verification, and sentence verification with adaptive compression rates. Post-training recognition was tested for the same talker from the previous phases, for a new talker, and for natural fast speech. For the same talker, all groups that received any audio during training outperformed the coloring group. For the new talker, the adaptive verification group was the only one to outperform the coloring group. Natural-fast speech recognition was somewhat better in the groups that trained on either transcription or verification. Thus, even a brief period of adaptive training may be beneficial for learning.

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6:00-7:00 PM (5053)

Same-Talker Benefit? Revisiting Talker-Specificity in Episodic Encoding Across Diverse Voices. WILLIAM CLAPP, *Stanford University,* CHARLOTTE VAUGHN, *University of Maryland,* MEGHAN SUMNER, *Stanford University* — A word repeated in the same voice is recognized more quickly and accurately than a word repeated in a different voice (talker-specificity effect). However, prior work has not examined whether or how this effect may vary across voices. Two continuous recognition memory experiments were conducted in which the talker set either contained a diverse sample of voices (Exp. 1: recognizably Black/white, male/female, and Southern/Western) or a homogeneous but contextually non-standard

sample (Exp. 2: Black or white Western males). In both experiments, performance on same-talker repetitions was strong across the board. Performance on different-talker trials varied widely and correlated with the demographic characteristics—most significantly the race—of the talker heard at encoding, affecting the magnitude of the difference between same and different talker trials. Overall, results suggest that memory encoding of voice attributes is asymmetrical across talkers. Further, although the talker-specificity effect is often described as a same-talker recognition benefit, our findings suggest it may also manifest as a different-talker cost and highlight the possibility of a ceiling effect on same-talker trials.

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6:00-7:00 PM (5054)

Does the McGurk Illusion Arise from Ambiguity? ZUNAIRA J. IQBAL, *University of California, Merced,* KRISTINA C. BACKER, *University of California, Merced,* HEATHER BORTFELD, *University of California, Merced,* MADISON C. LACANLALE, *University of California, Merced,* ANTOINE J. SHAHIN, *University of California, Merced* — In the McGurk illusion, a mismatch of audio-ba with visual-ga causes some to hear "da/ta/tha." The mechanisms behind this illusion have been attributed to phonetic encoding modulations in both the auditory and visual systems. Here, we hypothesize that the audiovisual mismatch creates ambiguity, which in turn leads the auditory system to default its phonetic encoding to specific phonemes, e.g., "d/t/th." To test this hypothesis, participants listened to words and pseudowords with certain phonemes replaced by silent gaps in an auditory-only setting. They also underwent an audiovisual block with McGurk stimuli. In both tasks, participants typed out what they heard. The default account predicts that participants should perceive "d/t/th" during the silent gaps, and individual differences in auditory phonetic encoding should correlate with illusory McGurk perception. Preliminary results (n = 14) suggest that during gaps, the perception of "t" and "th" occurred more than any other phoneme, and in pseudowords more than words. This supports the default account and suggests that prior lexical knowledge plays a role in phoneme-defaulting. Correlation of phoneme with McGurk perception is inconclusive, pending data from additional subjects.

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6:00-7:00 PM (5055)

Talker Variability Facilitates the Statistical Learning of Speech Sounds. STEPHEN C. VAN HEDGER, *Huron University College at Western,* LAURA BATTERINK, *University of Western Ontario* — The current experiment assessed whether speech sounds produced by multiple talkers benefits or impairs statistical learning, including the ability to generalize patterns to a novel talker. Participants listened to approximately 12 minutes of continuous speech made up of repeating trisyllabic words, spoken either by a single talker (single-talker condition) or four talkers speaking for three minutes each (multiple-talker condition). Post-training, all participants completed three assessments of learning: (1) an explicit familiarity rating task, (2) an explicit forced-choice recognition task, and (3) an implicit syllable target detection task. Results indicated that participants in both training conditions showed evidence of statistical learning across all assessments. Further, in both the forced-choice recognition task and target detection task, participants in the multiple-talker condition showed evidence of facilitated statistical learning, particularly when listening to a novel talker. Overall, these results suggest that training with multiple talkers can improve aspects of statistical learning across different measures of learning.

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6:00-7:00 PM (5056)

The Influence of Language Experience on Sound-Symbolic Size Correspondences. ANA MARIA HOFFMANN, *Emory University,* LYNNE NYGAARD, *Emory University* — Sound-symbolism, or non-arbitrary sound to meaning mappings, is assumed to be universal, such that language-specific experiences should not influence judgements of sound symbolic correspondences. Here, we evaluate whether variations in pronunciation associated with a Californian dialect influence sound-symbolic size mappings. Californian u-fronting is associated with a shift from the back vowel [u] to the front of the mouth, [u]. Back versus front vowels are associated with large versus small size referents. To determine if u-fronting influences sound-symbolic judgments, Californian and non-Californian participants rated 40 pseudowords (e.g., ugug) on the size of their associated referents in a silent reading task (Exp 1) and a listening task using productions by Californian and non-Californian speakers (Exp 2). In Exp 1, results showed that Californian participants rated u-words as significantly smaller than non-Californian participants, reflecting their dialect differences (Shibata, 2018). In Exp 2, preliminary results show that Californian listeners rated u-words as smaller than non-Californians. These findings suggest that precise sound symbolic mappings may not be universal, but rather modulated by language experience.

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6:00-7:00 PM (5057)

Audiovisual Benefit from Temporal Cues, Digitally-Generated Point Light Displays, and Natural Faces. JULIA STRAND, *Carleton College,* JED VILLANUEVA, *University of Southern California,* GRACE FARWELL, *Carleton College,* MAYA G. ROGERS, *University of Minnesota,* KATRINA SEWELL, *Carleton College,* XINGYI ZHANG, *Carleton College,* NIC BERRY, *Carleton College,* HELEN HU, *Carleton College,* GIGI PAULIG, *Carleton College,* VIOLET BROWN, *Washington University in St. Louis* — Among the most robust findings in speech research is that the presence of a talking face improves the intelligibility of spoken language. Faces provide fine phonetic detail about the placement of the articulators that is complementary to what is derived from the auditory input. Seeing a talker's face also provides redundant temporal information about when speech is occurring. In this study, participants were presented with spoken sentences in masking noise in five different conditions: audio-only, audiovisual (a natural face), a

digital face created with moving dots akin to a point-light display, the same dot display with only the lips visible, and a modulating circle that provided temporal cues. Differing amounts of visual information led to different degrees of audiovisual benefit in terms of speech intelligibility as well as self-reported listening effort. These findings have implications for understanding the mechanisms underlying audiovisual speech perception and also demonstrate a new method for generating digital stimuli for speech research.

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6:00-7:00 PM (5058)

Examining Individual Differences in Semantic and Acoustic Cue Use. ANNE MARIE CRINNION, *University of Connecticut,* PHOEBE GASTON, *University of Connecticut,* EMILY MYERS, *University of Connecticut* — Speech perception at the sentence level involves many types of information, including bottom-up (acoustic-phonetic) and top-down (semantic) cues. Prior work from our group and others shows considerable participant-level variability in cue use. Understanding why certain individuals use some cues over others requires examining cue use across tasks. Individual-level variability could arise due to the presence of multiple (potentially competing) cues that are integrated differently, or because a single cue is used differently across people. We sought to establish reliability of individual differences in sensitivity to (1) semantic cues and (2) acoustic-phonetic cues, each in a task that manipulated only that information source. In the same participants, we examined semantic cue use with a cross-modal priming paradigm and examined acoustic cue use with a visual analog scale task (e.g., rating how /ba/-like a token along a /ba-da/ continuum was). Performance across two sessions revealed stability in cue use. Ongoing work looks at how cue use in isolation (as examined here) relates to cue use at the sentence level, where multiple, sometimes competing, cues may be present.

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6:00-7:00 PM (5059)

Do People's Problematic Reproductions of Inaccurate Information Decrease over Time? JOSIE A. HOLOHAN, *Northwestern University,* TIFFANY LOU, *Northwestern University,* DAVID N. RAPP, *Northwestern University* — People exposed to inaccurate statements can reproduce the included inaccurate ideas as answers to related questions. Studies demonstrating this well-replicated effect usually test people's responses immediately after reading the statements. We examined whether people's reproductions of previously read inaccuracies would change after a longer delay between reading and test. Participants read statements containing inaccurate ideas, accurate ideas, or unrelated ideas (i.e., control). They were subsequently asked questions related to the statement contents either immediately after reading all of the statements or two months after reading the statements. Participants tested immediately showed traditional patterns: They reproduced inaccurate information to answer questions after reading inaccurate statements more than they spontaneously produced inaccurate responses after reading accurate or control statements. Participants tested after a two-month delay, however, showed little influence of the inaccuracies in their answers. These results indicate inaccurate exposures can be influential in the short-term because they are readily available in memory. But barring transfer into long-term memory, the effects may attenuate over time.

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6:00-7:00 PM (5060)

Does the Act of Handwriting Words Make Them More Memorable Than Typing Them? LINDSAY RICHARDSON, *Carleton University,* GUY LACROIX, *Carleton University,* MOHAMMED ASWAD, *Carleton University,* VIJAY ROBINSON, *Carleton University,* RENEE WHITTAKER, *Carleton University* (Sponsored by Guy Lacroix) — With the influx of technology in the classroom, researchers have been examining the effect of notetaking modality (i.e., pen vs. keyboard) on the well-established benefit of notetaking. Unfortunately, the results have been inconclusive. Thus, three free recall experiments examined whether the act of handwriting or typing words results in performance differences. Wammes et al.'s (2016) methodology was utilized with the addition of a typing condition. The results replicated the drawing effect, whereby drawn words were better recalled than handwritten ones. No differences were found between handwriting and typing, however. If the pen is indeed mightier than the keyboard (Mueller & Oppenheimer, 2014), then the effect is not due to mechanistic differences between these two modalities.

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6:00-7:00 PM (5062)

Curious About What You Know? Curiosity and Prior Knowledge's Effects on Learning. RYAN TAYLOR, *Stony Brook University,* KATHLEEN ARNOLD, *Radford University* — Curiosity, the drive to learn what is unknown, has been associated with increased memory (Kang et al., 2009). However, the nature of this relationship is still unclear, as most prior work has focused on natural variations of curiosity rather than experimentally manipulating it. Prior work has shown evidence that when curiosity is directly manipulated, an increase in learning does not always occur, which suggests a potential third variable may be driving the effect and/or there may be important boundary conditions that limit the impact of curiosity on learning (Arnold et al., in prep). We aimed to determine if there is a causal relationship between curiosity and learning and what role, if any, prior knowledge may play in this relationship. Participants first completed a prior knowledge test across two domains: NFL football and cooking. Next, they were presented with false "pseudofacts" in the form of trivia questions (high curiosity) or statements (low curiosity). Lastly, they were given a final test on the pseudofacts. Both increased prior knowledge and high curiosity were associated with better memory for the pseudofacts with no interaction between the two, suggesting that both factors may independently enhance learning.

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6:00–7:00 PM (5063)

The Impact of Students' Utility Values on Their Study Strategies. CRISTINA ZEPEDA, *Vanderbilt University,* ANDREW C. BUTLER, *Washington University in St. Louis,* CHRISTOPHER ROZEK, *Washington University in St. Louis,* JOSHUA WEDE, *The Pennsylvania State University,* AUSTIN BOYLE, *The Pennsylvania State University* — How can students be motivated to use study strategies that produce desirable difficulties? One possibility is to help them see the value of using such effective strategies (McDaniel & Einstein, 2020; Zepeda et al., 2020). As a first step, we investigated whether students' utility values impact the types of study strategies that they employ when preparing for exams in their courses. We predicted that if students see value in a course, then they may be more likely to use effective strategies to study for exams and thus perform better. Approximately 400 undergraduates from two courses (economics and psychology) reported their utility values at the start of the course. Students were then randomly assigned to a utility value intervention or control condition. In the utility value intervention condition, they completed two writing assignments in which they related course topics to their own lives. In the control condition, the two writing assignments consisted of summarizing a course topic. Students completed the first assignment before Exam 1 and the second assignment before Exam 2. At Exams 1 and 2, study strategies usage and exam performance were measured. Results from this study and their implications will be discussed.

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6:00–7:00 PM (5064)

Can Online Exams Provide Meaningful Assessment of Student Learning? DAHWI AHN, *Iowa State University,* JASON C.K. CHAN, *Iowa State University* — The prevailing wisdom amongst many instructors is online exams are too easy and undiagnostic because they essentially turn closed-book exams into opened-book exams, which makes it difficult to prevent cheating. This assumption is hard to test in experiments because there are little to no stakes when students are not taking real exams, so participants would have little incentive to cheat in lab-based experiments. However, the Spring 2020 semester offered a unique opportunity to examine this question, because most classes had to move online mid-semester due to the rise of the COVID-19 pandemic. In this study, we compared in-person and online exam scores during Spring 2020 by collecting data from 16 courses (N = 1,937) from a large midwestern university. In contrast to the common perception, we found a strong correlation (r = .55) between online and in-person exams, indicating the rank order of exam performance was similar regardless of the exam format. The same pattern persisted regardless of different course levels or fields of study. The results indicate that online exams have similar diagnosticity as in-person exams, and instructors can be encouraged to implement the online exams whenever necessary.

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6:00–7:00 PM (5065)

Are You Sure? Uncertainty's Impact on Learning New Information. KAREN ARCOS, *University of California, Santa Cruz,* BENJAMIN C. STORM, *University of California, Santa Cruz,* HANNAH HAUSMAN, *University of California, Santa Cruz* — Learners may be uncertain about whether encountered information is true. In some situations, uncertainty may encourage people to critically assess information's accuracy, serving as a kind of desirable difficulty beneficial for learning. Uncertainty may also have negative effects, however, leading people to mistrust true information and/or to later think that false information is true. In three experiments, participants were exposed to history statements. In one condition, all the statements were true, and the participants knew it. In the other two conditions, some statements were true and others were false. Participants were either told statements' accuracy or asked to guess statements' accuracy prior to feedback. All participants were then tested on their ability to recall the true information and to identify true from false statements. Although mixed across experiments, the results suggest that uncertainty may potentially enhance learning, perhaps by inducing people to encode to-be-learned information more deeply than they would otherwise. This benefit may come at a cost, however, leading them to also be more likely to think that false information is true.

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6:00–7:00 PM (5066)

The Benefits of Test-Enhanced New Learning Emerge Regardless of Whether Participants Are Encouraged to Avoid Intrusions. MARNI A. GOLDSTEIN, *Toronto Metropolitan University,* JASON C.K. CHAN, *Iowa State University,* LYNN LOHNAS, *Syracuse University,* CHRISTOPHER N. WAHLHEIM, *University of North Carolina at Greensboro,* KARL SZPUNAR, *Toronto Metropolitan University* — Interpolating study with tests improves new learning that follows testing. One hallmark of test-enhanced new learning is that testing, relative to re-studying, results in more correct recall and fewer prior list intrusions. We aimed to (1) replicate this pattern using a standard free recall paradigm that encourages participants to avoid producing intrusions, and (2) examine whether this pattern arises in an externalized free recall paradigm that encourages participants to report and categorize any items that come to mind during a test. Participants studied two sets of unrelated word lists that were either interpolated with test or re-study opportunities (within subjects). The test for the criterial list in each set was either standard free recall or externalized free recall (between subjects). Preliminary findings indicate that interpolated testing enhances new learning regardless of whether participants are encouraged to avoid or to generate-and-categorize intrusions. Implications for the role of intrusions in test-enhanced new learning are considered.

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6:00–7:00 PM (5067)

Flip It and Reverse It: Does Adaptive Sequencing Really Work? DAPHNE E. WHITMER, *Naval Air Warfare Center Training Systems Division,* CHERYL I. JOHNSON, *Naval Air Warfare Center Training Systems Division,* MATTHEW MARRAFFINO, *Naval Air Warfare Center Training Systems Division,* MAUREEN NAMUKASA, *Florida Institute of Technology,* MEREDITH CARROLL, *Florida Institute of Technology,* WHITNEY IGWE, *Florida Institute of Technology,* GUY YELENCSICS, *Florida Institute of Technology,* MORGAN NASH, *Florida Institute of Technology* — In our past research, we have been unable to replicate the benefits of an adaptive sequencing algorithm over random sequencing for flashcard-based learning (Johnson et al., 2021; Whitmer, Johnson, & Marraffino, in press). In particular, the Adaptive Response Time-based Sequencing (ARTS) algorithm (Mettler & Kellman, 2014; Mettler et al., 2011, 2020) increases the time between the presentation of correct flashcards by prioritizing incorrect flashcards first, followed by correct flashcards with slow reaction times, and then correct flashcards with fast reaction times last. We aimed to determine whether the ARTS algorithm was more effective than a reversed-ARTS algorithm, which completely flipped the prioritization of the presented flashcards. Using a pre-test, training, post-test design with a geography task (used by the algorithm creators) and a four-alternative choice paradigm, we found no significant differences between the ARTS and reversed-ARTS conditions in terms of long-term learning gains or learning efficiency. These results provide additional uncertainty about whether assessment and reaction–time-based adaptive sequencing is an advantageous approach for flashcard learning.

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6:00–7:00 PM (5069)

Interpolated Testing Improves New Learning in an Online Setting. KARL SZPUNAR, *Toronto Metropolitan University,* SARAH DUNNETT, *Toronto Metropolitan University,* HYMNJYOT K. GILL, *Toronto Metropolitan University,* MARNI A. GOLDSTEIN, *Toronto Metropolitan University* — Research has shown that interpolating video-recorded lecture content with memory tests can sustain attention and improve learning. However, prior studies have primarily made use of video-recorded content in laboratory settings, and so little is known about whether interpolated testing might support attention and learning while participants view lectures in more unconstrained settings. 240 participants viewed one of two lectures (introduction to statistics or introduction to personality) that were parsed into four segments and interpolated with either tests or opportunities for re-study. Interpolated tests were either in the form of cued recall or recognition. All participants responded to mind wandering probes during the lecture, completed a test on the final (criterial) lecture segment, and then recalled as much as they could remember about the lecture. Preliminary data reveal that interpolated testing supports learning regardless of lecture content or test type. Implications for applying interpolated testing in real-world contexts are discussed.

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6:00–7:00 PM (5070)

Investigating the Mechanisms of Elaboration: What Is Underlying Its Memory Benefit? JOSCHA DUTLI, *University of Zurich,* KLAUS OBERAUER, *University of Zurich,* LEA M. BARTSCH, *University of Zurich* — The elaboration benefit on long-term memory (LTM) is well established and widely replicated (e.g., Galli, 2014). Yet, studies investigating the mechanisms underlying the effect are scarce. In two experiments, we tested two opposing hypotheses: (a) Elaboration has been assumed to benefit LTM by leading to meaningful integration of stimuli into existing networks of knowledge, and thereby, establishing potential retrieval cues (richness account, e.g., Craik & Tulving, 1975), and (b) that elaboration makes memory representations distinct from others, thus, facilitating memory search (distinctiveness account, e.g., Gallo et al., 2008). We manipulated combinations of elaborated features in order to create (a) rich and detailed or (b) distinct memory traces. Neither detailed nor distinctly elaborated words were remembered better than words elaborated with only one feature, which can be taken as direct evidence against the distinctiveness account. Although we also do not find evidence supporting the richness account, a slightly modified version of it could accommodate our results: Therein, elaboration benefits LTM retention by activating well-established semantic networks that have the potential to act as strong retrieval cues later on.

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6:00–7:00 PM (5072)

Effects of Instructor-Provided and Learner-Generated Visualizations on Metacomprehension Accuracy. LOGAN FIORELLA, *University of Georgia,* ALLISON J. JAEGER, *Mississippi State University* — This study tested how different formats of instructional visualizations affect students' metacomprehension accuracy when learning from science texts. Undergraduates (n = 132) studied a series of five biology texts, made judgments of learning, and completed comprehension tests. Participants studied the texts either without visualizations (text-only group), with provided static visualizations (provided visuals group), with provided animations of instructor-drawn visualizations (instructor-generated visuals group), or by generating their own visualizations on paper (learner-generated visuals group). The four conditions did not significantly differ in comprehension test performance; however, they did differ in metacomprehension accuracy. Students who viewed instructor-generated visuals or generated their own visuals exhibited significantly higher relative metacomprehension accuracy than students who viewed static provided visuals or no visuals. This suggests the constructive nature of instructor- and learner-generated visuals may provide more diagnostic metacognitive cues than static visuals or text alone.

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6:00-7:00 PM (5074)

Instructor Fluency, But Not Gender, Affects Students' Judgments of Learning and of Teaching Quality. KELLY A. KANE, *Elmira College,* SHANA CARPENTER, *Iowa State University,* AMBER WITHERBY, *Creighton University* — Student Evaluations of Teaching (SETs) are popular measures of teaching effectiveness, often used for employment decisions. However, growing evidence suggests that SETs are sensitive to factors that do not reflect quality of teaching (e.g. verbal fluency), and may be insensitive to students' actual learning. We manipulated instructor gender and verbal fluency to measure the impact on both SETs and actual learning. Student participants watched a video lecture delivered by a male or female instructor, in a fluent or disfluent manner, and afterward completed SETs and made a judgment of learning (JOL) before completing a quiz on the information. Students' JOLs and SETs were lower for the disfluent instructor, and somewhat lower for the female instructor. Quiz scores were affected by instructor fluency but not gender. These findings have implications for the use of SETs, if such measures are inappropriately influenced by extraneous qualities of instructors.

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6:00-7:00 PM (5075)

Does None-of-the-Above (NOTA) as a Multiple-Choice Alternative Hurt Students' Confidence? JERI L. LITTLE, *California State University, East Bay,* KIMBERLY ABRAHAM, *California State University, East Bay,* RACHEL KARLIN, *California State University, East Bay* — Students claim that multiple-choice (MC) questions can be tricky, particularly those with competitive incorrect choices or choices like none-of-the-above (NOTA). In multiple studies, we investigated the effects of including NOTA as an MC choice on students' confidence and performance on trivia questions. Participants answered two types of questions: basic five-choice MC questions (basic condition) and equivalent questions in which one choice was replaced with NOTA (NOTA condition). After each question, participants rated their confidence. Then participants answered cued-recall versions of the questions and made a global confidence judgment. Surprisingly, we found no significant differences in confidence or performance between the two conditions. Looking at the global judgments, however, among the participants who stated feeling more confident in one condition than in the other, about 60% stated having more confidence in the basic condition, suggesting that although item-by-item confidence does not differ between the two groups, global confidence might be affected. Although people often report that NOTA questions hurt their confidence, the present results suggest that they might not—at least not on a question-by-question basis.

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6:00-7:00 PM (5076)

Instruction Meets Experience: The Effectiveness of Theory- and Experience-Based Support to Promote the Use of Interleaved Practice. ERDEM ONAN, *Maastricht University,* FELICITAS BIWER, *Maastricht University,* WISNU WIRADHANY, *Bina Nusantara University,* ANIQUE DE BRUIN, *Maastricht University* — The current experiment aimed to improve students' self-regulated use of interleaved practice through either theory- or experience-based support, or both. We randomized 120 Prolific-recruited participants into four conditions, in which they received (or did not) theory- and/or experience-based support. The theory-based support refuted two misconceptions: (1) faulty beliefs about the effectiveness of interleaved practice, and (2) misinterpretation of effort (i.e., high effort means low learning). The experience-based support required students to monitor their perceived effort and learning across time, and showed them the improvements associated with interleaved practice (perceived effort decreasing and learning increasing), using a visual metacognitive prompt. Dependent variables were strategy decisions and classification performance. We found that interleaved practice was desirably difficult for students: It improved category learning, but students experienced high effort and low learning during strategy implementation – at least initially. Overall, there was a significant increase in the use of interleaved practice across time, but this increase was substantially larger when students received both theory- and experience-based support together.

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6:00-7:00 PM (5077)

Exploring Boundary Conditions of the Peak-End Rule. MELANIE PRIETO, *University of California, Santa Cruz,* HANNAH HAUSMAN, *University of California, Santa Cruz* — Would you rather stick your hand in painfully-cold water for one minute, or painfully-cold water for one minute followed by 30 more seconds of slightly less cold ice water? Counterintuitively, people prefer the latter. The same preference has been observed in painful academic tasks. Participants find extended learning experiences less uncomfortable and shorter than objectively shorter learning experiences, a phenomenon known as the peak-end rule. Prior research has not examined whether peak-end applies when the difference between tests is not as salient, such as with different topics. In the present study, participants completed two tasks from two domains (30 difficult math problems vs. 30 difficult and 15 moderate vocabulary questions or vice versa). Participants rated their discomfort, confidence, and interest throughout the two tasks and indicated their preferred task at the end of the experiment. We are also investigating the downstream effects on study choices. We anticipate to still find a peak-end effect, albeit weaker due to preference for vocabulary. Should the peak-end rule not apply, then our results will have theoretical implications for the mechanisms of peak-end and practical implications for educational design.

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6:00–7:00 PM (5078)

Effects of Very Brief Mental Simulation on Memory: An Online Study. NICOLASA C. VILLALOBOS, *Texas Tech University,* MICHAEL J. SERRA, *Texas Tech University* — Mental simulation allows individuals to visualize events that can strengthen the association between thought and action. For example, Pham and Taylor (1999) had participants engage in mental simulation at home for seven days prior to studying for an exam. They either mentally simulated the outcome (mentally simulated the score they wanted to earn) or the process (mentally simulated the process by which they would study the items). Process simulation led to greater study time and test scores compared to outcome simulation or no simulation. In the present study, we examined if such effects occur with short-term mental simulations (often less than one minute) and if conducted online. We assigned participants to either an outcome simulation, process simulation, or control group. All participants then studied difficult general-knowledge facts online for a cued recall test. Despite the very short nature of the mental simulations, both led to greater study time than in the control group. Study time was positively associated with greater test performance, regardless of simulation condition. These results suggest that even a very brief and online mental simulation intervention can lead to increased study time and performance.

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6:00–7:00 PM (5079)

Can People Become Overconfident in Their Topic Knowledge After Reading Introductory Texts? MANDY M. WITHALL, *Northwestern University,* MICHAEL C. MENSINK, *University of Wisconsin-Stout,* DAVID N. RAPP, *Northwestern University* — Introductory-level explanatory texts inform understandings of new topics and complex ideas. But can these texts lead readers unfamiliar with a topic to overestimate what they know and understand? The current project examined this issue and whether warnings temper any resulting beliefs. In Experiment 1, experimental participants read an introductory text on natural selection, half of whom received a warning about the topic's complexity. Control participants read an unrelated text on comets. Before and after reading, participants rated their understandings of natural selection. Reading the introductory text on natural selection, but not the control text, increased participants' knowledge ratings. The warnings about topic complexity failed to influence their judgments. But were participants overconfident? Experiment 2 used the same method and participants also completed the Conceptual Assessment of Natural Selection, which provides an objective measure of topic expertise. This allowed for examining whether participants' confidence was calibrated with actual understandings. The overall results suggest explanatory texts can provide informative introductions, but readers may mistake emerging understandings for expertise.

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6:00–7:00 PM (5080)

Stopping Too Soon: Truncated Search in the Effects of Delayed JOLs on Learning. JASON GELLER, *Princeton University,* AMBER WITHERBY, *Creighton University,* SHANA CARPENTER, *Iowa State University* — Delayed judgements of learning (JOLs) can enhance learning. In cases where delayed JOLs are less effective than retrieval practice, it has been suggested participants terminate search before an item has been retrieved. In two experiments, we examined the effect of delayed JOLs on cued recall by comparing them to overt retrieval practice and restudy. In Experiment 1, after an initial study phase, participants either restudied, overtly retrieved, or made cue-only delayed JOLs for each cue-target pair. Experiment 2 replicated Experiment 1 and included an additional group that provided delayed JOL justifications. In both experiments, we found no differences in reaction time or memory performance between delayed JOL and overt retrieval groups. Looking at JOL justifications, high JOLs were associated with retrieval and better performance whereas low JOLs were associated with truncated search and poorer performance. These findings have theoretical implications for the effects of delayed JOLs on learning.

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6:00–7:00 PM (5081)

Students Can (Mostly) Recognize Effective Learning, So Why Don't They Do It? STEPHANY D. REA, *The University of Texas at Austin,* LISI WANG, *The University of Texas at Austin,* VERONICA X. YAN, *The University of Texas at Austin* — A common refrain in cognitive psychology is that students are not able to recognize effective learning strategies for long-term learning. Our data challenge this claim. In Study 1, participants were assigned to describe either a bottom 10%, average, or top 10% student. Responses revealed differences in both quantity (the top 10% student engaged in more of all strategies) and in quality of study. Results revealed nuanced knowledge of the benefits of self-explanation, retrieval practice (including the placement of retrieval practice throughout study), but not of interleaving. In Study 2, we assessed recognition and reasons for why students' own behaviors might differ. When presented with vignettes describing different sets of learning strategies (passive, active, metacognitive), participants were readily able to distinguish the more effective behaviors from less effective ones. Next, they reported the reasons why they don't always use these more effective strategies, highlighting various perceived barriers (e.g., time, effort, and psychological costs). Taken together, these results suggest that sub-optimal study behaviors is not due to a lack of knowledge, and imply that interventions should also target perceived costs.

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6:00-7:00 PM (5082)

The Effects of Instruction and Experience on Students' Learning Strategies. EZGI M. YUKSEL, *University of Wisconsin-Madison,* SHAWN C. GREEN, *University of Wisconsin-Madison,* HALEY VLACH, *University of Wisconsin-Madison* — When students are left to their own learning strategies, they are more likely to engage in ineffective learning strategies such as rereading textbooks rather than testing themselves (Dunlosky et al., 2013). The aim of the present study was to examine whether the combination of instruction and direct experience with the best practices in learning propagates forward to positively impact how the students engage with classes. 316 participants (177 women, M age = 19.03) were asked to indicate how frequently they use a set of strategies and how effective they perceive them to be. Participants' perceptions of effectiveness and frequency of use of effective strategies (e.g., practice test) were not different between intervention and business-as-usual groups. Participants' understanding and frequency of usage, however, decreased for ineffective strategies (e.g., cramming). Studies in the future will investigate the individual differences and the differences between effective and ineffective strategies with regard to change in behaviors and understanding.

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6:00-7:00 PM (5083)

Benefits of Supportive, Video Feedback on Academic Writing. YASMIN CHOWDHURY, *University of California, Santa Cruz,* JEAN E. FOX TREE, *University of California, Santa Cruz* (Sponsored by Jean E. Fox Tree) — We use feedback as a tool in academia to assist student learning and performance. Feedback can be supportive or critical, and it can be provided in writing or with speech. We tested how the medium we use to give feedback and the type of feedback affected performance, feelings of social presence, and feelings towards the feedback. In an experiment conducted over Zoom, we provided participants with feedback on their writing. The feedback was either supportive or critical and was given either via video or text. In preliminary results, we found an improvement in performance when students were given supportive, video feedback. We also found stronger feelings of social presence towards the feedback giver and more positive feelings towards the feedback when it was given in the video modality.

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6:00-7:00 PM (5084)

Investigating the Relationship Between Context in Event-Based and Time in Time-Based Prospective Memory. ANNE E. VOGEL, *The University of Mississippi,* GAGE REGIER, *The University of Mississippi,* REBEKAH SMITH, *The University of Mississippi* — The current study investigates prospective memory (PM) – or performing a future intention – specifically, whether context in an event-based (EB) PM task and time in a time-based (TB) PM task are utilized in a similar fashion. We compared EB (respond to four target words) and TB (respond to four target times) tasks, both with and without context. In all conditions, participants made true/false judgments for an ongoing sentence task. In the EB context condition, participants were informed that the target words would appear on trials 25-30, 50-55, 75-80, or 100-105 and were told to press a special key to view the trial numbers. Participants in the EB no context condition were not given information about trial numbers. In the TB context condition, participants were told to press a special key to view the time. Participants in the TB no context condition did not have access to a clock and had to estimate the time. We analyze performance on the ongoing and prospective memory tasks and, for the two context conditions, trial number or clock checking behavior.

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6:00-7:00 PM (5085)

Being Present for the Future: Exploring Mindfulness and Prospective Memory. CHRISTOPHER O. NUÑO, *University of Tennessee at Chattanooga,* JILL SHELTON, *University of Tennessee at Chattanooga,* ANNA PUSSER, *University of Tennessee at Chattanooga,* MORGAN ROBINSON, *University of Tennessee at Chattanooga,* CHRISTIAN ISHAK, *University of Tennessee at Chattanooga,* ABIGAIL EVERETT, *University of Tennessee at Chattanooga* — Although mindfulness research has become a trending topic in cognitive science, there is a gap in the literature that fails to explore the relationship between mindfulness and prospective memory. To explore this relationship, students in either a mindfulness condition or vocabulary control condition were asked to remember and complete 10 self-concordant academic tasks (both time-based and nontime-based) over the course of five days. Bayesian models revealed a very high probability that time-based tasks were more difficult than nontime-based tasks, a high probability that mindfulness training increased time-based performance, and a moderate probability that mindfulness increased nontime-based performance. When assessing trait mindfulness, there was a very high likelihood that the acting with awareness and observing mindfulness traits were positively related to performance while the nonjudging and nonreactivity mindfulness traits were likely to negatively affect performance. The influence of individual difference factors, such as Need for Cognition, Attention-Related Cognitive Errors, and Conscientiousness, was also explored. Of these three factors, Conscientiousness was most likely to be the strongest predictor of performance.

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6:00-7:00 PM (5086)

An Examination of the Impact of Drug-Use History on Prospective Memory. XAVIER CELAYA, *Arizona State University,* GENE BREWER, *Arizona State University* — Prospective Memory (PM) is the act of establishing an intention to be carried out at a future time. Research has identified that illicit drug use may interfere with neural systems thought to be responsible for cognitive mechanisms such as memory and attention that are necessary for successful PM. We sought to examine the impact of drug-use history on PM ability in a large sample of college-aged participants. Participants completed

an extensive questionnaire inquiring about various illicit substances and their respective usage frequency, followed by the Prospective Retrospective Memory Questionnaire, a self-report survey asking participants about daily memory-related behaviors, and lastly, an experimental PM task with a brief behavioral intervention known to improve PM in people with neurological deficits (i.e., implementation intention encoding). Implementation intention encoding involves having participants vocally repeat an intention and imagine themselves completing it during formation. We first hypothesized that drug-use history would be associated with impoverished naturalistic and laboratory prospective memory ability, and second, that implementation intentions would mitigate the negative effect of drug-use history on PM.

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6:00–7:00 PM (5087)

After-Effects of Responding to Activated and Deactivated Prospective Memory Target Events Differ Depending on Processing Overlaps. BEAT MEIER, *University of Bern,* MILVIA COTTINI, *Free University of Bolzano-Bozen* — Responding to a prospective memory task requires switching tasks, which typically comes at a performance cost. Similarly, when the prospective memory task is deactivated, a cost can occur when previously relevant prospective memory targets appear unexpectedly. In three experiments, we investigated whether the after-effects of activated and deactivated prospective memory target events varied with different degrees of cue focality. The results showed that lower focality resulted in stronger after-effects when the prospective memory task was activated but in weaker after-effects when the prospective memory task was deactivated. For deactivated prospective memory, after-effects occurred only under high process overlap situations in a zero-target condition, in which participants were instructed for the prospective memory task but never had the opportunity to perform it. We discuss these findings within the process overlap framework, which allows more fine-grained distinctions than the focal versus non-focal dichotomy.

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6:00–7:00 PM (5088)

Prospective Memory Reminders: Too Much of a Good Thing? PHILIP PEPER, *The University of Texas at Arlington,* HUNTER BALL, *The University of Texas at Arlington* — Previous retrospective memory research has found that participants expecting a reminder at test have worse recall than those who know they will not have a reminder. However, little is known about how these expectations influence prospective memory (PM; the ability to fulfill actions in the future). In the current study, participants completed four PM task blocks in which they were to make a special keypress upon seeing learned target words embedded in an ongoing syllable judgement task. Two groups had reminders for the targets during the first three blocks, but not the fourth. Critically, the non-expecting group learned the reminder would be unavailable in the fourth block, whereas the expecting group did not. A third no-reminder group never had reminders. Results show that fourth block target detection was greater in the non-expecting than the expecting reminder group. Moreover, the no-reminder group performed nominally better than the non-expecting group. This latter finding provides preliminary support for the 'the use it or lose it' hypothesis, which states that overreliance on reminders can reduce memory performance. This work should be considered when developing PM interventions to avoid negative consequences of reminders.

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6:00–7:00 PM (5089)

Will You Remember to Attend This Presentation? Appointment Attendance as a Naturalistic Time-Based Prospective Memory Task. ERIN HARRINGTON, *The Pennsylvania State University,* CELINDA REESE-MELANCON, *Oklahoma State University,* JARROD BOCK, *Towson University* — Prospective memory (PM) refers to our memory for future actions or events. Despite its relevance to everyday life, limited work has documented PM in naturalistic settings. The present work examined appointment attendance as a naturalistic time-based PM task. Specifically, we addressed metacognitive features (i.e., self-reported strategy use, task importance and memory perceptions) among individuals who successfully attended (Show) and failed to attend (No-Show) a research appointment. Consistent with previous work, No-Show participants often reported that they had simply forgot to attend their scheduled appointment. Show participants were more likely than No-Show participants to report using strategies to help them attend, particularly technology-based strategies. Furthermore, reported strategy use was associated with a greater likelihood of attendance when participants viewed attendance as less important or perceived themselves to have poor PM. The present study highlights potential avenues to improve appointment attendance and PM in daily life.

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6:00–7:00 PM (5090)

Animates Help You Remember What to Do! Evidence from a Nonfocal Prospective Memory Task. SARA B. FÉLIX, *William James Center for Research, University of Aveiro,* JOSEFA N S. PANDEIRADA, *William James Center for Research, University of Aveiro,* MARIE POIRIER, *City, University of London* — From an evolutionary perspective, it would be adaptive to remember better animates/living beings (than inanimates/nonliving things) due to their fitness-relevance (e.g., they are predators, prey, etc.). Such an advantage (a.k.a. the animacy effect) is overly established in retrospective memory (i.e., retrieving information from the past). Another adaptive feature of memory is the fact that it is future-oriented (information from the past is used to plan the future). In this work, we combined these two features and explored the influence of animacy in prospective memory (PM; memory for intentions to-be-performed in the future). A total of 81 participants performed a PM task (sample size calculated for α=.05, 1-β=.85, dz=.35; Faul et al., 2007). Participants

responded to an ongoing visuospatial task but, importantly, when a given animate (e.g., NURSE) or inanimate (e.g., PHONE) occurred (PM targets), an alternative response was required (PM response). Correct PM responses were significantly higher for animate than inanimate target-words, revealing that PM is also sensitive to animacy. Furthermore, this result is informative regarding a potential attention-based proximate mechanism of this effect. The study was pre-registered.

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6:00-7:00 PM (5091)

Does Clarity of Famous Faces Affect the Rate of Tip-of-the-Tongue States? HYEONJEONG LEE, *Florida International University,* ALI POURNAGHDALI, *University of Southern California Leonard Davis School of Gerontology,* BENNETT L. SCHWARTZ, *Florida International University* — This study investigates if the visual fluency of familiar faces affects name recall, recognition, and the likelihood of tip-of-the-tongue experiences for those faces. To manipulate the visual fluency of faces, we set three levels of clarity for 396 celebrity faces: high (100%), medium (70%), and low (30%) clarity. Participants were asked to recall the last names of the celebrities for all clarity levels, and if they did not recall, to indicate if they experienced tip-of-the-tongue states. Following tip-of-the-tongue questions, they performed a name recognition test in which they chose one of two alternative last names. The results showed that the clearer the faces, the more tip-of-the-tongue experiences occurred for unrecalled faces. Name recall was also higher for clearer faces. However, the correct answer rate in the name recognition test was the same regardless of clarity levels. This study, consistent with other work on metacognition, demonstrates that fluency influences metacognitive judgments.

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6:00-7:00 PM (5092)

Moving Away from Verbal-Based Measures of Cognition: Using Drawing to Measure Event Comprehension and Memory. TAYLOR L. SIMONSON-VARGO, *Kansas State University,* ISABELLA HUBBELL, *Washburn University,* HEATHER BAILEY, *Kansas State University* — Nonverbal communication measures are currently utilized to assess cognition in certain clinical populations (e.g., clock-drawing test for dementia patients, Gestalt drawings for those who experience brain trauma), but these measures are often used for diagnoses rather than to measure complex cognition. Measures that do not rely on verbal abilities are needed to avoid potential barriers and provide all individuals with ways of expressing comprehension and memory. Our work uses drawing, rather than verbal reports, to assess event comprehension and memory. Participants watched film clips and then drew 4-panel comics of each narrative. Drawings were scored using an action coding scheme to identify narrative goals (i.e., A1 units/small goals and A2 units/large goals) within each panel. Comprehension for the film clips, as measured by the comic drawing, was compared to working memory (i.e., O-SPAN) and free recall data (e.g., normalized word counts) to evaluate the psychometric properties of our drawing measure and to identify potential relationships between standard measures of cognition and our proposed drawing method.

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6:00-7:00 PM (5093)

Encounters and Memory for Representational and Abstract Art. SEAN DAGEFORDE, *University of Notre Dame,* DANI PARRA, *University of Notre Dame,* ROBIN JENSEN, *University of Notre Dame,* JAMES BROCKMOLE, *University of Notre Dame,* GABRIEL RADVANSKY, *University of Notre Dame* — Our project examined the perception, understanding, and memory of different types of art. We operationalized this in two ways: perceptual understanding of the physical object itself and interpretive understanding of what each piece was about (gist). For this study we had a large number of participants view 22 pieces of representational and abstract artworks during a first session while answering perceptual and interpretive prompts (e.g., "What color?" vs. "What emotions?"). We then tested memory for the viewed pieces after three retention intervals: immediately after viewing all of them during the first session, 24 hours later, and one week later. Overall, our results showed that art type influenced memory and that memory declined over time. For representational art, both perceptual details and interpretive gist declined at similar rates. However, gist memory was relatively more stable in abstract art, and gist memory was superior overall. Finally, memory for representational art is positively correlated with reported emotional engagement with the art, whereas abstract art was negatively correlated.

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6:00-7:00 PM (5094)

The Impact of Music Complexity and Likability on Learning and Memory. MATTHEW COLLINS, *Nova Southeastern University,* REBECCA BRIGGS, *Nova Southeastern University,* JADALEE EYMA, *Nova Southeastern University,* ERIN L. GOONAN, *Nova Southeastern University,* SARIKA CHAUHAN, *Nova Southeastern University,* ISAAC HAI, *Nova Southeastern University,* QUINN TOMPKINS, *Nova Southeastern University,* ALEXIS TOLA, *Nova Southeastern University* — We examined the effect that music has on learning rate and memory, specifically how music complexity, likability, and extraversion moderate the relationship between music and arousal. Participants were placed into one of four conditions: simple music, complex music, self-selected music, or a silent control. The simple and complex music conditions were the acoustic and original versions of the same songs, respectively. Self-selected music was music selected by the participants. Following ten minutes of listening to music or silence, participants completed seven repetitions of a paired-associate learning task to assess their learning rate and a final delayed recall task to assess their long-term retention. Participants in the complex condition showed significantly faster learning and better long-term retention. However, this

relationship was not moderated by level of extraversion or music likability, as hypothesized.

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6:00–7:00 PM (5095)

The Effect of Choice on Memory for Consumer Products. MICHELLE COVERDALE, *Purdue University* — Research suggests that chosen items are more memorable than not chosen items. This chosen-item effect could be applied to influence consumer memory if it extends to brand names and consumable products. We conducted a series of experiments to determine whether the chosen-item effect could be obtained using consumer related stimuli such as products and brand names, and with both subjective and objective choice tasks. Participants were shown pairs of advertisements and made either subjective, preference-based choices or objective, size-based choices between the two brands/products being advertised. We replicated the chosen item effect with these new stimuli and tasks. Across all experiments, we found an incidental memory benefit for chosen items over unchosen items. This mnemonic benefit for chosen brands/products did not depend on participants' preferences for the advertisements or the size of the products being advertised.

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6:00–7:00 PM (5096)

Effects of Dividing Attention While Encoding on Trace Accumulation. ANNE OLSEN, *University of South Florida,* KEN MALMBERG, *University of South Florida* — The list-strength effect (LSE) describes that increasing the strength of some items affects memory for the other items on a list. When traces with more accurate item and contextual information have sampling advantages over weaker traces, a +LSE is expected in recall. However, Sahakyan and Malmberg (2018) showed that dividing attention (DA) during study reduced trace interference in recall (null LSE) and decreased differentiation between items in recognition (+LSE). If DA prevents traces accumulation, are multiple study attempts storing as separate weak traces? We conducted several experiments investigating DA role in trace accumulation using mixed-pure paradigms focusing on context accumulation. In both full and DA study conditions, we tested recall effects of item strengthening by study time, number of attempts, and by order of study. In addition to recall probability, conditional recall probabilities and first recall probabilities will be examined to quantify contextual accumulation.

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6:00–7:00 PM (5097)

The Relationship Between Subjective Vividness and Neural Recruitment During Emotional Memory Retrieval Across the Lifespan. SAMANTHA E. WILLIAMS, *Boston College,* ELIZABETH A. KENSINGER, *Boston College,* JACLYN H. FORD, *Boston College* — Age is associated with neural changes in emotional memory retrieval. Ford and Kensinger (2017) found age-related decreases in the relationship between medial prefrontal cortex activation and negative event vividness. In an effort to replicate and extend these previous findings, we asked participants to encode visual images paired with verbal titles and then retrieve memories under multiple conditions that varied whether participants were explicitly instructed to elaborate on memory details. Vividness of the retrieved memories was rated during all conditions. A parametric modulation analysis was then conducted to examine the relationship between neural activity and subjective vividness ratings. Preliminary results revealed the medial prefrontal cortex showed stronger activation during retrieval of negative titles compared to positive titles as a function of increased imagery vividness and younger age. In other words, older adults, but not younger adults, who rated negative titles (compared to positive titles) as less vivid showed more activation of medial prefrontal cortex during the retrieval of those titles. Reduced activation may contribute to decreased negative event vividness of older adults compared to younger adults.

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6:00–7:00 PM (5098)

Testing the List Composition Effect on the Emotional Enhancement of Memory in Younger and Older Adults. SANDRY M. GARCIA, *Boston College,* ELIZABETH A. KENSINGER, *Boston College* — The list-composition effect on the emotional enhancement of memory (EEM) occurs when emotional items are remembered better than non-emotional items in mixed but not pure lists. The current study examined the list-composition effect in young and older adults, under conditions designed to optimize for the effect. There were three viable alternatives. First, young and older adults could show the list-composition effect. Alternatively, due to age-related decreases in cognitive resources, older adults could show weaker effects of list-composition. Finally, older adults often show preferential processing of positive information, and thus the effect could vary by valence for older adults. Younger (18-35) and older adults (55+) participated online in an experiment using pictures (55 younger, 56 older) or words (61 younger, 56 older). Results from both experiments revealed the list-composition effect on the EEM. The magnitude of this effect was not significantly different in the two age groups; both younger and older adults showed this list-composition effect on the EEM. Together, these results suggest that older adults can show a comparable list-composition effect to younger adults.

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6:00–7:00 PM (5099)

COVID-19 and Memory: A Novel Contamination Effect in Memory. GAËTAN THIEBAUT, *Université Bourgogne Franche-Comté,* PATRICK BONIN, *Centre National de Recherche Scientifique (CNRS) & Université Bourgogne Franche-Comté,* PAVOL PROKOP, *Comenius University,* ARNAUD WITT, *Laboratoire d'Etude de l'Apprentissage et du Développement (LEAD)-Centre National de Recherche Scientifique (CNRS) & Université Bourgogne*

Franche-Comté, ALAIN MÉOT*, Université Clermont Auvergne* — The Behavioral Immune System (BIS; Schaller & Park, 2011) is a defense system whose function is to protect individuals against pathogen exposure. Among the cognitive processes involved, memory is an important component of this system. For instance, previous studies have reported better recall of items related to contamination rather than those associated with good health (Bonin et al., 2019; Fernandes et al., 2017, 2021). We investigated "contamination effects" in memory in relation to COVID-19. Photographs of everyday objects were shown to adults (N = 80) in the hands of either a healthy or a contagious person who had contracted SARS-CoV-2. "Contaminated objects" were recalled better than "non-contaminated objects," suggesting that a contamination effect in memory in humans is easily acquired in the absence of apparent visual cues of disease.

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6:00–7:00 PM (5100)

What Makes a Story: Uncovering Mechanisms of Memory Communication. DEVLIN ECKARDT*, Temple University,* HELEN SCHMIDT*, Temple University,* CHELSEA HELION*, Temple University,* JANICE CHEN*, Johns Hopkins University,* VISHNU MURTY*, Temple University* — Memories are not veridical representations of our past, rather they are adaptive, serving future goals like sharing information with others. To test how communication goals influence memory, participants played an exploratory video game and then recalled their experience 24-hours later. We manipulated participants' retrieval goals, such that a control group was directed to recall everything they remembered from gameplay, while a friend group was directed to recall as if to a friend everything they remembered from gameplay. Both groups had equal recognition memory ($p = 0.26$), and recalled equal amounts of information ($p = 0.86$). However, the content of memories varied across groups such that the friend versus control group was biased towards semantic information and away from event-specific information ($p < 0.01$). Linguistic analyses of memories showed that the friend group spoke more informally ($p < 0.001$) and with more social clout ($p < 0.001$). Interestingly, a separate group of participants indicated greater enjoyment and likelihood to purchase the game (p's < 0.001) when listening to memories from the friend versus control group. Our findings suggest that autobiographical narratives can be tailored to facilitate communication.

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6:00–7:00 PM (5101)

Low-Level Linguistic Features Predict Conversational Recall. EVGENIIA DIACHEK*, Vanderbilt University,* SARAH BROWN-SCHMIDT*, Vanderbilt University* — Empirical studies of conversational recall show that the amount of conversation that can be recalled after a delay is limited. Certain features of conversation, including semantic and interactional factors may shape what is and is not recalled. This study aims to predict the quantity and similarity of conversational recall based on linguistic features of what was said, as well the mood of the conversational partners. Across 59 conversational dyads, participants mood did not predict free recall of conversation, nor did it predict the mnemonic similarly of dyad's conversational recalls. Similarly, disagreements between the interlocutors were not predictive of better recall. We did, however, find that utterances that were disfluent ("um", "uh") or were backchanneled ("ok", "yeah") were more likely to be recalled. Importantly, while we replicated the well-known production effect, listening to but not producing disfluent or backchannel utterances resulted in better memory for those utterances. Finally, the memory boost for the disfluent utterances was similar regardless of the number of disfluencies in the utterance. Overall, we conclude that low-level features of language are predictive of conversational recall.

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6:00–7:00 PM (5102)

Does Post-Encoding Alcohol Consumption Really Enhance Memory Consolidation? A Preregistered Encoding-Maintenance-Retrieval Analysis. JULIAN QUEVEDO PÜTTER*, University of Mannheim,* EDGAR ERDFELDER*, University of Mannheim* — Retrograde facilitation by alcohol refers to the puzzling effect of post-encoding alcohol consumption enhancing performance on a delayed memory test (Parker et al., 1981). This effect is currently seen as one crucial piece of evidence for the notion that episodic memory consolidation will occur whenever the ability to encode new information into memory is reduced. However, retrograde facilitation by alcohol can also be explained by more traditional retroactive interference accounts which attribute the effect to retrieval benefits. Against this backdrop, we conducted a conceptual replication of the original Parker et al. (1981) study, comparing an alcohol against a placebo condition. To shed light on the underlying mechanisms, we used the encoding-maintenance-retrieval (EMR) model (Küpper-Tetzel & Erdfelder, 2012). This model provides separate estimates for the latent contributions of encoding, maintenance, and retrieval processes to the observable memory data. Hence, the EMR model enables us to precisely test the predictions of the consolidation and the interference account. The results of this study can be expected to advance the discussion on retrograde facilitation by alcohol and its implications for memory consolidation.

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6:00–7:00 PM (5103)

Part-List Cuing Impairment Is Reduced When To-Be-Forgotten Items Serve as the Cues. PELIN TANBERG*, University of Waterloo,* COLIN M. MACLEOD*, University of Waterloo* — The ability to voluntarily forget information on demand—intentional forgetting—is often examined using an item-method directed forgetting paradigm. Research has long shown that to-be-remembered (R) and to-be-forgotten (F) items are encoded differently, with R items better represented than F items in long-term memory. Consequently, we predicted that the well established part-list cuing impairment of

recall caused by re-exposure of part of the learned material should be greater when R items rather than F items serve as the part-list cues prior to test. Consistent with prediction, relative to no part-list cues, both R and F items reduced recall performance for the remaining studied items but R items caused a larger part-list impairment than did F items. We interpret this finding as evidence that, having not been elaboratively rehearsed, F items disrupt the retrieval strategy less than R items.

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6:00–7:00 PM (5104)

Remindings Cause False Memories. JONATHAN TULLIS, *University of Arizona* — Remindings, cognitive processes in which encoding novel stimuli prompts retrieval of prior learned episodes, support various cognitive skills, including categorization, interpretation of ambiguous events, and problem solving. Remindings bring temporally separated, related ideas together in mind, which may foster generalization across those ideas. Utilizing the Deese-Roediger-McDermott (DRM) protocol, I tested whether remindings cause over-generalizations across items and create false memories of unstudied words. Five semantically related words were presented across a study list on either consistent or varied background pictures to manipulate the probability of remindings. Words studied across consistent backgrounds (which are theorized to prompt remindings) were recalled better than words studied on varied backgrounds. Further, learners recalled un-studied critical lures for words presented on consistent backgrounds more frequently than for those on varied backgrounds. Results suggest that remindings, prompted by consistent backgrounds, caused false memories for unstudied items. Implications for theories of recursive reminding and spreading activation are discussed.

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6:00–7:00 PM (5105)

The Influence of Pain, Disability, Anxiety, Depression, and Loneliness on Immediate and Delayed Recall in Chiari Patients. PHILIP ALLEN, *University of Akron,* RICHARD LABUDA, *Conquer Chiari,* MEI-CHING LIEN, *Oregon State University,* FRANCIS LOTH, *Northeastern University,* DOROTHY LOTH, *University of Akron* — Chiari malformation Type I (CMI) is a neurological syndrome that results in compression of the brainstem and cervical spine areas by the cerebellar tonsils. There is accumulating evidence that CMI results in memory dysfunction. In a sample of 474 Chiari patients, we examined the relationship between memory (as indexed using a modified version of the RAVLT immediate and delayed recall tasks), disability (Oswestry Head and Neck Pain Index), pain (McGill Pain Questionnaire), depression and anxiety (DASS21), and loneliness (UCLA Loneliness Scale). There were significant Pearson Product-Moment correlations for both memory measures with all five of the clinical measures. However, when these five predictors were regressed on the memory measures separately, only disability predicted unique delayed recall performance, but both disability and depression scores predicted immediate recall. These findings suggest that while the effect of disability inhibits both encoding and retrieval, depression appears to inhibit encoding more than retrieval.

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6:00–7:00 PM (5106)

A Comparison of the Effects of Reminders and Motivated Forgetting of Fake News on Subsequent Memory for and Beliefs in Real News. PAIGE L. KEMP, *University of North Carolina at Greensboro,* SYDNEY M. GARLITCH, *Millikin University,* VANESSA M. LOAIZA, *University of Essex,* CHRISTOPHER N. WAHLHEIM, *University of North Carolina at Greensboro* — Recent findings suggest that reminding people of fake news immediately before correcting it improves subsequent memory and belief accuracy for real news partly by enhancing integrative encoding. The present study attempted to replicate these reminder benefits and determine if they exceed the potential benefits of motivated forgetting of fake news. Participants first viewed real and fake news headlines and were instructed to disregard a subset of fake news headlines that were labeled as such. Participants then viewed real news headlines that corrected fake news or repeated real news. Some corrections appeared after a fake news reminder. Memory and belief accuracy for real news headlines was higher when fake news reminders appeared than when fake news was labeled on its initial appearance. These results are compatible with the recommendation that interventions designed to mitigate the influence of fake news should encourage integration rather than differentiation of competing news details.

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6:00–7:00 PM (5107)

Investigating the Asymmetric Nature of the Contiguity Effect in the Probed Recall Task. HAZAL ARPACI, *Middle East Technical University,* ASLI KILIC, *Middle East Technical University* (Sponsored by Asli Kilic) — In free recall, there is a tendency to generate a word that either follows or precedes the just recalled word in the study list, namely the contiguity effect. A robust forward asymmetry in the contiguity effect indicates that after recalling an item, generating a word that follows the just recalled word is more likely than a word that precedes it. The probed recall task was designed to test causal and non-causal models of recall. However, different than the results in free recall, forward asymmetry was not observed in probed recall. This failure could be due to the low performance in probed recall compared to free recall. We developed a simplified and optimized version of the task, which improved the overall accuracy and the benchmark in free recall is reached. The results of the current study showed both within-list and between-list contiguity effects, supporting the causal explanation of recall. The asymmetry was observed in the between-list contiguity effect, providing further evidence for the causal models, however, we failed to observe the asymmetry in the within-list contiguity effect. Results are discussed in terms of the model predictions.

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6:00–7:00 PM (5108)

Does Restudying Impair Memory for Non-Restudied Information? A Real Word Application of the List-Strength Effect. SKYLAR J. LAURSEN, *University of Guelph,* BROOKE FARRELL, *University of Guelph,* CHRIS M. FIACCONI, *University of Guelph* — Despite a plethora of research indicating that retrieving as compared to simply restudying recently encoded material boosts final test performance, restudying remains a popular learning strategy among students. However, in addition to being a suboptimal learning tool, there may be conditions under which restudying introduces a mnemonic cost. Here, we examined whether restudying a self-selected subset of items impairs memory for the remaining non-restudied items. This question was inspired by research on the list-strength effect, in which re-presentation of only a subset of items impairs recall for items presented only once. Across two experiments, we found that following initial encoding of all items, honoring participants' restudy selections did indeed impair recall for the non-restudied items relative to a condition in which all items were presented only once. Therefore, it appears that restudying only a self-selected subset of items can produce memory performance costs for non-restudied items.

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6:00–7:00 PM (5109)

Surviving Interference. GIULIA R. MCDONALD, *Mississippi State University,* DEBORAH K. EAKIN, *Mississippi State University* — Survival processing has been proposed as a special form of deep processing at encoding (Nairne et al., 2007). Even compared to a host of other deep-processing controls—forming a visual image, self-reference, or pleasantness ratings—survival processing has resulted in superior recall (Nairne et al., 2008). We theorized that survival processing must also be protective against forgetting due to retroactive interference (RI), and more extremely, retrieval blocking (McGeoch, 1942). Participants studied word pairs under three encoding conditions: Survival, Moving, and Vividness using a typical RI paradigm (encoding conditions were matched across RI lists). The final test used the modified opposition test (MOT; Eakin et al., 2003), to induce retrieval blocking. Significant RI effects were obtained across all encoding conditions. In addition, across the control conditions, memory was best for vividness, not survival, processing. In addition, survival ratings were not correlated with memory outcome.

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6:00–7:00 PM (5110)

The Animacy Advantage in Memory Likely Reflects More Effortful Encoding of Animate Than Inanimate Words. JULIA N. SHULL, *Texas Tech University,* NICOLASA C. VILLALOBOS, *Texas Tech University,* TIMOTHY D. KELLEY, *University of California, Los Angeles,* MICHAEL J. SERRA, *Texas Tech University* (Sponsored by Michael Serra) — Participants typically recall more animate (living) words than inanimate (non-living) words in free-recall tasks. We tested whether participants allocate more effort to animate over inanimate words during encoding. In Experiment 1, we crossed a value-directed remembering manipulation (10 or 2 points per item) with animacy (animate or inanimate) to discourage participants from allocating effort to animate over inanimate words. Participants recalled more 10-point than 2-point items. They showed an animacy advantage for 2-point items, but not for 10-point items, suggesting that the value manipulation partially disrupted participants' differential encoding of items by animacy. In Experiment 2, we attempted to enhance or reverse the animacy advantage by instructing participants to focus on either animate or inanimate words (between participants). Participants showed a large inanimate advantage when instructed to focus on inanimate words, and an even larger animate advantage when instructed to focus on animate words. These results suggest that participants typically allocate more encoding effort to animate than inanimate words in the standard occurrence of the animacy effect, perhaps unintentionally.

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6:00–7:00 PM (5111)

Improving Contact Tracing with Directed Recall. BELGIN ÜNAL, *University of Illinois Urbana-Champaign,* AARON BENJAMIN, *University of Illinois Urbana-Champaign* — Contact tracing is a key strategy for slowing the spread of infectious diseases. Across two experiments, we evaluated the effect of a directed recall manipulation on the quantity of names produced during contact tracing interviews. Participants reported their close contacts over the four days prior to the experiment. People report more contacts when they are guided in directed recall (i.e., backward or forward in time) than when given the freedom to recall as they please. A second recall opportunity leads to retrieval of additional contacts, regardless of recall direction. Finally, the direction of recall instructions does not affect the overall number of names retrieved but does result in different patterns of retrieval with respect to time. Backward recall elicits more recall of the most recent contacts, making it appropriate for forward tracing protocols. Forward recall elicits more retrieval of more distant contacts, making it appropriate for backward tracing protocols.

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6:00–7:00 PM (5112)

Age-Related Impairments in Memory Recall Depend on What You Are Remembering. JENNIFER GOVE, *University of Massachusetts Amherst,* MERIKA W. SANDERS, *Harvard University,* ZHUOHAN JIANG, *McGill University,* ROSEMARY COWELL, *University of Massachusetts Amherst* — Traditional theories of memory have ascribed the process of recall to the hippocampus, regardless of the memory content. A newer, representational account suggests that brain regions are best understood not in terms of cognitive processes, like recall/recollection, but in terms of the representations that a region contains. Loss of hippocampal function thus results not in a loss of "recollection" but in a loss of complex, associative representations, e.g., of high-dimensional scenes or episodic memories. We tested this in older adults, in whom hippocampal

function is deteriorating relative to young adults. We used a recall task with a stimulus manipulation: participants performed part-cued recall of 1) images of complex, spatial scenes (which should engage the hippocampus) and 2) images of individual objects (which should not). If the hippocampus is required for recall regardless of the stimulus material, older adults should be equally impaired at recall of objects and scenes. However, if the key role of the hippocampus is to represent high-dimensional stimuli, stimulus type should interact with age, such that older adults are more impaired at scene than object recall, relative to young adults. We found such an interaction.

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6:00-7:00 PM (5113)

The Time Window of Reconsolidation: A Replication. KEVIN MOHAWK, *University of Nevada, Las Vegas,* LAURA WERNER, N/A, *The University of Texas at Austin,* CHRISTOPHER KILEY, *University of Nevada, Las Vegas,* COLLEEN M. PARKS, N/A, *University of Nevada, Las Vegas* — Reconsolidation theory argues that memories can be reactivated, rendering them vulnerable to modification. We replicated a study by Hupbach et al. (2007), who demonstrated that reconsolidation is only found when there is a delay following reactivation, indicating that reconsolidation is a time-dependent process. On Day-1 of the experiment, participants learned a list of 20 objects. On Day-2, participants learned a second list in either the same location as Day-1 (reactivation group) or in a different location (control group). Another control group skipped Day-2. List-2 intrusions into list-1 memory were taken as evidence of reconsolidation. In a 3-day condition, participants were tested over list-1 on Day-3. In a 2-day condition, participants completed the list-1 memory test after learning the second list on Day-2. We found evidence of reconsolidation in the reactivation group compared to the control groups, but only in the 3-day condition, replicating Hupbach et al's finding of time dependency.

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6:00-7:00 PM (5114)

Divided Attention Decreases the Amount, But Not the Effectiveness, of Saccadic Exploration During Memory Encoding. CHLOE A. KINDELL, *Louisiana State Unviersity,* HEATHER D. LUCAS, *Louisiana State University* (Sponsored by Heather Lucas) — Humans use eye movements to encode information into memory, and memory difficulties co-occur with altered viewing behaviors. For example, age-related memory decline is associated with more frequent but less effective eye movements during study tasks, indicative of altered communication between memory and vision. We examined whether taxing attentional resources would produce similar effects in healthy young adults. Eye movements were recorded while participants (n=44) viewed sets of complex displays, each followed by a spatial memory test. Attentional resources during study were manipulated within-subjects by varying the difficulty of a concurrent auditory task. Greater secondary task difficulty was associated with worse memory performance. However, unlike with aging, this memory decrement was accompanied by a decrease in visual exploration, as evidenced by fewer and longer fixations and smaller saccades during study. These viewing changes seem to be compensatory, as they correlated across participants with smaller load-related memory decrements. These data suggest that cognitive load during study impacts memory by restricting the use of eye movements rather than by making visual exploration less effective.

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6:00-7:00 PM (5115)

How Learning with Variable Cues Interacts with Testing Effect and Spacing. EWA BUTOWSKA, *SWPS University,* KATARZYNA ZAWADZKA, *SWPS University,* MACIEJ HANCZAKOWSKI, *Adam Mickiewicz University* — Effective learning involves repeated retrieval attempts that are spaced in time and followed by corrective feedback. Studies on repeated retrieval practice use the same cues at each practice cycle. Here we examined how providing variable cues affects learning. We presented foreign words embedded in sentences in participants' first language which were either repeated (constant cues) or changed (variable cues) throughout five cycles of learning via spaced retrieval practice with feedback. Experiment 1 revealed better performance for translating foreign words when learning involved retrieval with variable cues. Experiment 2 included a restudy condition and demonstrated that the testing effect was larger with variable than with constant cues. Experiment 3 compared spaced and massed retrieval and showed that the benefits of spacing were larger when cues were variable rather than constant. Experiment 4 assessed participants' awareness of the benefits of using variable cues during learning via retrieval practice and showed that people have no pre-existing beliefs about the effects of cue variability, but after experiencing learning with varied and constant cues, they wrongly believe constant cues to result in better learning.

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6:00-7:00 PM (5116)

Adaptive Skills in Survival Processing: Individual Differences in Working Memory Capacity. MARY C. AVERY, *University at Albany, SUNY,* JEANETTE ALTARRIBA, PHD, *University at Albany, SUNY* — Studies of survival memory have reported superior recall when rating words for their survival relevance (Nairne, 2007). Research has since examined the factors that mediate this effect (e.g., creativity; Altarriba & Avery, 2021). Other individual differences likely to play a role remain untested (e.g., working memory capacity). Only one study within the survival processing literature has investigated working memory via a load manipulation, which reduced recall, and often, eliminated the memorial advantage entirely (Kroneisen et al., 2014). This finding is at odds with an evolutionary account. In the current study, participants with high vs. low working memory capacity completed a survival memory task or pleasantness rating task followed by an unexpected recall task. Results revealed an overall main effect of processing condition (survival vs. pleasantness

control) on recall, but no main effect of working memory capacity or interaction. Findings are discussed with reference to individual differences in working memory as a result of processing in a survival mode.

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6:00-7:00 PM (5117)

Surviving Short-Term Memory: Long-Term Retention Through Associative Learning and Activation Sharing. JOSEPH J. GLAVAN, *Wright State University,* JOSEPH W. HOUPT, *The University of Texas at San Antonio* — We propose a theory of contextual and contextually-invariant associative memory. The theory is presented as an extension of the ACT-R cognitive architecture and generalizes its spreading activation mechanism to allow activation to be shared among contextually-relevant items in memory. This creates structure between the items over time, which increases the efficiency of attentional refreshing and allows groups of items to be quickly reactivated upon the reinstatement of relevant context. Furthermore, we implement associative learning in ACT-R based on a theory of causal induction, which permits the model to learn contextually-invariant connections between items that promote long-term retention. We present the results from a simulation study examining recall in a complex span task and subsequent delayed test. We compare the model's performance to archival human data, and discuss the model's predictions for memory span and temporal clustering effects in a novel experimental paradigm.

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6:00-7:00 PM (5118)

Domain Differences in the Performance of Serial Recall Tasks. NAN NI, *Kyoto University,* SATORU SAITO, *Kyoto University* — There is well-established research on the mechanism of verbal serial recall. However, the representations and processes involved in spatial serial recall are much less well understood (Gathercole et al., 2019). Besides, the common points and differences in the ways of representing and processing sequences in verbal and spatial domains also remain unclear. To address these questions, we compared the data of four serial recall tasks (the letter forward and backward tasks in the verbal domain, the circle forward and backward tasks in the spatial domain), which were acquired in our previous working memory training studies. We found that verbal recall was overall slower and less accurate in backward direction than in forward direction, but this was not the case for spatial recall. Moreover, there was a more marked recency effect in verbal backward recall than in spatial backward recall. These results suggest that verbal WM favors the forward-going direction during encoding and retrieval. On the other hand, spatial WM may not inherently encode sequences in the forward direction, which makes retrieval possible in either direction.

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6:00-7:00 PM (5119)

Changed-Goal or Cue-Strengthening? An Investigation into the Underlying Mechanisms of Judgment of Learning Reactivity. MINYU CHANG, *Cornell University,* CHARLES J. BRAINERD, *Cornell University* — Making judgments of learning (JOLs) can sometimes directly modify subsequent memory, which is termed JOL reactivity. To explain this phenomenon, the changed-goal hypothesis posits that JOLs increase participants' awareness of differences in item difficulties, which switches their learning goals from mastery-oriented to performance-oriented and prompts them to focus more on easier items at the cost of harder items. The cue-strengthening hypothesis states that making JOLs strengthens cues that inform JOLs and thus benefits memory performance if memory tests are sensitive to the enhanced cues. In Experiment 1, we found that immediate JOLs produced positive reactivity for related word pairs but prestudy JOLs did not, although both types of JOLs signaled differences in item difficulty. In Experiment 2, we manipulated target-target relatedness between consecutive word pairs and administered either free or associative recall tests. Only list-level but not item-level JOLs produced positive reactivity for target-target related pairs with free recall. Thus, both experiments support the cue-strengthening hypothesis more than the changed-goal hypothesis.

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6:00-7:00 PM (5120)

Dividing Attention Does Not Impact the Mnemonic Benefits of Reminding. JIYU LI, *University of Arizona,* YAOPING PENG, *Hunan University,* JONATHAN TULLIS, *University of Arizona* — Being reminded of prior related events is an important component of effective cognition because reminding supports problem solving, categorization, and transfer. Reminding also impacts memory; words followed by related words are remembered better than those followed by unrelated items, which has been labelled the reminding effect (Tullis et al., 2014). In the current study, we examined whether reminding is an effortful, resource-demanding process by assessing the impact of dividing attention on reminding. Participants studied lists of single words that contained related (e.g., jacket…coat) and unrelated items (e.g., jacket…end). In the divided attention condition, participants studied words while simultaneously completing a secondary task. In the full attention condition, participants studied words without a secondary task. Results across two samples showed that related words were recalled better than unrelated words, showing the expected mnemonic benefits of reminding. Second, dividing attention impaired recall. Finally, dividing attention did not affect the mnemonic benefits of reminding, suggesting that reminding boosts memory without significant cognitive effort. Implications for theories of reminding are discussed.

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6:00–7:00 PM (5121)

Great Minds Think Alike: New Measures to Quantify the Similarity of Recalls. ALEXANDRA F. ORTMANN, *Stony Brook University,* MICHAEL BIXTER, *Montclair State University,* CHRISTIAN LUHMANN, *Stony Brook University* (Sponsored by Christian Luhmann) — Given the recent interest in how memory operates in a social context, it is more important than ever to meaningfully measure the similarity between recall sequences of different individuals. Similarity of recall sequences has been quantified using primarily order-agnostic measures, as well as some order-sensitive measures that are unique to memory research. To date, there is little agreement which measures should be preferred and when. Edit distances-a family of measures that has been used extensively in other discliplines-have not yet been used to quantify the similarity of recall sequences. Using simulations and behavioral data we show that edit distances provide a complementary measure of similarity, adding unique information in addition to order-agnostic measures. We present several exemplary research questions, illustrating potential applications of edit distances to both collaborative and individual settings and revealing the multifaceted impact of collaboration.

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6:00–7:00 PM (5122)

Stimulus Duration and Memory Load on Visuospatial Bootstrapping. MITCHELL METZGER, *Ashland University,* MALLIK PETER, *Ashland University,* RAVEN HILL, *Ashland University,* MIKEHLAH CARR, *Ashland University* — Presenting numerical sequences in familiar visual displays produces better performance (visuospatial bootstrapping effect). We expanded on this effect by manipulating stimulus duration (msec stimuli were displayed) and stimulus load (number of items in the sequence). 90 participants viewed numerical sequences that were presented sequentially (single display) or in a typical keypad (TKP). Sequence load was either 6 and 7 digits, and numbers were displayed for either 250, 500, or 1000 msec each. Significant differences were observed for stimulus display ($F1,87 = 4.08$, $p<.05$), load ($F1,87 = 79.67$, $p<.01$) and stimulus duration ($F2,87 = 9.21$, $p<.01$). There were no significant interactions. Additional analyses showed participants were more accurate in the TKP condition at stimulus load of 7 ($t89 = 2.51$, $p<.02$). Darling's visuospatial bootstrapping effect was replicated. Our results show that the effect was only observed during specific load conditions, and that increasing stimulus duration did not alter the bootstrapping effect.

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6:00–7:00 PM (5124)

Hebb Repetition Learning: Neither Continuous nor Implicit: Insights from a New Modeling Approach. PHILIPP MUSFELD, *University of Zurich,* JULIA KRASNOFF, *University of Zurich,* ALESSANDRA S. SOUZA, *University of Porto,* KLAUS OBERAUER, *University of Zurich* — A classic demonstration of long-term learning by repetition is the Hebb-Effect: immediate recall performance improves for lists presented repeatedly as compared to non-repeated lists. This has been described to reflect a slow but continuous accumulation of new long-term memory traces over repetitions (e.g., Page & Norris, 2009). Furthermore, it has been argued that this process requires no awareness of the repetition, taking the Hebb-Effect as an instance of implicit learning (e.g., Guérard et al., 2011; McKelvie, 1987). While these assumptions match the data from a group-level perspective, another picture emerges when analyzing data on the individual-level. Here we used a new Bayesian hierarchical mixture modeling account to model individual learning curves: In two preregistered experiments, using a visual and a verbal Hebb paradigm, we demonstrate that (1) individual learning curves are rather steep but with variable onset points over repetitions and that (2) onset of learning was contingent on explicit awareness of the repetition. Our results provide new insights into the underlying mechanism of repetition learning and show how reliance on group-level data can lead to misconceptions about the underlying cognitive processes.

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6:00–7:00 PM (5125)

Transfer of Task-Sequence Learning Benefits. KRZYSZTOF PIĄTKOWSKI, *SWPS University,* KATARZYNA ZAWADZKA, *SWPS University,* MACIEJ HANCZAKOWSKI, *Adam Mickiewicz University* — Repeated short-term maintenance of to-be-performed task sequences allows for establishing their long-term representations. These representations facilitate subsequent performance for the same sequences, yet it is unclear whether those benefits are due to task sequences being easier to maintain in working memory or due to practice in recoding these sequences into actions. In the present study, we presented participants with strings of letters representing sequences of to-be-performed actions, together with cues denoting whether the sequences should be enacted from left to right or from right to left. The cues were manipulated at acquisition and testing, creating congruent and incongruent conditions. If repeating sequences facilitates memory maintenance, test performance should be augmented independent of congruency, but if the locus of benefits lies in facilitating recoding, only congruent conditions should reveal these benefits. Two experiments yielded a complex pattern of results, suggesting that learning of sequences interacts with habitual reading processes, such that repeating sequences aids memory maintenance, but this is reflected in test performance only when sequences need to be enacted in the usual direction of reading.

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6:00–7:00 PM (5126)

Neural Oscillations of Attentional Refreshing and Verbal Rehearsal. MAXIMILIEN LABARONNE, *Cognitive Mechanisms Research Laboratory, Université Lumière Lyon 2,* GAËN PLANCHER, *Cognitive Mechanisms Research Laboratory, Université Lumière Lyon 2* — The working memory literature mainly considers two maintenance mechanisms for verbal information, verbal rehearsal and attentional refreshing. Differences in their effects on

short-term and long-term recall and their ability to maintain unfamiliar material provide arguments in favor of their independence. The objective of the presence study was to test their independence by measuring neural oscillations associated with verbal rehearsal and attentional refreshing. Participants performed a working memory task, in which they were instructed to either rehearse or refresh the memoranda. We measured EEG activity during maintenance intervals and memory performance at short-term and long-term. Consistent with the hypothesis of independence, memory performance was better at immediate recall after using verbal rehearsal and better at delayed recall after using attentional refreshing. Interestingly, we found evidence that using attentional refreshing or verbal rehearsal led to different pattern of activity in the midline frontal region for the theta band, and in the bilateral temporal and right centro-parietal regions for the alpha band. Further analyses to link EEG activity to short-term and long-term successful recall are under progress.

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6:00-7:00 PM (5127)

Modeling Verbal Short-Term Memory: A Walk Around the Neighborhood. JEAN SAINT-AUBIN, *Université de Moncton,* MARIE POIRIER, *City, University of London,* JAMES M. YEARSLEY, *City, University of London,* DOMINIC GUITARD, *University of Missouri,* JEAN-MICHEL ROBICHAUD, *Université de Moncton* — Poirier et al. (2015) proposed an activation-based view of verbal short-term memory, where order recall relies on the level of activation within long-term lexico-semantic networks (hereafter ANet). We tested some predictions derived from ANet. In three experiments, we manipulated the orthographic neighborhood of to-be-recalled items. The latter is a factor operating at the sublexical level. Results of the first two experiments revealed the pattern of item migrations predicted by ANet, with order errors increasing in expected ways when manipulations were thought to heighten activation levels. The third experiment, however, contradicted the predictions of ANet and suggested that migrations were more related to the similarity between the items than to activation. The results were successfully modelled by calling upon the Revised Feature Model (Saint-Aubin et al., 2021), where retrieval heavily depends on the similarity of the cueing information and the to-be-recalled item relative to the similarity between the cue and competing retrieval candidates.

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6:00-7:00 PM (5128)

Is Working Memory Linked to Encoding or Retrieval Processes in Long-Term Memory? CAROLIN STREITBERGER, *University of Mannheim,* BEATRICE G. KUHLMANN, *University of Mannheim,* NINA R. ARNOLD, *Central Institute of Mental Health,* MATT E. MEIER, *Western Carolina University* — Working memory capacity (WMC) and long-term memory performance are correlated, possibly due to an encoding or a retrieval advantage. To disentangle these processes, we used Bayesian hierarchical multinomial modeling. In Experiment 1, participants learned a list of 20 individually presented words, including pair words (e.g., knife – fork), followed by a free-recall task. We instructed one group of participants to associate the words to detect the pairs. In Experiment 2, participants learned 20 weakly associated word pairs (e.g., office – doctor) and completed free- and cued-recall tasks. In both experiments, we assessed WMC with the operation and symmetry span tasks. We found that high-WMC individuals encode more than low-WMC individuals, given that associative encoding was instructed (Experiment 1) or inherent to the task (Experiment 2). This suggests that high-WMC individuals show an advantage in associative encoding. We found no evidence for a retrieval advantage, meaning that high-WMC individuals do not retrieve information more efficiently.

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6:00-7:00 PM (5129)

Memory Guides Eye Movements in the Absence of Visual Information. AGNES ROSNER, *University of Zurich,* MAUÉ PANTOJA, *University of Zurich* — Whereas it is well known that we move our eyes to objects present in the world, the influence of memory on eye movements is less well understood. Both visual attention and attention to information in memory compete for activation in a shared spatially organized priority map held in memory. The location with the highest activation is selected as the target for the next fixation. Consequently, the higher the memory strength for an item held in memory, the more people should fixate at associated spatial locations in the absence of any useful visual information. We tested this assumption in a cued recall task in which words were presented in random order in rectangles on a screen. Cues were list position, leaving spatial locations irrelevant. We replicated set-size and serial-position effects on accuracy. Fixation proportions to associated spatial locations declined with increasing set size and were highest for first or last item positions. The results are in line with eye movements reflecting memory-driven activations in the shared priority map.

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6:00-7:00 PM (5130)

Removal and Encoding of Information Proceed Simultaneously in Working Memory Updating. CHENYU LI, *University of Zurich,* KLAUS OBERAUER, *University of Zurich,* GIDON T. FRISCHKORN, *University of Zurich* — Removal of outdated information from working memory (WM) is a specific process in updating. It was assumed that removing old information precedes encoding new information when updating. However, this assumption has never been examined. In this study, we compared a full updating condition to (1) updating without encoding condition (removal only), (2) updating without removal condition (encoding only), and (3) no updating condition. Results showed that response time (RT) of no updating condition was faster than the other three conditions, indicating both removal and encoding are specific processes in updating that cost time. Analysis of accuracy showed that removing old items from WM improved participants' performance, which further provided evidence of the existence of removal. Modeling RT showed that the time for full

updating was much less than the sum of the times for removing and encoding, suggesting that replacing old information with a new one is faster than executing removal and encoding processes sequentially.

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6:00-7:00 PM (5131)

Examining Accuracy in Small Multiples Using Abstract Visualization Tasks. HELIA HOSSEINPOUR, *University of California, Merced,* LACE PADILLA, *University of California, Merced* — Small multiples are popular visualization methods for displaying trends with multiple frames sharing the same scale and axes. Despite their popularity, there are no guidelines regarding the optimum number of small multiples that will not overwhelm our working memory capacity. The main goal of this study was to curate a group of controlled small multiples to include in an extensive follow-up study on the working memory demands of small multiples. We compared three types of tasks – lookup, comparison, and ensemble – with 18 visualizations that varied by the number of frames. These visualizations started with graphs of only two frames and increased by four to reach graphs with 70 frames. We found that participants exhibited higher levels of accuracy with less difficult tasks (i.e., look up and comparison). Additionally, accuracy decreased as the number of frames increased in all tasks except for comparison tasks, perhaps because participants were always only comparing two frames across all visualizations. Our results provide insight into task performance when engaging with differing numbers of frames on a single graph and lay the foundation for further research into working memory demands associated with small multiples.

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6:00-7:00 PM (5132)

The When and Where of the Looking at Nothing Effect: Examining Eye Movements During Memory Retrieval. RUHI BHANAP, *University of Zurich,* KLAUS OBERAUER, *University of Zurich,* AGNES ROSNER, *University of Zurich* — Looking at Nothing (LAN) describes the behavior that people look at empty spatial locations when trying to retrieve information from memory which was previously associated to these locations. This study investigated LAN for retrieval from working memory. We tested at what time LAN occurs, and its relation to retrieval performance. We also investigated situations with two locations associated to the retrieved information and asked whether LAN is directed to both or only one of them. During encoding, participants saw four word-pairs in four different spatial locations on a screen. During retrieval, they heard two words and had to indicate whether the words came from one previously seen word-pair (positives) or from two different pairs (lures). Thus, for lures there are 2 relevant locations. We found that participants only showed LAN to the first probe's location, but this occurred when hearing the second probe, irrespective of the correctness of the response. The results speak in favor of memory processes leading to LAN during the recollection of information in working memory.

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6:00-7:00 PM (5133)

Exploring the Long-Term Effects of Device Usage on Exam Grades: Do Students Change Their Device Usage in the Classroom? KENNETH BARIDEAUX, *University of South Carolina Upstate,* SUSAN E. RUPPEL, *University of South Carolina Upstate,* JUSTIN TRAVIS, *University of South Carolina Upstate* — Classrooms today are replete with students using personal electronic devices. Although these devices can be useful to support task-relevant behaviors such as note-taking, they also allow students to engage in off-task classroom activities (e.g., texting, scrolling social media, etc.). Prior research has indicated that engaging in these off-task behaviors during class can adversely affect academic performance. In the current study, we examined the long-term effects of electronic device usage on exam performance. In three separate classes, across an entire semester, students were asked to self-report their device usage during that day's lecture. Results indicated that device usage was a significant predictor of exam grades, with high device users scoring the lowest on the first exam. Interestingly, findings also revealed that device usage did not significantly impact grades on the last regularly scheduled exam. These results demonstrate a negative association between device usage and exam grades; however, students appear to self-regulate their device usage as the semester progresses.

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6:00-7:00 PM (5134)

Is Inhibition Necessary for Successful Theory of Mind Performance? ELIZABETH FRISKI, *Texas A&M University–Commerce,* DAVID FRANK, *Texas A&M University–Commerce* — Theory of mind (ToM) is the ability to take the perspective of others. Theories differ regarding the role of executive functions in ToM performance (Happé, 1994). Modular theorists postulate that ToM is an ability independent of basic cognitive resources (McGlamery et al., 2007). Theory Theorists and Simulation Theorists argue that inhibition is necessary for ToM performance (Carlson et al., 2002; McGlamery et al., 2007; Wynn & Coolidge, 2009). Participants performed a task requiring ToM on some trials, and only working memory (WM) on others. Additionally, a secondary finger-tapping task (Kane & Engle, 2001) was used to vary the executive resources available for inhibition. Contrary to Theory Theory and Simulation Theory, participant response times were affected similarly by the secondary task, independent of ToM involvement. On Accuracy, ToM and WM trials were impacted conversely–WM trials trended towards impaired performance under cognitive load, and ToM trials trended towards superior performance under cognitive load.

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6:00-7:00 PM (5135)

Self-Diagnosis: A Little Knowledge Can Be Dangerous. SEOK-SUNG HONG, *Barnard College,* LISA SON, *Barnard College* — When making decisions under uncertainty, the most we can do is to select the behaviors that might result in accumulation of information and a favorable outcome. Often, however, we are unable to

accumulate sufficient knowledge to make the most informed decision. In these instances, our confidence may play a bigger role in guiding our decisions. Thus, it is crucial that our evaluations of confidence are accurate. In Experiment 1, we investigated people's confidence judgments in relation to the accumulation of information they received. We focused on whether there was a certain level of information that might lead to overconfidence. In Experiment 2, we checked to see if participant's confidence levels would guide whether or not they would seek more information. The results showed that confidence was associated with the decisions made regarding the seeking of new information. Overall, we believe that a deeper examination of the ways in which our confidence judgments can affect out decisions – positively or negatively – under uncertainty.

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6:00-7:00 PM (5136)

Definitions of Intelligence, Knowledge, and Memory: How Lay Participants Conceptualize These Interrelated Constructs. JOHN CIPOLLINI, *Colby College,* JEN H. COANE, *Colby College,* SHARDA UMANATH, *Claremont McKenna College,* LINDSEY HERNANDEZ, *Colby College,* TALIA BARRETT, *Colby College,* SOFIA LEVINA, *Colby College,* KAI CHANG, *Colby College* — In the scientific community, the constructs of intelligence, knowledge, and memory are related: Knowledge is the contents of semantic memory, crystallized intelligence reflects the accumulation of knowledge, knowledge and event memory interact, and fluid intelligence and working memory correlate. Naturally, the lay public has implicit theories of these constructs. Misconceptions about how memory functions are widespread. Lay theories of intelligence mainly distinguish between intelligent and unintelligent behaviors and tend to include characteristics outside psychometric studies of intelligence, such as emotional intelligence. Here, we collected lay definitions of these constructs to understand their alignment or lack thereof with theoretical conceptualizations. Qualitative coding of participant definitions showed that intelligence and knowledge are closely related, but asymmetrically: When defining intelligence, participants refer to knowledge, but not vice versa. Memory and intelligence emerge as distinct constructs. Although participants do note that intelligence is multi-faceted and related to problem-solving, there is an emphasis (in terms of frequency of mentions) on the crystallized side of intelligence (i.e., knowledge).

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6:00-7:00 PM (5137)

Confidence Changes Following Exposure to Other People's Responses: The Role of Source Credibility and Response Consistency. TYLER M. MILLER, *South Dakota State University* — People utilize cues to make metacognitive judgments based on intrinsic, extrinsic, and mnemonic factors (Koriat, 1997). The cue-utilization framework has been extended to estimating others' knowledge (e.g., Tullis 2018). The present experiments examined the extent to which source credibility and response consistency would lead to changes in participants' confidence and responses. Participants answered general knowledge questions from Tauber, Dunlosky, Rawson, Rhodes and Sitzman (2013) and reported confidence judgments. Following each confidence judgment, participants read a short vignette about another person's correct response to the same question and then made a second confidence judgment and indicated whether they would change their response. Results from both Experiments 1 and 2 revealed participants deferred to high-credible sources by changing their confidence and responses. Asymmetric changes following exposure to others' responses suggested both source credibility and response consistency impacted metacognition. Follow-up analyses reveal important caveats for the resistance-certainty effect (Tormala & Petty, 2004).

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6:00-7:00 PM (5138)

Thinking About Believing: Can Metacognition Encourage Belief Change? WESLEY B. FLETCHER, *Brevard College,* ALLISON O'LEARY, *Brevard College* — Throughout the COVID-19 pandemic, examples of people clinging to beliefs despite counterevidence (e.g., the efficacy of mask wearing, safety of vaccines) have been abundant. This resistance to belief updating can have powerful consequences, potentially driving political division. Previous work suggests that the reflective nature of metacognition may have the potential to catalyze belief updating. The purpose of the current study was to determine whether a relation exists between metacognitive processes and an individual's tendency to change a belief. In a randomized controlled experiment (N=76), we attempted to generate belief change by presenting participants with evidence counter to their existing beliefs on a topic (genetic modification in humans). We examined how inducing state metacognition via metacognitive prompts could influence participants' belief change compared to a control condition. Those prompted to use metacognitive processes were significantly more likely to update their beliefs to be more consistent with the presented counterevidence. These findings suggest that metacognition could be a valuable tool in processing evidence that does not align with one's existing beliefs.

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6:00-7:00 PM (5139)

Conceptual Overlap Among Texts Impedes Comprehension Monitoring. LENA HILDENBRAND, *University of Illinois Chicago,* THOMAS D. GRIFFIN, *University of Illinois Chicago,* JENNIFER WILEY, *University of Illinois Chicago* — Metacognition describes a learner's ability to accurately monitor and judge their learning so they can effectively control and direct their time and attention to where it is most needed. Research on relative metacomprehension accuracy has demonstrated that many learners struggle to accurately discriminate their comprehension of texts. While laboratory studies have found baseline intra-individual correlations between predicted and actual test performance of around .27, in classroom contexts even lower accuracy levels have been reported

(Guerrero et al., 2022; Wiley et al., 2016). The present study was designed to test one possible explanation for strikingly low levels of accuracy: Might low accuracy be related to the high conceptual overlap between texts? In a between-subjects design, two text sets were compared. With no differences seen for average test performance or within-subjects variation across texts, mean relative accuracy was found to match typical baseline levels for the low-overlap set and was significantly higher than that for the high-overlap set. Results suggest text similarity is an important factor impacting comprehension monitoring accuracy.

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6:00-7:00 PM (5140)

Performance Predictions and Confidence Over Time in Low- and High-Performing Students. MELTEM KARACA, *University of Massachusetts Lowell,* LISA GERACI, *University of Massachusetts Lowell,* NAYANTARA KURPAD, *University of Massachusetts Lowell,* MARCUS LITHANDER, *KTH Royal Institute of Technology in Stockholm,* STEVE BALSIS, *University of Massachusetts Lowell* — Students who perform poorly on exams tend to overestimate their grades compared to students who perform well on exams, and their calibration remains poor throughout the semester. Although the low-performing students continue to overpredict their performance, it is possible that they learn from test experience over the course of a semester, as evidenced by lowering their confidence in their predictions. To examine this hypothesis, we measured students' predictions and confidence across four exams in two courses. Results from both studies showed that low-performing students were more miscalibrated than high-performing students. Also, results showed that calibration and confidence remained stable across tests for both low- and high-performing students. The confidence findings are consistent with the hypothesis that participants continue to believe that they will perform well on upcoming exams despite contrary evidence, particularly for low-performing students. Thus, it is important to find methods to enhance students' metacognitive monitoring in classrooms.

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6:00-7:00 PM (5141)

Study-Strategy Perceived Effort and Familiarity Influence Self-Regulated Learning Decisions via Perceived Fluency. JESSICA MACALUSO, *University of Pittsburgh,* SCOTT H. FRAUNDORF, *University of Pittsburgh* — Why don't learners choose effective study strategies? Past work (Kirk-Johnson, Galla, & Fraundorf, 2019) suggests that learners often misinterpret the effort associated with effective strategies as poor learning. Here, we examined how the influence of study habits could be integrated into this model (Ariel, Al-Harthy, Was & Dunlosky, 2011). In two experiments, learners saw two contrasting study strategies—blocked and interleaved schedules—to discriminate photos of bird families. After experiencing each strategy, learners rated it for perceived learning, effort, and familiarity, then chose which strategy they'd use for future learning. In both experiments, mediation analyses showed that the more effortful interleaving felt, the less learners felt they learned from it, and were less likely to choose it for future use, replicating Kirk-Johnson et al. (2019). New to this study, strategy familiarity predicted strategy choice, mediated by perceived learning. Further, Study 2 confirmed that, contrary to learners' judgments, the less familiar interleaving strategy led to better learning. Thus, learners make ineffective JOLs due to their perceptions and ergo don't use the best study strategies in self-regulated learning decisions.

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6:00-7:00 PM (5142)

Metacognition About Collaborative Learning: Students' Beliefs Are Inconsistent with Their Learning Preferences. YUNFENG WEI, *Montana State University,* MICHELLE MEADE, *Montana State University,* NICHOLAS SODERSTROM, *Montana State University* — Collaborative studying plays a mixed role in educational contexts. Collaborative learning improves students' engagement and motivation (Persellin et al., 2015) and can lead to post collaborative memory benefits, but students suffer from collaborative inhibition and social contagion (Rajaram & Pereira-Pasarin, 2010). Little is known about students' metacognitive beliefs about group study. The present study used an online survey to investigate students' beliefs toward group study, their preferences about group study, strategies they use when studying individually and in groups, and important characteristics of their group members. The results show that although students think group study is beneficial in general, they prefer to study individually, indicating that their beliefs are inconsistent with their learning preferences. When studying in groups, students most frequently use strategies emphasizing collaboration and interaction, such as quizzing each other. Also, students prefer to work with group members who are focused, motivated, and hard-working. Students' metacognitive beliefs about group studying have implications for better use of collaborative learning in educational contexts.

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6:00-7:00 PM (5143)

Awareness of Reading Improves Metacomprehension Accuracy. AARON WONG, *University of New Hampshire,* CAITLIN MILLS, *University of Minnesota, Twin Cities* — Metacomprehension refers to a person's awareness of their understanding of a text and is typically measured by comparing one's metacomprehension judgment with their actual comprehension score. Because metacomprehension accuracy tends to be poor, research has aimed to improve accuracy by bringing attention to cues related to a reader's comprehension processes e.g., ease of processing. Here we tested the possibility that simply being meta-aware of your thoughts may also improve metacomprehension judgments, perhaps through internal monitoring cues. 125 participants were probed for both meta-awareness and task-unrelated thought while reading 4 texts. After reading the texts, participants made metacomprehension judgments and answered comprehension questions. In line with expectations, higher

metacomprehension accuracy was related to more meta-aware, on-task thought but was not related to on-task thought that lacked meta-awareness. This dissociation suggests meta-awareness may play a key role in the ability to make accurate judgments about what you've learned from a text.

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6:00-7:00 PM (5144)

I Want to Know Why This Feels Familiar: Can Cue Familiarity Prompt Curiosity and Information Seeking? ANDREW M. HUEBERT, *Colorado State University,* BROOKE N. CARLAW, *Colorado State University,* KATHERINE L. MCNEELY-WHITE, *University of California, Davis,* ANNE M. CLEARY, *Colorado State University* — Metacognition's relationship to curiosity remains relatively unexplored in psychology. In two experiments, we investigated whether familiarity (the sense of recognition without the recall of specifics), would prompt curiosity to learn the source of that familiarity. We used the recognition without cued recall paradigm, whereby participants study words and are later given test cues (e.g., POTCHBORK) that potentially resemble either four (e.g., PITCHFORK, PATCHWORK, POCKETBOOK, PULLCORK), one (e.g., PITCHFORK), or no studied words (see Huebert et al., 2022). Of primary interest are the trials where participants cannot recall any studied word resembling the cue; among these, familiarity ratings increase with increasing feature overlap between the cue and the unrecalled study items. Increasing cue familiarity during recall failure led to increased curiosity ratings regarding the source of any familiarity. It also led to an increased tendency to spend a limited number of trials to see the studied word(s) resembling a particular cue. These results suggest that familiarity-detection prompts curiosity to learn the source of that familiarity.

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6:00-7:00 PM (5145)

The Association Between Déjà Vu-Like States and Curiosity. KATHERINE L. MCNEELY-WHITE, *University of California, Davis,* ANNE M. CLEARY, *Colorado State University* — Déjà vu and its auditory counterpart, déjà entendu, are inherently intriguing subjective phenomena. However, whether these metacognitive sensations are mere quirks of the cognitive system or serve a useful purpose within the larger cognitive system remains unclear. To assess the latter possibility, the present study examined the relationship between déjà vu-like states, feelings of curiosity, and changes in information-seeking behaviors. Across two experiments, participants received test lists consisting of either novel visual scene cues (Experiment 1) or novel tonal sequence cues (Experiment 2) that potentially shared critical features with previously studied stimuli. During cued recall failure, participants gave higher feeling-of-curiosity ratings during reported déjà vu-like states than non-déjà vu-like states. Additionally, while experiencing déjà vu-like states, participants were more likely to expend limited experimental opportunities to discover the target pertaining to the test cue. These findings suggest that déjà vu-like states may serve a useful purpose in the larger cognitive system; specifically, they may prompt curiosity and information-seeking behaviors.

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6:00-7:00 PM (5146)

Beliefs About COVID-19: Effects on Processing Fluency for Global vs. Item-Level Confidence Judgments. ANNE CORMIA, *Claremont Graduate University* — Effectively refuting COVID-related misinformation requires an understanding of not just what people know and believe, but also how pre-existing beliefs about the COVID-19 virus interact with fluency to affect processing of related information. Participants first completed a screener to assess their pre-existing beliefs about COVID-19. They then read 60 statements about COVID-19, half true and half false, and made true/false judgments and confidence judgments for each. Across two experiments (total N = 518) conducted between January and March 2022, pre-existing beliefs were associated with significant overconfidence in true/false item-level decisions about COVID-related statements. This effect was heightened when statements were presented more fluently, with high misinformation endorsers making more confidently wrong item-level judgements when the statement was easy to process. However, for postdictive global confidence judgments following the rating of all 60 items, only pre-existing beliefs, not processing fluency, affected the confidence-accuracy relationship. The finding that belief in misinformation led to overconfidence for both global and item-level performance on a true/false task about related information has implications for the effects of pre-existing beliefs on metamemory accuracy and on approaches to countering misinformation.

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6:00-7:00 PM (5147)

Exploring Reactivity Effects with Aggregate-Level Judgments of Learning. AMANDA R. STEVENS, *Texas A&M University-Commerce,* BENTON H. PIERCE, *Texas A&M University-Commerce* — Recent evidence suggests that memory for semantically related word pairs is enhanced when learners make judgments of learning (JOLs) compared to when no JOLs are made (e.g., Soderstrom et al., 2015). The present study aimed to replicate and extend these reactivity effects. In Experiment 1, we replicated the finding that cued recall performance for related word pairs is enhanced following immediate item-level JOLs, whereas memory for unrelated word pairs is not. In Experiment 2, participants studied categorized lists of single words and then made aggregate-level JOLs for each list. At test, participants were presented with the category identifier (e.g., types of furniture) for each list and were instructed to recall the studied words from that category (e.g., desk, table). Results demonstrated a reactivity effect, such that cued recall performance was enhanced for participants who made aggregate-level JOLs compared to participants who did not make JOLs. These results suggest that reactivity effects for item-level JOLs extend to JOLs made on an aggregate level for categorized lists of single words. Possible mechanisms underlying reactivity will be discussed.

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6:00–7:00 PM (5148)

Are Students Self-Regulating Their Device Usage? The Effects of Off-Task Device Usage in a Classroom Setting. SUSAN E. RUPPEL, *University of South Carolina Upstate,* KENNETH BARIDEAUX, *University of South Carolina Upstate,* JUSTIN TRAVIS, *University of South Carolina Upstate* — With the proliferation of personal electronic devices in the classroom (e.g., laptops, cell phones), one wonders if their presence might have a negative impact on learning. The purpose of the current study was to investigate: a) the influence of off-task electronic device usage in class on subsequent exam performance, and b) whether students self-regulate their electronic device usage throughout the semester. Results of the study indicate that off-task electronic device usage contributed to lower performance on exam one, beyond the effects of class size, length, interest, and understanding; however, electronic device usage was not predictive of last exam performance. Although many instructors integrate personal electronic devices in their courses, believing that students will only use them for class-related activities, our research has shown that this may not be the case. Instead, students use their personal electronic devices for both academic and non-academic activities, thus impairing their exam performance.

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6:00–7:00 PM (5149)

Optimizing Effort Regulation: Effects of Systematic Versus Self-Regulated Breaks During Self-Study. FELICITAS BIWER, *Maastricht University,* WISNU WIRADHANY, *Bina Nusantara University,* MIRJAM OUDE EGBRINK, *Maastricht University,* ANIQUE DE BRUIN, *Maastricht University* — During self-regulated learning, students need to monitor and regulate mental effort to replete working memory resources and optimize learning results. Taking breaks during self-study could be an effective effort regulation strategy. However, little is known about how break taking affects learning. We investigated the effects of taking systematic breaks or self-regulated breaks on self-study time, mental effort and task load in real-life study sessions during one day. Eighty-seven students participated in an online intervention during self-study. In the self-regulated-break condition (n=35), students self-decided when to take a break during self-study; in the systematic break conditions, students took either a 6 minute break every 24 minutes (systematic-long, n=25) or a 3 minute break every 12 minutes (systematic-short, n=37). Students had longer study sessions and breaks when self-regulating. This was related to higher levels of fatigue, distractedness, and lower levels of concentration, and motivation compared to those in the systematic conditions.

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6:00–7:00 PM (5150)

Vision Tracking Meets Gaze: The Effects of Gaze Cues on Reaction Times. RALPH G. HALE, III, *University of North Georgia,* JONATHAN KROEGER, *University of North Georgia,* ERIN CONWAY, *University of North Georgia* — Gaze cuing refers to the natural inclination to direct our gaze in the direction of another's gaze. This can be used in visual search tasks to facilitate or interfere with the search. Here, we examined the interaction between three gaze cue conditions (congruent, incongruent, and neutral) and a search task using letter arrays. Congruent cues looked at the target, incongruent looked away, and neutral looked straight ahead. An eye tracker measured search completion times (CTs). Participants fixated on a target. The target disappeared. Then the gaze cue appeared, followed by a search array. We expected CTs to be shortest for congruent and longest for incongruent, with neutral in the middle. Trials were randomized between conditions. We found a significant main effect of gaze cuing. Pairwise comparisons found significant differences between congruent and incongruent and between neutral and congruent. However, there was not a significant difference between neutral and incongruent. Together, these results support our hypothesis; congruent gaze facilitates visual search tasks and incongruent gaze interferes. These findings provide a more firm understanding of the interactions between gaze cuing and visual search paradigms.

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6:00–7:00 PM (5151)

Behind Blue Mask: Partially Occluded Faces Are More Attractive Than Nude Counterparts. KRISTOPHER J. PATTEN, PHD, *Arizona State University* — Recent research has demonstrated that mask wearers are perceived as more attractive than those without masks. The mechanism that has been proposed is that mask wearing is a gesture of kindness and, therefore, a signal of a good mate. The current study attempts to prove an alternate mechanism: that observers are filling in the occluded portion of the face with probable information and expecting a more attractive face. Participants rated the attractiveness of 30 faces from the Chicago Face Database, half with masks superimposed on their lower faces and half with the face fully visible. Participants were then shown the occluded faces again both with and without masks and asked to amend their ratings. Overall, participants rated occluded faces as significantly more attractive, disproving the mate selection argument.

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6:00–7:00 PM (5152)

Incongruent Emotion Labels Increase Visual Mismatch Negativity (vMMN) in Facial Expression Processing: An ERP Study. HYEONBO YANG, *Pusan National University,* DONGHOON LEE, *Pusan National University* — Verbal labels influence visual perception by providing categorical prior information to the processing of incoming sensory input (Lupyan, Rahman, Boroditsky, & Clark, 2020). In this ERP study, we investigated the effect of emotion labels on the facial expression processing based on predictive coding view. We focused on visual mismatch negativity (vMMN) component regarded as visual prediction-error signal. In the passive oddball task, participants responded to target labels which were presented along with the labels "Happiness", "Anger", or "Shape", while task-irrelevant standard (i.e., neutral face, 80% of the

trials) or deviant (i.e., happy face or angry face, 10% each) stimuli were presented in the background. vMMN was obtained by subtracting the ERP of neutral faces from that of happy or angry faces. The results showed that when emotion label and facial expression were incongruent, a greater amplitude of vMMN was evoked in occipito-temporal electrodes compared to congruent or irrelevant conditions. This result suggests that predictive prior information activated by the labels does not affect predictive processing if it matches current sensory inputs, whereas it amplifies prediction-error signals if it is mismatch.

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6:00-7:00 PM (5153)

When One Visual Field Outperforms the Other: Individual Differences. BEN BERNARD, *Tufts University,* AARON L. GARDONY, *U.S. Army Combat Capabilities Development Command (DEVCOM) Soldier Center & Tufts Center for Applied Brain and Cognitive Sciences,* HOLLY A. TAYLOR, *Tufts University* — Neuroscience research suggests potential lateralization of visual working memory (VWM) capacity. Such lateralization could yield better VWM performance when stimuli appear in a particular visual hemifield. Evidence for such population-wide hemifield biases is mixed, but research suggests substantial individual differences in hemifield bias. This individual variation might explain the previous mixed population-wide results. To address this question, we examined individual hemifield biases using two color-change detection experiments. Both showed that individual variation explained a majority of the RT variance, but little of the accuracy variance. We found weak support for a population-wide hemifield bias. Ongoing studies in our lab are exploring how individual differences in hemifield bias influence specific dimensions of visual processing (identity vs. location perception).

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6:00-7:00 PM (5154)

Oblique Effect and Central Tendency Bias Arise from the Same Underlying Mechanism. SANDARSH PANDEY, *University of Massachusetts Amherst,* KYLE CAVE, *University of Massachusetts Amherst* — The central tendency bias (CTB) arises in the estimation of visual feature dimensions such as size, color, numerosity, and spatial frequency, but not in orientation. If CTB is present, plotting the error in the reported feature against the stimulus magnitude will yield a negatively sloped line, as values at the ends of the range are biased towards the middle. With reports of orientation, however, the same plot yields a sinusoidal pattern that reflects a bias away from the cardinal orientations, which is labeled the oblique effect. We propose that CTB and the oblique effect arise from the same mechanism. By constraining the range of stimulus orientations, we show that CTB is present in orientation estimation tasks. Tong & Dube (2022) showed that serial dependency can give rise to the central tendency bias. We present a mathematical model showing that both the oblique effect and CTB can arise from serial dependency.

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6:00-7:00 PM (5155)

Representations of Distance May Subconsciously Invoke Velocity Transposition. NATHANIEL BRASWELL, *Claremont McKenna College* — Holding the real velocity and the surrounding field of a stimulus constant, the visual system reports increased perspectival velocities at longer physical distances relative to the observer. In this experiment, distance-invoking primes (25 ms) were rendered invisible by highly distorted masks that contrast-matched the prime. Primes depicted target-viewing tunnels of varying lengths. The viewing distance of the prime either contradicted or confirmed the perspectival distance of the target, which was a difficult speed estimation task in which participants judged the disposition of a sphere after it flew behind a floating checkerboard. The real velocity of the sphere was manipulated across trials. An overall priming effect of prime type was significant, showing that at relatively faster velocities, a long-distance prime led to larger disposition estimates than a short-distance prime. At all velocities, the existence of a prime correlated with larger disposition estimates. Collectively, the data reveal possible operation of motion constancy mechanisms in the absence of conscious processing.

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6:00-7:00 PM (5156)

Complex Postural Sway Is Related to Perception of Stand-on-Ability. TYLER R. OVERSTREET, *The University of Southern Mississippi,* CATHERINE DOWELL, *The University of Southern Mississippi,* ALEN HAJNAL, *The University of Southern Mississippi* — Body movements during perceptual tasks can be considered as exploratory activity that facilitates perception. In the present study we tested whether the complexity of postural sway is related to perception of affordances. Effort-to-compress (ETC), a novel measure of complexity, was shown to be related to perception as compared to gross measures of body sway (mean magnitude and variability). Specifically, complexity was related to perceptual responses in a behavioral task (judge "standonableness" of sloped terrain), but not when numerical angle judgments of slope were solicited. Furthermore, ETC was extreme at the action boundary of standonableness whereas magnitude and variability of body sway were not. This provides further evidence that the purpose of perception is to guide meaningful behavior (perceive affordances) via active exploration, and not to estimate abstract numerical quantities such as slope angles of ramps. We concluded that moving the body in ways that produces complex exploratory activity is necessary to perceive affordances.

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6:00-7:00 PM (5157)

How the Number of Sides Impact Necker Cube Instability. CHRIS KOCH, *George Fox University* — Increasing the length of a side was previously shown to increase the stability of a Necker cube. As the length of a side increased, the amount of time to detect an orientation change also increased. In this study, two experiments examined whether the number of sides also influence the stability of the

Necker cube. In the first experiment, line drawings prisms based on a triangle, square, pentagon, and hexagon. Participants were instructed to press a key whenever the shape changed orientation. The shapes were randomly presented across trials. Response times were similar for all four shapes suggesting that the number of sides does not affect stability. In the second study, a Necker cube was shown as a single cube, two cubes stacked on top of each other, or as three cubes stacked on top of each other. Participants used a key press to indicated that the shapes changed orientation. All shapes were randomly presented. Response times increased as the number of cubes stacked on top of each other increased. Similar to previous findings, as the length of the side increased, the response time to notice an orientation change also increased suggesting greater stability of the object.

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6:00-7:00 PM (5158)

A New Tool for Visualization of Gaze Data in 3d Unity Virtual Environments. XAVIER J. MARSHALL, *Rensselaer Polytechnic Institute,* NATHANIEL POWELL, *The University of Texas at Austin,* GABRIEL J. DIAZ, *Rochester Institute of Technology,* BRETT R. FAJEN, *Rensselaer Polytechnic Institute* — The use of eye tracking in behavioral studies has become more widespread in recent years as a result of drops in hardware cost and improvements in hardware mobility. Some studies of gaze behavior are conducted in 3D virtual environments that are created using tools such as the Unity game engine and the open-source Unity Experiment Framework. However, the raw data provided by eye trackers is often noisy and difficult to validate and interpret without visualization. Such visualizations are best implemented in the context of the original environment, but manual implementation to verify experimental results can significantly stall data analysis. To address these issues, we created a generic experimental playback system for Unity that is capable of replaying the frame-by-frame state of the environment without leaving the engine. This GUI-based tool includes options for visualizing gaze behavior from different perspectives and additional analyses that are commonly used to analyze gaze data, such as saccade detection and fixation target selection. We demonstrate the utility of this tool in the context of a visually guided steering task and discuss how it can facilitate the analysis of gaze data collected in 3D virtual environments.

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6:00-7:00 PM (5159)

The Golden Mean Strikes Again: The Role of Spatial Frequency in Emotion Perception. ISABELLE CHARBONNEAU, *Université du Québec en Outaouais,* CAROLINE BLAIS, *Université du Québec en Outaouais,* MARIE-PIER PLOUFFE-DEMERS, *Université du Québec à Montréal,* JOËL GUÉRETTE, *Université du Québec en Outaouais,* DANIEL FISET, *Université du Québec en Outaouais* (Sponsored by Daniel Fiset) — In the past decades, many studies were interested in the role of spatial frequencies (SF) in emotion and face perception. Most of these studies used arbitrary cutoffs to isolate the impact of low (e.g. below 6 cycles per face) and high SFs (e.g. above 32 cpf). The use of such cutoffs also hinders the potential contribution of mid SFs, leading to an incomplete or incorrect account of the role of SF in face perception. To verify this possibility, we used a data-driven method (Willenbockel et al., 2010) without a priori about the most useful SFs in two emotion processing tasks. We revealed different pattern of SF use for the six basic facial expression and neutrality across tasks (categorization and discrimination; 40 participants in total; 4200 trials per participant). Mainly, our results highlight the importance of mid SFs in the visual processing of many facial expressions which is consistent with face identification results (e.g. Parker & Costen, 1999) and suggest that any method removing mid SFs is offering an incomplete account of SF diagnosticity for emotion recognition and face perception in general. The use of arbitrary cutoffs to isolate the impact of SF in face processing will be discussed.

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6:00-7:00 PM (5160)

The Profiles of Creative Students. JEAN-CHRISTOPHE GOULET-PELLETIER, *University of Ottawa,* DENIS COUSINEAU, *University of Ottawa* — Students differ on their standards of performance, reasons for attending school, and the importance they place on school and creativity. The current study employed Latent Profile Analyses to identify sub-populations of university students based on the following seven indicators: standards of perfectionsim and excellencism, academic autonomous, controlled and amotivation motivations, as well as academic and creative self-concepts. From a sample of n = 184 university students, five profiles were identified. The profiles could be described as Perfectionists with controlled motivation, Excellentists with autonomous motivation, Intermediate strivers with autonomous motivation, Intermediate strivers with controlled motivation, and Low strivers. The profiles were regressed onto various academic and creative outcomes. The results showed that the profiles labelled as Perfectionists and Excellentists had similar achievement goals (i.e., high on performance and mastery goals) but different motivations and divergent thinking abilities. The Low strivers profile was low on all achievement goals but high on divergent thinking abilities. We discuss the implications of finding creative profiles within the academic environment.

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6:00-7:00 PM (5161)

Automating the Documentation of Experimental Designs with Natural Language Processing. SEBASTIAN MUSSLICK, *Brown University,* BRIAN JI, *Brown University* — A major obstacle to open science in experimental psychology is that it takes time and effort to standardize and communicate all aspects of the research process, such as the generation of experimental designs. In this work, we seek to address this problem by applying state-of-the-art methods for natural language processing (GPT-3) to automate the documentation of experimental designs that are expressed in terms

of SweetPea—an open-source programming language for sampling experiment sequences (Musslick et al., 2021, in BRM; www.sweetpea.ai). We demonstrate several use cases involving the automated documentation of experimental designs for common psychological paradigms designed for the study of cognitive control (e.g., the Stroop task, the cued task switching paradigm, and the N-back task) that are expressed in the form of a computer program implemented in SweetPea. We discuss future directions for reversing our method to enable the translation of the description of experimental designs written in English into computer code written in SweetPea. We hope that this open-source work will aid experimental researchers in the standardization and documentation of experimental designs and, ultimately, in enhancing the replicability of psychological experiments.

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6:00-7:00 PM (5162)

Semantic knowledge of words is necessary to produce an incidental self-reference effect. HARRISON PAFF, *University of Queensland,* KYUNGMI KIM, *Wesleyan University,* JOSEPHINE ROSS, *University of Dundee,* Natasha Matthews, University of Queensland, ADA KRITIKOS, *University of Queensland* — The self-reference effect (SRE) refers to the tendency to recall self-related information more accurately than non-self-related information. Typically, the SRE is investigated with evaluative self-referencing paradigms (eSRE). These require participants to judge if a trait (abstract) word presented above or below a referent is self-descriptive (e.g., are you 'honest'?) vs. other-descriptive, most commonly a celebrity or stranger (e.g., is Angelina Jolie agreeable?). The SRE is also produced when non-evaluative associations are formed between the self and stimuli, when trait words appear above or below the self- or other-referent name (incidental SRE; iSRE). However, the eSRE is not produced when concrete nouns are encoded. It is possible that a trait-specific eSRE occurs because traits can be encoded in relation to an individual's self-schema, whereas concrete nouns cannot. It is not known whether potential word type (trait, concrete noun, pseudo-word) attenuation, and therefore potential differences in encoding in relation to the self-schema modulates the iSRE. We investigated whether the iSRE is produced at least in part due to an interaction between the relative semantic elaboration of words and the referencing to self. Participants (n = 93) encoded trait-, concrete noun-, or pseudo-words incidentally to the self vs. stranger by indicating if the words appeared on the left or right of the referent names. An iSRE was produced with trait- and concrete noun- but not pseudo-words. Our novel results suggest participants must have semantic knowledge of to be encoded words in reference to an individual's self-schema to produce an iSRE.

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Virtual Only Posters
Thursday, November 17, 2022, Through Sunday, November 20, 2022

Note: All posters, both in-person and virtual only, are available in the virtual poster hall on the conference website. The following virtual only posters are not included in the author-attended poster sessions occurring during the live event.

V001

Age Differences in the Effects of Reducing Arousal on Attentional Control. ANDY J. KIM, *University of Southern California,* SANTIAGO MORALES, *University of Southern California,* RAEL CAHN, *University of Southern California,* MARA MATHER, *University of Southern California* — Age-related cognitive impairments co-occur with noradrenergic dysregulation. However, the basic mechanisms of this relationship are unclear. Here, we examined whether reducing tonic noradrenergic discharge can improve attentional control in both young (aged 18-30) and older (aged 50-80) adults. Participants completed two blocks of rest with eyes opened and eyes closed, a passive auditory oddball task, and an active auditory oddball task in which they were required to maintain an attentional template to a specific target sound while also being presented with standard and distractor auditory cues (3 stimulus oddball task). In one block (order counterbalanced), participants were engaged in relaxation through slow-paced breathing to reduce state arousal. To indirectly measure noradrenergic activity, we conducted pupillometry analyses and measured event-related potentials (ERPs).

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V002

Is Statistical Learning of a Salient Distractor's Color Implicit, Inflexible, and Distinct from Inter-Trial Priming? AIDAI GOLAN, *Tel Aviv University,* DOMINIQUE LAMY, *Tel Aviv University* — Observers can learn to ignore salient distractors endowed with some regularity, such as a high-probability location or feature – a phenomenon known as distractor statistical learning. Unlike goal-directed guidance, such learning is thought to be implicit, long-lasting, and inflexible. We tested these claims for distractor-color statistical learning in a high-power (N=160) pre-registered experiment. Observers searched for a known-shape singleton target and a color singleton distractor, when present, appeared most often in one color during the learning phase, but equally often in each color during the extinction phase. We used a sensitive measure of observers' awareness of the probability manipulation: this test was administered after the extinction phase for one group, and after the leaning phase for another group. The latter group was also informed that the probability imbalance would be discontinued in the upcoming extinction phase. We found that while high-probability feature was suppressed during learning, this bias did not survive during extinction. Importantly, awareness of the manipulation was associated with reduced color suppression. We conclude that learnt color suppression is an implicit bias that decays rapidly.

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V003

Distraction by Deviant Sounds Is Modulated by the Environmental Context. FABRICE PARMENTIER, *University of the Balearic Islands,* LAURA GALLEGO, *University of the Balearic Islands,* ANTONIA MICUCCI, *Università di Bologna,* ANDRÉS PILAR, *University of the Balearic Islands,* LEIVA ALICIA, *Universitat de Vic-Universitat Central de Catalunya,* MURRAY MAYBERY, *University of Western Australia* — Participants performing a continuous visual categorization task respond slower following the presentation of unexpected task-irrelevant sounds relative to a repetitive standard sound. We explored the role of the environmental context on this type of distraction. In two experiments, participants categorized left/right arrows while ignoring irrelevant sounds (A & B) and background pictures (forest vs city scenes). While equiprobable across the task, sounds A and B were presented with probabilities of .882 and .118 in the forest context, and with the reversed probabilities in the city context. The results showed clear evidence of context-dependent deviance distraction. The cognitive system was capable of almost instantaneously resetting sensory predictions based on context when the latter was defined by a single picture (Exp 1), but it took a trial when context had to be abstracted from numerous pictures (Exp 2). We conclude that irrelevant sounds are processed in association with the environmental context (even though these stimuli belong to different sensory modalities) and that sensory predictions are context-dependent.

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V004

Gaze Cues Trigger Social Facilitation. TAKATO OYAMA, *Senshu University,* KENTA ISHIKAWA, *Senshu University,* MATIA OKUBO, *Senshu University* — Gaze cues produce faster reaction time than the other attentional cues (e.g., abrupt onset, directional arrow), irrespective of cue validity. We hypothesized that gaze cues induced social facilitation and contributed to the faster reaction time: The presentation of the gaze cues should heighten emotional arousal and accelerates performance. To test this hypothesis, we used the gaze and arrows in the attentional cueing task and measured pupil dilation as an index of arousal. Pupil dilation positively predicted overall performance (i.e., faster reaction time). This result supports our hypothesis and suggests that the presence of others raises emotional arousal and accelerates performance in the gaze cueing paradigm.

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V005

Are You Looking at Me? Animal Gaze Produces the Reversed Stroop Effect in Spatial Stroop Task. KENTA ISHIKAWA, *Senshu University,* TAKATO OYAMA, *Senshu*

University, YOSHIHIKO TANAKA*, Senshu University,* MATIA OKUBO*, Senshu University* — The gaze of others produces a special attentional process such as a facilitation effect of direct gaze or joint attention. The present study investigates the attentional process triggered by various types of gaze stimuli. A total of 245 university students participated in four experiments. They performed a spatial Stroop task, in which four types of gaze stimuli were presented as a target (i.e., human, cat, fish, and robot gaze). Participants were asked to judge the direction of the target (indicating left or right), irrespective of the location of the target (left or right). The result showed that the human and the cat targets produced a reversed spatial Stroop effect while the fish target did not. The results of the robot target were inconsistent across experiments. These results suggest that the attention to the gaze of socially communicable beings (i.e., human and cat) is responsible for the reversed spatial Stroop effect.

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V006

The Effects of Task Demand on Binding and/or Retrieval of Features and Responses in Inhibition of Return. HSUAN-FU CHAO*, Chung Yuan Christian University,* FEI-SHAN HSIAO*, Chung Yuan Christian University,* SHIH-CHING HUANG*, Chung Yuan Christian University* — Across three experiments, we investigated the effects of task demand on binding and/or retrieval of the location, form, and response in inhibition of return. We used a target-target paradigm of inhibition of return with a detection task (Experiment 1), a localization task (Experiment 2), and a discrimination task (Experiment 3). In Experiments 1 and 2, when target detection or target localization was required, the results showed binding of the location and response, but not the form. In Experiment 3, when form discrimination was required and the form of the target was hence task relevant, the results indicated that there was binding of location, form, and response. These results suggest that the features and responses are integrated into episodic representations or event files. And the task demand modulated the binding and/or retrieval of these episodic representations or event files.

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V007

Pupil Size Modulates Gaze Cueing. CLARA COLOMBATTO*, Yale University/University College London,* YANG YI LIN GUO*, McGill University,* BRIAN J. SCHOLL*, Yale University,* JELENA RISTIC*, McGill University* — Perhaps the most important visual stimuli in our lives are other people's eyes, of which two features are especially salient: (a) the direction in which the eyes are pointed (which can help to index what people are attending to) and (b) how dilated their pupils are (as cues to how attentive people are in the first place). Both have been studied extensively (in studies of gaze cueing and pupillometry, respectively), but to our knowledge they have never previously been combined. Here we did so, by asking whether pupil size influences gaze cueing. Participants viewed faces with constricted or dilated pupils, and responded to peripheral targets appearing either along the line of gaze ('congruent' targets) or opposite the line of gaze ('incongruent' targets). We found a counterintuitive result: gaze cueing (i.e. the difference in response times for congruent versus incongruent targets) was stronger for faces with constricted pupils — even though images with dilated and constricted pupils differed by only a fraction of degree of visual angle. This suggests that perceived attentiveness in others influences our attentional allocation too, in a form of attentional contagion.

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V008

Sensorimotor Grounding of Concrete and Abstract Categories. BRIONY BANKS*, Lancaster University,* LOUISE CONNELL*, Maynooth University* — Abstract categories (such as emotions, units of time) have historically been defined as lacking sensory referents compared to concrete categories (e.g., fruit, furniture). In a series of exploratory analyses, we compared the sensorimotor grounding of concrete and abstract categories using a set of category production (semantic fluency) norms and ratings of multidimensional sensorimotor experience. Both category types were strongly grounded in sensorimotor experience and particularly vision, but concrete categories were more grounded in touch and hand/arm action, while abstract categories were more grounded in hearing and interoception (internal bodily sensations). Importantly, subdomains of concrete and abstract categories (e.g., ingestible, animate; internal, social) were grounded in different sensorimotor dimensions. These findings suggest that the distinction between abstract and concrete categories is not as clear-cut as previously assumed, and that examining multiple dimensions of sensory and motor experience is important in understanding the nature of both concrete and abstract concepts.

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V009

Learning New Words from Context. LAYLA UNGER*, The Ohio State University,* ANJU ANILKUMAR*, The Ohio State University,* VLADIMIR SLOUTSKY*, The Ohio State University* — Many of the words that people know must be learned from situations in which the primary information available about a word's meaning is its linguistic context, or the other words it occurs with. Context can be informative because words similar in meaning occur in similar contexts. For example, because words for fruits occur with "juicy" and "sweet", a new word that occurs with "juicy" and "sweet" is probably also a fruit. However, we know little about how people use context to learn words. Here, we contrasted two routes : (1) "Prediction", in which the context preceding a new word is used to predict upcoming words that then become linked to the new word, such as learning that "doff" means "banana" from "The monkey's favorite food is doffs", versus (2) "Integration", in which the context following a new word is used to retroactively update its meaning, such as learning that "doff" means "banana" from "Doffs are the monkey's favorite food". We found that in adults, both routes led to word learning, with Prediction resulting in more robust learning. We aim to build upon these

findings by investigating the contributions of these routes to word learning across child development.

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V010

Spaced Presentation Facilitates Readily Accessible Representations. MICHAEL DUBOIS, *University of Toronto,* MARLIE TANDOC, *University of Pennsylvania,* AMY FINN, *University of Toronto* — Temporally spaced study is generally superior for learning than massed study, yet it is unclear how the representations learners form from these different types of study differ. Here we test the degree to which spaced versus massed study fosters representations that are consciously accessible in a category learning study. At study, participants were told to learn 6 categories of birds belonging to 2 superordinate groups. Stimulus exposure duration was fixed (4s), while the intertrial interval was manipulated between subjects: the massed study condition had no delay, while the spaced condition had a 10s delay, during which they judged simple math equations. At test, participants completed a 6AFC task, for old and new birds, and gave confidence ratings. We found that the spacing benefit was only present when participants were very confident, while at low confidence the massed condition was best. When comparing learning using only superordinate knowledge we found that the massed condition was again superior at lower confidence levels, with no difference between conditions at the highest confidence level. These findings suggest that the benefits of spacing are limited to knowledge that is easily accessible to conscious recollection.

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V011

Joint Eye and Mouse Tracking in Categorizing (A)typical Exemplars. MARY E. FRAME, *Parallax Advanced Research,* RIMA-MARIA RAHAL, *Max Planck Institute for Research on Collective Goods,* JOSEPH W. HOUPT, *The University of Texas at San Antonio* — Eye and mouse tracking are process tracing methods that provide the most direct window into understanding cognitive processes as they unfold. However, little attention has been devoted to simultaneous collection and modeling of this data, despite the differential value afforded by collection of eye and mouse data. We utilized a classic mouse-tracking paradigm in which participants categorized typical and atypical exemplars while collecting eye and mouse movement data concurrently. We present evidence that the intercorrelation of eye and mouse tracking measures indicate decision conflict and effort and further demonstrate the typicality effect on decision conflict with both eye and mouse tracking measures. We compared visual search patterns to mouse data clustered by whether they represent different types of continuous vs. discrete changes of mind. In particular, we assessed how closely mouse and eye behavior were linked, comparing correlations between mouse behavior and fixations in trials categorized as discrete changes of mind versus continuous changes of mind. Finally, we compared conclusions that can be drawn about the discreteness of changes of mind from eye and mouse tracking data.

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V012

Decision Making in Poker: Evaluating Optimality After a Bad Beat. CLINTON DENNARD, *Texas A&M University-Commerce,* DAVID FRANK, *Texas A&M University–Commerce* (Sponsored by Clinton Dennard) — We investigated the effect of a bad beat (unexpected monetary loss) on future optimal risk-taking decisions (as determined by Kelly's formula) of individuals participating in a computerized poker simulation task (CPST). Additional analysis included assessing for the effects of poker playing experience (as determined by scores on the Poker Experience Scale, PES) and baseline levels of emotional regulation as measured by Carver & White's (1994) behavioral inhibition system/behavioral activation system (BIS/BAS) questionnaire on future optimal risk-taking decisions on the CPST. In this study, two questions were proposed. First, will individuals make optimal or suboptimal risk-taking decisions after experiencing a bad beat? Second, do individual differences in poker playing experience and emotion related traits predict if an individual will make optimal risk-taking decisions?

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V013

Impact of Risk Frame and Integral Affect on Perceived Investment Risk and One's Likelihood to Invest. ANDREW MIENALTOWSKI, *Western Kentucky University,* ALYSSA MINTON, *DePaul University* — Integral affect, or how one feels about decision attributes, impacts perceived risk and choice in decisions presented within gain and loss frames. We manipulated the framing of investment risk attributes within mutual funds to investigate how risk frame and integral affect impact perceived investment risk and one's likelihood to invest in mutual funds. Risk attributes were sampled for each mutual fund from common asset classes. People considered investments in the context of starting a retirement account as a benefit of a new job. Additionally, individuals considered framed risk attributes for each fund in the absence of return- or volatility-related information or with a clear picture of one of these factors. Positive feelings about the investments mediated the relationship between frame and one's likelihood to invest, whereas both frame and negative feelings about the investments predicted perceived risk. Framing effects were observed for one's willingness to invest when investment risk was highlighted but disappeared when favorable backward looking investment returns were included.

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V014

What Do I Know About Severe Weather? The Influence of Weather Knowledge on Protective Action Decisions. MARK A. CASTEEL, *The Pennsylvania State University, York* — Research by Nunley and Sherman-Morris (2020) found that individuals in the lowest quartile of objective weather knowledge overestimated their knowledge, while individuals in the highest quartile of weather knowledge underestimated their knowledge, a disconnect known as the Dunning-Kruger Effect (DKE). These findings

suggest that individuals with the lowest levels of actual knowledge might be those most prone to make poor protective action decisions in cases of severe weather. Research I presented at last year's Psychonomics replicated the DKE, but no decision-making differences were found as a function of weather knowledge. The research presented here used a revised test of weather knowledge and more immediate weather threats. Participants took a test assessing their perceived weather knowledge, then a test that assessed their true knowledge on the same weather topics. Participants then read three severe weather Wireless Emergency Alerts on a simulated smartphone screen. After each alert, participants made protective action decisions. Protective decisions were analyzed as a function of objective knowledge quartile. Implications of the results will be discussed, and potential next steps will be offered.

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V015

Decision Making in the Information Age: Effect of Number of Alternatives and Spatial Arrangement on Choice Context. JACOB STANLEY, *University of South Carolina,* DOUGLAS WEDELL, *University of South Carolina* — Real-world decisions include many more options than the three alternative sets typically used to study decoy effects. Our study had individuals engage in a simulated online grocery shopping task while monitoring eye movements to better understand effects of number of alternatives and spatial arrangement on context dependent choice. Sets of grocery items containing attraction decoys with 3, 9, and 15 alternatives (holding proportion of decoys constant) were presented randomly arranged on half of the trials and ordered by-price on the other half. Decoy effects significantly reduced with increase in number of alternatives, and this relationship was unaffected by presentation method. As number of alternatives increased, dimension-wise comparisons increased and the proportion of the total information attended to decreased. Overall, participants tended to filter the choice set as the number of alternatives increased, resulting in reduced context effects, simplified choice strategies such as lexicographic choice, and greater choices of inferior alternatives.

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V016

Jekyll and Hyde: The Dual Nature of Remorseful and Criminal Facial Features and Their Effect on Legal Decision Making. BETH B. STEVENS, *Georgia State University,* HEATHER M. KLEIDER-OFFUTT, *Georgia State University* — Defendant remorse and criminal appearances both contribute to sentencing severity during a criminal trial. Signs of remorse are typically associated with more lenient sentencing decisions, and criminal appearances are associated with harsher punishments. Recently, literature has suggested that defendants' faces can naturally appear more remorseful or criminal based upon certain facial features/cues, despite the defendant's intent, and these facial cues can then impact subsequent legal outcomes. However, it is unknown how faces that have cues of both criminal and remorseful face-types influence legal decisions and how crime-type interacts with face-type to influence legal outcomes. The current study investigates how judgments of faces containing both remorseful and criminal features influence legal system punishments for different crimes. Preliminary analyses suggest that participants are less likely to grant parole to faces with features of criminality—regardless of the remorseful features—and those associated with violent crimes, suggesting implicit facial biases influence legal decisions.

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V017

Where You Lead I Will Follow: Prayers for and Perception of Divine Guidance in Real-Life Decision Making. DAVID A. WASHBURN, *Covenant College,* G. GRACYA RUDIMAN, *Covenant College,* SARAH AGEE, *Covenant College* — Faced with big decisions, many people seek divine guidance through prayer as part of their decision-making strategy. For people who pray for divine direction, the perception of received answers to such prayer may eclipse all other risk and utility considerations in the ultimate decisions. To reveal how prayer affects decision making and how answers to prayers for divine guidance are perceived, survey data were collected from a national (US) adult sample, about 60% of whom described themselves as religious or spiritual. Participants described major, uncertain decisions they faced and indicated the strategies they employed for such decisions. Across the sample, 35% of respondents indicated that they prayed for divine guidance. A similar percentage agreed that they would never make an important decision without seeking divine guidance, and that divine direction they receive in response to prayer is the most important factor in the ultimate decision. The majority (71%) of people who prayed for guidance reported receiving answers to those prayers. Qualitative and quantitative data characterize how divine direction was perceived and provide insight into the cognitive effects of prayer on reasoning, attention and problem solving.

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V018

Encoding of Unrelated Stimuli Interleaved Within a Decision-from-Experience Task. NICK SIMONSEN, *University of Nottingham,* CHRISTOPHER R. MADAN, *University of Nottingham* — The expectation and anticipation of receiving a reward are well known to enhance memory; previous studies have often done this by interleaving unrelated images between the presentation of a trivia question and answer. Moreover, reward prediction error facilitates formations of memories. A pre-registered experiment assessed whether memorability for unrelated images was affected by increased experience with reward outcome contingencies in a decisions-from-experience task. Participants made choices between options that either resulted in a deterministic or probabilistic gain. Outcomes were either high or low in relative value. Participants saw trial-unique images in-between making a choice and receiving reward feedback. Memory for the unrelated images was tested in a

recognition procedure. While the first experiment replicated previously demonstrated biases in risky choice, memory performance for the unrelated images was poor. In subsequent experiments, we modified the task to improve the encoding of the unrelated images. Again, we tested the effects of outcome predictability and value and how this may trade-off with learning risky outcome contingencies.

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V019

Training Two-Digit Addition: Asymmetrical Transfer from Vertical and Horizontal Training Equations. JEFFREY P. TOTH, *University of North Carolina at Wilmington,* HANNAH TER-HAAR, *University of North Carolina at Wilmington* — Research on cognitive training suggests that the far transfer of skills across disparate stimuli or tasks is very limited, if it exists at all. The current study thus focused on how specific training may be in the educationally relevant domain of mathematics. We examined the transfer of two-digit addition training using the two presentation formats, horizontal and vertical, most often used in teaching basic arithmetic. Previous research suggests that horizontal and vertical equations tap into different components of working memory with the phonological loop being more involved with horizontal equations and the visuospatial sketchpad more involved with vertically equations. We thus hypothesized that training on one of these formats may show little or no transfer to the other. Results confirmed that vertical training provided little transfer to identical problems presented horizontally. In contrast, horizontal equations showed clear evidence of cross-format transfer to vertical equations. Our results suggest that training with horizontal math problems may be a "desirable difficulty" that transfers to vertical problems, a finding with clear implications for basic math learning and early education.

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V020

Do Phonological and Visual Abilities Predict Reading and Writing Performance in Young Children? TAMIRES ZAR, *University of São Paulo,* SYLVIA BARRERA, *University of São Paulo* — Since each writing system encodes spoken language differently, the demands of learning to read are also different in each language. Phonological factors have been shown to influence the development of learning to read and spell in various languages. But other factors involved in fluency and orthography are also important during this development. We aim to present and discuss the factors that are presumed to be related to reading and spelling development in children. We analyze the contribution of visual and phonological processing skills in reading and writing performances in a sample of young children (1st to 5th grade) from Brazilian private schools in the state of São Paulo. We will discuss our results by examining the differences between the developmental stages of reading and writing during early school years and also in terms of the differences between good and bad performances in reading and writing.

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V021

The Role of Embodiment in Immersive Virtual Reality Language Learning: An fNIRS Investigation. JEAN P. BODET III, *University of Houston,* ARTURO E. HERNANDEZ, *University of Houston* — This project aims to investigate the role of embodiment in immersive virtual reality (iVR) language learning. Embodied learning is the process of, "learning in contexts involving a high degree of perceptual and sensorimotor integration" (Legault et al., 2019). Some have theorized that embodiment underlies iVR's increased pedagogical effectiveness compared to traditional classroom methods (like "flashcard" learning) (Legault et al., 2019; Lin & Lan, 2021; Repetto et al., 2015), as embodied real-world learning techniques have also proven to be more effective than such traditional methods (Macedonia et al., 2020; Mayer et al., 2015). To investigate the role of embodiment in iVR learning, this project will take a multimodal approach to comparing three conditions of varied embodiment in an iVR language-learning paradigm. We will first analyze whether manipulating embodiment affects behavioral iVR learning outcomes. We will then assess whether a relationship exists between those learning outcomes and neural activity in regions known to be particularly involved in embodied learning (Macedonia et al., 2019). Preliminary results are not yet complete, but will be included in presentation at the Psychonomics conference.

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V022

Emotional Valence Affects Free Recall of Words in a Foreign Language After Video Exposure. FRANCIA ARRIAGADA-MÖDINGER, *Universidad Católica del Maule, Chile,* ROBERTO A. FERREIRA, *Universidad Católica del Maule, Chile* — Emotion words tend to be better remembered than neutral words. Previous studies suggest that emotional valence in a native language affects word retrieval, with an advantage for both positive and negative words over neutral words. However, these findings remain inconsistent in a foreign language. The present study investigated the effect of emotional valence on free word recall in English as a foreign language. Thirty-six proficient Spanish-English learners watched a set of twelve emotionally valenced videos. After video exposure, students completed an immediate free recall task. The same task was presented after a two week-span. Our results demonstrated that emotional valence significantly affected word recall in both immediate and delayed recall tests. These findings suggest a quadratic valence effect on word recall in English as a foreign language, as reported in studies in a native language. We discuss these results in view of the motivated attention account.

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V023

Mechanisms of Source and Destination Memory in Monolinguals and Bilinguals. NAOKO TSUBOI, *The University of Texas at El Paso,* WENDY S. FRANCIS, *The University of Texas at El Paso* — Everyday conversation involves two directions of

information transfer: information input from another person (source memory) and information output to another person (destination memory). We form information-person associations through conversation but struggle to remember such associations later. We addressed the question of how the direction of information transfer and bilingual language proficiency levels would influence the strength of information-person associations in a direct-interactional conversation setting. Prior literature showed an advantage for source memory over destination memory, but the mechanisms differentiating source and destination memory remain unclear. We tested whether the monolingual-bilingual differences observed in source memory tasks with individual words would extend to source and destination memory using sentences in conversational interaction. We analyzed and interpreted data using signal-detection theory and multinominal processing tree models. We replicated the advantage for source over destination memory but found no bilingualism-related effects. Supported by Dodson Grant from the University of Texas at El Paso.

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V024

The Non-Selectivity of Trilingual Lexical Access: Evidence from Eye Movements of Chinese–English–Malay Trilinguals. LI-HAO YEH, *Chung Yuan Christian University,* HUI SHIN PEE, *Chung Yuan Christian University* — This study was to investigate trilinguals' cross-language activation in terms of whether and how a non-target language influences the interaction between the other two languages using two translation recognition tasks (TRTs). 60 Mandarin–English–Malay trilinguals took part in this study. In a critical trail of the Malay–Mandarin TRT, participants looked at a Malay prime (interlingual homograph) and then looked for the correct translation (target) together with one competitor and two other distractors on the screen. The design of Mandarin–Malay TRT is similar to the Malay–Mandarin TRT and the major difference is that instead of using interlingual homographs as primes, the interlingual homographs were used as one of the potential answers in the Mandarin–Malay TRT. The results showed that in both tasks, participants were more likely to fixate and had a longer viewing time on the targets, subsequently followed by the competitors and last on the distractors indicating that co-activation of non-target language (e.g., English) moderated the translation process between two target languages (e.g., Mandarin and Malay). Hence, this study provide more understanding of the complexity of the three-way interactions of the three languages.

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V025

Limits of Associative Binding Within Events in Narrative Stories. BARBARA PITTS, *Kansas State University,* HEATHER BAILEY, *Kansas State University,* KAREN L. CAMPBELL, *Brock University* — To make sense of the complex activity in our world, our perceptual system parses ongoing activity into discrete events at memory encoding. Previous studies suggest that words and objects within an event show greater associative binding on later memory tasks than words and objects from different events. Across two studies with young and older adult participants, we tested associative binding within and between events using written narratives followed by implicit associative memory tasks. In Study 1, we found no difference in reaction time on a lexical decision task for word pairs from within the same event versus word pairs taken from different events, for either age group. In Study 2, we used a speeded recognition task and again found no better priming for words from within the same event versus words from different events, for either age group. Despite these null effects, we found evidence of event segmentation (i.e., longer reading times for boundary sentences), suggesting that event boundaries were perceived but did not affect subsequent implicit memory. These findings suggest that the associative binding effect seen within events requires an explicit memory task to reinstate the event model in working memory at retrieval.

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V026

Connecting Math Anxiety, Statistical Anxiety, and Self-Efficacy. CATERINA B. AZZARELLO, *University of Northern Colorado,* DANIEL EDI, *University of Northern Colorado,* MOLLY JAMESON, *University of Northern Colorado,* JOANNA LEWIS, *University of Northern Colorado* (Sponsored by Joanna Lewis) — A common theme amongst students of disliking or dreading math topics is known as math anxiety (MA) (Richardson & Suinn, 1972). MA affects many factors like math self-efficacy, which influences performance (Jameson & Fusco, 2014). Math is a broad discipline of study, and statistics is considered a subset within. Similarly, statistics anxiety (SA) affects self-efficacy to learn statistics (Onwuegbuzie & Daley, 1999). We aim to determine whether a relationship exists between math (AMAS) and statistical (SAS) anxiety and whether the relationship between them is mediated by math (MSES) and statistical (SELS) self-efficacy, utilizing a mediation model. We found direct and indirect (via statistical self-efficacy) effects of MA on SA. The results suggest that higher MA led to lower statistical self-efficacy, which in turn led to higher SA. Efforts to reduce SA in the classroom should also focus on reducing MA and on improving students' self-efficacy to learn mathematics.

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V027

Bilingual Language Processing of Evidentiality in a Turkish-English Translation Task by Bilinguals with Various Background. SUMEYRA TOSUN, *Medgar Evers College of the City University of New York,* LUNA FILIPOVIĆ, *University of California, Davis* — Evidentiality is a linguistic property to encode source of knowledge. Some languages (e.g., Turkish) mark evidentiality in the grammar; other languages (e.g., English) encode it optionally. This study investigated whether this typological difference was noticed by late and early-bilinguals and whether learning Turkish or English late would influence translation accuracy. A total of 58 Turkish-English bilinguals (19 L2-English and 12 L2-Turkish and 27 early

bilinguals) were asked to translate simple firsthand and non-firsthand sentences in either direction. The results demonstrated that AoA, the source of information and direction of the translation influenced the speakers' translation accuracy. Firsthand sentences were translated more accurately by all bilingual groups. This effect was more apparent when translation was from Turkish-to-English. L2-Turkish and early bilinguals tend not to include the non-firsthand source when translating from Turkish-to-English more than L2-English bilinguals. When translating from English-to-Turkish, although all bilingual groups' accuracy increased, L2-Turkish bilinguals more accurately translated.

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V028

Selective Attention to Attributes of Two-Letter Strings. ALBERT F. SMITH, *Cleveland State University* — As part of an investigation of whether two-letter words may be perceived as configurations, participants completed binary classification tasks (discrimination, filtering, condensation) with the four two-letter stimuli in sets constructed by crossing two vowels with two positions relative to a consonant. Four stimulus sets varied in whether lexicality was an emergent property (e.g., It, Ti, Ot, To vs. Ek, Ke, Uk, Ku) and whether items were orthographically regular (e.g., It, Ti, Ot, To vs. iT, tI, oT, tO). Each of 14 participants performed the classification tasks with one stimulus set. Filtering (e.g., It, Ti vs. Ot, To) may be carried out with information about one stimulus attribute (i.e., vowel identity or vowel position). Overall, neither emergent lexicality nor orthographic regularity significantly affected performance. However, for all stimulus sets, filtering was slower than the average of the two discrimination tasks for the same attribute. Further, judgments of vowel location were slower than judgments of vowel location. Selective attention to these attributes of the stimuli in these sets was not successful.

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V029

How Pervasive Are Transposed-Letter Priming Effects? MASAHIRO YOSHIHARA, *Tohoku University,* SAVITHRI WEWALA, *Tohoku University,* STEPHEN J. LUPKER, *University of Western Ontario,* MARIKO NAKAYAMA, *Tohoku University* — Different-script bilinguals show transposed-letter priming effects (jugde-JUDGE < junpe-JUDGE) in L2 English word recognition (Witzel et al., 2011), indicating that L2 readers develop a flexible letter position coding system similar to that of L1 readers despite their two languages having different scripts. The present experiments examined transposed-character priming effects in L1 and L2 Japanese readers. L1 readers produced significant transposed-character priming effects for words written in Katakana (タネマギ-タマネギ < タロドギ-タマネギ), consistent with results reported by Perea and Pérez (2009). Japanese L2 readers, who were all different-script bilinguals, also showed significant transposed-character priming in Katakana. However, neither L1 nor L2 Japanese readers, showed transposed-letter priming effects when those same Japanese stimuli were written in Romaji script (e.g., batien-BAITEN = baguten-BAITEN). The implications of these results for models of letter position coding will be discussed.

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V030

How Word-Level Processing Constrains Sentence-Level Processing During the Course of Reading Acquisition. BRICE BROSSETTE, *Université Lyon 2,* ÉLISE LEFÈVRE, *Université Lyon 2,* JONATHAN GRAINGER, *Aix-Marseille University,* BERNARD LÉTÉ, *Université Lyon 2* — Three groups of French primary school children (Grades 2, 4 and 6) performed lexical decision (LD) and grammatical decision (GD) tasks which are assumed to assess two key component processes of skilled reading: word-level and sentence-level processing. Brief stimulus durations were used and response accuracy measured. In each task, the display time of the target was manipulated using 4 different levels. Results showed that accuracy in the LD task increased for all children as display time increased, but Grade 2 children needed a longer display time of 220 ms to increase their performance, whereas Grade 4 and 6 children only needed 145 ms. In contrast, in the GD task, only Grade 4 and 6 children improved their accuracy as the display time increased. We discuss the implications of these results for the developmental trajectory of word- and sentence-level processing during the course of reading acquisition.

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V031

The Influence of Language Experience and Bigram Frequencies on Rapid Automatized Naming. ASHLEY CHUNG-FAT-YIM, *Northwestern University,* JAMES BARTOLOTTI, *Hoglund Biomedical Imaging Center,* VIORICA MARIAN, PHD, *Northwestern University* — Statistical regularities within a language are continuously extracted to facilitate language learning and word recognition. To examine how previous experience with the orthographic structure of words influences letter recognition, native English speakers named 10 lists of letters while their eye movements were recorded. Letters in each list were arranged in high-probability or low-probability sequences based on the bigram frequency between two adjacent letters. Participants fixated longer on letters arranged in high-probability than low-probability sequences, possibly because letter pairs with higher bigram frequencies activate a larger network of words than letter pairs with lower bigram frequencies. Furthermore, higher next bigram frequency was associated with longer fixations on each letter, whereas higher previous bigram frequency, current letter frequency, and next bigram frequency were each associated with faster letter naming fluency. We conclude that prior experience with a language builds expectations for upcoming letters and impacts word recognition and processing.

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V032

The Influence of Potential Physical Interaction (PPI) on Verb Processing in the Lexical Decision Task. DEVIN DICKINSON, *University of South Alabama,* MARK YATES, *University of South Alabama* (Sponsored by Mark Yates) — Research on semantic richness effects has demonstrated that multiple dimensions of meaning affect visual word recognition. The embodied cognition framework provides one account that explains specific richness effects by emphasizing the importance of sensorimotor information in defining semantic representations. Given the importance of sensorimotor information within the embodied cognition framework, the current study investigated the impact of sensorimotor content on verb recognition. Ratings that measured Potential Physical Interactions (PPI) were collected for verb stimuli. This PPI measure evaluated verbs on the number of potential physical objects they could interact with. Verbs were rated on a seven-point scale from few potential interactions (e.g., to spike) to many (e.g., to push). The results show that words higher on PPI were responded to more rapidly than those lower on PPI.

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V033

Do You Notice a Beeping Difference? Priming Effects of the Censor Beep. KAYLA SOMA TSUTSUSE, *University of Hawai'i at Mānoa,* JAY STOUT, *University of Hawai'i at Mānoa,* SCOTT SINNETT, *University of Hawai'i at Mānoa* — In American media, a 1000 Hz tone is used to censor inappropriate language so frequently that previous studies report those with perfect pitch identify the beep as the censor sound used in public broadcasts (Van Hedger et al., 2016). However, an investigation of the beep and its association with profanity is needed to see if individuals perceptually interchange the tone and censored words, arguably nullifying the intended effect of the beep. The current study presents a video using the 1000 Hz tone as a censor, a white noise burst as a censor, uncensored profanity, or no profanity. After the video, a lexical decision task including neutral, profane, and non-words is presented. Preliminary findings show that participants are faster when identifying real words compared to non-words across all priming conditions. Response latencies are shortest following videos without profanity, and slower following videos with uncensored profanity, censored by a 1000Hz tone or white noise. This suggests that any censored and uncensored profanity leads to similar response patterns. However, current results fail to reach significance and are based on limited sample size, as this is an in-progress study.

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V034

Cross-Language Phonological Activation Among Bilingual Learners: A Meta-Analysis. NAN ZHANG, *University of Maryland, College Park,* MIN WANG, *University of Maryland, College Park* — Numerous studies have investigated whether phonological activation in bilingual lexicon is non-selective. Results from various phonological priming tasks, however, were controversial, i.e., reaction time to the homophone-primed target was either reduced or not. In this meta-analysis, we sought to systematically examine whether there is indeed a cross-language phonological priming effect and what factors moderate its magnitude. Preliminary analysis (samples = 11, n = 261) showed that there is a significant phonological priming effect (standardized mean difference = 0.35, CI = [0.15, 0.55]), supporting the non-selectivity hypothesis. Among the potential moderators, including priming direction (L1-L2 vs. L2-L1), task demand (lexical decision vs. word naming), orthographic distance (within- vs. cross-script), stimulus onset asynchrony, number of participants and items per cell, and L2 language proficiency, only the number of items significantly contributes to the variance in the priming effect. We plan to increase the number of studies in the formal analysis with more power to examine the effects of cross-language phonological priming and the various potential moderators.

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V035

Interactions Between Recently Learned and Existing Words During Meaning Access. XIAOPING FANG, *Beijing Language and Culture University,* CHARLES A. PERFETTI, *University of Pittsburgh* — Although seeing a familiar word usually leads to automatic activation of its meaning, it remains unclear how meanings are accessed when words are only recently learned, for which fast meaning access may not be achived yet. In the current study, participants learned novel spoken words associated with different semantic categories (actions or visual features) through an intensive four-day training paradigm. They then made meaning judgments on recently learned words and existing words while their EEG was recorded. In Experiment 1 where the two types of words are presented in separate blocks, we found evidence for an early semantic category effect around the spoken word recognition point on both recently learned words and existing words. However, such effects were absent when we presented the two types of words within the same blocks in Experiment 2. These findings suggest that learners are able to flexibly (and implicitly) adopt their strategies to allow for efficient lexical search and meaning access under different conditions, including searching within a much smaller pool instead of the whole mental lexicon when only recently learned words are expected.

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V036

Constructing Lineups for Distinctive Suspects: Can Replicating a Similar, But Not Identical, Distinctive Feature Across the Lineup Members Improve Eyewitness Accuracy? MELISSA F. COLLOFF, *University of Birmingham,* ALEENA MAHMOOD, *University of Birmingham,* GEORGIA L. ROUGHTON, *University of Birmingham* — Constructing fair lineups for distinctive suspects can involve replicating the distinctive feature across the fillers. We examined how replicating a similar but non-identical feature (low-similarity) influenced identification accuracy compared to replicating an identical feature (high-similarity) or

doing nothing to prevent the distinctive suspect from standing out. We made predictions using a signal-detection-based feature-matching model and the ensemble decision rule. In Experiment 1 (N=4,915), the innocent suspect had a feature that matched the description of the perpetrator's feature. Compared to high-similarity lineups, low-similarity lineups increased the hit rate without affecting the false alarm rate and increased discriminability. In Experiment 2 (N=1,964), the innocent suspect had a feature that was identical to the perpetrator's. Compared to high-similarity lineups, low-similarity lineups increased the hit rate and the false alarm rate and impaired discriminability. This suggests that the feature-matching model provides a useful theoretical framework for considering the effects of lineup member similarity on identification performance. It also suggests that it may be beneficial in practice for police to replicate a similar but non-identical feature across lineup members when constructing lineups for distinctive suspects.

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V037

Autobiographical Memory in the Classroom: Identity Influences on Flashbulb Memories in Students Who Don't Remember 9/11. SAMANTHA A. DEFFLER, *York College of Pennsylvania,* LATASHA R. HOLDEN, *University of Illinois Urbana-Champaign,* RANDI SHEDLOSKY-SHOEMAKER, *York College of Pennsylvania* — Flashbulb memories (FBM) are memories of the circumstances of learning of important and surprising events (Brown & Kulik, 1977). Discussion of FBM enables teaching on the reconstruction of memory and the discrepancy between confidence and memory accuracy. However, to be an effective teaching tool, it is ideal for students to examine their own culturally-relevant FBM (e.g., self-reference effect; Rogers et al., 1977). Presently, textbooks and professors continue to use 9/11 as an example of FBM, but many students do not remember 9/11. To identify relevant FBM for current students, we conducted two studies. Study 1, with a predominantly White sample, identified common FBM, including recent mass shootings (Parkland, Sandy Hook) and elections (Trump, Obama). Study 2 examined whether FBM identified in Study 1 were relevant to a more racially-diverse sample and identified additional events. Participants reported FBM for the common events from Study 1 (Parkland: 71%; Trump Election: 81%, Obama Election 61%; Sandy Hook: 53%). Additional FBM in this more diverse sample include the deaths of Kobe Bryant and Michael Jackson and the Capitol Riots. We explore the phenomenology and identity relevance of these events.

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V038

Learning Lessons and Insights: Content Analysis of Autobiographical Narrative of Natural Disaster from the Perspective of Resilience. AYA HOSOKAWA, *Aino University* — Memories on a negative or traumatic event in the past could include interpretations, such as lessons, insight, and feelings through meaning making process from the perspective of autobiographical reasoning. While recapturing negative events could entail trauma and negative feelings, meanings in turning point events are likely to bestow lessons and insights in the process of self-development and self-understanding across the lifespan. The purpose of the current study is to focus on how experience of natural disaster would contribute to self-development and self-understanding through leaning lessons and insights to explore paths to resilience. Autobiographical narratives on the Great East Earthquake, 3.11. in 2011 were rated on the criterion of lessons and insight by several coders to get compared with those on other lifetime negative events. The results found that autobiographical narratives by the 3.11 Earthquake represented higher levels of lessons and insights than those on lifetime negative event. The results implied further research focusing on other interpretive components would contribute to resilience.

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V039

Dysfunctional Effect of Episodic Counterfactual Thinking on Emotion Regulation. ŞEYMA KURTULMUŞ, *Kadir Has University,* SEZIN ONER, *Kadir Has University* (Sponsored by Sezin Oner) — Counterfactual thinking is a field that has been studied in hypothetical scenarios for a long time. However, counterfactual thinking as produced in an episodic context, i.e., the production of counterfactuals from autobiographical memory, has only been studied recently. There are very few studies on episodic counterfactual thinking and its functions in an emotional context. Therefore, this study aims to explain the effect of the phenomenological features of episodic counterfactual thoughts, namely emotional intensity, reliving, and valence, on the emotional states of individuals. We proposed a mediation model testing of the distinct role of counterfactual phenomenology on the link between memory phenomenology and mood. We demonstrated that as memory phenomenology increases, counterfactual phenomenology increases, which then resulted in a decline in current mood. This pattern was significant only in the group who thought it could have been worse about their episodic memories, i.e., upward counterfactual thinking, which indicates some counterfactual features can be dysfunctional for emotion regulation.

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V040

Effect of Autobiographical Memory Characteristics on Emerging Adults' Meaning in Life: The Mediating Role of the Functions of Autobiographical Memory. XUAN GU, *Guangdong University of Finance and Economics,* CHI-SHING TSE, *The Chinese University of Hong Kong* — The present study examined how emerging adults' autobiographical memories could associate with meaning in life. Four hundred fifty-nine university students in China completed the Autobiographical Recollection Test, Thinking about Life Experience Scale, and Meaning in Life Questionnaire to rate the characteristics and functions of their autobiographical memories and the degree of life purpose. Results showed that (a) the

high-quality characteristics positively predicted the functions of autobiographical memory and the meaning in life. (b) The self-continuity and social-bonding functions mediated the effect of autobiographical memory characteristics on the search for meaning. But they did not mediate the effect of characteristics on the presence of meaning. (c) The directing-behavior function mediated the effect of autobiographical memory characteristics on both the search for and the presence of meaning. The findings suggest that enriching autobiographical memory's phenomenology and positively-oriented functions can be efficient pathways for emerging adults to live meaningful lives.

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V041

Examining the Associations Between Nonbelieved Memories and Memory Distrust, Self-Esteem, and Rumination. YIKANG ZHANG, *Maastricht University,* FABIANA BATTISTA, *KU Leuven,* DIMITRA THISSEN, *Maastricht University,* HENRY OTGAAR, *Maastricht University,* JIANQIN WANG, *Fudan University,* MARKO JELICIC, *Maastricht University* — When autobiographical beliefs in memories are reduced while recollections remain relatively intact, a phenomenon termed nonbelieved memories (NBMs) unfolds. The current pre-registered study used a 3-week longitudinal design to investigate the relationships between the frequency of NBMs, memory distrust, rumination over autobiographical events, and self-esteem. Poisson/ negative binomial regressions with data from a sample of 104 university students (M age = 20.7, n male = 15) showed that memory distrust was a positive predictor for the number of recalled NBMs for Time 1 but not for Times 2, 3, and 4. Exploratory analyses showed that self-esteem was negatively related to the total number of NBMs. Rumination measured by (In) voluntary Autobiographical Memory Inventory (IAMI and VAMI) as well as Event-Related Rumination Inventory-intrusive subscale was positively associated with the total number of NBMs in Time 1. IAMI and VAMI were also significant positive predictors for the total number of NBMs in Times 2, 3, and 4. Our study is one of the first ones showing that NBMs might be uniquely tied to specific individual markers.

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V042

A Framework for Memory of Fictional Information. PIERRE GANDER, *University of Gothenburg,* KATA SZITA, *Trinity College Dublin,* ANDREAS FALCK, *University of Oslo,* ROBERT LOWE, *University of Gothenburg* — Much of information people encounter in everyday life is not factual but fictional, such as from novels, movies, computer games, and role playing. There is a need for a theoretical account of how memory of fictional information is related to other types of memory and which mechanisms allow people to separate fact and fiction in memory. In this theoretical work, we present an extension of the dimensional model of memory proposed by Rubin to account for memories of fictional information of events, places, characters, and objects. Further, we offer a set of proposed mechanisms involving various degrees of complexity and levels of conscious processing that mostly keep fact and fiction separated but also allow influence, such as misinformation, from fiction. In this way, we characterize the processing of fiction as a fundamental cognitive process that is culturally universal, spontaneous, and independent of medium and modality and whether the information is mediated or directly experienced.

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V043

Effects of CS-US Intervals on Food Aversion Conditioning in Japanese Fire-Bellied Newts. TOHRU TANIUCHI, *Kanazawa University,* MIKI SUZUKI, *Kanazawa University,* WEISHENG ZHAO, *Kanazawa University* — The present study examined effects of CS-US intervals on food aversion conditioning in Japanese fire-bellied newts. Newts were allowed to eat pieces of 40 mg raw beef as CS food for 60 min. and then received an injection of 0.15 M lithium chloride (LiCl) solution (190 mg/kg) 0, 6, or 24 h after CS presentation. Control newts were injected a saline solution 0 h after CS presentation. In a test conducted one week after the CS presentation, Groups 0 h, 6 h, and 24 h showed reliable decrease in CS consumption compared to Control group. Strength of the conditioning was significantly weaker in Group 24 h than Groups 0 h and 6 h. These results show that Japanese fire-bellied newts, like rats, acquire food aversion conditioning over long CS-US intervals.

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V044

Item-Specific Stimulus-Classification Associations Rely Both on Pre-Established Semantic Classifications and Newly Learned Arbitrary Classification Features. ANA-MARIA ROSCA, *Albert-Ludwigs-University Freiburg,* HANNAH DAMES, *University of Zurich,* CHRISTINA U. PFEUFFER, *Catholic University of Eichstätt-Ingolstadt* — Stimulus–response (S-R) associations consist of two independent components: Stimuli become associated with motor outputs (stimulus-action, S-A, association, e.g., apple – right key) and task-specific classifications (stimulus–classification, S-C, association: e.g., apple – small). Moreover, both components of S-R associations can be acquired by actively responding to a stimulus (execution) or by mere instruction. Importantly, the impact of S-C associations (corresponding item-specific priming effects) is significantly reduced for instruction as compared to execution. Here, we assessed whether instruction-based item-specific S-C priming effects relied solely on pre-existing semantic networks, whereas additional new associations were formed when actively responding. In Experiment 1, participants classified words either according to a non-arbitrary or arbitrary classification task in prime and corresponding probe. Item-specific costs of switches in the classification task were also observed following arbitrary task primes, suggesting a contribution of newly acquired associations to execution-based effects. Subsequently, we further contrasted instruction-based and execution-based S-C associations.

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V045

Chunk Size Depends on Sequence Length and Practice. LAURE TOSATTO, *Aix-Marseille University & Centre National de Recherche Scientifique (CNRS),* JOEL FAGOT, *Aix-Marseille University & Centre National de Recherche Scientifique (CNRS),* DEZSO NEMETH, *Université Claude Bernard Lyon 1, Eötvös Loránd University, & Hungarian Academy of Sciences,* ARNAUD REY, *Aix-Marseille University & Centre National de Recherche Scientifique (CNRS)* — During the acquisition of visuo-motor sequences, long sequences are typically segmented into chunks leading to more fluid and accurate performances. However, chunking tends to be less investigated in shorter sequences. The question of chunk size has been often investigated but little is known about the dynamics of chunk size evolution relative to sequence length. In three experiments, we studied the dynamics and the evolution of a sequence's chunking pattern for different sequence lengths in a non-human primate species (Guinea baboons, Papio papio). Baboons had to point on a touch screen to a moving target and to produce repeatedly the same sequence of 9 (1,000 trials), 4 (2,000 trials), and 5 movements (4,000 trials), respectively. For all lengths, baboons initially produced small chunks that became longer with practice and the evolution of the chunking pattern varied depending on sequence length. Finally, with extended practice, we observed that the mean chunk size reached a plateau indicating that there are fundamental limits to chunking processes that also depend on sequence length. These data therefore provide new empirical evidence for understanding the general properties of chunking mechanisms in sequence learning.

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V046

Discriminability of Object Durations Enhances Visual Statistical Learning on Time Information. SACHIO OTSUKA, *Kyoto University* — My previous studies demonstrated that people could learn the regularities of temporal order on object durations (Otsuka, 2018; 2020; Psychonomic Society [poster presentation]). However, participants' performance in the familiarity decision was low (approximately 55%). This study examined whether the discriminability of object durations within triplets enhances visual statistical learning on time information. Participants observed a sequence of randomly presented visual objects. However, the timing of three successive objects was fixed. That is, each timing triplet had three successive durations, but objects were untied to them in the sequence. In the subsequent test, two sequences were presented: a timing triplet presented in prior and a foil created from different timing triplets. Participants were required to decide which sequence was more familiar. The results of this experiment were compared with those of my previous study (Otsuka, 2020), which revealed higher performance in the familiarity test in this experiment. These results suggest that discriminability of object durations enhances visual statistical learning on time information.

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V047

Developing and Testing Automatic Feedback on an Interactive Web Platform. ROMAN TARABAN, *Texas Tech University* — Research shows that guided discovery and feedback are essential when learning is involved and need to be tailored to the instructional contexts in which they occur. We provided English-speaking university students in the U.S., India, and Ukraine with guiding questions for composing responses to ethical dilemmas on an open-access website (https://EthicalEngineer.ttu.edu) that was used as an instructional resource for university instructors teaching ethics. Upon submitting brief essay responses (approx. 350 words in length), students received immediate automatic feedback. The web-delivered feedback was designed to be objective, personal, and to function at summary and detailed levels. Multiple tests of the naïve Bayes classifiers used to generate the feedback showed approximately 77% agreement with human judges. Survey data showed participants considered the feedback to be informative and agreed with the feedback at moderate-to-high levels, based on Likert-type ratings. Suggestions for revisions were provided, and students were receptive to the suggestion of revising their responses based on the feedback provided.

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V048

The Merits of Peer Discussion and Self-Explanation in Multimedia Learning Environments. DANIA IBRAHIM, *University of California, San Diego,* EMMA GELLER, *University of California, San Diego* — Peer Instruction (PI) is a classroom activity that requires students to answer conceptual questions and discuss their thought processes with peers. Studies show significant benefits of PI on student performance given that students engage in discussion with peers. However, synchronous discussion is not always possible for students. This necessitates the use of other instructional methods, such as "self-explanation" prompts, to mitigate the loss of peer discussion. The following study involves the analysis of classroom data from a hybrid research methods course at UCSD. Students answered PI questions and reported their attendance modality every lecture, but were only prompted to self-explain their PI answers for half of the instructional quarter. We found a significant benefit of PI and synchronous attendance on assessment question accuracy but did not find a significant effect of self-explanation prompts on class performance. These results highlight that PI benefits students, but an independent instructional method such as self-explanation may not be an effective alternative for peer discussion. This understanding may help instructors better structure lessons with student modality in mind.

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V049

Feedback Timing Impacts the Likelihood of Revising Misconceptions. DANIELLE M. SITZMAN, *Eastern Washington University,* JAMES J. WOLFF, *Eastern Washington University,* ADDISON L. BABINEAU, *Texas Christian University,* S. UMA TAUBER, *Texas Christian University* — The coactivation of

inaccurate knowledge and correct information is an important step in the knowledge revision process (Kendeou & O'Brien, 2014). Across 3 experiments, we examined how the delay between an inaccurate response and feedback may impact the likelihood of revising health misconceptions. Experiments 1 and 2 found that participants who received feedback immediately after answering a true/false health statement were more likely to correct a misconception on the final test (after 10 minutes or 1 week) compared with participants who received feedback after a brief delay. Experiment 3 demonstrated that participants could revise misconceptions followed by delayed feedback as effectively as misconceptions followed by immediate feedback if inaccurate knowledge was reactivated directly before viewing feedback. Thus, explicitly activating knowledge before reading a refutation may enhance the degree of coactivation between inaccurate knowledge and correct information, ultimately increasing the likelihood that misconceptions will be revised.

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V050

Nonlinear Temporal Structure Provides a Common Substrate for Production, Perception, and Memory of Language. DAMIAN KELTY-STEPHEN, *SUNY New Paltz,* MADHUR MANGALAM, *University of Nebraska Omaha* — Movements for producing or exploring speech bear rich nonlinear structure, blending brief events (e.g., syllables) with longer-term events (e.g., discourse, task) to support the ongoing integration of new information (Dixon et al., 2012; Van Orden et al., 2003; Abney et al., 2014). This blending offers a common substrate for mutual understanding between interlocutors. Using a self-paced listening task (Ferreira et al., 1996), we presented spoken words in a narrative sequence to listeners using a keypress to request each next word. In an experiment manipulating speaker type—one human and one text-to-speech (TTS) synthesizer, we found that the nonlinear temporal structure of speakers' movements (e.g., via speech-amplitude waveform) speeded listeners' keypresses for the next word and, second, that nonlinear temporal structure of listener keypress latencies across the entire story promoted memory for narrative content. Furthermore, auditory-waveform nonlinearity reduces word-listening times for TTS-synthesized speech above and beyond traditional psycholinguistic features like frequency and phonological neighborhood size. In summary, nonlinear cross-scale interactions may be an important resource for bodies using language.

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V051

Attentional Templates Maintained in Working Memory and Long-Term Memory Have the Same Search Efficiency. HUIXIN SONG, *Zhejiang University,* HUI CHEN, *Zhejiang University* — Studies have found that attentional templates (ATs) could be maintained in either working memory (WM) or long-term memory (LTM). This study aimed to systematically compare the search efficiency of ATs maintained in WM and LTM. In Experiments 1-3, participants were asked to remember several colors (two in Exp.1; one vs. three in Exp.2; two vs. five in Exp.3) and then find a target with one of these colors. The colors changed from trial-to-trial in the WM condition, while repeated throughout the block in the LTM condition. The results consistently showed that the search slopes in WM and LTM condition were comparable regardless of color numbers, indicating a similar search efficiency of ATs maintained in WM and LTM. An alternative account could be that the colors maintained in LTM were retrieved to WM and thus lead to same search efficiency as the colors maintained in WM. Experiment 4 inserted a secondary WM task and found that the search efficiency was only impaired in WM condition but not in LTM condition, while the alternative account would predict that the search efficiency should be similarly impaired between the two conditions. In short, these results suggest that ATs in WM and LTM have the same efficiency in guiding search.

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V052

Shared Representations for Visual Imagery and Visual Working Memory: Evidence from the Breaking Continuous Flash Suppression Paradigm. YILING ZHOU, *Zhejiang University,* MOWEI SHEN, *Zhejiang University,* HUI CHEN, *Zhejiang University* — Visual imagery resembles visual working memory, both of which actively represent visual information. Several previous studies have demonstrated that the contents of visual working memory are prioritized for visual awareness. Thus, it is possible that items that are imagined may also receive priority in the access to awareness. Here, three experiments were conducted to investigate the effects of visual imagery on awareness using a breaking Continuous Flash Suppression task. The results found that suppressed color reached visual awareness faster when they matched imagined color than when they did not. Critically, this priority resembled that evoked by visual working memory. Moreover, such effect was observed when semantic bias was ruled out and when complex stimuli such as faces were used. These results showed comparable effects of visual imagery on awareness as that of visual working memory, suggesting that visual imagery and visual working memory might rely on common visual representations.

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V053

Uncertainty and Performance Monitoring with High OCD Symptomatology: A Pilot EEG Study. XIOMARA NÚÑEZ-ESTUPIÑAN, *Universidade Federal do Rio Grande do Sul,* GUSTAVO GAUER, *Universidade Federal do Rio Grande do Sul,* GERSON SIEGMUND, *Universidade Federal do Rio Grande do Sul* — Performance monitoring has been consistently overactive in obsessive-compulsive disorder (OCD) and obsessive-compulsive (OC) symptomatology. The present exploratory study aimed to examine the incidence of the ERN and ΔERN components of error responses at a gambling-type task. Ten participants completed the Flanker task, and the Hilo game with varied conditions of uncertainty,

while EEG data was recorded. The ERN was elicited in the Flanker as expected, and behavioral effects were observed as well. The HiLo game was not successfully eliciting the ERPs related to error monitoring; however, significant differences were detected between grand averages waveforms in the low-uncertainty condition. Correlations were found between the Flanker-CRN and grand average waveform for wins in the no-uncertainty trials. These findings point to necessary experimental and methodological modifications of the levels of uncertainty in the HiLo game to elicit the event-related potentials of interest robustly. Limitations and future directions are discussed.

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V054

Effects of Paper and Digital Presentation on Reading Comprehension in Interaction with Cognitive Control and Motivational Processes. MARIEL F. MUSSO, *University of Granada/Interdisciplinary Center for Research in Mathematical and Experimental Psychology-National Council for Scientific and Technical Research (CIIPME-CONICET)/Universidad Argentina de la Empresa,* ALEJANDRA FUENTES CUIÑAS, *Universidad Argentina de la Empresa,* EDUARDO C. CASCALLAR, *KU Leuven* — This study analyses the effect of reading format (Paper, Digital, and Hypertext) on reading comprehension (RC) and its interactions with Working Memory (WM), Executive Attention (EA), and Motivation. Participants: 82 tertiary students (males: 62.2%; Medad=25.07; SD=5.27). Symmetry Span, Attentional Network Test, Online Motivational Questionnaire, and Nelson Denny Comprehension Test were applied. There were significant interaction effects between reading condition (RCd), low-high WM, and low-high Subjective Competence (SC). High WM & high SC participants have better RC on digital condition than on paper condition. A main effect was found of SC on RC, but the interaction effects with EA and RCd were not significant. Low SC participants have lower RC in all RCd. A significant interaction effect was found between RCd and WM: high WM participants increased their RC in digital condition. These results are consistent with previous studies suggesting the crucial role of cognitive control and motivation in challenging tasks.

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V055

Tuning the Internal Timekeeper in Continuation Tapping Tasks. ANDREW SLIFKIN, *Cleveland State University,* GRACE BLATT, *Cleveland State University,* ALLISON GYURE, *Cleveland State University,* SARA PATRICK, *Cleveland State University,* SOPHIA KYRKOS, *Cleveland State University,* BRANDON MAY, *Cleveland State University,* DANIEL VENORSKY, *Cleveland State University,* LAYA RAGHAV, *Bedford High School,* MARINA MEDIATI, *Cleveland State University,* BRIGHAM LOWRY, *Cleveland State University* — A continuation timing task begins with an initial synchronization phase where participants tap in time with a metronome beat; during the subsequent continuation phase, the metronome is extinguished and participants attempt to continue tapping at the synchronization-specified rate. Performance during the continuation phase is thought to reflect operation of the internal timing mechanism. Here, we varied the number of synchronization taps—6, 11, 21, 41, and 81—and examined changes in continuation-phase performance. In addition, we assessed that relation at each of four synchronization inter-stimulus intervals (ISIs): 500, 1000, 1500, and 2000 ms. Preliminary analyses of continuation performance showed that participants accurately scaled their mean inter-tap intervals (ITIs) to target ISI levels, regardless of the synchronization-tap-number level. At shorter ISIs (500 & 1000 ms), increases in synchronization-tap-number did not influence ITI variability. However, at longer ISIs (1500 & 2000 ms), increases in synchronization-tap-number resulted in reductions in ITI variability .

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V056

Finger-Specific Reaction-Time Biases During Single and Multi-Finger Presses. ZIJUN LI, *University of Sheffield,* HANNES SAAL, *University of Sheffield* — When selecting a finger among all ten fingers at a time, reaction times (RT) for the middle fingers (D3) have repeatedly been reported to be longer than those of the other fingers; however, debate continues about the mechanisms underpinning this effect. This study aims to further investigate and generalise this effect. Firstly, we adjusted the response set (the fingers that could potentially be chosen). Our results implied that the prolonged RT is independent of the response set and was contrary to a previous study which suggested otherwise. Secondly, we extended the task to selecting multiple fingers simultaneously; our results suggested that in addition to finger enslaving, prolonged RT for D3 remained when selecting more than one finger. Taken together, these results rule out some previously proposed mechanisms and suggest that, at least in part, the organisation of cortical sensorimotor representations underlies the effect.

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V057

Work Ability in Middle-Aged and Older Adults: Examining the Role of Physical Fitness, Social Life, and Cognitive Functions. JENNIFER A. RIEKER, *Universidad Nacional de Educación a Distancia,* PATRICK D. GAJEWSKI, *Leibniz Research Centre for Working Environment and Human Factors at Technical University Dortmund,* EDMUND WASCHER, *Leibniz Research Centre for Working Environment and Human Factors at Technical University Dortmund,* JOSÉ MANUEL REALES, *Universidad Nacional de Educación a Distancia,* SOLEDAD BALLESTEROS, *Universidad Nacional de Educación a Distancia,* STEPHAN GETZMANN, *Leibniz Research Centre for Working Environment and Human Factors at Technical University Dortmund* — The present study explored the relationships between Physical Fitness, Cognitive Functions, and Social Life and their influence on Work Ability (WA). Data from 247 middle-aged and 236 older employees from the Dortmund Vital Study were analyzed using a structural

equation modelling approach. The proposed model showed a good fit (chi-square = 404.97, df = 305, CFI =.945, RMSEA = .037). Social Life was the strongest predictor for WA in middle-aged ($\gamma = .556$, $p < .001$) and older adults ($\gamma = .558$, $p < .001$). Fitness predicted WA only in middle-aged adults ($\gamma = .223$, $p < .01$) and Cognitive Functions had no influence on WA in either group. In older adults, Fitness correlated with Cognitive Functions ($r = .259$, $p < .01$), whereas in middle-aged, Cognitive Functions correlated with Social Life ($r = .253$, $p < .05$). Our results show that the positive effect of social life on WA is age-independent, but that the influence of physical fitness on WA decreases in older workers. This research contributes to the knowledge of how WA could be most effectively promoted in different age groups.

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V058

Pupil-Linked Arousal Is Sensitive to Model Reset But Not Model Update. HAMIT BASGOL, *University of Tübingen,* PETER DAYAN, *Max Planck Institute for Biological Cybernetics & University of Tübingen,* VOLKER H. FRANZ, *University of Tübingen* — Humans use internal models to make predictions. When the environment changes and predictions are suddenly violated, there is model reset, excess arousal, and learning of a new model. This appears to be accompanied by locus coeruleus activity/norepinephrine release (LC-NE) and pupil dilation responses (PDRs). Following Zhao et al. (Nature Communications, 2019), we explored this phenomenon using switches between regular and random patterns of tones. A regular pattern admits a simple model which, when violated by a switch to a random pattern, putatively induces model reset. The converse switch should only lead to progressive model change, as violations of a random model are statistically more obscure. We also considered a novel way of inducing model reset by switching between different regular patterns. With N=21 participants, we replicated Zhao et al. (2019), showing that PDRs are induced by switches from regular to either random or regular patterns but not by switches from random to regular patterns. In addition, we detected a later pupil constriction induced by switches from one regular to another regular pattern. Results suggest that LC-NE is indeed sensitive to model reset.

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V059

Validation of a Survey to Assess Psychosocial Outcomes Related to Performance in STEM Programs. ANGELIQUE M. BLACKBURN, *Texas A&M International University,* MARCUS YNALVEZ, *Texas A&M International University,* CLAUDIA SAN MIGUEL, *Texas A&M International University* — To improve retention in STEM programs, we created a survey to assess psychosocial outcomes related to performance: STEM self-efficacy, STEM identity, and sense of belonging (SOB). The survey was administered to 115 undergraduates, and we conducted exploratory factor analysis. Preliminary results revealed five factors: self-efficacy (α=.973), identity (α=.958), and three factors related to SOB (α=.779). Theoretical analysis of these factors indicated that our SOB measure reflects three underlying factors of general SOB (α=.920), anxiety (α=.881) and rejection (α=.902). Known-group validity testing on the three predicted components was conducted by comparing STEM and non-STEM majors. As expected, STEM majors reported significantly higher STEM identity, $t(73.20)=8.78$, $p<.001$, self-efficacy, $t(113)=4.77$, $p<.001$, and SOB, $t(113)=3.83$, $p<.001$, than non-stem majors, providing initial validity for the survey items. These preliminary results suggest the survey is reliable and valid, but an abbreviated version would be ideal. The results are being used to design a short version of the survey that can be implemented to assess the efficacy of programs to improve learning and is already in use to improve retention in an existing STEM program.

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V060

Investigating Effects of the COVID-19 Pandemic on College Students. JOSEPH PONTORNO, *St. John's University,* DANA CHESNEY, *St. John's University* — COVID-19 disrupted the education of millions of students across the world. Many classes moved from in person to online, raising concerns that the resulting social isolation would be problematic for students' mental health and that their education would suffer. We investigated these concerns in an online study of 42 undergraduate students attending St. John's University during the first year of the COVID-19 pandemic. Students reported their levels of campus attendance and academic performance (GPA) and completed a modified version of the Beck Depression Inventory (BDI-II). As hypothesized, a high proportion of students reported mental distress, with 48% (N=20) of participants reporting mild (N=8), moderate (N=6), or severe (N=6) depressive symptoms. However, contrary to our hypothesis, depressive symptoms, academic outcomes, and Campus attendance were not strongly related (all ps>.10). Indeed, when looking at differences between cumulative vs. Fall 2020 GPA, there was a correlation between more depressive symptoms and improved GPA ($r(40)=.265$, $p=.090$). These results suggest that while the COVID-19 pandemic can certainly impact both GPA and mental health, interactions between these constructs may be indirect and non-obvious.

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V061

Perceptual Correspondence Between Visual Clutter and Auditory Features. RYOSUKE NIIMI, *Niigata University,* ATSUYA HIRANO, *Niigata University* — We examined perceptual correspondences between visual clutter, a relatively higher-order visual feature, and auditory features. In experiments 1 and 2, participants were presented with contour shapes (high/low clutter) and 3-sec sound clips, and rated how well they fit together. Visual clutter did not show correspondence with sound frequency but showed partial correspondence with auditory tempo. In experiment 3, participants saw pairs of visual stimuli (low and high clutter) and selected the one they thought fit better with the simultaneously-presented sound. We adopted three types of visual stimuli; contour shapes, bandpass

filtered scenes, and Gabor arrays. As a result, high-clutter visual stimuli were selected more often with louder sound and higher tempo. It was also found that high-clutter stimuli were selected more often with banjo sound than oboe sound. These results suggested perceptual correspondences between visual clutter and loudness, tempo, and timbre. Experiment 4 showed that these correspondences required attention and conscious processes. It was concluded that visual clutter has a perceptual correspondences with auditory features.

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V062

Is There a Common Cognitive Mechanism for Statistical Summary Representations Across Sensory Modalities? MIDORI TOKITA, *Mejiro University,* AKIRA ISHIGUCHI, *Ochanomizu University* — Many studies have shown that people may have the ability to extract summary statistics over objects/events in a set. However, it has also been shown that different processes may be involved depending on the stimulus types. This study tested whether there might be a common mechanism for summary statistics between visual, auditory, and tactile modalities using stimuli characterized by prothetic continua. The visual stimuli consisted of a series of circles of different sizes; the auditory stimuli consisted of pure tones with different sound intensities; the tactile stimuli consisted of vibrotactile stimulation with different intensities. We tested precision (i.e., JND) and bias (i.e., PSE) in extracting the average value of the sequence in each modality and performed correlation analysis among them. In deriving the JNDs and PSEs, we used the method of constant stimuli: The observers in each trial decided which stimulus—the standard or the comparison—had the greater size or intensity. The results showed significant correlations between precisions in auditory and tactile conditions but negligible correlations between those in auditory and visual and tactile and visual conditions.

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V063

IAT Faking Indices Revisited: Aspects of Replicability and Differential Validity. JESSICA RÖHNER, *University of Bamberg,* RONALD HOLDEN, *Queen's University,* ASTRID SCHÜTZ, *University of Bamberg* — Indices [slowing, speeding, increasing or reducing errors in congruent or incongruent blocks; Combined Task Slowing (CTS); Ratio 150-10000] allegedly detect faking in IATs, however, studies on these are inconclusive and statistically underpowered. Also, results' stability, indices' unique predictivity, combining indices, and variations in computing faking success remain unexplored. We reanalyzed a large sample (N = 750) completing an extraversion IAT, finding that faking strategies depend on the direction of faking. Successful faking of low scores was detected from slowing down on the congruent block, and less with CTS. Successful faking of high scores was detected from slowing down and increasing errors on the incongruent block, and with CTS. Results demonstrated stability across subsamples and different computations of faking success. Increasing errors had the strongest impact on the classification. Apparently, fakers use goal-dependent strategies which are not all successful. To detect faking, we recommend combining indices and considering the context.

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V064

Expressing Psychological Similarity Spaces Using Pointwise Mutual Information. MIKAELA AKRENIUS, *Indiana University Bloomington* — Psychological similarity spaces are the building block of many cognitive models, such as the generalized context model (Nosofsky, 1986) and the similarity-choice model (Luce, 1963; Shepard, 1957), and of applications of multidimensional scaling in psychometrics (e.g. Borg & Groenen, 2005; Kruskal, 1964). The similarity between two stimuli is typically expressed as a function of their distance in a postulated geometric space that defines stimulus locations relative to two or more feature dimensions. The distance between stimuli is determined by the Minkowski power metric (Minkowski, 1896; see e.g. Beckenbach & Bellman, 1961), which generalizes several different distance measures and can be used to model task- or feature-specific variation in the structure of the similarity space (e.g. Borg & Lingoes, 1987; Garner, 1974; Melara, Marks, & Lesko, 1992; Shepard, 1964). The goal of this presentation is to explore properties of psychological similarity spaces that are built using variants of pointwise mutual information, and to compare the ability of these spaces to account for empirical data relative to spaces based on the Minkowski power metric.

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V065

Attentional Preparation to Distractors. VIRGINIE LECLERCQ, *Université Paul-Valéry Montpellier,* KILLIAN BONNIN, *Université Paul-Valéry Montpellier* — In our environment, distractors can be expected. For example, when we drive a car, we know that advertisements will be presented on the side of the road and that they are irrelevant information. How do we prepare for these distractors? Some authors propose that a feature-based inhibition of distractors can take place during preparation (Gaspelin & Luck, 2018). On the contrary, others propose that when distractors are expected, preparation to the distractors results in allocation of attentional resources to the distractors (Makovski, 2019). In 2020, we investigated with the LaBerge's Attentional Preparatory Test these two propositions, and our results supported distractors inhibition, but extra experiments were necessary. We conducted new experiments, and results still support distractors inhibition. Altogether, these results ask for the determinants of attentional preparation to the distractors.

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V066

Examining the Effect of Cognitive Processing Strategy on Tracking Performance and Dynamic Visual Search Using a Modified Multiple Object Tracking Task. MENGZHU FU,

University of Nebraska at Lincoln, MICHAEL D. DODD*, University of Nebraska at Lincoln* — Previous research has shown that both multiple object tracking (MOT) and dynamic visual search are influenced by a variety of factors, with some evidence that processing strategy influences performance. Consistent with the Gestalt view that visual system prioritizes processing the holistic aspect of visual stimuli, a recent study demonstrated a global advantage in MOT, with improved tracking performance when a distinctive global property is present and attended (Wei, Zhang, Li, Hu, & Li, 2019). In the current study, we examined the effect of adopting different cognitive processing strategies on tracking and search efficiency. A dual task paradigm was used which combines a dynamic pop-out display with the standard MOT task. Global vs. local orientation was primed via a Navon task (E1) or explicit instruction (E2) and performance was impacted by the processing strategy adopted. The results provide insights into flexibility of attentional allocation and its limitation during tracking and search.

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V067

Exploring the Adaptability of the Bilingual Mind. CHRISTIAN RUIZ*, The University of Texas at El Paso,* ASHLEY S. BANGERT*, The University of Texas at El Paso* (Sponsored by Ashley Bangert) — Prior research indicates that bilingual experience may impact executive control mechanisms, particularly in children and older adults; this effect is less apparent in college students. Factors like task difficulty and sensitivity of measures used may account for these inconsistencies. This study explores whether the degree of balance between a bilingual speaker's languages modulates their response to conflict at the stimulus and response stages of processing in multiple sensory modalities. Participants with varying levels of English and Spanish language proficiency completed visual and auditory non-linguistic Simon (response conflict) and Stroop (stimulus conflict) type tasks. We used the coefficient of variation as a measure of performance stability. We examined whether higher balance in proficiency across languages was associated with more stable performance over time and whether this relationship differed by task and modality. Preliminary data did not reveal effects of task, modality, or modulation of these effects by relative balance in proficiency, consistent with prior work evaluating these effects in college students. Future work will explore whether context of language impacts performance stability.

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V068

Objective Versus Subjective Measures of Language Proficiency: Do Results Differ When Modeling Bilingual Effects on Executive Function? YU ZHOU*, Wenzhou-Kean University,* ADAM J. PRIVITERA*, Wenzhou-Kean University* — In psychological research, differences in ability are assessed using both objective and subjective measures. Studies investigating the effects of bilingualism rely heavily on self-report measures of language experience including proficiency. Despite this convention, whether people are accurate in their assessments is contested. While evidence supports that subjective and objective measures of language proficiency are correlated, few studies have explored whether use of either measure impacts on model results when investigating bilingual effects on executive function. To explore this, Mandarin-English bilingual young adults (n = 73) completed subjective and objective assessments of language proficiency and a Simon task. For both languages, subjective ratings of proficiency were lower than objective scores. Crucially, while proficiency measures were only weakly correlated, model fit and results did not differ when either measure was included. Results support that both objective and subjective assessments of proficiency may be equivalent when modeling bilingual effects on executive function.

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V069

Is Hyper-Binding a Unique Aging Effect? Evidence for Hyper-Binding Across the Adult Lifespan. ANDREW CHUNG*, Brock University,* KAREN M. ARNELL*, Brock University* (Sponsored by Karen Arnell) — Filtering out irrelevant information in the face of relevant information is critical in our everyday lives. Hyper-binding is a phenomenon where individuals fail to filter out task-irrelevant information, and also bind it to task-relevant information. For example, when presented with words superimposed on top of images one at a time and told to ignore the words and respond when the image is repeated, individuals show evidence of encoding the picture and word together in memory. Hyper-binding has been shown to occur only in older-aged adults (55+) whereas young undergraduate samples have not previously shown evidence of hyper-binding. In the current set of studies, hyper-binding was investigated using the identical study with four samples: 1) undergraduates tested online (N= 134, M age = 19.1 years), 2) a community sample between 18 and 45 years of age gathered through MTurk (N=117, M age = 29.4 years), 3) an undergraduate sample tested in the lab (N=60, M age = 19.1 years), and 4) an older-aged sample tested online (N=114, M age =62.9 years). Surprisingly, hyper-binding was found in all four samples and did not differ in magnitude across the samples. Results demonstrate that hyper-binding is not always unique to older-aged adults.

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V070

Age-Related Improvement in Face-Based Trustworthiness Judgment: A Comparison of Younger, Middle-Aged, and Older Adults. ATSUNOBU SUZUKI*, The University of Tokyo,* KENTA ISHIKAWA*, Senshu University,* MATIA OKUBO*, Senshu University* — People routinely infer the trustworthiness of other individuals based on their faces. In the present study, we compared the accuracy and bias in such face-based trustworthiness judgment among three age groups: younger (18–30 years old), middle-aged (40–55 years old), and older adults (65–80 years old). Participants saw face

photos of 30 unfamiliar young men one by one and judged whether each person appeared trustworthy or untrustworthy. Crucially, the young men had played a trust game in a past study, and, thus, we have objective data as to their actual trustworthiness. This experimental setting enabled us to estimate each participant's accuracy and bias in face-based trustworthiness judgment. Results revealed that the judgments made by older participants were more accurate and less biased than those by middle-aged and younger participants. The findings indicate an age-related improvement in face-based trustworthiness judgment across adulthood.

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V071

The Stability of Everyday Memory Failures in Young and Older Adults: A Longitudinal Diary Study. BRIGITA BRAZAUSKIENE, *University of Hertfordshire,* IOANNA MARKOSTAMOU, *University of Hertfordshire,* LIA KVAVILASHVILI, *University of Hertfordshire* — Results of diary studies on everyday memory failures (EMFs) suggest that a diary is an effective tool for capturing memory functioning in a natural environment. Nevertheless, the variability of findings across some studies (e.g., in terms of types of errors recorded) raises questions about the stability and reliability of the diary data. It has also been suggested that individual differences may affect the EMF frequency. To address these questions, we studied the frequency and types of recorded EMFs in young (n=41) and older (n=40) adults who kept two 3-day diaries one month apart and completed self-reported measures of busyness, routine, mood and levels of procrastination. In both diary-keeping periods, there was no significant effect of age on the total number of recorded EMFs, and younger adults reported more prospective memory (PM) failures than the old. However, this age-PM benefit disappeared when controlling for levels of procrastination. Importantly, there were moderate to strong correlations between the number of recorded EMFs in the first and second diary-keeping period, indicating that a diary method is a reliable tool for assessing everyday memory functioning in both young and older adults.

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V072

The Role of Rurality on Subjective Sleep and Objective Cognition in Middle-Aged and Older Adults. MADISON MUSICH, *University of Missouri,* AMY COSTA, *University of Missouri,* PUJA HALDER, *University of Missouri,* ASHLEY CURTIS, *University of Missouri* — Despite known independent associations of rurality and sleep on cognitive function in aging adults, studies examining the interactive association is limited. We aimed to determine whether rurality impacts the relationship between sleep and cognition in aging adults. Participants (N=61) aged 50+ years completed measures of subjective sleep (Pittsburgh Sleep Quality Index; sleep efficiency and duration subscores) and objective cognition (Sternberg working memory, Posner attentional orienting, and Stroop interference). Self-reported zip codes dichotomized rural/non-rural areas. Rurality moderated the association between sleep efficiency and Sternberg as well as Posner exogenous orienting performance. For those residing in rural areas, worse sleep efficiency was associated with worse Sternberg (β=-0.11, p=.05) and Posner (β=18.78, p<.01) scores. Findings suggest that it may be important to identify and treat poor sleep health in aging adults residing in rural areas to potentially help mitigate cognitive decline. Future studies should examine rurality characteristics (e.g., limited healthcare access and social support) that may play a role in the sleep/cognition relationship.

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V073

The Development of Spatial Organization in Visual Working Memory in Middle Childhood. NETA GOROHOVSKY, *The Hebrew University of Jerusalem,* HAGIT MAGEN, *The Hebrew University of Jerusalem* — Research in visual working memory (VWM) in adults has shown that visual items are maintained as integrated spatial configurations. Moreover, when participants construct VWM representations themselves (in self-initiated [SI] VWM), they form spatially structured representations, even when space is task irrelevant. Less is known about the spatial structure of VWM representations in children. We recently showed that children 7-10 years old formed spatially structured SI memory representations, that enhanced performance, when space was task relevant. Here we asked whether children would invest resources and form spatially structured representations, when space was task irrelevant. Forty children (7-10 years old) memorized arrays of 1-7 real-world objects they selected themselves, or random arrays provided to them. They were probed on the identity of a single object that appeared at the center of the screen. The results showed that all children constructed spatially structured representations. SI benefited memory performance mostly in the younger children, who were overall less accurate in the VWM task. Thus, children organize their environment in a spatially structured way, even when space is not directly related to task performance.

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V074

Sleep Disparities in Adolescents: Does Stress on Sleep Change Brain Connectivity and Academic Performance? LAUREN E. BARAN, *University of Delaware,* STEPHANIE DEL TUFO, *University of Delaware* — Low sleep duration during early adolescence increases risk of developing psychiatric disorders, cognitive problems, and diminished academic performance (Cheng et al., 2020). These findings are particularly concerning for racial and ethnic minority adolescents due to their increased risk of low sleep duration (Singh et al., 2013). Using the Perfect Storm Model (Carskadon, 2011) to guide our research, we aimed to elucidate how the physiological impact of stress on sleep impacts the brain differentially by race and ethnicity. Resting-state functional connectivity was employed to examine the intrinsic connectivity of a large sample of early adolescents included in the NIH ABCD Study (ABCD Study®). Stress and sleep were found to be jointly and independently connected to

the brain's intrinsic connectivity. These findings have the potential to bring to light protective factors that may reduce the effects of stress on sleep, particularly in those most likely to be negatively impacted by low sleep duration.

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V075

Social Influences on Implicit Causality Judgements. NAFISEH FAGHIHI, *Texas A&M University,* JYOTSNA VAID, *Texas A&M University* — Besides linguistic features of verbs (i.e., type and valence), implicit causality judgments are found to be affected by higher cognition through the perceived social power (e.g., a doctor vs. a nurse) held by the subject versus the object in an interpersonal interaction. Similarly, perceived gender of subject and object has been hypothesized to affect attributions of causality but the findings in the literature are quite mixed. Previous research on the effect of social influences through the perceived gender of interactants did not account for individual differences in stereotypical beliefs of participants. Holding less or more stereotypical views towards women could arguably influence attributions of causality to men versus women and not controlling for it could result in mixed findings. We administrated the Ambivalent Sexism Scale after an implicit causality task in which the gender of subject and object were experimentally manipulated. The findings are discussed in terms of linguistic and social influences on implicit causality judgements.

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V076

Decision Criteria in Signal Detection Model Are Not Based on the Objective Likelihood Ratio. XIAO HU, *Beijing Normal University,* CHUNLIANG YANG, *Beijing Normal University,* LIANG LUO, *Beijing Normal University* — How people set decision criteria in signal detection model is an important research question. The likelihood ratio (LR) theory, which is one of the most influential theories about criteria setting, assumes that (1) decisions are based on the objective LR of the two stimulus categories (signal and noise), and (2) LR criteria do not change across tasks with various difficulty levels. However, it is often questioned whether people are really able to know the exact shape of signal and noise distributions and obtain the objective LR. Here we asked participants in three experiments to perform memory or perceptual tasks with two difficulty levels and give their answer using a confidence rating scale. We found that the two assumptions of LR theory contradicted each other: if we assumed decision criteria were based on objective LR, then the computed LR criteria differed across difficulty levels and fanned out as task difficulty decreased. This result could be explained by a modified LR theory suggesting that decision criteria were based on subjective (rather than true) LR, and people might incorrectly estimate the distance between signal and noise distributions. Our study suggests decision criteria may not be based on objective LR.

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V077

Exploring Individual Differences in Preferences for Prolonged Uncertainty. LILY FITZGIBBON, *University of Stirling* — Responses to uncertainty are increasingly recognised as important predictors of both learning (e.g., curiosity) and wellbeing (e.g., intolerance of uncertainty; IU). States of curiosity, resulting from exposure to uncertainty-eliciting stimuli such as blurred images and trivia questions can lead to improved memory performance (Gruber, 2014; Jepma et al., 2012), but it is not known whether trait preferences for uncertainty modulate this effect. In the current study, we examined whether trait measures of responses to uncertainty predict preferences for remaining in a prolonged state of uncertainty and associated memory benefits in a blurred images task. Seventy participants completed trait measures of curiosity and IU and a task in which blurred pictures were revealed either immediately or slowly, first in a blocked design and then freely chosen to assess preferences. A free recall test assessed memory for the images. Neither trait curiosity nor IU predicted choices for prolonged states of uncertainty (slow image reveal). Replicating previous findings, participants remembered more of the slowly revealed images than the immediately revealed images, but this was not modulated by individual differences in curiosity or IU.

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V078

Exploring the Impact of Processing Fluency on Perceived Trustworthiness Through the Lens of Facial Androgyny. JEEVAN S. BAINS, *University of British Columbia,* NATHAN CASSIDY, *Kwantlen Polytechnic University,* CARLA MACLEAN, *Kwantlen Polytechnic University,* DANIEL BERNSTEIN, *Kwantlen Polytechnic University,* DANIEL DERKSEN, *Simon Fraser University,* DEBORAH CONNOLLY, *Simon Fraser University,* JUSTIN KANTNER, *California State University, Northridge* — Processing fluency refers to the ease with which people process information. People perceive fluently processed information as more credible. We examined whether the categorization of androgynous faces by gender triggers disfluency, and whether people interpret this disfluency as a cue that androgynous faces are less trustworthy than relatively easy-to-process gendered faces. We collected reaction times as participants classified androgynous and gender-typical (male/female) faces either by gender or by race (control condition). Following this categorization task, all participants rated the perceived trustworthiness of each face. As predicted, androgynous faces elicited slower responses than gender-typical faces when classified by gender. We did not, however, observe the predicted link between disfluency and distrust. That is, slower responses during the gender categorization task were not associated with lower ratings of perceived trustworthiness for androgynous faces.

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V079

Illusory Truth and Dunning-Kruger Effects with Psychological Misconceptions. DUSTIN P. CALVILLO, *California State University San Marcos* — The illusory truth effect occurs when exposure to information increases belief in it. In the present study, 198 psychology students rated their interest in 16 psychological misconceptions, half of which were worded so that they were true but commonly disbelieved ("Adult humans can grow new brain cells") and half were false but commonly believed ("Most people use only about 10% of their brain power"). Participants then rated the truth of 32 misconceptions: 16 they previously rated for interest and 16 new statements. Participants believed previously rated statements more than new statements, consistent with the illusory truth effect. Participants also judged their performance on the truth rating task. With these ratings, participants demonstrated a Dunning-Kruger effect: those who performed the worst overestimated their performance the most. These results demonstrate that exposure to psychological misconceptions increases belief in them and that people who believe most in misconceptions are confident in their beliefs.

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V080

Faces Judged Criminal and Threatening When "Less Human": Race Matters. HEATHER M. KLEIDER-OFFUTT, *Georgia State University,* ASHLEY M. MEACHAM, *Georgia State University* — Police sketch software (e.g., Identikit) creates suspect faces from a bank of facial features; the result is an unrealistic looking face that then is distributed for identification purposes. The "humanness" of faces is tested for robots/video games to ensure the target faces are likeable (the Uncanny Valley phenomenon). In this study, we tested the relationship between uncanny valley and judgments of criminality and threat on validated neutral, computer-generated faces of Black and White men. Results showed that when stimuli were judged as less human and eliciting negative feelings and judgments, White faces appeared more criminal and threatening while experiences of uncanny valley did not influence these judgments for Black faces. Moreover, Asian relative to non-Asian participants judged all the faces as more threatening and criminal; however, "humanness" reduced crime related judgments for White but not Black faces. Findings suggest that bias towards sketch software images may influence memory for criminal suspects. Implications for law enforcement procedure are discussed.

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V081

Messy Background, Messy Mind: Consequences of Background on Perceptions of Witnesses. BETHANY R. MUIR, *The Australian National University,* ERYN NEWMAN, *The Australian National University,* NORBERT SCHWARZ, *University of Southern California* — In 2022, we communicate regularly using remote platforms. In most cases, the spaces in which we appear have nothing to do with what we are saying, yet we are often given advice about how we should set up our backgrounds. When appearing online, people are often told to clean up the space behind them – suggesting that mess can be a potentially harmful social cue. But what does empirical research tell us about the impact of backgrounds on perceptions of a speaker and what they are saying? We systematically investigated whether backgrounds, specifically, mess in backgrounds, influence how people are perceived. We address these questions through two mock-juror experiments (total N = 600). Participants read witness statements from people with messy or clean backgrounds, and were asked to provide credibility ratings of each witness. We found that messy cues in backgrounds can negatively impact how credible a witness seems, even when participants were aware that the witness spoke from a room at work and had no control over the mess. This is important to consider for future policy development in virtual spaces, as it suggests that the advice people are receiving about cleaning up the mess behind them, may have some empirical backing.

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V082

Spillover Bias in Judgments of Group Diversity: A Potential Boundary Condition. SAMANTHA P. NAVARRO, *California State University, Fresno,* PAUL C. PRICE, *California State University, Fresno* — In two previous studies, we found that judgments of the racial and ethnic diversity of groups of faces were affected by irrelevant color variability within the stimulus display (i.e., colored frames around the faces and colored spots in the background). The present study explored whether this diversity spillover bias extends to judgments of the racial and ethnic diversity of groups of names. Eighty-two participants judged the ethnoracial diversity of several lists of names that varied in their level of ethnoracial diversity (i.e., low, medium, high). The names on each list appeared in one color (i.e., low color variability) or in three different colors (i.e., high color variability). A 3x2 repeated-measures ANOVA showed that there was a strong effect of objective ethnoracial diversity, $F(1,81) = 180.04$, $p < 0.001$, but there was no effect of color variability, $F(1,81) = 0.80$, $p = 0.38$. This suggests that the diversity spillover bias may be limited to situations in which the diversity judgment is based on variability that is directly perceived (e.g., variability in skin tone, hair color, etc.) as opposed to variability that must be inferred (e.g., racial and ethnic identification based on names).

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V083

Information Sampling in Correlation Judgment. LISHENG HE, *Shanghai University,* XIUMEI ZHANG, *Shanghai International Studies University,* HONGYI WANG, *East China Normal University,* SUDEEP BHATIA, *University of Pennsylvania* — Decision makers underestimate the correlations in 2D scatterplots and display a number of estimation biases owing to the visual features of the graph. To name a few, the underestimation bias is stronger when the scatterplot is displayed in a landscape view (i.e. long horizontal axis) than in a portrait view (i.e. long vertical axis). The underestimation

bias decreases as the range of axes increases. Yet, it is unclear how these systematic biases arise. Here, we propose that decision makers are Bayesian learners who perform "mental regression" using the observed data points in the graph. Accordingly, judgment errors can arise from biased information sampling. We test our model's predictions in three eye-tracking experiments and find that the Bayesian learning model trained on subjects' observed data points in the graph replicates classic behavioral findings. The model also predicts trial-level estimation biases with high accuracy. Our study shows how computational models trained on process-level data can shed light on the cognitive mechanisms underlying belief formation, and yields theory-driven practical implications for data visualization and statistical communication.

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V084

Experience of Control and Responsibility over Shared Monetary Outcomes: The Effects of Outcome Value and Gain Probability. ZEYNEP BARLAS, *De Montfort University* — Previous views suggested a close relationship between the experience of control and feeling of responsibility over the consequences of one's actions. The current study investigated this further in a joint action context where outcome value (gain vs. loss) and gain probability (80%, 50%, 20%) were manipulated. Participants completed an online card selection game with the goal to increase their shared sum with an alleged co-player. In each trial, both players viewed a deck of ten cards followed by the co-player highlighting their choice. Participants then performed the final selection which produced either some gain (£0.2) or loss (-£0.2) depending on the gain probability and rated the degree of control and responsibility they experienced over each outcome. A strong and positive correlation was found between the control and responsibility ratings, both of which were higher over gains than losses and in the 80%-gain than the 20%-gain condition. Both ratings were also greater when participants chose a different card than advised by the co-player, but only in the 80%-gain condition. Finally, gains compared to losses in previous trials led to stronger experience of control and responsibility in current trials. These results suggest that the mechanisms underlying the experience of control and responsibility in joint actions are vulnerable to self-serving bias and similarly influenced by contextual and situational cues pertaining to action outcomes.

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V085

Predicting Myside Biases in Covid-19 Death Estimates. AUSTIN L. KATZ, *University of South Florida,* BRITTNEE HAMPTON, *University of South Florida,* SANDRA L. SCHNEIDER, *University of South Florida* — Myside biases occur when belief-consistent information is relied on more heavily than counter-attitudinal information. We examined whether Covid-19 beliefs, news source preferences, or political party affiliation could predict myside biases in current U.S. Covid-19 death estimates during spring 2021. We expected that stronger convictions and preferences would predict greater inaccuracy in current domestic death estimates. Unexpectedly, all groups tended to underestimate the number of Covid-19 deaths. Nevertheless, we found that perceived Covid-19 threat weakly predicted myside biases, with the strongest tendency to underestimate deaths among those with lower perceived threat. Contrary to expectation, myside biases were not observed based on differences in political leaning or news source preference, with estimates varying widely regardless of propensities. Results indicated that myside biases may not always occur. Perceived threat weakly predicted myside biases; however, less proximal tendencies such as political affiliation and preferred news source did not. Nevertheless, most estimates were well under the true count, suggesting there are other sources of inaccuracy in these estimations.

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V086

Artificial Intelligence in Medicine: The Influence of Medical Expertise, AI Knowledge, and Confidence in AI Knowledge on AI Risk/Opportunity Perception. NADIA SAID, *University of Tübingen,* LEA SCHUMACHER, *University of Tübingen,* MARKUS HUFF, *Leibniz-Institut für Wissensmedien Tübingen* — Artificial intelligence (AI) is increasingly used in medicine, making it one of the largest and fastest-growing fields in which AI is applied. While research has shown that some AI-based applications are already outperforming experts regarding diagnostic accuracy, patients' trust in AI, for example, is still comparatively low. Given the tremendous potential of medical AI applications, understanding what influences patients' and doctors' perceptions of medical AI is of utmost importance. To this end, we assessed for N =750 participants (N = 684 laypeople and N = 66 medical experts) whether medical expertise, AI knowledge, and confidence in AI knowledge are related to the perception of risks and opportunities. Opportunity perception increased with higher AI knowledge and confidence in AI knowledge but was not related to medical expertise. On the other hand, risk perception increased with higher medical expertise and decreased with higher AI knowledge. Therefore, when introducing and using medical AI applications in the treatment of patients, it is essential to sensitize both patients and medical experts to the different perceptions. Such measures can be an important prerequisite for increasing AI acceptance in medicine.

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V087

Music to Your Ears: Effects of Musical Experience on Prosody in Sentence Production. REBECCA TEGIACCHI, *Union College,* TIM GEORGE, *Union College* — Previous research suggests overlap between language and music processing, including evidence that comprehension of prosodic elements of language (e.g., tone, rhythm) is enhanced in those with musical training. The current study examined whether prosodic production may be enhanced in musicians. Musicians and non-musicians read a series of target

sentences aloud for recording. Each target sentence was preceded by one of two context sentences (not read aloud). The meaning of the target sentence was dependent on the context, such that prosodic cues could disambiguate the meaning (e.g., "Wow what a beautiful day" either paired with the context of a sunny day or a rainy day). A separate group of blind raters rated each sentence recording on which context they believed the sentence was paired with. Musicians produced sentences that were more accurately rated by the raters compared to non-musicians. There were also positive correlations between music knowledge and experience and the accuracy of the sentence ratings. This suggests that musicians are not only more sensitive to prosodic cues in speech comprehension, but they also use prosodic elements to more clearly convey meaning.

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V088

Effects of Musical Irregularity on Linguistic Syntax and Semantic Ambivalence. GUSTAVO GAUER, *Universidade Federal do Rio Grande do Sul,* GUILHERME LANNIG, *Universidade Federal do Rio Grande do Sul* — Syntactic structure is a common feature of linguistic and musical objects. A common neurocognitive circuit for syntax in language and music has been hypothesized. If processing irregular musical and linguistic stimuli compete for the same resources, their concomitant presentation is expected to influence processing. However, semantic ambiguity might also play a role in their interaction. Twenty-one participants completed an online experiment. We used 3 types of sentences: Correct; Incorrect; and Ambiguous (garden-path sentences). Musical sequences could be Regular or Irregular, with an unexpected chord replacing the final tonic. Each trial consisted of a sentence of 8-10 phrases/clauses, 6 blocks of 12 trials. Phrases were sequentially presented for 1.5s, simultaneously with a chord. Participants pressed the spacebar to proceed to the next phrase, with Reaction Times recorded. They were instructed to focus on the meaning of sentences and ignore the musical stimuli. Our results showed that garden-path ambiguity, but not syntactic irregularity, significantly slows down reading times compared to regular syntax; musical irregularity had similar effect, but no interaction between musical and linguistic syntax was observed.

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V089

Rapid Acquisition of Implicit Absolute Pitch Memories. JAMES T. MANTELL, *St. Mary's College of Maryland,* MEARA R. JOHNSON, *St. Mary's College of Maryland,* JAMES C. ATWELL, *St. Mary's College of Maryland* — Although most listeners cannot identify the key signature of familiar music, they can identify familiar music that has been pitch-shifted such that it appears in a different musical key (Schellenberg & Trehub, 2003). In our preregistered study, we investigated whether listeners can encode implicit absolute pitch memories within a single listening session. Forty-two participants listened to four exposures of eight unfamiliar, instrumental music excerpts and rated the excerpts on familiarity, memorability, enjoyability, and uniqueness. Next, participants heard sound pairs including each excerpt in its original key along with a version that was pitch-shifted by two semitones; they were tasked with identifying the original version. Listeners selected the original excerpt significantly more often than chance, revealing that long-term exposure is not required for the acquisition of implicit absolute pitch memories. We plan to continue our investigation of the stimulus and attention factors that affect the development of absolute pitch memories.

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V090

Sorting Perceived Similarity of Timbres Using DiSTATIS. KIETH GRYDER, *The University of Texas at Dallas,* WALTER JAY DOWLING, *The University of Texas at Dallas* — Participants sorted 21 instruments into groups based on the perceived similarities of the timbres. Participants were allowed to group the instruments by any criteria they found appropriate and were given minimal limitations. The data were analyzed with DiSTATIS, which is an analysis that combines multidimensional scaling with principle component analysis. Participants made a clear distinction between wind and non-wind instruments. String and percussive instruments were more clearly sorted than wind instruments, the latter of which tended to be grouped together regardless of the type of wind instrument (e.g., brass vs woodwind). When considering participant comments of their grouping strategies, it seems that participants tended to group instruments by instrument families if possible, then by other attributes if they could not identify the instrument.

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V091

Phonological Planning Among Cantonese-English Bilingual Speakers: An ERP Study. ANDUS WING-KUEN WONG, *City University of Hong Kong,* TERRI YUEN-KING NG, *City University of Hong Kong,* YIU-KEI TSANG, *Baptist University of Hong Kong,* HSUAN-CHIH CHEN, *The Chinese University of Hong Kong* — Findings from the speech production research suggest that the nature of phonological planning units is language-specific, with phonemes as the planning units in Dutch and English but syllables in Cantonese and Mandarin Chinese. Little is known about how multilingual speakers possessing languages with distinctive phonological planning units plan for their speech. This study was conducted to investigate the roles of syllable and phoneme in Cantonese (L1) and English (L2) production among Cantonese-English bilinguals (N=26) using the form-preparation task with concurrent ERP recording. Significant priming on naming latency was found when the response words shared the same word-initial syllable but null effects were found when they shared merely the same word-initial phoneme in both L1 and L2 production. Critically, reliable ERP effects were found in the phoneme overlap condition among participants who had lived in an English-speaking country. These results suggest that the nature of the phonological units used in L2 production is primarily determined by the features of L1, and that one's experience of living

in an immersive L2 English-speaking environment may encourage the use of phonemes as the planning units in speech production.

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V092

The Roles of Radicals and Logographemes in Planning Chinese Handwriting. JIE WANG, *The Education University of Hong Kong,* LEQI CHENG, *The Education University of Hong Kong,* URS MAURER, *The Chinese University of Hong Kong,* SUIPING WANG, *South China Normal University,* HSUAN-CHIH CHEN, *The Chinese University of Hong Kong* — The current study investigated the word-form encoding process during Chinese written word production. Written Chinese is formed by square-shaped characters. These characters usually consist of a semantic radical and a phonetic radical, which often can be further decomposed into logographemes. The radicals provide a cue to the meaning (semantic radical) or pronunciation (phonetic radical) of the character, while logographemes are stroke patterns recurring in different characters independently. The current study adopted the form-preparation paradigm, which required participants to write down target characters in a homogeneous context, with all the target items sharing a radical or a logographeme, and a heterogeneous context with unrelated target items. The results showed a robust facilitation effect of shared radicals and a significantly weaker effect of shared logographemes, suggesting a more prominent role of radicals as planning units of Chinese handwriting than that of logographemes. The results of Mainland and Hong Kong Chinese participants were compared, who used simplified and traditional Chinese scripts respectively.

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V093

Relationship of Rapid Automatized Naming and Character Writing in Children Learning to Read Chinese. HSIN-CHIN CHEN, *Nathional Chung Cheng University,* ZIH-YUN YANG, *National Chung Cheng University* — Studies on learning to read have suggested that reading acquisition is associated with rapid automatized naming (RAN); however, few studies have examined the relationship between RAN and Chinese character writing even though studies have suggested that reading depends on writing at least in Chinese (e.g., Tan et al., 2005). The purpose of the present study was thus to examine the unique contribution of RAN on character writing in children learning to read Chinese. Second graders with normal IQ were recruited. Several tests including working memory, Chinese character recognition, number RAN, and Chinese dictation were administered. Both analyses of correlation and hierarchical multiple regression were conducted. After controlling for age, gender, and working memory, performance of RAN independently predicted Chinese dictation over and above Chinese character recognition. The present results suggested that character production may associate with aspects of language fluency not shared with character recognition in Chinese acquisition.

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V094

Exploring the Dynamics Underlying Taxonomic and Thematic Semantic Organization in Picture Naming. MINGJUN ZHAI, *Rice University,* CHEN FENG, *Chinese Academy of Sciences,* QINGQING QU, *Chinese Academy of Sciences,* SIMON FISCHER-BAUM, *Rice University* — Semantic knowledge about concepts has been argued to be organized in different ways: based on shared features (taxonomic relations) or based on co-occurrence in common scenes and scenarios (thematic relations). The present project focuses on the flexible use of taxonomic and thematic organization in the context of different task demands. Our approach is to apply representational similarity analysis (RSA) to EEG datasets collected in a series of picture naming tasks. Task demand was manipulated by including different types of relationships in different experiment blocks, either taxonomically or thematically related blocks, or unblocked picture naming data. Using RSA, we examined the pairwise similarity in scalp-recorded amplitude patterns at each time point following the onset of the picture and relate it to theoretical taxonomic/thematic measures. With this approach, we found that picture naming relies on taxonomic knowledge more than thematic knowledge of objects, regardless of the task demands.

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V095

ERP Evidence for Classifier Processing in Second Language Noun Phrase Production. SHAOYU WANG, *Leiden University,* NIELS O. SCHILLER, *Leiden University* — This study explores the processing of lexico-syntactic classifier features in Dutch late learners of Mandarin from a behavioral and an electrophysiological perspective. Native Dutch participants overtly produced noun phrases in Mandarin while their electroencephalography (EEG) was monitored in a picture-naming task. We manipulated classifier congruency and semantic relatedness using a picture-word interference paradigm. Naming latencies were faster in classifier-congruent and semantically unrelated conditions compared to classifier-incongruent and semantically related conditions. Electrophysiological data yielded N400 effects, supporting the behavioral results. Our findings provide evidence that classifier features and lexical nodes are activated and selected in noun phrase production by non-native speakers, suggesting that Dutch learners of Mandarin are sensitive to classifier congruency and semantic relatedness in a second language. Our study extends the scope of language production models to include classifiers as lexico-syntactic features to improve the power of theoretical interpretation and enables further cross-linguistic explorations of Mandarin and other Indo-European languages.

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V096

Can Embodied Cognition Be Quickly Recalibrated? A Study on the Impacts of Reading Direction Congruency on Memory Retrieval. HYOJI HA, *Ewha Womans University,* HWAJIN YANG, *Singapore Management University,* SUJIN

YANG, *Ewha Womans University* — Language and embodied cognition can shape our perception of the world. We examined the influence of reading direction—left-to-right (LTR) or right-to-left (RTL)—on spatiotemporal memory. Thirty-nine LTR participants completed ten blocks. Each block comprised a five- or seven-stimuli video presentation followed by nonverbal memory tests. Except for the last two mixed blocks, the first eight blocks alternated between LTR (congruent to the reading direction) and RTL (incongruent). After controlling for handedness and WM, participants only had significant switching costs in two shifts (from block1 to block2, p=.023, and from block 5 to block 6, p=.000) and adjusted quickly in the others. Significant interaction with reading direction congruency was found, p=.009. The effect was more pronounced with a larger number of stimuli, p=.008. This result indicates two elements that make adjustment difficult. Our findings suggest cognitive embodiment quickly recalibrates when linguistic variations exist, lending support for linguistic relativity.

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V097

How Do Arabic Speakers Conceptualize Time? JUANA PARK, *American University of Sharjah,* TALINE DIA, *American University of Sharjah,* ZAINAH AL-JUNDI, *American University of Sharjah* — The conceptual metaphor theory states that metaphors help us understand complex abstract concepts by representing them in terms of concrete concepts (e.g., people talk about the abstract concept of time using vocabulary related to space, such as in The meeting date is far away). Previous studies suggested that the embodiment of these temporal metaphors is determined by the writing direction (e.g., when Chinese speakers are asked to arrange cards depicting stages of development of plants and animals, they do it from top to bottom, whereas English speakers arrange them from left to right). We want to investigate how the embodiment of the mapping between time and space occurs in Arabic speakers. Given that Arabic is written from right to left, we expect Arabic speakers to equate the past with their right side and the future with their left side when arranging cards depicting scenes of a story in chronological order.

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V098

Readers Use Characters' Identity as Context in the Processing of Ironic Language. NICOLE CALMA-RODDIN, *New York Institute of Technology,* SUSAN E. BRENNAN, *Stony Brook University* — To understand the statement "What a beautiful day!" as ironic, one must have some contextual knowledge. One might have information about the state of the world, such as the fact that it is raining out, or about the speaker, such as that they love rain. In prior studies of ironic language, often, stimuli have been constructed so that part of the context or part of the target statement varies to produce the desired sincere vs. ironic interpretation. In the current study, our stimuli are dialogues between opposite-stereotyped characters to allow for both the context and target statements to be held constant, with the desired sincere vs. ironic interpretation hinging only on the speaker's identity. In two experiments we: (1) ask participants to read dialogues while we measure reading times and (2) ask participants to read dialogues and rate target (and filler) statements based on how ironic each statement is coming from the given speaker. Results show to what degree people are able to use only the speaker's identity to determine whether a statement is ironic or sincere and the time course of such a determination.

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V099

Exploring the Interaction Between Semantics and Phonology in Traditional Chinese Character Naming. YEN-HAN CHEN, *National Cheng Kung University,* YA-NING CHANG, *National Chen Kung University* (Sponsored by Ya-Ning Chang) — Studies in Chinese character naming demonstrated a null effect of the interaction between phonetic consistency and imageability in contrast to the findings in studies in English. The result was interpreted as access to entire word meanings would not be moderated by phonological processing. However, most evidence was based on a small sample size using factorial designs. Moreover, various lexical-semantic variables (e.g., age of acquisition, AoA) have been associated with different levels of semantic processing, which has not been properly investigated. To resolve these issues, multiple regression analyses were conducted to investigate imageability and AoA separately and their relationships with consistency using a large-scale Chinese character naming database. The results demonstrated a null effect of an interaction between consistency and imageability, while a significant interaction effect between consistency and AoA. Overall, the results demonstrated an interplay between phonological and semantic processing in Chinese character naming, depending on different levels of semantic access.

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V100

Keeping Information in Mind: Can Spontaneous Refreshing Really Be Used Before Adulthood? BEATRICE VALENTINI, *University of Geneva,* EVIE VERGAUWE, *University of Geneva* — Several mechanisms are assumed to support the substantial improvement in working memory observed during childhood. One of them is attentional refreshing. Refreshing is an attention-based maintenance mechanism that improves the accessibility of working-memory representations. It is assumed to operate serially, with attention cycling from one mental representation to the other, in order to sequentially reactivate every to-be-maintained list item. Although it has been suggested that the efficiency of refreshing increases between 7 and 14 years old, recent results seem to contradict this notion. In fact, by using a recently-developed index to detect the occurrence of refreshing, i.e., the last-presented benefit, no sign of attentional refreshing was found until the age of 11 (Vergauwe et al., 2021). Here, we present a set of studies manipulating the time available to engage in refreshing, to examine when spontaneous attentional refreshing occurs in children of different age groups (i.e., 7-8

years-old, 11-12 years-old, and 14-15 years-old). Our results seem to suggest that refreshing is not as generalizable as originally thought.

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V101

Careful with That! Neurocognitive Mechanisms of Reading Impairment and Their Impact on Hazard Avoidance While Driving. LORENA A. ARNAL, *Nottingham Trent University & Universidad Autónoma de Madrid,* DAVID CRUNDALL, *Nottingham Trent University,* KATHERINE BAILEY, *Nottingham Trent University,* JAVIER ROCA, *Universitat de València,* PILAR TEJERO, *Universitat de València* — Hazard avoidance is a crucial driving-safety skill that includes locating, processing, and prioritizing hazardous precursors, and which leads to mitigating and evasive responses to on-road dangers. Understanding individual differences in hazard avoidance is vital for us to understand collision risk. In particular, recent theories suggest that the driving activity could impose a particular burden on the cognitive processing system of adult drivers with dyslexia as a result of alterations in the neurocognitive mechanisms related to attentional functions. However, it is still unknown whether such alterations would also impact on hazard awareness. The current study compares the hazard awareness scores of 2 driver groups (with/without reading impairment, as measured by the Rapid Online Assessment of Reading: ROAR) and attempts to predict hazard performance from ROAR scores. The results will be discussed in regard to their implications for hazard awareness assessment and training, and in terms of our wider understanding of the neurocognitive mechanisms of reading impairment.

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V102

The Influence of Mood on Comprehension and Emotional Word Recognition in Computerized and Traditional Reading Tasks. CHERYL TECHENTIN, *Mount Royal University* — The current study examines the relationship between mood, reading comprehension and the processing of emotional words in both a computerized and traditional reading task. Participants in each condition were asked to complete the POMS before reading an emotional short story After completing reading comprehension questions, they were presented with lists of emotionally valanced words (positive, negative, and neutral) and asked to identify those words that were in the story they read. Although no difference was found in reading comprehension, participants in both groups correctly identified more negative words than positive words from the story. In the computerized reading task, those who scored higher on the POMS were less accurate and slower to identify negative words from the text. No significant correlation was found between mood and the identification of positive words. Discussion focuses on how mood state may influence the processing of emotional information from computerized sources such as ebooks.

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V103

How Readers Build and Use Morphological Knowledge. SHAUNA DE LONG, *Kenyon College,* JOCELYN R. FOLK, *Kent State University* — Following up de Long and Folk (2021), the current research investigated the durability of incidentally learned word knowledge (spellings and meanings). Participants were presented with novel monomorphemic words (breese) in semantically informative sentences, followed by recognition posttests. One day later, participants completed delayed posttests. Participants were then presented with novel compound words (breesebin) in sentences that were semantically informative with transparent morphology (breesebin = fish storage), sentences that were semantically informative with opaque morphology (breesebin = alleyway), or sentences which were semantically uninformative, followed by final recognition posttests. Performance on these posttests was compared to a baseline condition in which participants were never exposed to the monomorphemic words and instead only learned the compound words. The results indicated that readers can remember incidentally learned monomorphemic words across a delay, and even after the delay, those lexical representations are strong enough to support the learning of bimorphemic transparent words and impede the learning of bimorphemic opaque words.

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V104

Individual Differences in Phonological Parafoveal Preview Effects. MEGAN E. DEIBEL, *Kent State University,* JOCELYN R. FOLK, *Kent State University* — Readers can use parafoveal information about upcoming words before their eyes land on the word. This results in facilitated word processing when the previewed word is subsequently fixated. Previous research has found that low-skill readers do not extract upcoming phonological information like high-skill readers can (Chace et al., 2005). However, other research has found that low-skill readers can only extract upcoming orthographic information parafoveally when the currently fixated word has low foveal load, meaning it is easier to process (Andrews et al., 2015). The present study investigated if low-skill readers can also extract a word's phonological code from the parafovea when the currently fixated word is easy to process using a boundary change paradigm. Target words were substituted parafoveally with primes (which were identical, a homophone, an orthographic control, and a random consonant string) prior to fixating on the target word, and the word prior to the target was manipulated to have either high or low foveal load. Reader skill was also measured. We used fixation times and target word skipping to determine what information was extracted parafoveally, prior to fixation.

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V105

Self-Construal Predicts Reading Motivation: A Comparison Between Hispanic American and Japanese College Students. HITOMI KAMBARA, *The University of Texas*

at Rio Grande Valley, YU-CHENG LIN*, The University of Texas at Rio Grande Valley,* SACHIKO ADACHI*, Niigata University* — Self-construal refers to how individuals view themselves independently from others (Independent self-construal) or interdependently with others (Interdependent self-construal). Although the self-construal theory claimed a connection between self-construal and motivation, none of studies explored the relation between self-construal and reading motivation. To bridge the gap, this study examined country and gender differences in self-construal and reading motivation of 236 Hispanic American and 114 Japanese college students. Additionally, we investigated the relation between self-construal and reading motivation. Our data indicated that country and gender modulated reading motivation, particularly reading efficacy. Furthermore, self-construal significantly predicted reading motivation regardless of country or gender. Specifically, Hispanic American and Japanese students with higher independence showed higher reading efficacy, whereas students with higher interdependence exhibited lower reading efficacy. This is the first study to reveal the close relation between self-construal and reading motivation in the field of social cognition and education.

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V106

Categorical Hierarchy Affects the Processing of Contrastive Focus. LIAN LIN*, Zhejiang Normal University,* SHUANG CHEN*, Zhejiang Normal University,* LIJING CHEN*, Fujian Normal University* (Sponsored by Shuang Chen) — Contrast elicited by focus requires the similarity and distinctiveness between contrastive elements. The present study tracked the eye movement during reading to explore the effect of hierarchical similarity between two elements on the ease to establish contrast. A 2 (Focus/Unfocused) × 2 (Similar/Dissimilar) within-subject design was used in two experiments, with concepts in the similar condition within a basic category. Dissimilar concepts belonged to different superordinate (Experiment 1) or different basic categories (Experiment 2). The focus was marked by "only." Experiment 1 showed that, except the Focus effect, similarity affected the processing of target words with more regression for the similar than dissimilar condition. In addition, Similarity interacted with Focus in the regression path duration. Moreover, the interaction also occurred in the post-target region. However, Experiment 2 only found the effect of Focus. The results verified Focus effect on reading comprehension. Furthermore, categorical hierarchy mediated the contrastive processing.

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V107

Force Dynamic Schemas and the Comprehension of Causal Language. DAWSON PETERSEN*, University of South Carolina,* AMIT ALMOR*, University of South Carolina* — The current study is an attempt to empirically test the predictions of Talmy's (1988) force dynamics (FD) which argues that causal sentences are understood by reference to basic image schemas. An unpublished study by Madden and Pecher (2010) attempted to prime the reading of causal sentences with animations referencing FD schemas but found no effect. The current study advances on M&P's methodology by turning the primes into short, interactive 2D games to increase the strength of the manipulation. Each prime was followed by the self-paced reading of a congruent, incongruent, or neutral sentence. We performed two experiments, one using concrete and the other abstract-metaphorical sentences. The first had 77 participants and the second had 82 participants. Data were analyzed using mixed-model regression. However, we found no priming effect from FD image schemas to sentence reading times. We have replicated M&P's (2010) null result. Given the results of a post-hoc power analysis and the strength of the manipulation involved in this study, we argue that that if a force dynamic priming effect exists, it is so small that it cannot contribute meaningfully to any theory of the processing of causal language.

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V108

The Role of Text Exposure on Language Comprehension. ANASTASIA STOOPS*, University of Illinois Urbana-Champaign,* ALYSSA CHOI*, Fordham University,* JESSICA L. MONTAG*, University of Illinois Urbana-Champaign* — Recent research has highlighted the large individual differences in even native adult speakers' knowledge comprehension of complex and simple syntactic structures (e.g. Dabrowska, 2012; Hulstijn, 2015; Kidd, Donnelly, Christiansen 2019). One source of these individual differences may be text exposure, or the amount of reading experience one has accumulated. In this study, we investigate text exposure as a source of individual differences in sentence comprehension in native English speakers to give insight into the relationship of language input, learner characteristics, and linguistic outcomes. Participants (n=420) virtually completed three assessments of reading experience: the author recognition test, vocabulary test, and a reading enjoyment survey. We then related those assessments of reading experience to participant reading times and accuracy of sentences that varied in syntactic complexity. Syntactically complex sentences took longer to read and more difficult to comprehend. Participants with more text exposure were faster and more accurate.

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V109

Does Speech Rate Predict Growth in Rapid Naming and Reading During Grades 2 and 3? MARJOLAINE COHEN*, University of Oslo,* ANGELIKI ALTANI*, University of Oslo,* KATERINA KATOPODI*, University of Athens,* GEORGE K. GEORGIOU*, University of Alberta,* ATHANASSIOS PROTOPAPAS*, University of Oslo* — Reading and rapid serial naming skills develop throughout the first years of schooling, with children rapidly gaining efficiency in both tasks, resulting in faster naming and reading times. Yet, it remains unknown if speech rate has an influence on rapid naming and reading growth. Recently, speech and reading rates have been associated in adults who are second language learners (Gagl et

al., 2022), suggesting that speech rate and reading may also be related in less efficient readers. This study investigates whether speech rate, assessed at the beginning of Grade 2, can predict the growth of rapid naming and reading through Grades 2 and 3. Two hundred forty-one Greek-speaking children took part in the study. They were assessed at the beginning of Grade 2, end of Grade 2, and end of Grade 3. Data are currently under processing. To address the research question, we will fit a latent change score model to speech rate, reading, and serial naming data. To assess the specificity of any speech rate effects on naming and reading growth, we will include additional control variables such as discrete symbol naming speed and nonverbal cognitive skills.

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V110

A Song to Remember? The Effect of Sung Misinformation on Memory. JOANNA K. ULATOWSKA, *Nicolaus Copernicus University,* MAGDALENA WOJCIECHOWSKA, *Nicolaus Copernicus University* — Music's effects on memory are twofold. On the one hand, music can facilitate learning. On the other hand, background music during encoding can decrease memory performance as it additionally engages the phonological loop. Less attention has been paid to false memory for music, and in the few studies of this type, music was usually used as original information rather than misinformation. Even rarer are studies in which misinformation is not only presented in audio format but also as a song (text + melody). In the current study, we aimed at testing how the memory of the original text will be affected by misinformation presented in pictorial format, or in a form of songs. The memory performance was tested with a forced-choice recognition test. The results are discussed in terms of the source monitoring framework.

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V111

Multinomial Processing Tree Modeling of Misinformation and Co-Witness Conformity Effects. ERIC MAH, *University of Victoria,* TIMOTHY FRIESEN, *University of Victoria,* BENNETT KING-NYBERG, *University of Victoria,* KELLY GRANNON, *University of Victoria,* ANDRES BALLESTEROS, *University of Victoria* — Misinformation and co-witness conformity effects describe the tendency to report non-witnessed post-event information on a final memory test after that information is presented by an experimenter or partner. These effects are commonly investigated in paradigms that elicit answers and confidence on 2AFC (original witnessed information, post-event misinformation) recognition memory tests. It is difficult to pinpoint underlying mechanisms (e.g., demand characteristics, source confusions, memory-impairment) from these data alone. We describe a multinomial processing tree (MPT) computational model that may provide more insight into these mechanisms. This model allows for estimation of parameters representing: memory for original and post-event information, endorsement of post-event information when both the original and post-event information is retrieved, guessing, and probabilities of high- and low-confidence responses given retrieval and non-retrieval. Via preliminary tests of this model, we show that the model adequately fits a number of co-witness and misinformation datasets. We discuss implications of estimated parameter values for theoretical accounts of these effects, as well as limitations of the model.

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V112

Investigating Warnings and Stress in a Misinformation Paradigm. ALIA N. WULFF, *Arizona State University,* JESSICA M. KARANIAN, *Fairfield University,* ELIZABETH RACE, *Tufts University,* AYANNA K. THOMAS, *Tufts University* — Eyewitnesses are likely to experience stress while witnessing an event, which could impact their initial report and influence susceptibility to misleading post-event information. In two experiments we investigated the impact of warnings and stress on eyewitness memory using a repeated retrieval misinformation paradigm. Participants first witnessed an event and took an initial test. They were then exposed to misinformation, followed by a final test. We induced stress between the original event and the initial test to investigate the impact of an acute stress response on initial retrieval and subsequent susceptibility to misleading post-event information. We warned people about the presence of misinformation in the post-event information immediately prior to the final test. Our results support that a warning given prior to final testing improves accuracy, even when eyewitnesses were stressed, while the stress response was found to have little impact on both misinformation susceptibility and initial memory accuracy.

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V113

False Recall in Working Memory. MARLENE ABADIE, *Aix-Marseille University,* VALÉRIE CAMOS, *Université de Fribourg* — There is growing evidence showing that semantic false memories can occur in working memory (WM) tasks with only a few semantically related words and seconds between study and test. Recently, Abadie and Camos (2019) proposed a new model describing the role of the two main WM maintenance mechanisms, namely articulatory rehearsal, and attentional refreshing, on the occurrence of false memories in recognition tests. The present study provided a new examination of the impact of these two WM mechanisms on the occurrence of false memories in recall tasks performed after a retention interval of a few seconds (immediate test) or later at the end of a block of several trials (delayed test). In the immediate test, semantic errors were more numerous when WM maintenance mechanisms were blocked. Specifically, articulatory rehearsal prevented the occurrence of semantic errors in the immediate test, while attentional refreshing had no effect on their occurrence in this test but increase them in the delayed test. These results support Abadie and Camos' (2019) model, indicating that distinct processes may underlie false memories when WM and LTM can be used, which is consistent with a dual view of memory.

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V114

Elimination of Continued Influence Effect of Misinformation by Strong Causal Explanation in Updating Information. LEE-XIENG YANG, *National Chengchi University,* CHIN-YEN CHIANG, *National Chengchi University* — The continued influence effect (CIE) of misinformation is referred to that the misinformation even after being retracted can influence people's memory retrieval and reasoning continuously. Psychologists have so far been able to reduce it but still cannot eliminate it. In this study, we manipulated the causal strength of the updating information from weak to strong in six conditions: fake-only (no updating information), retraction (declaring the misinformation is wrong), correction (pointing out the wrong statements in misinformation), low-causality (providing a weak causal explanation), high-causality (providing a strong causal explanation), and true condition (only the true information). The results showed that the participants' performance in the memory and reasoning tests after reading the materials was not different between the high-causality condition and the true condition, suggesting an elimination of CIE. Our results support the mental model account. In addition, a weak effect of working memory capacity on fighting against CIE was found.

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V115

"Have I Seen That Before?" Enhanced Recognition (with a Remember Experience) for Potential Sources of Contamination. SÓNIA M. P. SANTOS, *William James Center for Research, University of Aveiro,* NATÁLIA L. FERNANDES, *William James Center for Research, University of Aveiro,* JOSEFA N S. PANDEIRADA, *William James Center for Research, University of Aveiro* — From a functional perspective, memory should be tuned for disease-threats, aiding their avoidance and, thus, increasing one's chances of survival. Accordingly, studies have reported a memory advantage in free recall tasks for potential sources of contamination – the contamination effect. Using a procedure inspired by the law of contagion (i.e., objects become contaminants/remain neutral when paired with pathogenic sources/non-pathogenic sources), we explored this effect in recognition memory. During encoding, participants saw objects paired with sick or healthy faces and then identified who touched each object. Later, they responded to a surprise old/new recognition task. Items identified as old were followed by a remember/know judgment. People recognized more items previously paired with sick (vs. healthy) faces. Remember judgments occurred more often when recognizing objects associated with sick faces, whereas know judgments were more frequent for objects associated with healthy faces. These results suggest that the mnemonic tuning to potential sources of contamination extends to the less effortful recognition memory. Also, the richer recognition experience should promote the avoidance of potential health threats.

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V116

Facilitation of Face and Voice Recognition via Multisensory Encoding. JOSHUA TATZ, *University of Iowa,* ZEHRA PEYNIRCIOGLU, *American University* — In a study comprising four experiments, we showed that studying unfamiliar face/voice combinations (visual/auditory information in a multisensory context) compared to studying the faces alone or the voices alone benefitted subsequent episodic recognition of just faces or just voices. Studying the same items with additional unisensory information did not benefit (and even impaired) subsequent recognition, underscoring the unique contribution of encoding items within a multisensory context. Further, multisensory facilitation effects occurred only when unisensory recognition levels were lower and thus were much more robust for voice items. These results were consistent with the principle of inverse effectiveness (e.g., Meredith & Stein, 1986), which states that multisensory information benefits weaker unisensory neural or perceptual responses more. Our findings thereby extend this principle to the domain of episodic memory, suggesting that it might be a broader organizing principle of brain and behavior.

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V117

Understanding the Temporal Dynamics of Schema-Memory Interactions via Computational Modeling. MICHELLE RAMEY, *University of Arkansas,* GRANT SHIELDS, *University of Arkansas* (Sponsored by Grant Shields) — When making memory decisions, we do not rely solely on our memory—we also draw heavily from our general knowledge of the world, or schemas. The mechanisms underlying this process, however, are not yet clear. In the current study, we developed a diffusion model of schema-memory interactions to determine the role of temporal dynamics in the interplay between schemas and memory in influencing memory decisions. Participants first searched for target objects in schema-congruent and schema-incongruent locations within scenes, then in a subsequent test phase, they made spatial recall judgments for the objects and recognition memory judgments for the scenes. We used a confidence-based scale to isolate different recognition memory processes (i.e., recollection, familiarity, and unconscious memory). We found that schemas and memory trade off in a competitive fashion, and that the outcome of this competition is modulated by their temporal dynamics, as well as the type of underlying memory.

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V118

It Seems Easier, But It's Not: The Effect of Face Masks on Recognition Memory for Spoken Words. SABRINA BERGEN, *Rollins College,* JUAN D. GUEVARA PINTO, *Rollins College,* JENNIFER QUEEN, *Rollins College* — Due to the recent COVID-19 pandemic, face masks have been encouraged across different settings, including classroom environments. Yet, the impact, if any, that face masks have on human memory is still not understood. We thus examined whether face masks influenced recognition

memory for spoken words presented in videos, as well as participants' judgments of learning (JoLs) for such words. Across two within-subjects experiments, our results showed that while participants provided higher JoLs for words spoken without face masks relative to words spoken with a face mask, memory performance did not differ between the two conditions. Additionally, Experiment 2 also demonstrated that this effect is not due to differences in the audio recording between conditions. We interpret our results in the context of perceptual fluency effects in recognition memory, and suggest that information learning without face masks creates a metacognitive illusion that learning is easier, despite no objective benefit in recognition.

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V119

Incorporating Exogenous and Endogenous Sources of Evidence in Recognition Memory to Explain Trial-by-Trial Drift Rate Variability in the Diffusion Decision Model. JIE SUN, *The University of Melbourne,* DANIEL FEUERRIEGEL, *The University of Melbourne,* ADAM OSTH, *The University of Melbourne* (Sponsored by Jie Sun) — The diffusion decision model (DDM) has successfully accounted for reaction times distribution and accuracy for simple choice tasks by assuming a diffusion evidence accumulation process. However, the model has been criticised for its ad hoc distributional assumptions of cross-trial variability in its parameters, such as the drift rate. Using a word recognition task with electroencephalography recording, the current study aims to include both exogenous factors (e.g., word frequency and study-test lag) and EEG signals corresponding to retrieval success as endogenous factors to account for trial-to-trial variability in drift rate. The EEG signal was calculated based on two classic components observed in recognition memory tasks that differentiate types of memory judgement, namely the negative frontal component (FN400) and the late positive component (LPC). Our results have shown when assuming individual trial drift rate as a linear combination of these factors, better model fits were observed as indicated by superior model selection scores. The benefit from the EEG endogenous factors further suggests an involvement of these EEG components in the evidence accumulation process

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V120

The Tradeoff Between Item and Order Information in Short-Term Memory Does Not Depend on Encoding Time. DOMINIC GUITARD, *University of Missouri,* NELSON COWAN, *University of Missouri* — Participants can optimize encoding of an immediate verbal memory test for item, for order, or both kinds of information. However, dividing encoding comes at a cost more severe for order information. Here, we evaluated which factor can better account for this asymmetry by contrasting two hypotheses. According to a rate hypothesis, divided attention affects the rate of encoding more for order than for items. According to the asymptote hypothesis, divided attention does not affect the rates but diminishes the endpoint of order encoding more than item encoding. In three experiments to distinguish these hypotheses, participants prepared for an item test, an order test, or both tests, in trials with different duration of presentation (250, 500, 1000, 1500, 2000, or 3000 ms per item). Overall, our results support the asymptote hypothesis and demonstrate that the allocation of attention to item or order processing can be disentangled from the time on task.

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V121

Why Do People Overestimate the Effectiveness of Blocked Learning? JULIA KRASNOFF, *University of Zurich,* CLARA OVERKOTT, *University of Zurich* — Interleaved learning is better for delayed memory performance than blocked learning. Nevertheless, people judge blocked learning to be more effective. In the present work, we tested different explanations for this metacognitive bias. Participants studied sequences of object-color associations for a color-reproduction test. In Experiment 1, colors of a sequence were selected from one color category (blocked) or distinct color categories (interleaved). Participants gave higher judgements of learning (JOLs) for objects studied in the blocked condition, although performance was better for objects in the interleaved condition. In Experiment 2, participants' immediate memory performance after each sequence was additionally measured. JOLs were again higher for objects in the blocked condition, and they mimicked participants' immediate memory performance suggesting a link between participants' evaluations of the strategies and their immediate memory effects. In Experiment 3, the objects of one sequence were either grouped by category (blocked) or derived from distinct categories (interleaved). Neither JOLs, nor immediate performance was affected by this manipulation of blocked learning, discarding the idea that people prefer blocked learning because of habit only. We conclude that people overestimate the effectiveness of blocked learning due to an immediate memory boost and not due to their previously acquired habit to study in blocks.

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V122

Feeling of Knowing for Face-Name Pairs: The Effects of Amount and Emotional Content of Contextual Information. PINAR KURDOGLU-ERSOY, *Ege University,* BENNETT L. SCHWARTZ, *Florida International University,* AYCAN KAPUCU, *Ege University* — The non-criterial recollection hypothesis (Brewer et al., 2010) predicts that feeling-of-knowing judgments (FOKs) will be affected by retrieval of contextual information presented during study episodes. In our study, we manipulated the amount and the emotional content of contextual information for 30 face-name pairs presented either alone (no information) or with a disgusting or neutral behavior description of the person pictured (medium information), or with the person's profession and the disgusting/neutral behavior description (maximum information). At test, we examined recall, FOK magnitude, and recognition for the pairs. The results showed a dissociation between memory and metamemory measures; the presence of additional information led to higher FOKs

but lower recall and recognition rates, indicating a metacognitive illusion. FOK magnitudes for negative and neutral conditions of the same amount of information did not differ from each other. However, we found that FOKs and correct identification of source valence were related, and this was more evident for negative than neutral items. The findings provided further support for non-criterial recollection hypothesis using stimuli with high ecological validity.

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V123

Boldface Generates Metamemory Illusions, but Only with Sentences. KARLOS LUNA, *Universidad Nacional de Colombia,* SARA CADAVID, *Universidad del Rosario* — Past research has shown that people believe that they will remember better words in bold, but then they do not use boldface as a cue for judgments of learning (JOLs). However, that research was conducted with single words or word pairs. We propose that boldface would affect metamemory when a word in bold is embedded within sentences in regular font, just as in textbooks. First, we confirmed that most participants believe that a word in boldface within a sentence will be better remembered than in regular font (Experiment 1). Then, we presented word pairs (Experiment 2) or long sentences (Experiment 3), with the target word in bold or in regular font. We requested judgments of learning (JOLs) and measured memory for the target words. JOLs were higher for boldface than regular font only when target words were embedded in sentences, but not in word pairs. Boldface did not affect memory. This research shows that the cues used to monitor memory vary with the materials under study and that, with sentences, boldface causes metamemory illusions. This research also suggests that boldface may not be the best tool to highlight contents in textbooks.

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V124

Idiosyncratic Influences on Metamemory Monitoring and Control. SOFIA NAVARRO-BAEZ, *University of Mannheim,* JOSEFINE GIEBLER, *University of Mannheim,* MONIKA UNDORF, *University of Mannheim,* ARNDT BRÖDER, *University of Mannheim* — The impact of idiosyncratic information on monitoring judgments such as judgments of learning (JOLs) – predictions of remembering recently learned items – has rarely been addressed due to measurement difficulties. Recently, the C parameter of Brunswik's (1952) lens model has been proposed to measure idiosyncratic influences on metamemory. In this study, we tested whether the self-reported personal significance of study words would impact memory and the two aspects of metamemory, monitoring and control, and thus be reflected in the C parameter. Participants made JOLs (Experiment 1) and restudy choices (Experiment 2), completed a free recall test, and reported which of the studied words were personally significant. Results showed that personal significance increased JOLs, decreased restudy choices, and improved memory. Including personal significance as a predictor in the lens model reduced C when JOLs were the judgment criterion and, although to a lesser extent, when restudy choices were the criterion. This study shows that subjective reports of personal significance can be used to assess idiosyncratic influences on metamemory monitoring and control.

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V125

Stimulus-Response Compatibility with Wrist-Based Vibrotactile Stimulation: Does Wrist Orientation Matter? JAMES MILES, *California State University, Long Beach,* JORDAN WILSON, *California State University, Long Beach,* KIM-PHUONG VU, *California State University, Long Beach* — Wrist-based vibrotactile stimulation is now commonly used to provide alerts in wearable consumer products. The current study investigates spatial stimulus-response compatibility effects when left/right responses are made to vibration of the dorsal/volar sides of the wrist. We manipulated several factors which may influence the natural mapping between stimulation of wrist side and an ensuing spatial response, including which arm is stimulated and the orientation of the wrist when the stimulation occurs. Participants received dorsal/volar vibrotactile stimulation on their left or right wrist while holding a steering wheel on the side (vertical orientation - palm facing body midline) or top (horizontal orientation - palm facing downward) and made left/right button responses with the contralateral hand. Results indicate stimulus-response compatibility effects based on both the wrist midline of a vertically-oriented wrist and which arm was stimulated. These compatibilities remained identical with stimulation of a horizontally-oriented wrist. We discuss how data are consistent with spatial coding based on stereotypical wrist position as well as salience coding.

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V126

Gazing the Consequences: Effect Binding But No Action Binding for Visual Effects Caused by Saccades. JULIAN GUTZEIT, *Julius-Maximilians-Universität Würzburg,* LYNN HUESTEGGE, *Julius-Maximilians-Universität Würzburg,* JENS KÜRTEN, *Julius-Maximilians-Universität Würzburg,* LISA WELLER, *Julius-Maximilians-Universität Würzburg* — Temporal binding (TB), the compression of the perceived time interval between actions and subsequent effects, has been assumed to result from both action binding and effect binding. TB is often used as an implicit measure of Sense of Agency (SoA), the feeling of being in control over actions and subsequent effects. Here, we examined TB for eye movements and visual effects thereof. Subjects fixated different stimuli on a screen while saccades were recorded. The fixated stimulus changed its color 300-700 ms after fixation. We manipulated the degree of SoA by either changing the color solely as a consequence of participants' saccades (agency) or by implementing additional random color changes that were perceived as being not contingent on the participants' saccades (baseline). Participants estimated the time of their saccade onset or the time of the color change with an auditory Libet clock. We found significant effect binding but no action binding in the agency condition. We conclude that eye movements, which are

usually assumed to rather serve visual information uptake instead of the control of the environment, can produce similar SoA as manual movements but that peculiarities of the oculomotor domain need to be considered.

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V127

Social Media and Misinformation: Eye Tracking Shows That Contextual Information of Tweets Distracts Those Who Score Inadequately in Health Literacy. MARK LOWRY, *National Cancer Institute,* ASHLEY HYSTAD, *National Cancer Institute,* YUKI LAMA, *National Cancer Institute,* KATHRYN HELEY, *National Cancer Institute,* FRANK PERNA, *National Cancer Institute* — Social Media platforms are increasingly used by individuals to obtain and share health information, increasing the risk of misinformation exposure. Health literacy (HL) is a moderating factor for evaluating health information. Using eye-tracking (webgazerjs), we explore accuracy and attention to message features of tweets and statements between inadequate and adequate HL scorers. Health information was presented as either statements or as part of a tweet, and 137 participants determined whether they were true (e.g., Vaccines don't cause autism) or false (e.g., Vaccines cause autism). Overall, adequate scorers were 5.3 percentage points more accurate than inadequate scorers, 95% HDI [2.6, 7.8]. First fixation duration on message text revealed a credible main effect of health literacy and interaction between HL and condition: for statements, inadequate fixated 98ms longer than inadequate scorers did, 95% HDI [49, 147]; however for tweets, there was no credible difference between inadequate and adequate scorers, 95% HDI [-73.9, 11.5]. The eye tracking results indicate that contextual information can distract inadequate scorers from the text of a tweet.

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V128

Fake News Belief and Engagement Behaviors in a Media Savvy Population. OLIVIA C. BISHOP, *Temple University,* MICHELLE CHIU, *Temple University,* JASON CHEIN, *Temple University* — To date, little is known about the psychological factors that might account for variation in the degree to which individuals believe in, and engage with, misinformation. Our study had two specific aims: (1) investigate belief and sharing of nonpolitical news headlines, and (2) examine how individual differences in psychological traits relate to fake news engagement and belief. Participants viewed news headlines formatted as Facebook posts, decided whether or not to "like" and "share" them, and rated each post for accuracy (Phase 1). After completing a series of surveys, participants the repeated Phase 1 procedures with a further series of headlines (some repeated, some novel). Some of these headlines were "true" news, some were verified fake news, and some were fabricated. Preliminary analyses suggest a positive association between belief and sharing of news headlines, as well as a negative association between evasive "bullshitting" and sharing. Interestingly, this latter finding may imply a social evaluation component to engagement behaviors, wherein those more afraid of social judgement share less news on social media.

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V129

Effects of Advisor Accuracy on the Utilization of Algorithmic and Human Advice. MALTE MÖLLER, *University of Passau,* SUSANNE MAYR, *University of Passau* — While algorithmic decision making is frequently superior to human judgement, it is a robust finding that failure to provide perfect forecasts decreases the willingness to entrust decisions to an algorithm, constituting the so-called algorithm aversion (e.g., Dietvorst et al., 2014). In three experiments, we investigated whether perceiving an algorithmic advisor as imperfect is sufficient for algorithm aversion to occur. All studies systematically varied the advisor (algorithm or human) in a within-subjects Judge Advisor System paradigm (e.g., Logg et al., 2019). In Experiments 1 and 2, information about the advisor accuracy (low, high, or no information available) was systematically manipulated within participants, while Experiment 3 demonstrated the performance of an algorithmic and a human advisor of identical accuracy prior to the task. Results showed that participants (1) adhered more strongly to advice given by an algorithmic as compared with a human advisor and (2) were more willing to incorporate advice from highly as compared with less accurate advisors. Together, the findings consistently show algorithm appreciation, indicating that imperfect algorithmic forecasting is not the sole determinant of algorithm aversion.

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V130

Is Cognition Harmed by Webcam Visibility? LYNDSEY K. LANAGAN-LEITZEL, *Eastern Connecticut State University* — Video conferencing became a dominant mode of instruction and meetings during the COVID-19 pandemic. Some instructors and supervisors may have felt strongly that students and employees had to be visible on webcam, but it is unknown whether cognitive resources might be depleted by this, especially for those with high levels of state and trait anxiety, social anxiety, impression management, and self-monitoring. Twenty-four undergraduate students completed measures of sustained attention, working memory, problem-solving, lexical decision, and lexical fluency while visible on webcam and with their webcam off. They also completed survey measures of the constructs above. Most of the cognitive tasks were affected by webcam visibility, mental health construct, or an interaction of the two. Because of the profound implications for continued use of webcams in educational and professional settings, these interactions should be studied further and with other cognitive tasks and mental health constructs to help clarify the impact of video conferencing on cognition.

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V131

Dynamics of the Secondary Task Activation in Task-Interruption Contexts. PATRICIA HIRSCH, *Rheinisch-Westfälische Technische Hochschule Aachen University,* IRING KOCH, *Rheinisch-Westfälische Technische Hochschule Aachen University* — Task interruptions are prevalent phenomena in our daily life. In this study, we examined whether the cognitive representation of the secondary task (i.e., interruption task) is activated when resuming the interrupted task. To this end, participants performed a primary task which consisted of a pre-defined sequence of three subtasks. There were trials without an interruption and trials with an interruption after the first subtask or the second subtask. Performance was worse in a subtask after an interruption than in the corresponding subtask in non-interrupted trials. Moreover, we analysed congruency effects in the subtask after an interruption (i.e., stimulus in the subtask after an interruption is associated with a different vs. with the same response in the subtask after an interruption and the secondary task). Such a congruency effect would indicate that interference due to the activation of the secondary task contributes to the performance decline in the subtask after an interruption.

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V132

Gaming the System: Processing Fluency Impairs Adaptive Control Adjustments. GONCALO A. OLIVEIRA, *William James Center for Research,* MIGUEL REMONDES, *Instituto de Medicina Molecular João Lobo Antunes,* TERESA GARCIA-MARQUES, *William James Center for Research* — Recent research suggests that the monitoring system of control could be using affective cues intrisinc to changes in information processing, to initiate top-down regulatory control mechanisms. This hypothesis implies that, if control relies on the detection of these cues (e.g., negative affect), ease-of-processing could be used to exploit the monitoring system and cause control mechanisms to relax instead of activating them. We have tested this hypothesis using an interference task comprised of trials varying in congruence and perceptual fluency. A pseudorandomization procedure within different proportion of congruence conditions was used to maximize discrepancy and fluency effects. Our results suggest that participants commited more fast errors when incongruent easy-to-read trials were presented in a mostly congruent contex. Furthermore, at a trial-by-trial level, we have found that the presentation of consecutive congruent trials in a mostly incongruent context, lead to more errors on the following trial. Together, these results suggest that ease-of-processing can be used as a signal that the activation of control is not necessary and that transient and sustained feelings of processing fluency may have different impacts.

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V133

Predicting the Latency of Anticipatory Saccades Towards Future Action Consequences via Machine Learning. HELENE ACKERMANN, *Albert-Ludwigs-Universität Freiburg,* FLORIAN GOURET, *Albert-Ludwigs-Universität Freiburg,* CHRISTINA U. PFEUFFER, *Catholic University of Eichstätt-Ingolstadt* — Humans proactively monitor the future effects of their actions. That is, we anticipatorily saccade towards the future location of these effects and we do so earlier/later depending on the effects' delay. Here, we assessed whether a neural network trained on basic trial characteristics as inputs (e.g., manual RT, action mode, effect delay) is able to predict the latency of the first such anticipatory saccade towards the future effect per trial. A basic neural network (random data selection) and two networks with criterion-based data selection (mean individual frequency vs. latency patterns of anticipatory saccades; smaller training samples) were trained and tested on/transferred to the data of four/three experiments (testing: mean RMSEs = 0.78 to 1.32 SDs; transfer: mean RMSEs = 0.53 to 0.85 SDs). The basic model had the lowest mean prediction errors, whereas both criterion-based networks better captured individual differences in the variance of anticipatory saccade latencies. We conclude that a systematic process underlies the latency of anticipatory saccades. This process appears to be linked to both the frequency and latency distributions of anticipatory saccades, allowing for novel insights into proactive effect monitoring.

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V134

A Hierarchical Bayesian Examination of Trial-to-Trial Variability in Cognitive Control Measures and Its Relation to Mind-Wandering. JEAN-PAUL SNIJDER, *Heidelberg University,* LENA STEINDORF, *Heidelberg University,* JAN RUMMEL, *Heidelberg University* — Cognitive control is the deliberate regulation of processing information. Although experimental effects of cognitive control (e.g., Stroop interference effect) are consistently replicated, research struggles to uncover a coherent psychometric construct of cognitive control. Traditionally, cognitive control ability estimates are calculated as average task performance (e.g., mean reaction time, mean accuracy). However, this common approach ignores trial-to-trial variability (TTV), which has been found to represent an important aspect of task performance, namely, consistency in cognitive control. Furthermore, increases in TTV are suggested to represent fluctuations in cognitive control, which can lead to lapses of attention and task-unrelated thoughts (TUTs). Employing hierarchical Bayesian modeling, we examine whether TTV a) is a better individual differences measure than mean performance across different tasks of cognitive control and b) predicts TUTs as measured by thought probes.

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V135

Perceptual Display Variability Does Not Modulate the Mentalistic and Directional Aspects of Gaze Following. FLORENCE MAYRAND, *McGill University,* SARAH D. MCCRACKIN, *McGill University,* JELENA RISTIC, *McGill University* — The mechanisms behind gaze following, or the spontaneous orienting or attention towards gazed-at locations, have long been debated. We recently demonstrated that both directional information from the cue as well as the mental content attributed to the gazer contribute to this effect. In the present study, we investigated whether this result was sensitive to perceptual display features. To do so, we presented participants with a perceptually ambiguous central cue, which was revealed once to depict a directional social avatar. Participants were asked to localize a peripheral target, a number 3 oriented in four different directions to represent the number 3, and the letters E, M, and W. The avatar's gaze direction and mental content attribution consistency were manipulated individually to create conditions in which the two factors combined and those in which they dissociated. As before, the results indicated slower responses in the conditions in which cue direction and mental content dissociated relative to those in which they combined. Thus, mentalistic and directional aspects of gaze following appear to be resilient to perceptual variability within the display.

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V136

Goal-Directed and Stimulus-Driven Features Coactively Guide Visual Attention. ZEXUAN NIU, *University of Iowa,* J. TOBY MORDKOFF, *University of Iowa,* ANDREW HOLLINGWORTH, *University of Iowa* — Although goal-directed and stimulus-driven features can each guide visual attention, it is unclear whether these two sources of guidance are integrated simultaneously on a common priority map. We used a redundancy-gains paradigm to answer this question. On each trial, participants searched a circular array of colored shapes for the presence of either a goal-directed feature (e.g., a cued shape), a stimulus-driven feature (e.g., a singleton color), or both. The first two conditions were single-target trials; the last constituted redundant-target trials. We assessed whether there was a substantial proportion of responses on redundant-target trials that were faster than could have been generated by the faster of two independent guidance processes operating in parallel (i.e., violations of the race-model inequality). Robust violations were observed in a series of experiments, indicating that goal-directed and stimulus-driven features coactivate to determine attentional priority. In addition, coactivation was location specific, consistent with integration on a spatially organized priority map.

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V137

Bilinguals May Not See It Coming in a Second Language: Processing Social Feelings in L2 Discourse Comprehension: An ERP Study. ANDREA G-G ALDARIZ, *Universidad Nebrija,* PABLO RODRÍGUEZ-GÓMEZ, *Universidad Complutense de Madrid,* CARLOS ROMERO RIVAS, *Universidad Autónoma de Madrid, Madrid, Spain,* SARA RODRÍGUEZ-CUADRADO, *Universidad Autónoma de Madrid, Madrid, Spain,* ALICE FOUCART, *Universidad Nebrija,* EVA MARÍA MORENO, *Instituto Pluridisciplinar, Universidad Complutense de Madrid* — Social factors impact sentence comprehension in a first language (L1), suggesting that semantic processing cannot be dissociated from social and moral feelings in relation to pro/antisocial individuals. Given that integrating multiple types of information and processing emotion-laden pragmatic information are costlier in a second language (L2), we used ERPs to investigate whether social factors would affect discourse comprehension similarly in L2. Processing the outcomes of scenarios involving pro/antisocial characters provoked similar neural patterns in L2 as in L1 (Rodríguez-Gómez et al., 2020), suggesting that L2 speakers pay more attention to socially accepted characters (P2), regardless of the final outcome; they also tend to significantly reconsider unfortunate outcomes at a later time-window (LPP). The N400 revealed that L2 speakers integrate social feelings during sentence processing, like L1 speakers; however, the direction of the N400 suggests that anticipation mechanisms may not contribute to discourse processing to the same extent in L2.

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V138

Do Foreign Speakers Affect Moral Decision-Making? MEREL VERMEER, *Radboud University,* SUSANNE BROUWER, *Radboud University,* ALICE FOUCART, *Universidad Nebrija* (Sponsored by Susanne Brouwer) — Responses are more utilitarian when a moral dilemma is spoken by a foreign-accented (FA) speaker than by a native-accented (NA) speaker (Foucart & Brouwer, 2021). To further understand what drives this Foreign Accent effect, we investigated whether social categorization and the stereotypes associated with the foreign speakers' nationality affect moral decision-making. Fifty-five native Spanish (Exp. 1) and 54 native Dutch participants (Exp. 2) were presented with written bios of a Spanish (Exp. 1) or Dutch (Exp. 2) NA speaker, an English FA speaker, and a Moroccan FA speaker, all described as having a strong accent. Each speaker exposed two moral dilemmas to which participants had to respond. In both experiments, results show more utilitarian responses when dilemmas were exposed by FA speakers (English, Exp. 1: 53%, Exp. 2: 54%; Moroccan, Exp. 1: 50%, Exp. 2: 54%) than NA speakers (Exp. 1: 47%, Exp. 2: 43%), independent of the speaker's nationality. The findings suggest that stereotypes do not affect moral decision-making. Furthermore, social categorization might be language-dependent, because only native Dutch speakers make significantly more utilitarian decisions for a FA speaker.

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V139

Processing Syntactic Violations in the Non-Native Language: Different ERP Correlates as a Function of Typological Similarity. SARAH VON GREBMER ZU WOLFSTHURN, *Leiden University,* LETICIA PABLOS ROBLES, *Leiden University,* NIELS O. SCHILLER, *Leiden University* — Despite often featured in theoretical accounts, the exact impact of typological similarity in non-native language comprehension and its corresponding neural correlates remain unclear. Here, we examined the modulatory role of typological similarity on syntactic violation processing, e.g., [el volcán] (the volcano) vs. [*la volcán] in the non-native language Spanish, as well as on cross-linguistic influence. Participants were either Italian late learners of Spanish (highly similar language pair) or German late learners of Spanish (less similar language pair). We measured P600 component amplitudes, accuracy and response times. In line with our predictions, we found a larger P600 effect and differential CLI effects for Italian-Spanish speakers compared to German-Spanish speakers. Interestingly, Italian-Spanish speakers responded overall more slowly compared to German-Spanish speakers. Taken together, these results reflect a typological similarity effect in non-native comprehension in the form of a processing advantage for typologically similar languages, but only at the neural level. These findings have critical implications for the interplay of different languages in the multilingual brain.

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V140

Reducing Vaccine Hesitancy by Explaining Vaccine Science. CHAO QIN, *University of Washington,* JEE HOON HAN, *University of Washington,* SUSAN JOSLYN, *University of Washington,* SONIA SAVELLI, *University of Washington,* NIDHI AGRAWAL, *University of Washington* — COVID-19 vaccine hesitancy remains a problem 1.5 years after mRNA vaccines became available. This may be due in part to misunderstandings about the vaccines, arising from complexities of the science involved. Two experiments, conducted on unvaccinated Americans at two periods post vaccine rollout in 2021, demonstrated that providing simple explanations correcting known misunderstandings reduces hesitancy compared to providing no information. Four misunderstandings were addressed in Experiment 1: mRNA vaccines containing live virus or altering DNA, rushed vaccine testing, likely severe side effects, and limited vaccine effectiveness. Several formats of each explanation were tested, including expository text and refutational text explicitly stating and refuting the misunderstanding. All four explanations reduced vaccine hesitancy. The refutational format addressing mechanism and side effects were the most effective. These two were retested individually and jointly in Experiment 2. Again, vaccine hesitancy was reduced by all explanations despite differences in political ideology. These results suggest that simple explanations of critical issues in vaccine science can reduce hesitancy, especially when accompanied by refutation.

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V141

Investment in Risky Assets and Participation in the Financial Market: Does Financial Literacy Matter? ANDREAS OEHLER, *Bamberg University,* MATTHIAS HORN, *Bamberg University,* STEFAN WENDT, *Bifröst University, Iceland* — Our study contributes to a better understanding of the relationship between financial literacy and participation in the financial market. For this purpose, we provide an estimation of a structural equation model by using the dataset of the third wave from the Panel on Household Finances of the German central bank. The dataset contains households' net wealth and risk aversion as well as information on the levels of financial literacy, education, financial satisfaction status, age, and patience of the households' decision-maker. We broadly define participation in the financial market and consider a set of risky assets like mutual funds, bonds, publicly traded shares, values of non self-employment private business, and other financial assets in addition to the usually analyzed stock investments. Our results show that although households' net wealth is the dominant driver of investments in risky assets, financial literacy plays a remarkable role. Financial literacy has an indirectly positive influence on participation in the financial market through the household's risk aversion. The higher the financial literacy, then the lower the risk aversion is.

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V142

Effects of Acute Stress on Rigid Learning, Flexible Learning and Value-Based Decision-Making in Spatial Navigation. QILIANG HE, *Georgia Institute of Technology,* ELIZABETH BEVERIDGE, *Georgia Institute of Technology,* VANESA VARGAS, *Georgia Institute of Technology,* ASHLEY SALEN, *Georgia Institute of Technology,* THACKERY BROWN, *Georgia Institute of Technology* — How acute stress affects learning and decision-making has been studied for decades, but few studies have investigated whether stress differentially affects rigid and flexible learning. Furthermore, few studies have investigated how stress affects the way memory was utilized to inform value-based decision-making. In our study, participants first learned to find locations of various objects in a virtual environment from a fixed starting location (rigid learning), and then learned to find the same objects from unpredictable starting locations (flexible learning). Participants then decided whether to reach goal objects from the fixed or unpredictable starting locations. We find that 1) stress impairs rigid learning but only in females, and 2) it does not impair flexible learning but even improves flexible learning when the performance with rigid learning is controlled for. Using a computational model, we find that 3) stress reduces memory integration, making participants focus more on recent episodic memory and less likely to integrate information from related sources in decision-making. Collectively, our results show how acute stress impacts different memory systems and the communication between episodic memory and decision-making.

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V143

Examining the Relationships Between Social Skills, Executive Function and Level-1 and Level-2 Visuospatial Perspective Taking. BEN FORD, *Edge Hill University,* ADAM QURESHI, *Edge Hill University* — Understanding what is visible to another person (Level-1 perspective taking; L1-VPT) or how the world appears (Level-2 perspective taking; L2-VPT) facilitates our representation of the intentions, knowledge, and beliefs of others. A partial-least squares path analysis examined how L1-VPT and L2-VPT differentially relate to executive function (inhibitory control and visuospatial working memory) and higher-order social behaviour (empathy and social skills). Moreover, considering the increased egocentricity experienced during periods of high anxiety or low mood, path analysis established the relationship between state-anxiety and state-depression and perspective taking to understand egocentricity effects on switching between the self and other perspectives. Doing so examines VPT as a mediating process between lower-order cognitive functions and higher-order social skills and its role as a socio-cognitive precursor to cognitive and affective theory of mind. The project also expands our current understanding of the differential roles of L1-VPT and L2-VPT both cognitively and socially.

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V144

Debiasing Reasoning on the Base-Rate Task: Education and Urban Living Boost the Effect of a Short Training Intervention in a Non-Western Population. ESTHER BOISSIN, *LaPsyDÉ & Université Paris Cité,* MATHILDE JOSSERAND, *Université Lumière Lyon 2,* WIM DE NEYS, *Université Paris Cité/LaPsyDÉ/Centre National de Recherche Scientifique (CNRS),* SERGE CAPAROS, *Université Paris 8* — While decades of research have established that many reasoners are biased when they solve simple reasoning problems, recent studies have shown that short explanations about the correct solution strategy can massively boost performance (Boissin et al., 2021). This effect is thought to rely on the reactivation of prior knowledge acquired through education. Given that in Western developed countries most adults are educated and, in children, level of education is confounded with age/cognitive development, we tested this model in a sample (N=85) of non-Western remote participants, the Himba of northern Namibia. The participants performed a base-rate reasoning task. and we contrasted their level of accuracy before and after having received a short training intervention. We explored the moderating effects of formal education ("highest school level achieved") and informal education (using the proxy "rural/urban living"). Results showed that (1) the intervention improved performance, and (2) this positive effect was boosted by urban living (to a large extent) and education (to a lesser extent). We discuss the implications of these findings for ongoing debates in the field.

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V145

Exploring the Neural Basis of Fast Logic. MATTHIEU RAOELISON, *Université Paris Cité/LaPsyDÉ/Centre National de Recherche Scientifique (CNRS),* EMILIE SALVIA, *Université Paris Cité/LaPsyDÉ/Centre National de Recherche Scientifique (CNRS),* ANDRE KNOPS, *Université Paris Cité/LaPsyDÉ/Centre National de Recherche Scientifique (CNRS),* SYLVAIN CHARRON, *Institut de Psychiatrie et Neurosciences de Paris,* ANNA FAYOLLE, *Institut de Psychiatrie et Neurosciences de Paris,* CLÉMENT DEBACKER, *Institut de Psychiatrie et Neurosciences de Paris* MACARENA CUENCA-MAIA, *Groupe Hospitalier Universitaire Paris–Psychiatrie & Neurosciences,* ARNAUD CACHIA, *Université Paris Cité/LaPsyDÉ/Centre National de Recherche Scientifique (CNRS),* CATHERINE OPPENHEIM, *Inserm UMR1266, Institut de Psychiatrie et Neurosciences de Paris,* GREGOIRE BORST, *Université Paris Cité/LaPsyDÉ/Centre National de Recherche Scientifique (CNRS),* WIM DE NEYS, *Université Paris Cité/LaPsyDÉ/Centre National de Recherche Scientifique (CNRS)* — Dual-process theories characterize thinking as an interaction between intuitive and deliberate thought processes. For instance, logical reasoning is assumed to require effortful deliberate thinking. However, recent findings obtained with new behavioral paradigms have questioned this assumption. A key observation is that people can process logical principles intuitively without deliberation. Still, the nature of this newly discovered fast logical reasoning is not clear. For instance, its neural basis has not been explored. To address this shortcoming, we'll compare fast and slow trials to investigate whether intuitive and deliberate processes recruit different brain areas. Participants solved conflict and no-conflict variants of the bat-and-ball problem while in an fMRI. A short training intervention mid-study also explained the correct solution strategy to participants. Our main goal is to identify the unique neural basis of correct intuitive reasoning for the first time. To do so, we'll contrast brain activations in fast and slow trials for correct and incorrect conflict responses. We'll also explore differences between pre- and post-training blocks.

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V146

Moral Competence and Orientation in Relationship with Syllogistic Reasoning Performance. LUCIA-ELISABETA FAICIUC, *Romanian Academy* — Moral competence was defined by Lind (2016) as "the ability to solve problems and conflicts on the basis of universal moral principles through thinking and discussion, instead of using violence, deceit, and force." It involves principled reasoning in competition with egocentric affective tendencies, as the cognitive dimension of a moral judgment. Moral orientation, given by the Kohlbergian levels, is the affective dimension, inseparable from the cognitive one (Lind, 2016). So, one's deductive performance, as a kind of principled reasoning, should correlate positively with one's moral competence and the preference for higher levels of moral arguments, as measured with Moral Competence Test (Lind, 1978), and negatively with the preference for the lower levels of moral arguments. This prediction was investigated on a sample of 65 undergraduate

students at a fine arts university (mean age: 20 years), using a task with 24 categorical syllogisms in the traditional abstract format (12 valid, and 12 invalid). The results supported significantly the hypothesis only in the case of the performance for the invalid syllogisms, and regarding the negative correlation between the lower moral orientation of level 3 and the syllogistic performance.

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V147

I Have Never Heard It Before, But I Believe It: Intuition-Based Reasoning as an Accelerator of the Transmission of Unfounded Beliefs. MARC BALLESTERO-ARNAU, *Universitat de Barcelona,* JOSUÉ GARCÍA-ARCH, *Universitat de Barcelona,* MILA ARCH MARÍN, *Universitat de Barcelona* — The irrepressible speed of pseudoscience transmission is becoming a global problem. Current research has succeeded in identifying several cognitive variables (e.g., intuitive thinking, reasoning biases) capable of predicting pseudoscientific beliefs. However, it is not known whether those cognitive variables are also able to predict who will be more likely to propagate these beliefs. Using a multivariate model, we here investigate the relationship between familiarity, pseudoscientific beliefs, willingness to propagate and intuitive thinking style. Our results suggest that faith in intuition is able to predict pseudoscientific beliefs and the willingness to transmit them. Interestingly, no relationship or mediational effect was found between intuitive thinking and familiarity, although familiarity was a good predictor of beliefs. Our findings suggest that through very little exposure, intuition-based reasoning may exacerbate pseudoscience spread. Possible educational strategies to mitigate this phenomenon are discussed.

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V148

Understanding Complex Traffic Signs: The Efficacy of Combined Messages. ANA HERNANDO, *Universidad de Zaragoza,* PILAR TEJERO, *Universitat de València,* JAVIER ROCA, *Universitat de València,* ANTONIO LUCAS-ALBA, *Universidad de Zaragoza* (Sponsored by Maria del Pilar Tejero) — Complex-electronic traffic signs display different types of information in real time, requiring drivers to infer their meaning on the fly. This work aims to evaluate the efficacy of combined messages (verbal and pictorial information) to inform drivers on the location of a certain event (e.g., roadworks). Four message designs were tested, resulting from two factors: a) the event was represented by text or a pictogram, and b) the direction was indicated by text (a preposition) or an arrow. Participants indicated the location of critical events by pressing the correct key. Preliminary results (n = 20) shows that messages using a pictogram for the event resulted in faster responses, compared to text. In contrast, responses were slower in messages using an arrow for the direction than a preposition. The interaction was not significant. Thus, combined messages (pictogram and text) might be a functional strategy to inform drivers about traffic situations.

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V149

An Intoxicating Sense of Control? The Satisfaction of Solving Problems Is Largely Determined by Solution Confidence. LINUS HOLM, *Umeå University,* PATRICK ODEN, *Umeå University* — Resolving abstract problems often appears intrinsically satisfying, but what determines the level of internal reward and why would the brain reward itself for solving problems without external utility? A native drive for solving problems might spur inventions and insights that eventually turn out to be adaptive to the individual as well as the group and the entire species. We hypothesized that problem difficulty might drive resolution satisfaction in two online mathematical-logical forced choice tasks involving 30 and 40 problems and 96 and 102 participants, respectively. Contrary to our hypothesis, both Experiments reliably demonstrated that participants were generally more satisfied the easier the problem that they correctly solved. In both Experiments, we found that resolution satisfaction was highly related to resolution confidence ratings. Our results suggest that cognitive satisfaction comes out of a state of confidence or cognitive control, rather than the extent of the achievement, or the learning experience. Thus, cognitive reward seems better predicted by confirmation than updating.

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V150

Unrelated to Compound Remote Associate Problems (CRA) Words Take Less Time for Lexical Decisions Than the Related Ones. ARTUR AMMALAINEN, *Russian Presidential Academy of National Economy and Public Administration (RANEPA),* NIKITA LOGINOV, *Russian Presidential Academy of National Economy and Public Administration (RANEPA),* VLADIMIR SPIRIDONOV, *Russian Presidential Academy of National Economy and Public Administration (RANEPA),* MICHAEL ÖLLINGER, *Parmenides Center for the Study of Thinking* — Recently, Öllinger & von Müller (2017) proposed that, apart from the activation of the relevant words, solving Compound remote associate problems (CRA) requires the inhibition of words which are irrelevant for the solution. We tested this hypothesis using a modified CRA (mCRA) task in which the first word of each triad was ambiguous (Spiridonov et al., 2021). In two experiments, we presented participants with mCRA problems and conducted lexical decision tasks (LDT). The LDT presented words which were either associated with the solution word, or misleading word, or irrelevant word, and word that was associated with the problem but not with the solutions (problem associates). The first experiment revealed that RTs for all related words were significantly longer than for irrelevant words. The second experiment confirmed that problem associates and relevant words revealed longer RTs than irrelevant words. Additionally, the order of the ambiguous word influenced the RTs. Our results provided evidence for the refined spreading activation account. The interplay of guided spreading activation processes which activate related and unrelated concepts at the same time and constraints which shape the search space is supported.

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Curious Content: This Article May Contain Content That Sparks Your Curiosity. ERIN SIMISTER, *Flinders University,* VICTORIA BRIDGLAND, *Flinders University,* MELANIE TAKARANGI, *Flinders University* — Instagram's sensitive screens seek to minimize engagement with negative content by blurring sensitive images and providing a warning (Mosseri, 2019). However, data from our lab show that many people deliberately and repeatedly uncover potentially distressing content (Simister et al., 2022), suggesting screens may not minimize engagement. The very design of sensitive screens may elicit uncertainty/curiosity and prompt information-seeking behaviors, congruent with the information-gap hypothesis (Loewenstein, 1994). To test this idea experimentally, we presented participants with screened negative images that were accompanied by a brief, detailed, or no-content description during a simulated Instagram task. Participants viewed screens/images one at a time and uncovered screens at their discretion. In line with our predictions, people uncovered screens irrespective of description type but did so most often when the screens had no description and least often when the screens had a detailed description. Most participants indicated that the descriptions influenced their decision to uncover screened images, and specifically knowing what the sensitive content contained bolstered their ability to make an informed decision. These results have implications for the use of sensitive screens; information provided alongside screened content can influence engagement and therefore should be considered as part of content guidelines.

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V152

To Sweat or Not to Sweat: Physiological Response to Aversive and Non-Aversive Audio, Visual, and Audiovisual Stimuli. SEWON OH, *University of South Carolina,* XUAN YANG, *University of South Carolina,* WILLIAM HAYES, *University of South Carolina,* DOUGLAS WEDELL, *University of South Carolina,* SVETLANA SHINKAREVA, *University of South Carolina* — The purpose of this experiment was to examine how physiological signals distinguish aversive from non-aversive stimuli across visual, auditory, and audiovisual modalities. In preliminary studies, we developed naturalistic stimuli recorded in audiovisual, audio-only, and visual-only modalities while matching aversiveness across modalities. Forty-three participants rated the valence and arousal of aversive and non-aversive 5s naturalistic clips of behavior presented in the three different modalities. Electrodermal activity (EDA), heart rate, corrugator (EMGC) and zygomaticus (EMGZ) facial muscle potentiations, and skin temperature were recorded. Physiological signals varied in response to aversiveness for different channels across modalities: EDA, EMGC and EMGZ for audiovisual stimuli, EMGZ and skin temperature for audio stimuli, and EMGC for visual stimuli. These results serve as a baseline for understanding physiological responses to aversive, non-aversive, and trigger stimuli in people suffering from misophonia, a condition characterized by strong physiological reactions to specific sounds.

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Dysphoria Impairs the Cognitive and Emotional Anticipation of Goal Success. RACHEL ANDERSON, *University of Hull,* HELGI CLAYTON-MCCLURE, *University of Hull,* JENNIFER BOLAND, *York St John University,* DAVID HOWE, *University of Hull,* KEVIN J. RIGGS, *University of Hull,* STEPHEN DEWHURST, *University of Hull* — In order to plan, prepare for, and shape events in line with one's goals, one needs to be able to anticipate future events and/or states. The reported study investigated the cognitive representations and emotional anticipation pertaining to goal achievement and whether these differ as a function of dysphoric symptoms. After listing approach and avoidance goals, participants made predictions about these goals (e.g., achievement likelihood) and rated their cognitive and emotional anticipation of goal success. Higher levels of dysphoria were associated with pessimistic predictions and impaired cognitive anticipation of goal success. A dichotomy emerged with respect to the emotional anticipation of goal achievement. Individuals experiencing high levels of dysphoria demonstrated no bias in anticipated positive emotions, believing that goal achievement would bring positive emotions akin to those experiencing lower levels of dysphoria, yet they exhibited a bias in anticipatory emotions whereby thinking about achieving their goal brings less in-the-moment pleasure. These findings have implications for both future work regarding both anticipated and anticipatory emotions as well as therapeutic techniques to aid depression and dysphoria.

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The Psychological and Cognitive Predictors of Adherence to Social Distancing Behavior: Data from an Italian Sample. ALESSANDRO SANTIROCCHI, *Sapienza University, Rome, Italy,* ANTONINO ESPOSITO, *LUMSA Università,* PIETRO SPATARO, *Mercatorum University, Rome, Italy,* VINCENZO CESTARI, *Sapienza University, Rome, Italy,* CLELIA ROSSI-ARNAUD, *Sapienza University, Rome, Italy* (Sponsored by Clelia Rossi-Arnaud) — Social distancing is a widely recommended policy for limiting the COVID-19 pandemic. An internet-based survey was used to investigate the role of several psychological variables in predicting social distancing compliance in Italy. Data from 373 participants, between March and August 2021, revealed that complying with social distancing and prioritizing the benefits to society over personal costs correlated positively with emotional intelligence, extroversion, and higher risk perception of COVID-19, and negatively with age. No relationship was found between working memory capacity and social distancing compliance. The mediation analysis suggests that as the costs of social distancing are perceived to be greater than the benefits, the effect of anxiety on social distancing diminishes. Further studies are needed to better understand the characteristics of individuals who choose to practice social distancing, as this is critical for developing public service campaigns to promote these behaviors during possible future pandemics.

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V155

IDEST: International Database of Emotional Short Texts. EGON WERLEN, *Swiss Distance University of Applied Sciences (FFHS),* JOHANNA K. KAAKINEN, *University of Turku,* YVONNE KAMMERER, *Stuttgart Media University,* CENGIZ ACARTÜRK, *Jagiellonian University,* XAVIER APARICIO, *Université Paris-Est Créteil/Cognitions Humaine et Artificielle (CHArt),* THIERRY BACCINO, *Université Paris 8,* UGO BALLENGHEIN, *Université Paris-Est Créteil/Cognitions Humaine et Artificielle (CHArt),* PER BERGAMIN, *Swiss Distance University of Applied Sciences (FFHS),* NÚRIA CASTELLS, *Universitat de Barcelona,* ARMANDA COSTA, *Universidade de Lisboa,* ISABEL FALÉ, *Universidade Aberta/Centro de Linguística da Universidade de Lisboa,* OLGA MEGALAKAKI, *Université de Picardie Jules Verne,* SUSANA RUIZ-FERNÁNDEZ, *FOM University of Applied Sciences/Leibniz-Institut für Wissensmedien* — The IDEST database contains 250 short texts each in one of six original languages (Finnish, French, German, Portuguese, Spanish, Turkish) and their English translations. The texts are 900-1100 characters long narratives written from the first-person perspective. The database contains ratings for valence, arousal, and comprehensibility of the texts in the respective original language and in English, and they have been categorised into different narrative types based on their emotional arc. In addition, the Flesch Reading Ease for the original texts and different readability indices for the English texts are reported. The texts show high comprehensibility and represent a wide range of emotional valence and arousal levels. Comparative analysis of the ratings of the original texts and the English translations showed that valence ratings were very similar across languages, while correlations between the two language pairs for arousal and comprehensibility were modest. The comprehensibility ratings correlated only with some of the readability indices. The database is freely available at Open Science Framework for research use.

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V156

Relationships Between Prospective Mental Imagery, Intrusive Imagery, and Thought Control in a Non-Clinical Sample. MEGAN BOOTH, *Ontario Tech University,* TANYA KARAM-ZANDERS, *Ontario Tech University* — Given the substantial role of future-oriented imagining on affect and mood, the maladaptive application (or absence) of control strategies might contribute to adverse psychological outcomes. Using self-report measures, we sought to investigate how participants' reliance on thought control strategies and proneness to intrusive imagery impacted the likelihood, vividness, and self-generation of imagined future events. Results indicated that specific thought control strategies were positively associated with intrusive imagery. While intrusive imagery was associated with more vivid negative events, thought control was associated with more vivid positive events. Further, intrusiveness and thought control levels interacted to differentially influence the vividness of positive versus negative imagined future events. There were no effects on the likelihood and self-generation of future events, suggesting that only certain components of future-oriented imagining are impacted. Together, these findings can contribute to the refinement of imagery-based therapeutic interventions and suggest that techniques enhancing adaptive control may benefit those prone to intrusive imagery.

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V157

The Heart Remembers What the Mind Forgets: Meta-Analysis of Emotional Enhancement on Episodic Memory for Valenced Pictures. NADA ALAIFAN, *University of British Columbia,* YEHING LUO, *University of British Columbia,* PETER GRAF, *University of British Columbia* — Emotional events (e.g., a graduation celebration or a funeral ceremony) are better remembered than neutral events (e.g., preparing breakfast on a particular day). Considerable evidence is mainly available from research on autobiographical memory, but the evidence from episodic memory remains unclear. This meta-analysis aimed to examine whether there is an emotional enhancement effect on episodic memory for valenced pictures, and whether the magnitude of this effect is the same for recall and recognition memory. I also examined the influence of a number of potential moderators in the magnitude of the emotional enhancement effect for both recall and recognition. The main findings of my meta-analysis revealed a medium-to-large emotional enhancement effect on episodic memory. The emotional enhancement effect was more pronounced for recall than for recognition. In both recall and recognition, the emotional enhancement effect was larger for negative pictures than for positive ones, and larger after a long retention interval than after a short retention interval.

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V158

Does Consolidation Matter for the Disgust-Related Memory Advantage? A Diffusion Model Analysis. ELIF YÜVRÜK, *Ege University,* AYCAN KAPUCU, *Ege University* — Previous studies showed that disgust-related stimuli increased memory accuracy, as well as liberal response bias, compared to fear-related stimuli. Retrieval dynamics of this disgust-related memory advantage after the consolidation process have yet to be investigated. We examined different retrieval components of disgust- and fear-related stimuli via diffusion model-based analysis. Participants first studied three blocks of disgust-related, fear-related, or neutral pictures and completed an old/new recognition test after a 24-hour delay. Model-based analysis indicated that participants were more liberal (in relative starting point) in responding to disgust-related pictures. Moreover, disgust-related pictures produced relatively higher familiarity memory bias (in drift rate), indicating more efficient evidence accumulation favoring the "Old" response compared to fear-related and neutral ones. Yet, regardless of specific negative emotion, participants were less cautious (in boundary separation) in responding to all emotional stimuli. Present study suggests that different retrieval mechanisms might contribute to disgust-related memory

advantage, which cannot solely be explained by valence and arousal properties of stimuli.

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V159

Building a Profile of the Highly Sensitive Person: Exploring Cognitive, Behavioural, Personality, and Gender Differences. JENNIFER L. BRIERE, *St. Thomas More College,* SOPHIA (HAOTANG) WANG, *University of Saskatchewan,* JEREMY J. SEHN, *University of Saskatchewan* — Using the Highly Sensitive Person (HSP) survey to measure sensory processing sensitivity (SPS), and the DOES model (depth of processing, optimal level of arousal/overstimulation, emotional reactivity/empathy, sensitive to subtle stimuli) to theoretically select measures, gender and SPS differences were examined across cognitive (true & false memory, spatial ability, body awareness), behavioural (visual search accuracy, visual search stress), and personality (Big-5, hypermasculinity, grit, empathy) domains. Although data collection is ongoing (n=216; male n=50), those with high HSP scores reported more extroversion (p=.029), neuroticism (p <.001), and openness (p<.001), were grittier (p=.058), had higher body awareness (p=.022), empathy (p< .001), and self-reported stress during visual searches (p=.002), but less hypermasculinity (p=.005). No significant gender-based interactions were found. Overall, a significant six-factor linear regression model, F(6, 128)=29.83, p<.001 (Empathy, Neuroticism, Body Awareness, Search Stress, Extraversion, and Agreeableness), explained 58% of the variance. Current results validate the DOES model as useful to explore SPS and to generate novel lines of research.

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V160

Is Mentalizing Related to Spatial Perspective-Taking? SUNGJOON PARK, *Texas A&M University,* BRANDON WATANABE, *Texas A&M University,* HEATHER BURTE, *Texas A&M University* (Sponsored by Heather Burte) — We often take perspectives to think about objects, places, and people. However, it is unclear the extent to which taking another person's spatial perspective (i.e., imagining taking a person's physical location or orientation) is related to how we mentalize (i.e., imaging other people's thoughts and feelings in a social context). If spatial perspective-taking is related to mentalizing, people who are better at taking spatial perspectives should also be better at mentalizing, and there should be common individual differences contributing to both abilities. We recruited participants, both online (N = 148) and in-person (N = 170), and they completed two spatial perspective-taking tasks, a mentalizing task, and a series of questionnaires on personality, and anxiety. We found that people who are better at taking another's spatial perspective were also better at mentalizing. However, we found no common individual difference factors. Our findings suggest that our spatial faculties are related to our ability to mentalize and think about abstract social relationships.

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V161

The Impact of Spatial Perspective (Route vs. Survey) and Information Media (Text vs. Map) on Direction Giving. REBECA COSTA DO NASCIMENTO, *Montclair State University,* CAPRICE E. KENNEDY, *Montclair State University,* YINGYING (JENNIFER) YANG, *Montclair State University* — Previous research has found that direction giving performance is better in a route than in a survey perspective and maps than in texts. The current study aims to examine spatial perspective (i.e., route vs. survey) and information media (i.e., map vs. text) in the same setting. Furthermore, different from previous studies, which overwhelmingly presented all materials simultaneously, the current study presented information sequentially, one piece at a time. A total of 120 college students participated. After learning a series of sentences and map segments, they were asked to give directions from different perspectives. Results showed that participants used more cardinal direction terms and fewer relative direction terms in the survey than in route question perspectives. Accuracy was higher in the map condition than in the text condition. The interactions between text perspective and question perspective were not significant for accuracy, using cardinal terms, and using relative terms.

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V162

Individual Differences in Spatial Navigation Domains of Knowledge. VERONICA MUFFATO, *Università di Padova* — Learning an environment from navigation provides the individual of different domains of knowledge, from the one about landmarks, to their locations and paths connecting them. People vary in their navigation abilities, but it is unclear whether individual factors relate differently to the various domains of knowledge. 270 people performed several individual visuospatial tasks and questionnaires. Then they learnt a virtual path and performed a free recall of landmarks, egocentric and allocentric pointing (location knowledge), route direction, and landmark locating (path knowledge) tasks. The resulting models showed that visuospatial abilities and wayfinding inclinations compose two distinct factors, the former relating to all the domains of knowledge tasks except for route direction, and the latter relating to allocentric pointing task and landmark locating (path-survey knowledge). Overall, the relationship between individual factors and environment learning from navigation depends on the domain of knowledge tested, with a stronger involvement of visuospatial factors in allocentric/survey knowledge.

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V163

Navigation Ability at Different Levels of Difficulty: Examining Motivational Factors, Mindset, and Stereotype. LAURA MIOLA, *University of Padova,* CHIARA MENEGHETTI, *University of Padova,* FRANCESCA PAZZAGLIA, *University of Padova,* INEKE VAN DER HAM, *Leiden University* (Sponsored by Chiara Meneghetti) — Across the general population there is great

variability in navigation ability. Initial evidence has sought to identify the role of motivational factors (e.g., self-efficacy and mastery experience), mindset, and gender stereotype in influencing navigation ability. To date, how such individual factors are related in explaining spatial navigation at different levels of difficulty remains unclear. The present study investigates how spatial self-efficacy interacts with growth mindset, gender stereotype and mastery experience in explaining navigation performance. A total of 150 adults answered questionnaires on spatial self-efficacy, growth mindset, and gender stereotype, then learned a route in virtual environment and performed five spatial recall tasks. Results from mixed-effect models showed that self-efficacy, mastery experience, and gender stereotype interacts in relation to performance in location allocentric and egocentric task. The present findings suggest that not only self-efficacy but the combination between the latter and mastery experience is associated to better performance in a difficult spatial recall task.

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V165

Development of Imagery Assessments. OLESYA BLAZHENKOVA, *Sabancı University,* IREM DUMAN, *Sabancı University,* BELGIN DERYALAR, *Sabancı University,* OZGENUR UMITLI, *Sabancı University,* ASLI AYDINLAR, *Sabancı University,* IREM TOGAL, *Sabancı University,* PELIN AKBAS, *Sabancı University,* JUNKO KANERO, *Sabancı University,* ROBERT BOOTH, *Sabancı University,* EKATERINA PECHENKOVA, *National Research University Higher School of Economics (HSE University),* VARVARA VASILENKO, *National Research University Higher School of Economics (HSE University)* — Our project aims to develop a set of validated tools for assessing individual differences in visual imagery. It is based on a cognitive/neuroscientific approach, which distinguishes between different imagery dimensions, i.e., object imagery (processing the appearance in terms of their shape, color, texture) and spatial imagery (processing spatial relations, locations, and spatial transformations). Most of the existing imagery measures are either self-report questionnaires assessing object imagery or performance tests of spatial imagery skills. Thus, we aim to develop assessments of object imagery performance and spatial imagery experience, currently lacking in the field. Our tools include performance tests that assess object imagery (e.g., Color Imagery Task, Pareidolia Task), as well as spatial vividness measures (e.g., Read and Imagine Task, Vividness of Object and Spatial Imagery Questionnaire). New instruments can be used to test and train diverse visual imagery skills. All the assessments are freely available for researchers and practitioners.

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V166

Following Navigation Instructions: Interdependent Spatial and Verbal Working Memory Processes. JAMES KOLE, *University of Northern Colorado,* ALICE F. HEALY, *University of Colorado Boulder,* VIVIAN SCHNEIDER, *University of Colorado Boulder,* IMMANUEL BARSHI, *NASA Ames Research Center* — This study investigated the ability to follow navigation instructions in a situation that mimicked communication between air traffic controllers and flight crews. Subjects heard navigation instructions describing movement within a 2-dimensional computer display of a 3-dimensional space consisting of four 4x4 stacked matrices. They repeated the instructions and then followed them by making movements on the computer screen. The 3-dimensional space was shown from 2 different orientations (with the matrices stacked top-to-bottom or front-to-back). The effects of movement dimension depended on orientation; the dimension that was most difficult always involved movement outside the picture plane. The movement dimension effects also depended on the response requirements; they occurred only when a spatial representation was needed to make the movements. Likewise, serial position effects for the immediate oral repetition responses depended on the subsequent response requirements, providing support for and elucidating the proposal that spatial and verbal working memory processes are interdependent.

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V167

The Impact of Foreign Accent on Native Speakers' Responses to Ironic Praises. LUCA BAZZI, *Universidad Nebrija,* SUSANNE BROUWER, *Radboud University,* ALICE FOUCART, *Universidad Nebrija* — Literature has shown that foreign-accented (FA) speech modulates the degree of irony perceived by native (NA) speakers, but the subsequent consequences it may have on social interaction are unknown. To address this question, we presented participants with written contexts with ironic/literal praises allocated to either a NA or a FA speaker. Written modality was used to avoid disfluency and to examine the impact of expectations of non-native comprehension on irony processing. For each of the 104 contexts, participants had to 1) assess the degree of irony of the speaker's praise inserted in the context, 2) assess the speaker's level of friendliness, and 3) indicate the level of correctness of the response given to the ironic/literal comment. Results indicate that the speaker's identity modulates the degree of perceived irony as well as the perceived correctness of the responses given to ironic comments, even when not experiencing the accent.

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V168

Not All Neighbors Are Similarly Similar: Phonological Similarity in Mandarin Chinese. LUAN LI, *East China Normal University,* MANYAN ZHANG, *East China Normal University,* SHUTING LIU, *University of Melbourne* — The definition of phonological neighbors (i.e., the one-phoneme edit rule) used in Indo-European languages inadequately captures the phonetic similarity among Mandarin words, which has simple syllable structures and lexical tones. The current study proposes graded Mandarin phonological neighborhoods and investigate the impacts of close-to-distant neighbors on lexical processing. We first investigated how the perceived

similarity of Mandarin monosyllables are influenced by differences at the tone, constituent (initial/final, onset/rime) and phoneme levels. Native Mandarin speakers rated the similarity between monosyllabic words on a 7-point Likert scale. It was found that the similarity ratings were influenced to a significantly different degree by edits in constituent > phoneme > tone. Based on the results, we constructed separate constituent-, phoneme- and tone-edited phonological neighborhoods for 4,721 monosyllabic words. Capitalizing on existing data, we tested how the density and frequency of graded neighborhoods differentially impact RTs in word naming, picture naming and lexical decision. The results show that close (tone-edited) neighbors were inhibitory and distant (rime-edited) neighbors were facilitative on word processing. Whereas the effect of medium-distant (phoneme-edited) neighbors depends on the task. The findings are discussed within the interactive activation framework.

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V169

Does Friendship Matter in Social Communication and Memory Among Young Adults? KELLY MCDONOUGH, *University of Iowa,* STEWART MCCAULEY, *University of Iowa,* SI ON YOON, *University of Iowa* (Sponsored by Si On Yoon) — Previous studies have shown mixed findings on whether communication partners remember more of what they vs. their partner contribute to an interaction. We examine conversational memory and its social effects by comparing memory for conversations between pairs of friends and pairs of strangers. Participants had a 15-minute conversation and a free-recall memory task after 20 minutes of the conversation. Each conversation and the retrieved information were transcribed and coded into "idea units." The results of conversation analysis showed more instances of turn-taking and a lower proportion of positive utterances between friends than strangers. In the memory test, both friends and strangers recalled about 20% of the conversation, and individuals remembered more of what they produced compared to what their partner produced. Further, friends remembered utterances with emotional valence better than strangers. This finding gives insight into the underlying mechanisms of conversational memory and the role of social connections between interlocutors.

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V170

Memory for Social Media Images Following Traumatic Brain Injury. KAITLIN LORD, *Vanderbilt University,* JORDAN ZIMMERMAN, *Massachusetts General Hospital,* MELISSA DUFF, *Vanderbilt University Medical Center,* SARAH BROWN-SCHMIDT, *Vanderbilt University* — Prior research has shown that there are multiple interpersonal benefits of computer-mediated communication, including communication via social media use, for persons with traumatic brain injury (TBI). In the present study, we investigated memory for social media posts in 53 persons with moderate-to-severe TBI and 53 neurotypical comparison subjects. Subjects viewed a series of real Instagram posts, arranged in 3x3 arrays, and were instructed to generate a comment on some of the images shown. Participants' memory was subsequently tested for target and non-target images. At test, persons with TBI were more accurate than not at identifying non-target images, and further, had better memory of target images that they had commented on, similar to the neurotypical comparison subjects. These results indicate that persons with TBI experience benefits from actively engaging with social media content and experience a memory boost for commented-upon social media posts.

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V171

Examining Listeners' Perception of Spoken Words with Different Face Masks. BETHANY G. COX, *Cleveland State University,* JESSICA MORICH, *Cleveland State University,* CONOR T. MCLENNAN, *Cleveland State University* — The COVID-19 pandemic made face masks part of daily life. While masks protect against the virus, it is important to understand the impact masks have on spoken word recognition. We examined three different mask conditions (no mask; cloth mask; Kn95 mask) in easy (low density, high phonotactic probability) and hard (high density, low phonotactic probability) words in a lexical decision task. The no mask condition produced the fastest and most accurate responses followed by the Kn95 mask condition and the cloth mask condition, respectively. However, there was a speed-accuracy trade-off with Word Type. Easy words produced faster but less accurate responses relative to hard words. The finding that cloth masks had a more detrimental impact on spoken word recognition than Kn95 masks is consistent with previous research, and the current results further demonstrate that this effect extends to individual word recognition tasks with only audio presentation.

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V172

The Role of Gradient Speech Perception in Learning Non-Native Speech Contrasts. EFTHYMIA KAPNOULA, *Basque Center on Cognition, Brain and Language (BCBL) & Ikerbasque,* ARTHUR SAMUEL, *Stony Brook University, Basque Center on Cognition, Brain and Language, & Ikerbasque* — Some listeners are highly sensitive to subphonemic differences in their L1 (Kapnoula et al., 2017; Kong & Edwards, 2016), which is likely due to weaker perceptual warping of acoustic cues around the boundary (Kapnoula & McMurray, 2021; e.g., due to less robust L1 phonological prototypes; Samuel, 1982). Here we examine the role of subphonemic sensitivity in learning a new phonetic contrast. New speech contrasts are often difficult to learn because unfamiliar speech sounds are assimilated to similar-sounding L1 categories (Best & Tyler, 2007; Kuhl, 1991). We hypothesized that weaker perceptual warping around L1 boundaries should reduce assimilation, thus facilitating L2 learning. Subphonemic sensitivity of native Spanish listeners was assessed and then participants were trained on a novel phonetic contrast (English /b/-/p/) over a period of two days. Learning was

tracked behaviorally and discriminability of the newly learned categories was assessed using the mismatch negativity (MMN) EEG component. Subphonemic sensitivity in L1 is expected to predict baseline discriminability of the new categories and learning success. Data collection/analysis is underway.

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V173

Lapses in Lesson Coherence Cause Students' Minds to Wander. KEESHIA KAMURA, *University of California, San Diego,* ROB ETHAN SANTIAGO, *University of California, San Diego,* CELESTE PILEGARD, *University of California, San Diego* — This study examined the effect of lapses in lesson coherence on college students' relevant task engagement as measured through mind wandering probes. Participants watched a three-lesson sequence on topics related to the immune system. The first and third lessons had high text coherence. The second lesson either lapsed into low coherence (experimental condition) or maintained high coherence (control). Mind wandering was measured through pseudorandom self-report probes throughout the lessons. After watching the lessons participants then completed a comprehension test. Students in the experimental group were more likely to report mind wandering during the second lesson than the control group. This effect was confined to the second lesson; no significant difference in mind wandering was found for the third lesson. Additionally, we found significantly lower test scores in the low coherence group for the second lesson, but not the third. This work contributes to a theory of sustained engagement during learning.

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V174

Review Websites Improved College Exam Performance, But There Was No Advantage for Retrieval Practice. KALIF VAUGHN, *Northern Kentucky University,* PERILOU GODDARD, *Northern Kentucky University,* DOUGLAS KRULL, *Northern Kentucky University* — Retrieval practice has been shown to improve learning and memory, but the bulk of these studies occurred within laboratory settings. We explored whether external review websites would influence exam performance in university-level psychology courses. The websites randomly assigned students to either a study group (i.e., the question and answer were presented simultaneously) or a retrieval-practice group (i.e., the question was presented by itself, with the answer being revealed after a retrieval attempt). Students could utilize the websites as frequently as they desired throughout the semester. Although students were encouraged to utilize the websites, we did not monitor or reward their usage. Results suggested that the review websites improved exam performance, but there was no advantage for those in the retrieval-practice versus study group. We discuss these findings in terms of limitations of real-world studies and selection bias.

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V175

Effects of Adjunct Question Feedback on Learning and Metacognition. INEZ ZUNG, *University of California, San Diego,* EMMA GELLER, *University of California, San Diego* — When instructors use adjunct questions, or questions embedded throughout a lesson, the feedback that students receive after answering the question is critical for their learning. The kind of feedback (i.e., accuracy or explanatory) that students see may modulate how effective adjunct questions are, perhaps via metacognitive changes. We tested this in a large undergraduate cognitive psychology course in which students watched lecture videos with embedded adjunct questions. For each video, they received one of three types of adjunct question feedback: 1) accuracy feedback that states the correct answer, 2) detailed feedback that provides explanations of each answer choice, or 3) no feedback. Students' performance on practice quizzes, weekly quizzes, and exams did not differ according to feedback condition ($ps > .05$). While their metacognitive judgments for exams were also unaffected by feedback condition, their metacognitive judgments for practice quizzes were most accurate after receiving detailed feedback, followed by accuracy feedback, then no feedback, $X2(2, N = 333) = 13.80$, $p < .01$. Instructors should therefore provide explanatory feedback for adjunct questions to encourage accurate metacognitive calibration.

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V176

The Derring Effect: Deliberate Errors Improve Learning and Transfer. SARAH SHI HUI WONG, *National University of Singapore* — Deliberately committing and correcting errors has recently been shown to enhance learning more than avoiding errors—a counterintuitive phenomenon known as the derring effect. In three experiments, the present research investigated whether deliberate erring boosts far transfer of learning to different knowledge domains. Learners studied scientific texts either by generating conceptually correct responses or deliberately generating conceptually erroneous responses then correcting them. Deliberate erring improved not only retention (Experiment 1), but also far transfer on inferential test questions that required applying the learned concepts to remote knowledge domains (Experiment 2). This advantage held even when the errorless control further involved spotting and correcting the same errors generated in the deliberate erring condition (Experiment 3). Altogether, these results suggest that the derring effect is not fully attributable to engaging in generation or elaboration per se. Neither does mere error exposure nor juxtaposition of correct versus incorrect responses suffice. Rather, personally committing and correcting deliberate errors is vital for enhancing retention and far transfer of knowledge to distant domains.

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V177

Intentional State Differences Between Successful and Unsuccessful Delayed Intentions in Everyday Life. TAISUKE MORITA, *Tokyo University of Science* — The intentional

status of a delayed intention refers to the readiness to perform an intended action in the future. This study examined differences between successful and unsuccessful delayed intentions on three aspects of intentional status (Will, Must, and Wish). A total of 217 participants reported successful and unsuccessful delayed intentions in their everyday lives. Additionally, they remembered and reported the intensity of the three aspects of their intentional status at the time they intended to carry out the delayed intentions. Comparison of intentional status between successful and unsuccessful delayed intentions revealed differences in the intensity of the three aspects of intentional status. The cognitive mechanisms underlying the association between the aspects of the intentional status and the success or failure of everyday delayed intentions are discussed in light of these findings.

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V178

Will You Remember Me? The Relationship Between Predicted and Observed Accuracy When Learning a New Face. REBEKAH L. CORPUZ, *University of Regina,* CHRIS ORIET, *University of Regina* (Sponsored by Chris Oriet) — Growing evidence suggests unsystematic variability (differences in expression, make-up, hairstyle) in encounters with unfamiliar faces leads to more successful recognition than systematic variability (differences in viewpoint or lighting) or no variability (learning from a single photo). Here we investigated whether subjects intuit this benefit. Subjects learned three unfamiliar target identities with unsystematic, systematic, or no variability, then sorted new photos of the targets from photos of similar-looking distractors. Subjects rated how confident they were that they would subsequently recognize the target pre-learning, post-learning, and post-sort. Pre-learning, subjects expected systematic variability to yield better memory than unsystematic or no variability. Interestingly, confidence ratings at post-learning increased only in the no variability condition. Thus, although subjects initially believed too much or too little variability would impede recognition, the experience of learning to recognize a face from a single still image strengthened their belief future recognition would succeed. The results provide evidence that subjects' beliefs about prospective face recognition abilities do not align with their performance.

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V179

An Unforgettable Face Makes a Memorable Name. ANDREW COOK, *Binghamton University SUNY,* SAMIRA DODSON, *Binghamton University SUNY,* REBECCA LURIE, *Binghamton University SUNY,* DEANNE L. WESTERMAN, *Binghamton University SUNY* — Images have an intrinsic memorability status that biases their likelihood of being remembered (e.g., Bainbridge, Isola, & Oliva, 2013). Although recognition tests have demonstrated a reliable effect for memorability status across diverse stimuli, little is known about how memorability status impacts memory for associated information. In this study, participants saw faces with high and low intrinsic memorability with names presented as paired-associates during encoding. Later, memory for the faces and names was assessed. Across four experiments, results consistently demonstrated that, in addition to the recognition advantage for highly memorable faces, names that were paired with highly memorable faces were more likely to be recalled on both the cued and free recall tests, compared with names paired with low memorability faces. The results suggest that highly memorable images confer a memory advantage to information that is associated with it during encoding.

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V180

Survival-Related Dimensions for 732 French Words and Memory Performance. PATRICK BONIN, *Centre National de Recherche Scientifique (CNRS) & Université Bourgogne Franche-Comté,* GAËTAN THIEBAUT, *Université Bourgogne Franche-Comté,* ALAIN MÉOT, *Université Clermont Auvergne* — Norms were collected on French adults for 732 words selected from the Bonin et al. (2003) database. The words were rated using Likert scales on three survival-related dimensions: "finding food and water," "avoiding predators," "avoiding contamination." Reliability measures were computed for the norms, descriptive statistical analyses and correlations were performed. The norms will be useful to researchers investigating episodic memory. Three experiments were conducted using the norms to investigate whether the survival processing advantage (SPA) in memory—memory for items is better after they have been processed in the context of a fitness-related survival scenario as compared to alternative processing contexts—was moderated by the congruency between relevance ratings (high vs low relevance) and survival contexts ("predation," "contamination," "food/water"). Using pleasantness as a control condition, the SPA was larger when the words were highly congruent with the survival dimension. The findings suggest that congruency constrains the generality of the SPA.

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V181

When Should We Put Our Heads Together? Exploring Collaborative Inhibition in Memory Foraging Tasks. JOHANNA FALBEN, *University of Warwick,* ADAM SANBORN, *University of Warwick,* NICHOLAS CHATER, *University of Warwick* — Past research has found that groups are less efficient recalling previously memorized information when compared to the same number of independently working individuals (i.e., when divided into "nominal" groups). The present study explored this using a memory foraging task where participants searched their memory to recall as many animal names as possible within a time limit. Replicating past work on collaborative inhibition, the interacting pairs recalled fewer unique items than nominal pairs and repeated their own and each other's ideas more often than participants in the individual condition. Crucially, the present research used a novel measure: the probability of following the other group member's ideas – e.g., choosing an animal related to that just generated by another group member. We found that groups in which each member followed the other to the

same extent were more successful than pairs who employed different strategies. Together, the present results highlight the importance of understanding social interactions in memory recall tasks and how working in group settings requires its members to adjust their own pre-existing strategies in order to converge into a shared group-specific strategy.

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V182

How Does Survival Processing Affect Storage and Retrieval Processes? MEIKE KRONEISEN, *University of Koblenz-Landau* — Words judged for relevance in a survival situation are remembered better than words judged for relevance in a non-survival context. This survival processing effect has been explained by selective tuning of human memory during evolution to process and retain information specifically relevant for survival. According to the richness-of-encoding hypothesis, however, the survival processing effect arises from a domain-general mechanism, namely, a particularly rich and distinct form of encoding. Depth of encoding should influence how well items are stored and maintained in memory (Riefer & Batchelder, 1995). To test if survival processing influences mainly storage processes or if it also alters retrieval processes, in one experiment, a multinomial processing-tree model (MPT) for a free-then-cued-recall paradigm was used (Rummel et al., 2016). The storage-retrieval model used in the present experiment allows to compare the contribution of storage and retrieval processes to memory between different scenarios (survival vs. moving). Implications for theories of the survival processing effect are discussed.

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V183

The Impact of Interview Modality on Memory Reports. MACKENZIE R. RIGGENBACH, *University of Oklahoma,* SCOTT D. GRONLUND, *University of Oklahoma,* PHILLIP R. ZOLADZ, *Ohio Northern University* — Following a witnessed event, eyewitnesses are typically asked to give a statement. Research investigating different types of interviews suggests that having witnesses talk or write about an event can lead to different report qualities. Thus, one goal of the present study is to investigate how interview type impacts memory reports. Additionally, being tested on previously learned information has been shown to improve memory for that information compared to re-studying. Therefore, another goal is to examine how questioning participants at Test 1, compared to a second exposure, impacts memory reports. Participants watched a short video and then were interviewed about its contents immediately, one week and one month later. Participants either wrote or spoke about what happened in the video. In general, writing leads to better quality memory reports, and even mitigates an anticipated testing benefit. However, writing may be more suitable for open-ended questions compared to specific-pointed forms of questioning.

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V184

Why Does Cognitive Load Affect Performance in Complex Working-Memory Span? EDA MIZRAK, *University of Zurich,* KLAUS OBERAUER, *University of Zurich* — When encoding information in working memory, doing a secondary task that demands attention impairs performance. The cognitive load effect refers to the finding that the size of this impairment depends on the relative amount of time secondary task demands. When the secondary task is done at a slower pace, performance is better than fast pace. This is explained by participants having more time to engage in maintenance mechanisms during the time they gained at slow pace. Recent work suggests an alternative explanation: slow pace is better because participants have more free time to replenish their depleted encoding resource. We examined whether this is the case. We manipulated the free time given after a secondary task during serial recall of consonants. In one of the inter-item positions, there was either a secondary task, or free time, or both. Whereas secondary task impaired memory for the items encoded prior to the task, free time added after the secondary task helped memory for subsequently presented but not preceding items. This finding suggests that free time gained from slowing the pace of a secondary task (i.e., reducing cognitive load) is used for replenishing an encoding resource, and not for maintaining preceding items.

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V185

Feature Binding: How Multi-Featured Objects Are Integrated in Working Memory (WM). SUAAD S. AL-HADHRAMI, *University of Zurich,* KLAUS OBERAUER, *University of Zurich,* LEA M. BARTSCH, *University of Zurich* — How are object features bound in WM? There are three views: 1) entire objects as units, either remembered completely or not, 2) object features are remembered independently of each other, 3) object features are only connected via mutual location. In three double-report experiments, participants memorized multiple objects which were random combinations of three features. They were then given one feature as a cue and prompted to report the other two features. We investigated the conditional probabilities of retrieving one feature, given successful or unsuccessful retrieval of the other (i.e., stochastic dependence). We obtained strong evidence for stochastic dependence in nearly all cues and targets. We then tested the three conceptual ideas about memory representations by constructing three multinomial models. The MPT model that appears to explain the current data accurately is the third model where features of an object are either represented in bound units or in pairwise bindings.

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V186

The Influence of Contextual Discriminability on the Retrieval of Stimulus-Response Episodes. RUYI QIU, *University of Passau,* MALTE MÖLLER, *University of Passau,* IRING KOCH, *Rheinisch-Westfälische Technische Hochschule Aachen University,* SUSANNE MAYR, *University of Passau* — According to

the event segmentation theory (Zacks et al. 2007), the on- and offset of an external context indicates the start and end of an event. Accordingly, we assume that the context may take on a structuring role for sequences of stimulus-response episodes (i.e., a pre-prime followed by a prime and a probe episode). Consequently, retrieval of the prime episode in the probe may be impaired if the prime and the pre-prime share an identical context (i.e., the low-discriminability condition), presumably due to increased likelihood of confusing these episodes as compared with the high-discriminability condition in which the pre-prime and the prime contexts are different. This hypothesis was tested by investigating effects of feature binding and retrieval in the negative priming paradigm using auditory stimuli and contexts. Results revealed a smaller retrieval effect in the low- as compared with the high-discriminability condition, suggesting organization of stimulus-response episode sequences by context.

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V187

Improving Visuospatial Working Memory Performance by Increasing Trial Distinctiveness: Two Approaches. LINDSEY LILIENTHAL, *The Pennsylvania State University, Altoona* — Previous research has shown that as proactive interference (PI) builds across trials of both verbal and visuospatial working memory (WM) tasks, memory performance declines. Interestingly, a few studies have found that increasing the distinctiveness of to-be-remembered locations can reduce PI and improve memory: Rowe, Hasher, and Turcotte (2010) varied the pattern covering the non-target locations on each trial (target locations were always black), whereas Lilienthal and Denz (2019) varied the color of the target locations on each trial (non-target locations were always white). Both manipulations successfully improved participants' memory, and the goal of the present study was to determine which is more effective at reducing PI. Therefore, participants in the present study completed three conditions of a visuospatial WM task: a Target Color condition in which the color of the target locations was varied across trials, an Array Color condition in which the color of the non-target locations was varied across trials, and a Baseline condition in which all trials were visually similar. Memory performance was then compared across the three conditions; results will be discussed.

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V188

Effect of Visual Presentation Format and Recall Direction on Error Patterns During a Letter Span Task in Deaf Signing and Hearing Nonsigning Adults. TYLER C. MCFAYDEN, *The Carolina Institute for Developmental Disabilities, University of North Carolina School of Medicine,* MARK FAUST, *University of North Carolina at Charlotte,* ANNE MCINTOSH, *University of Maryland Global Campus,* KRISTI MULTHAUP, *Davidson College* — Memory spans are consistently lower for deaf signers than hearing nonsigners. We tested the proposal (Hirshorn et al., 2012) that these groups flexibly use different aspects of working memory (WM) across tasks. Matched samples of deaf signing (N = 33) and hearing nonsigning adults (N = 32) performed a letter-span task with blocks of serial and simultaneous visual presentation, to bias phonological and visuospatial processing, respectively, and WM load manipulated by varying recall direction (forward, backward). Reduced spans were observed for deaf signers, sequential presentation, and backward recall. Deaf signers primarily experienced increased substitution errors, with secondary increases in omission and ordering errors. Simultaneous presentation resulted in deaf signers' spans as high as hearing nonsigners' with sequential presentation, and reduced errors of types associated with reduced spans for deaf signers. Ordering errors indicated that changes in sequential processing may play less of a role in the deaf-hearing span difference than previously proposed. Overall, the results support flexible use of different memory cues in deaf signers combined with reduced activation of phonological representations of linguistic items.

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V189

Puzzling Puzzles: How Solving Word Searches Affects Metacognitive Judgments. EMMALINE DREW ELISEEV, *Duke University,* ELIZABETH J. MARSH, *Duke University* — Previous research has shown the impact of searching the internet for information on people's metacognitive judgments. Here, we investigate how actively engaging in a non-informative search (i.e., by solving a word search puzzle) affects people's metacognitive judgments of their own knowledge. In this study, participants either actively searched for a target GRE vocabulary word in a word search puzzle or passively viewed a pre-solved word search puzzle before rating their ability to define the target GRE word. Across two experiments, participants who actively solved word searches were less confident in their knowledge of the target word's definition compared to participants who passively viewed the same pre-solved word searches. Although the ability to successfully locate the target word in a word search is unrelated to knowledge of the word's meaning, our findings suggest that conducting a non-informative searching task can still negatively impact people's metacognitive assessments of their own knowledge.

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V190

Individuals with Higher Metacognitive Insight into Their Political Knowledge Have Higher Need for Evidence and Lower Faith in Intuition and Belief That Truth Is Political. MICHAEL GEERS, *Max Planck Institute for Human Development,* HELEN FISCHER, *Leibniz Institute for Knowledge Media,* STEPHAN LEWANDOWSKY, *University of Bristol,* STEFAN HERZOG, *Max Planck Institute for Human Development* — Susceptibility to political misinformation is a major threat to societies and democracies worldwide. However, surprisingly little is known about the extent to which citizens are aware of their own errors when distinguishing political truth from falsehood. Here, we examine whether citizens can monitor their own political misperceptions in a

representative sample using the most viral true and false political news in the U.S. over a six-month period. We find that overall, citizens are quite knowledgeable and reasonably aware of their errors. Interestingly, however, we find several psychological factors related to epistemic belief to explain interindividual differences in this self-awareness: Lower self-awareness was related to higher faith in intuition for facts, stronger belief that truth is political, and lower need for evidence. We also find that older adults exhibit higher metacognitive accuracy. These results show that some people are particularly vulnerable to metacognitive blind spots for political misinformation, which has implications for information seeking, resistance to persuasion, and social influence.

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V191

A Temporally and Contextually Sensitive Method for Examining Real-Time Verbal Mediation of Self-Regulatory Behaviour in Young Children. MOHINI VERMA, *Bilkent University,* DAVID WHITEBREAD, *University of Cambridge* — Association between language use and self-regulation in children has been extensively examined through private speech -- audible or whispered, self-directed speech produced by children when engaged in an activity. Vygotsky proposed that private speech mediates the development of self-regulation in children as behaviour changes from being regulated by others to self-regulation. Studies in this tradition have since reported correlations between the mean rate of private utterances and average values of different task variables (e.g., performance, difficulty) as evidence of verbal mediation of behaviour. However, multiple calls have been made for studying real-time interactions of speech and behaviour as a source of direct and conclusive evidence for real-time verbal mediation of behaviour. The reported study demonstrates a novel method for examining real-time verbal mediation of behaviour within a stream of events by detecting recurring temporal patterns of speech and goal-directed behavioural events during goal-directed episodes of naturalistic behaviour of preschool children. Further contextual analyses of the detected patterns revealed characteristics such as timing, order, and meaning of the speech and behaviour interactions.

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V192

Metacognitive Hindsight Bias in Children and Young Adults. LIAM RUEL, *Kwantlen Polytechnic University,* IARENJIT RAI, *Adler University,* MEGAN GIROUX, *Simon Fraser University,* KIRANDEEP DOGRA, *Kwantlen Polytechnic University,* RAKEFET ACKERMAN, *Technion-Israel Instutute of Technology,* DANIEL BERNSTEIN, *Kwantlen Polytechnic University* — Metacognitive Hindsight Bias (MC-HB) is the tendency to be less confident in one's judgments in foresight than in hindsight. To date, this phenomenon has only been studied in adults. The present study examined MC-HB in children (ages 7.5-9.5, n = 53; ages 11.5-13.5, n = 39) and adults (ages 18-43, n = 55). In a foresight phase, participants identified blurry objects that clarified. Participants also rated their confidence after each guess. In a hindsight phase, participants saw each clear object before recalling their foresight guesses and confidence ratings for each level of blur. All age groups showed MC-HB, but there were no age differences. Metacognition is typically present in early childhood and improves with age, while hindsight bias is greatest in early childhood and older adulthood. We explain our results in terms of knowledge updating and fluency: People update their knowledge of the blurry objects' identities in hindsight once the objects' identities are clear. They then fluently process clarifying objects in hindsight and misattribute that fluency to having identified the objects sooner and with higher confidence in foresight.

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V193

The Effects of Question Order on Performance Estimates Following Retrieval of Studied Information. YOONHEE JANG, *University of Montana* — It has been known that global evaluations of performance are affected by question difficulty order: people tend to provide higher estimates of performance on general knowledge or item recognition tests that began with easy (vs. hard) questions and ended with hard (vs. easy) questions. However, a reversal of the effect has been reported in associative recognition tasks, which suggests that people base global postdictions on specific recollections: the more compelling memories from retrieval, the higher judgments of performance when hard questions appear first. To examine the possibility, the current study used paired-associate learning in two experiments, followed by 4-alternative forced-choice testing in which three foils were the items associated with other cues, or cued recall. Participants' estimates of performance were not higher for the test beginning with difficult items in both experiments. The results do not support the idea that recollections through effortful retrieval affect test performance perception. Discussions include an anchoring explanation for global performance evaluations of the test.

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V194

Metacognition in Mathematics: Factors That Influence Judgments of Learning (JOLs) in College Students for Worked Algebra Equations. WILLIAM L. KELEMEN, *Texas State University,* NICHOLAS ANSTEAD, *Texas State University* — We examined factors that influence metacognition for mathematics equations. Although judgments of learning (JOLs) have been widely studied for verbal materials, few studies have examined metacognition in the context of mathematics. In this research, college students viewed 24 equations with worked solutions. Using a 2 X 2 within-subjects design, participants were shown equations that varied by the number of terms in the equation (i.e., 2 vs. 4 terms) and the number of steps in the solution (i.e., 3 vs. 4 steps). Participants viewed stimuli for 6 seconds each and provided immediate JOLs, followed by an untimed test approximately 10 minutes later. JOLs were significantly higher for problems with 2 terms compared with 4 terms; in addition, JOLs were significantly higher for equations with 4-step

solutions compared with 3-step solutions. Overall, these data suggest that college students are sensitive to both the length of the problems and solutions in algebra equations.

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V195

ERP Evidence for the Role of Attention in the Visual Discrimination of Ensemble Summary Statistics. ANTON LUKASHEVICH, *University of Iceland,* MAXIM PETROV, *National Research University Higher School of Economics (HSE University),* NIKITA KUDRYAVSTEV, *National Research University Higher School of Economics (HSE University),* IGOR UTOCHKIN, *National Research University Higher School of Economics (HSE University)* — The visual system can represent the information about multiple objects in the form of ensemble statistics, such as mean feature per group. A question as to whether visual statistical summaries require attention to be calculated is under debate. We investigated this question using an ERP marker of automatic sensory discrimination under diverted attention, visual mismatch negativity (vMMN). In Experiment 1, observers attended to a central cross for detecting oddball events. The cross was surrounded by constantly changing background sets of 64 lines of different orientations (variation range was 50 degrees) that were unattended. The oddball events with lines included changes in their mean orientation by 20 degrees. In Experiment 2, observers had to attend the mean orientation of background stimuli. We found no evidence for the vMMN to unattended ensemble changes. However, when ensembles were attended we found the P300 component correlated with conscious change detection. The latter was supported by good behavioral rate of oddball detection when the ensembles were attended. These results let us suggest that attention is critical for ensemble discrimination, at least within the range of stimulus differences that we tested.

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V196

What Drives the Face Detection Effect? DEAN G. PURCELL, *Oakland University,* ALAN L. STEWART, *Stevens Institute of Technology* — The Face-Detection Effect (FDE) is defined by shorter detection thresholds for right-side-up faces (normal) than for inverted faces or faces with rearranged features (non-normal). The FDE is found, under visual backward masking, with threshold determination (Exp. 1) as well as with the Method of Constant Stimuli (Exp. 2). The FDE is generally thought to be produced by mechanisms specialized for processing faces. This being the case, the size of the FDE should be most strongly predicted by performance on normal faces. The greater the advantage for a normal face the larger should be the FDE. In Experiment 1 the dependent variable was the Stimulus Onset Asynchrony (SOA) between target and mask onsets corresponding to the 75 percent forced-choice detection threshold. In Experiment 2 the dependent variable was percent correct target detection with normal and non-normal faces at 3 levels of SOA (28.8, 36 & 43.2 ms). Experiment 1 unexpectedly showed that non-normal face thresholds most strongly correlated with the size of the FDE (r = -.49). Experiment 2, as hypothesized, found that the Normal face percent correct most strongly correlated with the size of the FDE (r = .52).

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V197

Investigating Body Based Mental Imagery and Its Relationship to Body Image Disturbance and Interoceptive Awareness from Young to Late Adulthood. SARAH COONEY, *University College Dublin,* AKANSHA M. NARAINDAS, *University College Dublin* — Body image disturbance (BID) is the distortion of perception, behaviour, or cognition related to weight or shape. There is significant variation in BID; with limited understanding of how body image evolves over time and the role that self-body imagery plays in this development. A within-subjects preregistered study was hosted online, 1188 female participants split across four 4 target age groups took part: Young adults (18-24), Adults (25-39), Middle aged adults (40-59), Older aged adults (60-75). The study used a modified Own Body Transformation (OBT) task to measure own-body mental imagery through visual perspective manipulations. Interoceptive awareness was measured by The Multidimensional Assessment of Interoceptive Awareness and cognitive-attitudinal components of BID (Body dissatisfaction, Body shame and Body Surveillance) were measured by questionnaires. Results show that allocentric transformation ability is modulated by Age and level of BID. This indicates that BID affects the way egocentric and allocentric information is processed.

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V198

The Role of Conscious Perception in Semantic Processing. NITZAN MICHER, *Tel Aviv University,* DIANA MAZENKO, *Tel Aviv University,* DOMINIQUE LAMY, *Tel Aviv University* — What is the role of conscious perception in semantic processing? Previous studies relied on the finding that subliminal masked primes affect categorization of visible targets (i.e., response priming) to demonstrate semantic processing of invisible stimuli. Thus, they did not explore the role of conscious perception. In addition, several criticisms challenge the claim that the tasks tapped semantic rather than lower-level processing, and unconscious rather than weak conscious processing. Here, we investigated the role of conscious perception in semantic processing using the Liminal Prime Paradigm. We compared response priming elicited by liminal words, when these were clearly seen vs. missed, while participants categorized target animals' names based on their size. We induced semantic or visuo-motor processing by manipulating task demands. We obtained evidence for unconscious semantic processing. Crucially, we also found a double dissociation between conscious and unconscious priming on their time courses along the distribution of reaction times. This double dissociation makes it unlikely that unconscious priming was contaminated by conscious priming in our study. Semantic processing benefitted from conscious perception and task demands constrained the extent of unconscious,

but not conscious, priming. We discuss the implications of these findings for the role of task demands in conscious and unconscious processing.

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V199

Orientation Dependency of Visual Ensemble Perception. YUN LIN, *Tsinghua University,* PEI SUN, *Tsinghua University* — The orientation of visual stimulus influences the performance of visual tasks (e.g., oblique effect, horizontal-vertical illusion). Previous studies mainly focused on how orientation influenced the processing of a single visual stimulus, but less is known for the orientation dependency of visual ensemble perception. The present study tested the orientation dependency of both ensemble and single-stimulus perception using orientation and length discrimination tasks. The orientation discrimination for both ensemble lines and a single line demonstrated a similar oblique effect. The effect of stimulus orientation on the perceived length differed between ensemble and single-stimulus perception, as the perceived length was longest in the vertical orientation for ensemble lines and was deviated from the vertical orientation for a single line. The orientation dependency for length perception diminished gradually as the standard deviation of orientation increased. The results indicated that there might be differences in the mechanisms of ensemble and single-stimulus length perception.

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V200

What Is the Complementary Color of Red: Green or Grehn? CHARLES Q. WU, *Perception and Cognition Research* — Currently, many textbooks that contain a coverage on color vision incorrectly describe red and green as a pair of complementary colors (e.g., see Goldstein, E. B., & Brockmole, J. R. [2017]. Sensation and Perception [10th ed.], p.207). The color complementary to red is cyan (viz., blue-green), and that to green is magenta (e.g., see Wu, C. Q. [2012]. A neurobiologically based two-stage model for human color vision, in Human Vision and Electronic Imaging XVII). Christine Ladd-Franklin (1847–1930) is a pioneer American woman psychologist who had studied in both the Helmholtz and the Hering schools in Germany; regarding color complementarity, she had written the following: "But green (in any ordinary signification of the word) is not complementary to red at all. In order to make things fit, Hering is obliged to assume as green a color which the unbiased eye would pronounce to be a distinct blue-green.…I propose to modify the spelling of that green which is in reality a blue-green, and to write it grehn, meaning by this word the green of Hering. It is then grehn and not green which is the complementary color to red." (Franklin, C. L. [1899]. Professor Mueller's theory of the light-sense. Psychological Review, 6, pp.75-76).

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V201

Effect of Color on Scene Perception in Peripheral Vision. LANA OKUBO, *The University of Tokyo,* KAZUHIKO YOKOSAWA, *Tsukuba Gakuin University* — Oliva and Schyns (2000) discovered that color facilitates the perception of natural scenes, but not artificial scenes, which is a diagnostic feature that could discriminate the type of scenes. We hypothesized that color is useful for scene discrimination even in peripheral vision limited by low spatial resolution, as well as in central vision. To examine the effect of color on scene perception in the peripheral visual field, we manipulated color (normal, monochrome, or inverted colors) and scene type (natural and artificial scenes). We presented the participants (N = 18) with images of scenes with masked central circular regions and asked them to respond with the scene category. The correct response rate revealed an interaction between color and scene type, indicating the effect of color on scene perception only for natural scenes. The participants performed better for natural scenes in the normal and inverted color conditions than in the monochrome condition. We concluded that color enhances the perception of natural scenes even in peripheral vision with limited color sensitivity.

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V202

How Effective Are Gamified Fake News Interventions? Re-Analysing Existing Research with Signal Detection Theory. ARIANA MODIRROUSTA-GALIAN, *University of Southampton,* PHILIP HIGHAM, *University of Southampton* — Gamified psychological interventions designed for improving people's ability to detect and thus discount online misinformation are becoming increasingly prevalent. Two of the most notable interventions of this kind are Bad News and Go Viral! To assess their efficacy, studies have analysed mean confidence ratings. This type of analysis conflates two distinct aspects of fake news detection: discrimination and response bias. In this context, discrimination is the ability to distinguish between true and fake news, while response bias is the tendency to rate news items as true or fake regardless of their objective veracity. Therefore, to accurately determine the efficacy of Bad News and Go Viral!, we re-analysed the results from prior studies with receiver operating characteristic (ROC) analysis, a method from signal detection theory that allows for discrimination to be measured free from response bias. We found that Bad News and Go Viral! did not improve discrimination, but rather elicited a more conservative response bias (i.e., general scepticism towards news items). These novel findings support the usefulness of ROC analysis, a formerly unexploited method in this setting, for assessing the effectiveness of fake news interventions.

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V203

Stronger Attentional Biases Can Be Linked to Higher Reward Rate in Preferential Choice. VERONIKA ZILKER, *Technical University of Munich* — When attention is biased to a

particular option during information search preceding preferential choice, this option is often more likely to be chosen—even if its value is objectively lower than that of the alternative. This article demonstrates that although attentional biases—even to lower-valued options—may reduce accuracy (the tendency to choose the highest-valued option), they can increase reward rate (the amount of reward obtained per unit of time invested in the choice). To achieve a higher reward rate it is often preferable to choose a lower-valued option quickly rather than spend time trying to identify the highest-valued option. Attentional biases are typically associated with faster choices. In terms of reward rate, this reduction in response time can often compensate for the accompanying decrease in accuracy. These patterns are predicted theoretically by the attentional drift diffusion model, and eye-tracking studies show that these predicted patterns also hold empirically. It may therefore often be beneficial for decision makers to allocate their attention in a biased manner—that is, to deliberately ignore information on some options—in order to reduce the time cost of choice and thereby achieve a higher reward rate.

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V204

Distinguishing Among Relative Valuation Models in Reinforcement Learning. WILLIAM HAYES, *Indiana University,* DOUGLAS WEDELL, *University of South Carolina* — In reinforcement learning tasks, choice outcomes may be encoded relative to the values of other outcomes in the learning context. Several relative value learning models have been proposed, but the behavioral tasks used in prior studies do not fully distinguish among them. We present results from multiple experiments that were aimed at testing among competing models. Our behavioral tasks allowed us to differentiate between a reference point model, which assumes a dynamic adaptation level process, a range adaptation model, which assumes dynamic range normalization, a frequency encoding model, which assumes ordinal or rank-based value comparisons, and a range-frequency model, which combines the range and frequency mechanisms. The results were most consistent with the idea that choice outcomes are valued based on how they rank relative to recently experienced outcomes from their local contexts, as proposed by frequency and range-frequency models. This result reflects the well-established preference for options that produce better outcomes most of the time. Our findings support the application of exemplar-based theories of subjective value (e.g., decision by sampling) to experience-based decisions.

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V205

Are Eyes Special? The Reversed Spatial Stroop Effect on Gaze and Tongue Targets. YOSHIHIKO TANAKA, *Senshu University,* KENTA ISHIKAWA, *Senshu University,* TAKATO OYAMA, *Senshu University,* MISA TAKASHIMA, *University of Tokyo,* MATIA OKUBO, *Senshu University* — In the spatial Stroop task, arrow targets produce the spatial Stroop effect, while eye-gaze targets produce the reversed spatial Stroop effect. This gaze-triggered effect is explained in terms of social interaction (e.g., eye contact or joint attention/distraction) and suggests the unique attentional mechanism for eye gaze. The present study investigated whether the gaze target selectively produces the reversed spatial Stroop effect. In addition to arrow and gaze targets, we used a tongue, which usually does not convey socially significant information, as the target in the spatial Stroop task. While the arrow and gaze targets replicated the previous findings (i.e., spatial Stroop and reversed spatial Stroop effects, respectively), the tongue targets surprisingly produced a reversed spatial Stroop effect. These results are inconsistent with previous accounts proposing the unique status of eyes and may require a modification of the theoretical framework for the reversal of spatial interference.

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V206

Working Memory Capacity Reveals a Competitive Relationship Between Proactive and Reactive Metacontrol. MOON SUN KANG, *Purdue University,* YU-CHIN CHIU, *Purdue University* — Context-guided control adjustment or metacontrol is deployed in two ways. When being cued for an upcoming control state, humans engage in metacontrol proactively. Whereas, after recognizing the need for a specific control state, metacontrol occurs at that moment reactively. As shown in previous studies investigating adaptive control, the two metacontrol modes are independent yet complementary. However, it remains unknown how the two modes relate to each other: Can participants deploy both proactive and reactive metacontrol concurrently? Here, we devised a cued task-switching paradigm to engage both proactive and reactive metacontrol. Namely, proactive metacontrol was explicitly instructed. Meanwhile, reactive metacontrol was induced by control regularities in the task environment. Despite explicit instructions promoting proactive metacontrol, we found reliable reactive metacontrol at the group level (N=187). Moreover, after factoring in each individual's working memory capacity (WMC), higher WMC participants showed more effective proactive metacontrol but suppressed reactive metacontrol. Together, our results implicate that WMC constrains a tradeoff relationship between proactive and reactive metacontrol.

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V207

A Cognitive and Neural Framework for Cognitive Flexibility: Perspectives from Traumatic Brain Injury. HAYLEY O'DONNELL, *Drexel University,* EVANGELIA G. CHRYSIKOU, *Drexel University* — Cognitive flexibility reflects our ability to respond to changes and obstacles in our environment with novel response strategies. Although this description is generally accepted among cognitive neuroscientists, the precise definition of cognitive flexibility, and its integration within other aspects of cognitive regulation, remains a topic of discussion. In an effort to shed light on this question, the aim of the current study was to examine

cognitive flexibility and its proposed underlying subfunctions—namely, salience detection, inhibition, shifting, and creative thinking—and determine the relative importance and relationships among these subfunctions in support of flexible cognition. The neurological profile of traumatic brain injury (TBI) presents an opportunity to investigate potential dissociations between these aspects of cognitive flexibility. Participants with or without TBI completed a series of tasks capturing different aspects of cognitive flexibility, as well as individual differences measures. The results revealed dissociable response profiles for inhibition and shifting compared to salience detection and creative thinking between the two groups and offer support for a novel framework for cognitive flexibility.

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V208

Delving Deeper into the Effects of Emotional Valence During Visual Search. ANDRAS N. ZSIDO, *University of Pécs, Hungary,* CINTIA BALI, *University of Pécs,* FERENC KOCSOR, *University of Pécs,* MICHAEL HOUT, *New Mexico State University* — It has been shown that emotional pictures catch and hold attention more than neutral ones. Threatening stimuli in particular may have a greater prominence than other emotional categories. We tested the impact of task-irrelevant emotional (negative, positive, and threatening) and neutral stimuli on the salience network and executive control of attention during low and high cognitive load situations. The pictures served as task-irrelevant distractors while participants performed a visual search task. Results showed that the distracting effect of threatening images resulted in slower initiation of the task compared to other emotional and neutral stimuli, but overall task performance was speeded in the presence of threatening and positive distractors (compared to negative or neutral ones). Participants fixated the distractor earlier and observed it longer throughout the task when it was threatening compared to nonthreatening, and effects were exacerbated when the primary task was harder. In sum, the effects of emotionally valent stimuli on attention depend on the nature of the emotions they evoke. Both threatening and positive stimuli can facilitate visual performance, possibly through different background mechanisms.

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V209

The Rise and Fall of Durable Color-Induced Attentional Biases. CHUN-YU KUO, *National Taiwan Normal University,* HSUAN-FU CHAO, *Chung Yuan Christian University,* YEI-YU YEH, *National Taiwan Normal University* — Prior experiences of target selection can influence how people allocate attention minutes or days later. However, inconsistent findings suggest that whether prior target-associated colors can induce a durable attentional bias remains to be elucidated. We clarified the inconsistence by showing that the utility of processing color information for achieving the task goal during learning is critical for the emergence of a durable bias. Colors were necessary for target localization in the training phase of Experiments 1 and 2, as the task was to report the line orientation inside one of two colored circles. Despite a regular association between colors and the target, the utility provided by color contingency was low in Experiment 3, as the task goal could be achieved by searching for an orientation singleton. The utility of target-associated colors was enhanced for searching a single horizontal notch among notched squares in Experiment 4. In the test phase, participants were instructed to ignore the colors and judge the orientation or the notch direction inside a singleton shape. The results highlight how attentional control adapts according to the dynamic interplay among task goals, stimulus salience, past and recent experiences.

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V210

Canine Creativity: Training for Variable Actions. EDUARDO MERCADO, III, *University at Buffalo, SUNY,* ALLISON SCAGEL, *University at Buffalo, SUNY* — Dogs are notable for their willingness to engage in playful interactions with both humans and each other, even as adults. Recent work on training creativity in dogs suggests that dogs readily learn "games" that require them to increase their exploratory behavior and behavioral variability. We examined dogs' capacity to learn to perform a variety of untrained actions when instructed to do so using a specific cue. Actions performed in response to the "create" cue were considered novel if they had not been produced before within that training session and were not already associated with a specific cue. Dogs proved to be able to self-select actions from a relatively large set, enabling them to succeed in this task for extended periods. Successful learning of the "show me something new" task may indicate that dogs are monitoring their recent actions and forming an abstract concept of avoiding recently performed actions, or that rewarding dogs for spontaneity increases the range of actions they select within the training context.

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V211

On the Salience of Perceived Aggression and Physical Characteristics for Various Breeds of Dogs. JACOB VAUGHN, *Texas Tech University,* PHILIP H. MARSHALL, *Texas Tech University* — We investigated the use of successive sorting tasks of dogs to determine the saliencies of the characteristic of implicit perceived aggression (Briones et al, in press) and the physical features of height and weight. Participants saw either standardized drawings or breed names of 20 dogs, and sorted them into two equal groups, three consecutive times. The possible sorting dimensions were not mentioned, and the only requirements were that they should produce two equal groups, and to change the sorting rationale each time. Analyses showed that images were significantly more likely to yield perceived aggression as the basis for sorting, and that the effect was most profound on the second sort. Though correlated, sorts by perceived aggression were always greater than by height and weight. The

findings are discussed in terms of encoding differences between pictures and words, and the information spontaneously available about our most popular animal companions.

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V212

Risky Decision Making and Alzheimer's Disease Descendants. HEAVEN CAUBLE, *The University of Alabama* — Decision-making capacity (DMC) is one of the most severe impairments of Alzheimer's Disease (AD). It can affect daily functioning in every aspect of life and oftentimes has extreme consequences. However, unlike other impairments of AD (e.g., memory and executive function), DMC has not been extensively researched as an early symptom. By studying people who are genetically at-risk of developing AD via family, researchers may be able to detect early differences in DMC as a possible result of genetic predisposition of AD. Thus, 60 middle-aged adults will be recruited into groups based on family medical history of AD and complete the Game of Dice Task, a gambling task that measures risky decision-making. We expect to find that family medical history of AD will contribute to variances between scores, indicating that having an increased genetic predisposition to AD is associated with risky decision-making in mid-adulthood for those individuals. This research could support looking at decision-making capacity as a possible early symptom of AD, thus allowing for earlier intervention.

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V213

Errors After Attentional Impairment at the Subitizing Limit Do Not Point to a Crowding Explanation. BIHTER AKYOL, *Koç University* — Previous studies showed that crowding is malleable to attention and induces numerosity underestimations. We simulated crowding effects by modifying the Occupancy Model (Allik & Tuulmets, 1991) to understand if crowding explains common error patterns in numerosity estimations across small and large numbers. We tested this model with two experiments in which participants estimated the numerosity of dot arrays, and the task was coupled with Posner cueing to manipulate attention. Contrary to the predictions, attentional impairment did not cause underestimations at individual subitizing limits in Experiment 1 (N=62). Small reductions in attention increased response variability at the subitizing limit while underestimations above the subitizing limit appeared after a large attentional reduction, which is a new dichotomy in small and large numerosity estimations. Using a smaller numerosity presentation range, Experiment 2 (N=60) showed that lack of underestimation at the subitizing limit cannot be due to a regression to the mean effect. We maintain crowding can explain attentional impairment only in large numerosities (>5), and a single crowding-based numerosity mechanism is insufficient to explain errors across small and large numbers.

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V214

Emotional Closure in Autobiographical Memories: An Investigation of Phenomenology and Involuntary Remembering. IREM ERGEN, *Koç University,* SAMI GÜLGÖZ, *Koç University* — Open autobiographical memories are events people could not put behind or leave in the past (i.e., closure). Only few studies focused on open and closed memory differences. From a novel point of view, current study further explores the closure potentiality of open events in the future. We compared events that are closed, open with a possibility of closure, and open without such possibility regarding phenomenology and involuntary recall. Participants (N = 87) recalled these events in a random order and filled out memory phenomenology questionnaires. We expected open events without closure possibility to be highest in negativity, emotional intensity, regret, and involuntary recall frequency, followed by potential open and closed events. We found that emotional intensity, negativity at recall, and involuntary recall frequency are higher for open than closed events. Open events without closure possibility were the highest in regret and rated as evoking more negative affect upon involuntary recall than open events with closure possibility, which were followed by closed ones. We will discuss our findings in relation to autobiographical memory and research on involuntary remembering, along with possible implications for intrusive thinking.

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V215

Cultural Life Scripts and Life Stories of LGBTIQ+ and Heterosexual Individuals. DENIZ ASOLAR, *Boğaziçi University,* ALI I. TEKCAN, *Boğaziçi University* — Cultural life scripts (CLS) refer to expectations regarding typical life events (e.g., getting married, having children) and their timing in a given culture. Although CLS tend to be substantially similar across cultures, a few studies examining sub-cultures (e.g., ethnicity, religious affiliation) showed some idiosyncratic events specific to sub-cultures. This study focuses on LGBTIQ+ community as a marginalised sub-culture of Turkey. We investigate CLS and life stories of LGBTIQ+ individuals in comparison to heterosexual individuals. In addition to comparing CLS of LGBTIQ+ and heterosexual individuals, the groups are compared on CLS and life story as well as the script normativity. Novel events specific to LGBTIQ+ individuals (e.g., discovering one's sexual identity, coming out) as well as lack of normative events (e.g., marriage, having children) in the life stories of LGBTIQ+ individuals were examined.

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V216

Rhythmic Tapping, Comprehension, and Mind Wandering. PETER DIXON, *University of Alberta,* DANNY DECKER, *University of Alberta* — Participants read texts presented at one word per second while rhythmically tapping at the same rate. Periodically, they were interrupted and asked to rate the extent to which they were on task with respect to the reading task and with respect to the tapping

task. The ratings predicted performance in their respective tasks, but the two tasks were largely independent of one another. The results suggest that being "off task" does not necessarily imply global performance deficits.

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V217

Constructing Connectionist Implementations of N-Dimensional Psychological Spaces. EBEN DAGGETT, *New Mexico State University,* MICHAEL HOUT, *New Mexico State University* — The Universal Law of Generalization predicts that the probability of generalization will fall off monotonically as a function of the dissimilarity between the two stimuli. The dissimilarity of two objects is often described in terms of an abstract psychological space that is commonly modeled and visualized using multidimensional scaling. Connectionist models have been created that simulate these generalization behaviors for stimuli that vary along a single dimension; however, no methodologies currently exist to generate connectionist simulations using the psychological spaces of complex, real world objects. We present a novel algorithm that takes as input a set of pairwise psychological distances between objects in an n-dimensional psychological space and constructs a connectionist model that abides by the Universal Law of Generalization. Such models may allow researchers to generate simulation-based behavioral predictions for individuals (or populations) from the modeled psychological spaces of participants. This technique should allow researchers to include psychological distance as a factor in the generation of theoretical models, and thus could lead to the creation of increasingly more precise experimental hypotheses.

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V218

Sequentially Changing Prices, Judgments of Value, and Response Time: Ability to Control Decisions. MASAYO NODA, *Kinjo Gakuin University,* HIROKI C. TANABE, *Nagoyo University,* MASATO KIMURA, *Konica Minolta, Inc.* — This study investigated judgments of value and response time when prices are sequentially changing with the added influence of participants' ability to control their decisions. Participants were asked to take part in a game of trading stock on a computer. The sequence of stock prices changed (increasing, decreasing or low-fluctuating) over 5 days or 2 days. Participants were asked to evaluate their satisfaction when seeing the stock prices after the second day (5-day 2), fifth day (5-day 5), and also after the second day (2-day 2), during which their response time was measured. The actual selling of their stock was determined by a game of luck. Sequential trend (increasing / decreasing / low-fluctuating) × Days (5-day 2 / 5-day 5 / 2-day 2) × Game (roulette / card) ANOVA was performed. The results showed that the response time was longer in the 5-day 5 than in the 5-day 2 when their selling was determined by the roulette game. The participants were more active in the roulette game compared to the card game, since they had control over when to choose. It appears that people feel more satisfied and spend a longer time to evaluate their satisfaction when they have the ability to control their decisions.

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V219

Delayed Priming of the Sublexical Route of Spelling. DONALD L. KNAPP, *Kent State University,* JOCELYN R. FOLK, *Kent State University* (Sponsored by Jocelyn Folk) — The dual-process model of spelling is comprised of a lexical process for spelling familiar words and a sublexical process for spelling unfamiliar words. The sublexical process operates by mapping sounds to letters, based on sound-spelling correspondences (Folk & Rapp, 2004). When spelling a novel word or nonword, spellers will often use the correspondence that is weighted more highly due to its frequency. However, a rare correspondence can be primed, and made more likely, by presenting a familiar word using that correspondence prior to the nonword (Patterson & Folk, 2014). This temporary re-weighting of lower frequency sound-spelling correspondences is one way in which the lexical and sublexical processes interact. This study investigated the mechanisms underlying this interaction by testing if a delay between a real word prime and a nonword would cause a re-weighting of the sound-spelling correspondences. Participants listened to a series of word primes and nonword targets and were asked to provide a spelling for the nonwords only. Implications for lexical-sublexical interaction in spelling are discussed.

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V220

Neural Decoding of Speech with Semantic-Based Classification. YI LIN, *Academia Sinica,* PO-JANG HSIEH, *National Taiwan University* — Speech is a complex cognitive process that begins with conceptualization, proceeds to word-level processing, and ends with articulation. Neural decoding of speech (i.e., using neural activity to decode the content of language production) has been mostly conducted by mapping neural activities in the later part of language production (i.e., phonological and motor processing). However, it remains unknown whether neural activities during language production can be linked to the initial part of language production (e.g., semantic information). To examine these possibilities, 8 subjects were recruited for 5-hour MRI sessions while either viewing or speaking the 119 stimuli in the scanner. With the neural decoding method and a natural language algorithm for semantic representation, we demonstrate that the classifier trained using the neural activity patterns of language perception was able to decode the content of language production, indicating a cross-modality similarity between language perception and language production in semantic representations. This work may contribute to a better understanding of language storage and further advance the development of speech decoders.

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V221

Age Differences in the Extraction and Integration of Parafoveal Information During Reading. AARON VELDRE, *The University of Sydney,* ROSLYN WONG, *The University of Sydney,* LILI YU, *Macquarie University,* ERIK D. REICHLE, *Macquarie University,* SALLY ANDREWS, *The University of Sydney* — Evidence of age-related declines in parafoveal processing of upcoming text has been argued to support the "risky reading hypothesis." According to this view, older adults compensate for slower processing by using linguistic knowledge and context in combination with partial parafoveal information to "guess" upcoming words during reading. This study examined whether older adults' parafoveal processing deficits are specific to the extraction of orthography and/or semantics from upcoming text, or whether they reflect reduced integration of parafoveal and foveal information across saccades. The eye movements of a group of young-adult readers (mean age 19.7 years) and older adults (mean age 71.6 years) were recorded as they read sentences containing a target word. The boundary paradigm was used to compare parafoveal previews that either preserved or masked target orthographic information and were either contextually plausible or implausible. The results suggest that older adults extracted a similar level of parafoveal information as young readers but showed a specific deficit in transsaccadic integration. The implications of these findings for theories of reading are discussed.

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V222

Orthographic Learning in Beginning and Advanced Readers: A Cross-Language Comparison of Lexicality Effects Using Eye Tracking. SIETSKE VAN VIERSEN, *Utrecht University,* DALIA MARTINEZ CANO, *University of Alberta,* PETER F. DE JONG, *University of Amsterdam,* GEORGE K. GEORGIOU, *University of Alberta,* RAUNO PARRILA, *Macquarie University,* LAOURA ZIAKA, *University of Oslo,* ATHANASSIOS PROTOPAPAS, *University of Oslo* — Orthographic learning (OL), that is, learning the letter sequences constituting orthographic word forms, is an essential part of reading development. Here we investigate OL of orally known vs. novel items in beginning and more advanced readers of (semi-transparent) Dutch and (opaque) English. Dutch (G2 n=75; G5 n=56) and English-speaking Canadian children (G2 n=98; G5 n=106) in Grades 2 and 5 read 64 sentences containing pseudowords and low-frequency real words that occurred either 2 or 6 times, under eye tracking. OL was assessed with online (gaze duration) and offline learning outcomes (orthographic choice and spelling dictation). Findings in Dutch showed larger effects of exposure on spelling pseudowords and higher learning rates in gaze to pseudowords in Grade 5. There was no interaction between exposure and grade, resulting in similar learning curves for beginning and more advanced readers. Data from English are currently under processing. We will examine whether they replicate the Dutch finding that the reading system of beginning and more advanced readers is about equally efficient in building up orthographic knowledge of specific words across repeated exposures, or whether substantial differences exist across languages.

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V223

Source Credibility, Trustworthiness, and Perceptions of Police Do Not Mitigate Misinformation Magnitude. CHENXIN YU, *Oklahoma State University,* KARA N. MOORE, *Oklahoma State University,* WILLIAM E. CROZIER, *Duke University* — Law enforcement is an important potential source of misinformation during crime investigations. Despite this, little research exists that directly examines how police (vs. alternative sources) can impact witnesses' propensity for misinformation acceptance. Likewise, the relationship between individuals' perceptions toward the police and their tendency to accept information from the police as the truth also remains unknown. In the current study, we employed the misinformation paradigm, in which participants watched a mock crime video, read a post-event narrative containing both true and misleading information about details of the video, and took a memory test. Holding perceptions of police constant, we found no evidence that misinformation magnitude differed by its source or the trustworthiness of the source. Participants accepted similar amount of misinformation across experimental groups. These findings are inconsistent with previous research showing the buffering effect of discrediting the source of misinformation. Future research may further examine the role of source credibility and its relationship with individuals' perceptions of police in eyewitness memory.

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V224

Lying Can Lead to False Memories: Factors That Impact the Rate. ERIC RINDAL, *Georgia College & State University,* RACHEL MCQUINN, *Georgia College & State University,* AMANDA BEARD, *Georgia College & State University* — In a series of experiments, we explore the impact that lying has on the liar's own memory. Across these experiments we demonstrate that lying can lead an individual to incorrectly assent to having witnessed false details they had originally lied about. In addition, we investigated several factors that could have an impact on the rate of these false memories. Factors that will be discussed include the number of times that an individual lies about an event, the number of different lies an individual tells, the retention interval before their memory is tested, and the format in which they lie. Some of these factors had an impact on the rate of false memories, whereas others did not. Potential mechanisms for these false memories and the everyday implications of these false memories will also be discussed.

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V225

Linear Ballistic Accumulator Models of Confidence and Response Time. HAOMIN CHEN, *University of Melbourne,* ANDREW HEATHCOTE, *University of Melbourne,* JAMES SAUER, *University of Melbourne,* MATTHEY PALMER, *University of Melbourne,* ADAM F. OSTH, *University of Melbourne* (Sponsored by Adam F. Osth) — Accurate decisions tend to be both confident and fast. Nonetheless, there are relatively few models that can simultaneously address this three-way relationship, especially for single stage decisions where participants indicate both their choice and their confidence. Extending on a common decision architecture of the linear ballistic accumulator framework, two models have been proposed: 1) a Multiple Threshold Race model which instantiates the Balance-of-Evidence hypothesis where confidence is determined through the difference between accumu-lated evidence for competing options (e.g., Reynolds, Osth, Kvam, & Heathcote, in revision), and 2) a newly developed Confidence Accumulator model which assumes that confidence itself is accumulated independently for each confidence option. To test these two confidence architectures, we ran two experiments manipulating the length of the confidence rating scale across 2 , 4 , or 6 options in a recognition memory task along with a perceptual task. Models were compared that made different allowance for how the length of the confidence scale affected model parameters. While both model classes found that thresholds were affected by the length of the scale, drift rates were only minimally affected. Implications for models of confidence and response time will be discussed.

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V226

First Gaze Assessment of the Selective Rehearsal Account of Item-Method DF. JONATHON WHITLOCK, *University of Illinois Urbana-Champaign,* YI-PEI LO, *University of Illinois Urbana-Champaign,* HUIYU DING, *University of Illinois Urbana-Champaign,* RYAN HUBBARD, *University of Illinois Urbana-Champaign,* LILI SAHAKYAN, *University of Illinois Urbana-Champaign* — Viewing behavior reflects previous experience by being drawn to the relations among previously encountered items. We assessed the duration of viewing test items that received the first gaze on each trial of a recognition test. First gaze measures differentiated associatively-cued items, but not between studied and non-studied items, demonstrating relational memory effects on viewing behavior emerge as rapidly as when they are first viewed during test. Closer inspection into relational memory revealed first gaze duration patterns contrasted between conditions involving memory strength differences due to repetitions and that of Item-Method DF. Furthermore, the duration of first gaze viewing to test items predicted their subsequent selection, which differed between R- and F-cued items in DF, whereas first gaze duration did not differentially predict subsequent selection during instances of memory strength differences due to repetitions. Current results are framed in relation to the theoretical accounts of Item-Method DF.

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V227

A New 360° Application for the Automatic Assessment of Memory. ELISA PEDROLI, *eCampus University,* FRANCESCA BRUNI, *IRCCS Istituto Auxologico Italiano,* LUCA GRECI, *STIIMA CNR (Sistemi e Tecnologie Industriali Intelligenti per il Manifatturiero Avanzato–Consiglio Nazionale delle Ricerche),* MARCO CAVALLO, *eCampus University,* GIUSEPPE RIVA, *IRCCS Istituto Auxologico Italiano & Università Cattolica del Sacro Cuore,* VALENTINA MANCUSO, *eCampus University,* CHIARA STRAMBA-BADIALE, *IRCCS Istituto Auxologico Italiano,* PIETRO CIPRESSO, *University of Turin & IRCCS Istituto Auxologico Italiano* — The global pandemic has altered the demands of the health system, limiting access to a variety of services. The aim is to present a cross-platform virtual reality application for an objective, standardized, and remote evaluation of memory, discussing usability results. The application included different sub-tests for different sub-components of memory (i.e., free recall and recognition of objects, faces, as well as two tests of spatial memory). For the usability study, participants were immersed in different scenarios and they were asked to perform memory tests. After that, usability questionnaires were filled in. The platform and the preliminary results of usability will be presented during the conference. All this will give the possibility to provide more and more cutting-edge tools that can facilitate remote telemedicine processes by providing an excellent health service, monitoring patients from a distance without requiring further visits and their movement.

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V228

A Comparison of Cross-Language Connections of Noun and Verb Translations in Korean-English Bilinguals. SEONGSIL LEE, *University of Maryland, College Park,* YASMEEN FAROQI-SHAH, *University of Maryland, College Park,* MIN WANG, *University of Maryland, College Park* — This study aimed to verify the often-made claim that verbs have weaker cross-language connections than nouns. A masked translation priming paradigm with two grammatical categories (noun and verb) and two production tasks (picture naming and oral reading) was used to measure the strength of cross-language connections between translations in Korean (L1)-English (L2) bilinguals. For both tasks and grammatical categories, participants' English response times were faster with Korean translation primes than with Korean unrelated primes, suggesting facilitative priming effects in both grammatical categories. This is the first demonstration of the verb translation priming effect in bilingual speakers. Crucially, the size of the priming effect did not significantly differ across nouns and verbs. These findings provide an important insight into the lexical organization of bilingual speakers that the strength of cross-language connections of translations is similar across nouns and verbs.

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V229

Are Judgments of an Argument's Validity Influenced by Who Makes the Argument? An Investigation of Informal Fallacies in Reasoning. DUN-YA HU, *Texas A&M University,* JYOTSNA VAID, *Texas A&M University* — Informal fallacies are arguments that are psychologically persuasive but logically invalid due to their misleading language. Informal fallacies are found in many different forms of argumentation. Previous studies have pointed out some individual differences in participants' ability to identify informal fallacies. However, a critical factor has been neglected: perceived social status of the originator of an argument. The relationship between the originator and the recipient of a message has been found to influence the persuasiveness of the message. The present study examined whether judgments of argument soundness will also be susceptible to perceived social status. Scenarios were constructed in which the originator of an argument was described using a male or a female name (Exp. 1) or in terms of a higher or lower occupational status (Exp. 2). Participants were to judge if the argument presented was valid or not. The results suggest that "irrational" factors can affect participants' reasoning.

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V230

Technological Assets or Attentional Liabilities? Assessing the Costs of Tablet-Based Multitasking in 1:1 College Classrooms. SARA G. GOODMAN, *St. John Fisher College,* JENNAH B. FERRARI, *St. John Fisher College* — The negative performance effects of engaging in multiple tasks are clearly documented in the literature. This is especially problematic in classrooms, where a majority of college students report regularly engaging in multitasking during class time (Ravizza et al., 2017). Sana and colleagues (2013) demonstrated that students who multitask on laptop computers during a lecture perform worse on a comprehension test than students who do not multitask, and that students who are in view of a neighbor's multitasking behavior also experience a comprehension decrement. Historically, students have been deterred from bringing technology into the classroom to mitigate the opportunity for distraction. However, the increasing popularity of campus-based 1:1 technology initiatives, where each student is provided with an institution-supported device, has lifted the cap on technology access (and thus, distraction opportunity) in learning spaces. Given the influx of 1:1 tablet technology in classroom spaces, we revisit the questions raised by Sana and colleagues (2013) via a 2-experiment conceptual replication to determine whether the original findings based on laptop computer use remains true with tablet computer use on a 1:1 college campus.

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V231

The Effect of Video Playback Speed on Learning and Mind-Wandering in Younger and Older Adults. DILLON H. MURPHY, *University of California, Los Angeles,* KARA M. HOOVER, *Claremont McKenna College,* ALAN D. CASTEL, *University of California, Los Angeles* — We have shown that watching videos at faster speeds does not significantly impair learning in younger adults; however, it was previously unclear how increased video speed impacts comprehension in older adults. Additionally, we were interested in the effects of increased video speed on mind-wandering. We presented younger and older adults with a pre-recorded video lecture and manipulated the video to play at different speeds. After watching the video, participants predicted their performance on a comprehension test covering the material from the video and then completed said comprehension test. We demonstrated that although younger adults can watch lecture videos at faster speeds without significant deficits in comprehension, older adults' test performance is impaired when watching at faster speeds. Additionally, faster playback speeds reduced mind-wandering (and mind-wandering was reduced in older adults relative to younger adults), potentially contributing to younger adults' preserved comprehension at faster speeds. Finally, when probed about their conscious experience during encoding, older adults no longer displayed comprehension deficits at faster speeds, indicating that mind-wandering probes may have some benefits to memory.

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V232

The Relationship Between Study Schedules and Sleep. ABIGAIL KORTENHOEVEN, *Texas Tech University* — Interleaving exemplars from different categories results in superior retention than blocking all exemplars from a single category. Further, sleep following encoding results in improved test performance. This study examined whether study schedule effects vary based on nocturnal sleep, rather than previously studied "nap" periods. A 2x2 mixed design was used: Interim activity (nocturnal sleep or waking) was manipulated between subjects, and presentation (blocked or interleaved) was manipulated within subjects. Students from Covenant College (n = 68) were equally distributed across interim activity conditions. Participants returned to complete a categorization quiz. A two-way ANOVA was used to analyze data. Consistent with prior research, participants in the nocturnal sleep condition exhibited higher retention, and interleaved items were more highly retained than blocked items. A non-significant interaction showed that nocturnal sleep and interleaved exemplars produced the highest retention. While this study was limited by the utilization of self-report for sleep duration and quality, the results indicate that both an interleaved presentation schedule and sleep can have beneficial effects on student learning.

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V233

Trouble with Double Speed: Effects of Lecture Speed and Note-Taking on Retention of Educational Material. ASHLEY CHEN, *University of California, Los Angeles,* DILLON H. MURPHY, *University of California, Los Angeles,* JORDAN A. BRABEC, *University of California, Los Angeles,* ROBERT A. BJORK, *University of California,* ELIZABETH L. BJORK,

University of California, Los Angeles — The use of pre-recorded lecture videos as a primary mode of instruction during online learning has allowed students flexibility in how they self-regulate their learning. Based on their goals, students must make decisions on how to engage with course content, such as at what speed to watch lecture videos and whether to take notes. Prior research has shown that increasing lectures up to 2x speed has little cost on retention (Murphy et al., 2022), but it is unknown whether note-taking at increased speeds affects comprehension. In the current study, participants (n = 170) watched pre-recorded lecture videos at 1x or 2x speed while simultaneously taking notes or not taking notes. Performance on an immediate comprehension test was significantly impaired for those who watched the videos at 2x speed, indicating that there may be a greater cost of watching accelerated lectures than previously thought. In addition, there was a significant benefit of note-taking that compensated for deficits associated with faster lecture speeds. Students should be cautious when watching accelerated lecture videos—they may save time, but at the cost of their comprehension.

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V234

Examining the Effects of Attention and Memory on Missing Person Sightings at the Level of the Individual. BLAKE L. NESMITH, *Oklahoma State University,* IAN T. JONES, *Oklahoma State University,* KARA N. MOORE, *Oklahoma State University* — Prospective person memory involves an individual recognizing, sighting, and reporting a person like missing or wanted persons sought by an agency. It is of practical interest to understand how to improve sighting rates across individuals. We analyzed existing prospective person memory data (Moore & Lampinen, 2019) to investigate how 3 variables - strategic monitoring via a reminder (yes, no), attention demands (high, low), and confederate (target, foil) - interacted during a simulated person search. Using a naïve Bayesian classifier to determine how many persons in the study behaved consistently with the hypothesis (Grice et al., 2020), we analyzed whether specific combinations of the 3 variables produced the greatest quantity of sightings amongst individuals. We found that an individual-level approach reciprocated the original group-level findings and hypothesis. When encountering the target and given a reminder to search for the target, more individuals made a sighting during low attention demands as compared to individuals under high attention demands. The opposite was true when individuals encountered the foil; more individuals made a sighting under high attention demands as compared to individuals under low attention demands.

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V235

A Dissociation of Retrieval Practice Effects on Recognition of Studied Words and Their Associates. DONNELLE DIMARCO, *University of Guelph,* HARVEY MARMUREK, *University of Guelph* — The testing effect is the finding that retrieval practice is superior for learning than restudying. According to the mediator effectiveness hypothesis, the testing effect is due to mediator generation during review testing that creates a link between the cue (A-items) and target (B-items). One goal of the current study was to further examine if mediators were more likely to be generated during a review test than restudying. As well, we sought to determine if mediator generation was specific to whether participants were completing a review test in which they were shown a cue related to the mediator (A-?) or a cue unrelated to the mediator (?-B). Carpenter et al. (2006) found that the testing effect size was the same regardless of whether the final test was in the same direction (A-?) or opposite direction (?-B) of the review test. However, studies have not explored varied review testing direction (A-? or ?-B) on mediator generation. The current study found evidence against the mediator effectiveness hypothesis by demonstrating that: 1) mediators were not more likely to be generated during a review test or restudying and 2) mediators do not become activated solely by the cue it is associated with.

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V236

Time-Frequency Analyses of EEG for Investigating the Control of Simon Conflict in Mouse-Tracking. JIEUN LEE, *Korea University,* HANSOL RHEEM, *University of Wisconsin-Madison,* YANG SEOK CHO, *Korea University,* MINWOO KIM, *Seoul National University* (Sponsored by Minwoo Kim) — The present study examined the underlying neural mechanism of the control process triggered by Simon conflicts in the mouse-tracking paradigm. Right-handed participants were instructed to perform horizontal and vertical color Simon tasks alternating in a trial-by-trial manner by moving a computer mouse towards one of four response buttons on the display. The congruency sequence effect (CSE) was observed in movement times (MTs) as well as various motoric measures, including x-entropy, the number of flips, x-flips, and y-flips, while it was not found in initiation times (ITs). Time-frequency analyses were conducted on electroencephalogram (EEG) recordings and each frequency band was put into the support vector machine (SVM) to classify the sequence of previous and current trial congruencies. The classification accuracy was higher than the chance level in the power of theta band from prefrontal, left frontal, frontal, and right frontal areas from just before the moment of the mouse-tracking movement initiation to early phases of the movement. These results suggested that the control involved in the CSE exerts its influence on later stages of human information processing, including the response initiation stage.

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V237

Children's Antonym Understanding Across Parts of Speech. AMALIA IONESCU, *University of California, Los Angeles,* HONGJING LU, *University of California, Los Angeles,* KEITH HOLYOAK, *University of California, Los Angeles,* CATHERINE SANDHOFER, *University of California, Los Angeles* — Understanding the concept of abstract relation and reasoning about various

instantiations of the same relation is an important marker in human cognition. Though children are formally taught the antonym relation in elementary school, evidence suggests that children develop an understanding of antonyms as early as age four (Phillips & Pexman, 2015). Here, we examine whether four- and five-year-olds (N= 67) are able to complete an analogy task involving antonyms and whether language cues facilitate children's ability to reason about the antonym relation. We found that explicit relation labels in the form of a relation phrase ("opposites") improved performance on the task for five-year-olds, but not four-year-olds. Five-year-old (but not four-year-old) children were more accurate for adjective and verb antonyms than for noun antonyms. These results suggest that children acquire a solid understanding of the abstract relation of opposites and can generalize it to various instantiations across different lexical classes.

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V238

The Impact of the Modality of a Narrative on Bridging Inferences. VIRGINIA TROEMEL, *Georgia State University,* DANNY FELLER, *Georgia State University,* JOHN HUTSON, *Georgia State University,* ELIZABETH TIGHE, *Georgia State University,* LESTER LOSCHKY, *Kansas State University,* JOSEPH MAGLIANO, *Georgia State University* — The impact of modality on bridging inferences at coherence breaks. While some hare argued that comprehension processes are similar across modalities, other have argued that differences in how narratives are conveyed across text and pictures could have implications on how these processes operate. There is surprising little research that has addressed the extent that the modality of a narrative affects comprehension processes. The presented study explored this issue in the context of bridging inferences that establishes that explicitly conveyed events are causally related. Participants viewed and read text and picture story version of the same stories. The presence of story events was manipulated in order to create coherence breaks that required bridging inferences to resolve. Inference generation was assessed via think aloud protocols and processing time data. Preliminary analyses suggests that participants more readily generated the bridging inferences when viewing picture stories than when reading.

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V239

Investigating Prevalence Effects During Visual Search for Threatening Targets. MICHAEL HOUT, *New Mexico State University,* HAYWARD GODWIN, *University of Southampton,* JAKUB POLAK, *National Institute of Mental Health, Czech Republic,* ANDRAS N. ZSIDO, *University of Pécs, Hungary* — Prevalence effects in visual search (rare items are missed more often or found slower than common ones) are problematic in applied settings like medical/security screening. However, they can be thought of as adaptive insofar as attention is prioritized to items we are likely to find, instead of wasting resources searching endlessly for items unlikely to appear. An additional adaptive feature of the visual system is that emotional items (like threats) tend to capture/hold attention more readily than neutral ones. Might the attentional benefit to threats convey them with protection against prevalence effects? In Exp1, we had people look for threatening (snakes) or neutral (rabbits) targets among mixed distractors. Classic prevalence effects in accuracy, RT, and balanced integration scores (a composite measure of performance) were replicated, but counter to prior work, performance was worse for threat targets. In Exp2, we used a relative-prevalence manipulation where people looked for threat targets (snakes) and a neutral but visually similar category (worms) simultaneously. We again replicated standard prevalence effects but found that performance was worse for threats than the visually similar but emotionally neutral category.

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V240

Brief Cues Influence Suppression of Singleton Distractors During Visual Search. VAISHNAVI MOHITE, *University of Hyderabad,* RAMESH MISHRA, *University of Hyderabad* — When a distractor is cued, target search becomes difficult. But if it is suppressed, cueing its location can enhance search. This has been seen with longer cue displays but not with brief cues (16 ms), which are often perceived unconsciously. Their influences on distractors can inform us if suppression is susceptible to unconscious processing. Many studies have shown that brief cues orient attention exogenously even if they are completely unconscious. The occurrences of endogenous unconscious orienting are, however, rare. This study uniquely investigates the influence of unconscious endogenous cueing on distractor suppression using brief cues that match either the distractor, target, or neutral colour during feature search. In two experiments, pre-exposure to brief cues influenced manual RTs. Compared to a target-matching cue (Experiments 1 and 2) and a neutral cue (Experiment 2), distractor-matching cues made suppression of the salient distractor most difficult. This suggests that conscious cues and brief cues influenced attentional processes, leading to distractor suppression. However, foreknowledge induced by the brief cues could not be controlled in a goal-directed manner.

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6:00-7:00 PM (V241)

The Predictive Function of Autobiographical Memory. DEMET AY, *Koç University,* SAMI GÜLGÖZ, *Koç University* — Recollecting personal memories serves four functions: self-continuity, social bonding, directing future behavior, and predicting future events. Activating scripted events that are not personally experienced (i.e., general events) may serve similar functions. This study investigates how often people recall personal and scripted events to serve these functions. We asked participants to elicit personal or scripted events with varying valence and fill out a questionnaire about the frequency of recollecting those events for each function. Results showed that scripted events are more frequently utilized for each function than personal events', and the directive function is differentially

pronounced in positive and negative events as opposed to the predictive function. These findings provide evidence that memory-based predictions might be spontaneous by showing that the event type influences people's function ratings. Participants tended to consider personal events less likely to be utilized purposefully. However, when they rate the scripted events experienced by a typical person in their society, they consider that others would be more likely to recollect past events to serve these functions than they would do.

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V242

Working Memory Related to Concurrent Subtasks Can Be Maintained in Separate Non-Interfering Stores. GÜLSÜM ÖZGE ŞENGIL, *Bilkent University,* TAMER GEZICI, *Bilkent University,* İPEK ÇIFTÇI, *Bilkent University,* AUSAF A. FAROOQUI, *Bilkent University* — We show that working memory (WM) related to concurrent subtasks are maintained in separate, non-interfering stores. Participants first memorized the orientation of subtask A lines (let's call this event mA), then memorized subtask B lines (mB), then recalled these B lines (rB), and finally recalled A lines (rA). The task structure was: mA-mB-rB-rA. Subtask A lines were thus held in mind during the execution of subtask B. Even though participants had to remember orientation of lines in both cases, increased WM load of lines A only affected performance on subtask A and did not affect the performance on subtask B. In Exp2, four trials of Exp1 were organized into a complex 4-part task with the added condition that A lines of a part be recalled not in that part but in the next part. The task structure was: mA1-mB1-rB1—mA2-mB2-rB2-rA1—mA3-mB3-rB3-rA2—mB3-rB3-rA3. Load of A lines again did not affect B lines. Crucially, load of A2 and A3 lines did not affect the recall of A1 and A2 lines, respectively. (This work is supported by The Scientific and Technological Research Council of Turkey, Grant No: 120K924)

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12:00-1:00 PM (V243)

Explicit and Implicit Long-Term Memories Guide Attention Differently During Visual Search. SISI WANG, *Vanderbilt University,* GEOFFREY WOODMAN, *Vanderbilt University* — Past experience guides our behavior. But do we need to be aware that we had that experience? Implicit memory phenomena, like the contextual cuing of attention by configurations of distractors, appear to operate beyond our awareness. Here we ask whether the memories that drive our attention to targets need to be explicit. Subjects were assigned to either the implicit or explicit learning group. In the explicit learning group, they were told the correlational structure in which targets appeared in one color the largest percentage of the time, another color the second most, and so on. In the implicit learning group, subjects were told that the colors were irrelevant and the target was defined only by its shape. We found that observers rapidly learned the correlational structure in both conditions. However, by recording subjects' event-related potentials we discovered that explicit learning of the color-target correlations resulted in early perceptual attention being biased to likely targets, while in both conditions learning speeding decision-making for likely targets. Thus, our results demonstrate that even with similar behavior effects of learning, explicit and implicit memory differentially control processing during visual search.

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6:00-7:00 PM (V244)

How Autobiographical Memory Retrieval Influences Later Retrieval for an Unrelated Memory Task in Older and Younger Adults. CORTNEY L. STEDMAN, *Boston College & Florida International University,* JACLYN H. FORD, *Boston College,* ELIZABETH A. KENSINGER, *Boston College* — Although episodic memory (EM) declines as we age, older adults (OAs) demonstrate little to no decline for emotional or socially relevant memories. One possibility is that retrieval of these memories relies on brain regions that experience relatively few changes as one ages. The current study examines whether engaging in socioemotional processing– in this case, an unrelated autobiographical memory (AM) retrieval task– would prime a retrieval mode that would improve OAs' memory for stimuli in a subsequent episodic memory retrieval task. Further, given age-related shifts in emotional processing, follow-up analyses examined how AM valence influenced later episodic memory. Surprisingly, EM accuracy did not differ between participants in the AM experimental and control conditions, and AM positivity had no effect. However, young adults (YAs) who retrieved AMs with greater negative word use had better EM accuracy than YAs in the control condition. This effect was specific to YAs, with no effect of negative word use in AM retrieval on OA EM. This result replicates prior findings that emotional arousal benefits later memory in YAs, but our study provides evidence that this effect may not pertain to OAs.

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12:00-1:00 PM (V245)

The Effect of Font Size and Emotional Valence on Metacognition and Memory. KARINA AGADZHANYAN, *University of California, Los Angeles,* FEIFAN ZOU, *University of California, Los Angeles,* ALAN D. CASTEL, *University of California, Los Angeles* — The present study investigated the simultaneous utilization of font size and emotional valence in metacognition and memory. Participants were presented with word lists varying in font size (small and large) and emotional valence (negative and neutral), and asked to make judgements of learning (JOLs) for each word. Results revealed that participants' metacognitive judgments were sensitive to font size, such that words in large font size received higher JOLs than words in smaller font size. Similarly, participants' judgments were sensitive to emotional valence, such that negative words received higher JOLs than neutral words. However, JOLs mapped onto recall performance only for negative words, as font size had little effect on recall.

Thus, the current study suggests that upon encoding, people incorporate both font size and emotional valence in their JOLs, but only emotion influences recall performance.

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6:00-7:00 PM (V246)

The Impact of Age and Early-Life Stress on Scam Susceptibility and Memory. KATIE M. SILAJ, *University of California, Los Angeles,* KYLIE ALBERTS, *University of California, Los Angeles,* ALAN D. CASTEL, *University of California, Los Angeles* (Sponsored by Alan Castel) — Scams have become increasingly prevalent in recent years, with millions of scams circulating globally. We examined how age and early-life stress influenced memory for and susceptibility to scams. Participants were presented with emails, half of which were scams, and were asked to indicate whether they thought each email was legitimate or not. Participants were then given a recognition test with lures and indicated whether each email was old or new and whether it was legitimate or not. Participants then completed the Adverse Childhood Experiences questionnaire after completing the memory task. We found that younger adults were more susceptible to scams for emails they had never seen before. Older age and more adverse experiences in early life predicted better recognition memory for both legitimate and scam emails. These findings suggest a variety of factors contribute to how people perceive and remember scam information.

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12:00-1:00 PM (V247)

Numeracy, Working Memory, and State Emotions Predict Cognitive Flexibility in Mastermind. LARA BERTRAM, *University of Surrey,* FLORIAN ELLSÄSSER, *Frankfurt School of Finance and Management,* ALBERTO FEDUZI, *University of Cambridge Judge Business School,* ZSÓFIA GYARMATHY, *Neuron Solutions,* JONATHAN D. NELSON, *University of Surrey* — In a complex and ever-changing world, many decisions must be made under challenging conditions. For example, people may experience time pressure or pursue multiple goals simultaneously, while trying to act optimally. How do people navigate such environments? What psychological factors shape the ability to flexibly adjust one's strategies to situation-specific requirements? We investigated this by using a code-breaking game, Mastermind, in which players have to crack a secret code by making queries and getting feedback. Participants are incentivised for either completing games quickly, for using as few queries as possible, or for both. Our results suggest that people adapt their behaviour to task-specific requirements, and that this ability is modulated by working memory and numeracy. Furthermore, state emotional dominance and valence explain incremental variance in game play strategies. Based on our findings we discuss the importance of considering individual differences, particularly emotions, in research on problem solving and decision making.

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12:00-1:00 PM (V248)

Towards a Thermodynamic Model of Spontaneously Perceiving and Responding to Visual Imbalance. JESSE SAXON, B.S., *Texas Tech University,* PHILIP H. MARSHALL, *Texas Tech University,* LISA BRIONES, P.HD., *Texas Tech University,* JACOB VAUGHN, *Texas Tech University,* JENNA R. DONET, *Texas Tech University,* NICHOLAS C. BORGOGNA, P.HD., *Texas Tech University* — We propose that perceiving and responding to imbalanced visual arrays is automatic and spontaneous, and should follow thermodynamic principles, with resulting performance reducing that imbalance. Accordingly, random selection of an item to be deleted (Study 1) or moved (Study 2) from within an array should proceed from a greater to a lesser populated area. As predicted, in Study 1 participants showed a significant ($p < .001$) preference for randomly deleting dots from that area of a visual array that contained more than half of the dots. Study 2 showed that dots were more likely to be chosen from a greater populated area and then moved to a lesser populated area ($p < .001$), as would be predicted to achieve balance in the array. Results are discussed in terms of the preeminence of compositional balance in aesthetic perception and preference.

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6:00-7:00 PM (V249)

Offloading Important Material: An Examination of Memory, Metacognition, and Transfer to Similar Tasks. MORGAN D. SHUMAKER, *Texas Christian University,* CAMI CIESIELSKI, *Texas Christian University,* MARY B. HARGIS, *Texas Christian University* — When information needs to be remembered for a later time, people often make use of external devices (e.g., laptops) to store the to-be-remembered material. This "cognitive offloading" can stave off forgetting when the offloaded material is available at the time of need (Risko & Dunn, 2015). However, when the offloaded material becomes inaccessible (e.g., a laptop crashes), people may forget the externally-stored material. Using the agenda-based regulation (ABR) framework, which posits that learners assess task constraints prior to study and construct agendas to achieve the task goal within these constraints (Ariel & Dunlosky, 2009; 2013), we investigated offloading decisions with respect to the value of the to-be-learned information, memory, metacognition, and potential transfer to other learning situations. Participants offloaded and later recognized more high- than low-value words. Participants were overconfident in their ability to remember offloaded words; this overconfidence decreased with task experience, suggesting some transfer of metacognitive awareness.

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12:00-1:00 PM (V250)

Less-Is-Better Bias: A Developmental Perspective. AUDREY PARRISH, *The Citadel,* EMMA SANDGREN, *The Citadel* — The less-is-better bias emerges when an alternative lower in

quantitative value (e.g., 24 intact dishes) is valued as higher/better than a larger alternative if the latter is degraded in some way (e.g., 24 intact dishes with 16 extra broken dishes). This bias has been attributed to the evaluability hypothesis: individuals judge objects on the basis of easy-to-evaluate attributes when judged in isolation (e.g., brokenness of items) yet shift to quantitative information (e.g., total items) when evaluated jointly. This bias has not been evaluated from a developmental perspective yet emerges robustly among adults and nonhuman primates, hence the current extension to elementary school-aged children. Children demonstrated the bias across a variety of forced-choice trial types, preferring an objectively lesser-valued option relative to a larger yet qualitatively poorer alternative under joint evaluation. These findings suggest that children continue to rely upon salient features of a set to guide decision-making under joint evaluation versus a switch to more objective attributes such as quantity. Decision-making among children may be more strongly governed by a general affective heuristic and context effects in comparison to adults.

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6:00–7:00 PM (V251)

Outcome Valence Affects Learning Trap Development Across Category Domains. AMY X. LI, *University of New South Wales,* BRETT K. HAYES, *University of New South Wales* — We learn about much of our world by actively sampling choice options. The choice-contingent nature of outcome feedback has been shown to lead to learning traps – suboptimal and persistent patterns of decision-making that reflect false beliefs about the reward structure of the environment. In two studies (N = 415 total), we examined the effect of outcome valence on learning trap development across two domains (object and social categories). On each trial, participants chose to approach or avoid instances associated with points rewards or losses. Maximal reward was predicted by a categorization rule based on two stimulus dimensions. In a contingent feedback condition, outcome feedback was only provided for instances that the participant approached. When most choice options led to small rewards, but a minority led to large losses ("frequent gains"), learning of a suboptimal rule was common. This learning trap was attenuated when the valence of rewards/losses was reversed ("frequent losses"). Fewer people learned a complete rule with social compared to non-social stimuli, but this was only true for the frequent-gains condition. The results reveal a previously unrecognized role of outcome valence in the development of learning traps.

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6:00–7:00 PM (V252)

An Eye-Tracking Investigation of Word Order Effects During Reading. PETAR ATANASOV, *University of Central Lancashire,* SIMON P. LIVERSEDGE, *University of Central Lancashire,* FEDERICA DEGNO, *Bournemouth University* — According to OB1 Reader Model (Snell et al., 2018), multiple words are lexically processed simultaneously to form a spatiotopic sentence-level representation based on word length and syntactic expectations (thereby explaining how words can be effectively processed out-of-order). We examined the effects of target word pair transposition and grammatical fit as we recorded participants' eye movements and grammaticality decisions for 5-word sentences. Target word pairs were the same length and transposed or not transposed. The final word was grammatical or ungrammatical. Standard parallel models (e.g., SWIFT, Engbert et al., 2002; Engbert & Kliegl, 2011) predict disruption prior to the first transposed target word while serial models (e.g., E-Z Reader, Reichle et al., 1998; Reichle, 2011) predict disruption at the target. OB1 predicts no disruption at the target but reduced grammaticality decision accuracy for transposed sentences. We found no early disruption and longer first-pass reading of transposed targets. Moreover, grammaticality accuracy was very high (>= 92%) across all conditions. Together the results support serial models of processing.

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