

Modeling dialogues in a dynamic theory of types

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MODELING DIALOGUES IN A DYNAMIC THEORY OF TYPES

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IN OTHER WORDS

A_1 Do you want coffee or tea?

A_1 Do you want coffee or tea?

B_2 Yes!

A₁ Do you want coffee or tea?

B₂ Yes!

- Natural Language Processing (NLP)
- Semantics of Natural Language
- Semantics of dialogues
- Statistical NLP **VS** Formal NLP?

A₁ Do you want coffee or tea?

B₂ Yes!

- Natural Language Processing (NLP)
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- Statistical NLP **VS** Formal NLP?
- Formal NLP **then** Statistical NLP!

DATA, DATA, DATA

Transcriptions of conversations in English between college students in Illinois (US) in an informal setting.

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A₁ When will you guys get off?

B₂ My last exam is like...I don't know, maybe on Monday or on Tuesday...

A₁ Vous décollez quand les gens?

B₂ Mon dernier exam est...je sais pas, peut être lundi ou mardi...

Recordings and transcriptions of philosophical (semi-guided) conversations in French between children from 6 to 10 years old and an adult.

Recordings and transcriptions of philosophical (semi-guided) conversations in French between children from 6 to 10 years old and an adult.

A₁ À qui vous osez pas poser des questions?

B₂ À ceux qu'on connaît.

A₃ Ah, ça c'est ceux à qui tu oses poser des questions?

B₄ Oui.

A₁ Who do you not dare to ask questions?

B₂ People we know.

A₃ Oh, those are ones who you dare ask questions?

B₄ Yes.

Anonymised transcriptions of semi-structured interviews in French performed by psychologists with either patients with schizophrenia under medication, patients with schizophrenia without medication or control patients (without any known diagnosis)

[Rebuschi et al., 2014].

A₁ Oh ouais et pis compliqué et c'est vraiment très très compliqué **la politique** c'est quelque chose quand on s'en occupe **faut être gagnant** parce qu'autrement quand on est perdant c'est fini quoi

B₂ Oui

A₃ J. C. D. **est mort**, L. **est mort**, P. **est mort** euh (...)

B₄ Ils sont morts parce qu'ils ont perdu à votre avis

A₅ Non ils gagnaient mais **si ils sont morts, c'est la maladie** quoi c'est c'est

A₁ Oh and it's complicated and **politics** is really very complicated, it's something when you do that, you **need to win** because otherwise when you lose it's the end you know

B₂ Yes

A₃ J. C. D. **is dead**, L. **is dead**, P. **is dead** hum (...)

B₄ They died because they lost, according to you

A₅ No, they were winning but **if they died, it was out of sickness** you know it's it's

TYPE THEORY AND ALL THAT

[de Groote, 2006]

Types:	individual/entity	ι
	proposition	o
	context	γ

[de Groote, 2006]

Types: individual/entity ι
 proposition o
 context γ

Mary loves Jane.

$\lambda e k. \text{love } j \ m \wedge k(m :: j :: e)$

e	γ
k	$\gamma \rightarrow o$
j,m	ι
love	$\iota \rightarrow \iota \rightarrow o$

REPRESENTATIONS

A₁ Vous habitez où?

B₂ À T.

A₃ C'est dans la ville de L.

B₄ Oui.

A₁ Where do you live?

B₂ In T.

A₃ Is it in the city of L?

B₄ Yes.

$$\left[\begin{array}{c} \text{LIVE} \\ \text{Ag: B} \\ \text{Loc: } \left[\begin{array}{c} \text{IS IN} \\ \text{Ag: T} \\ \text{Loc: L} \end{array} \right] \end{array} \right]$$

[Kallmeyer et al., 2015]






BACK TO THE PRESENT AND FUTURE

Frame Semantics Real-life examples (embedded frames)

RNNs Not enough data (generalization)

Inquisitive semantics Handling questions and answers
[Ciardelli et al., 2012]

Machine Learning Learning on logical representations
[Roberts and Demner-Fushman, 2016]

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THANK YOU.