Reading together as a Leisure Activity: Implications for E-reading

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Abstract. Reading from devices such as Kindles, Nooks, and tablets ("e-readers") is an increasingly common practice. A primary reason users purchase e-readers is to read for pleasure, as opposed to reading for work or school purposes. With paper, people sometimes read together from a single book (e.g., reading a bedtime story with a child) – a practice we call partnered reading. This practice, and the goals of e-reading for pleasure more generally, remain underexplored in the HCI literature. This paper contributes findings from a deployment study wherein participants used an e-reader application to read with a partner. These findings (a) provide descriptive accounts of how people use e-readers to read together, and (b) identify opportunities to improve the design of e-readers to support partnered e-reading for pleasure.

Keywords: E-reading, partnered reading, collaborative reading, pleasure, entertainment, leisure, iPad, ALLT.

1 Introduction

A recent survey by the Pew Research Center found that "one-fifth of American adults (21%) report that they have read an e-book in the past year, and this number increased following a gift-giving season that saw a spike in the ownership of both tablet computers and e-book reading devices such as the original Kindles and Nooks" [1]. Arguably, the growth of e-reading has largely been a byproduct of consumers purchasing e-readers for purposes of reading for pleasure [2].

According to the Pew Research Center, "80% of Americans age 16 and older say they read at least occasionally for pleasure. Some 36% read for pleasure every day or almost every day" [1]. Reading for pleasure outranked other reasons for reading, including current events, doing research, and reading for work or school purposes. The widespread appeal of reading for pleasure suggests that e-reading technologies may benefit from design decisions that support this specific type of practice.

While we often think of reading as a solitary activity, reading is always performed within a specific psychological and social context. We have motivations for reading,

and direct our reading processes based on the social context that we act within [3, 4]. Collaborative reading in the workplace is often characterized by formal, professional relationships among readers, and with well-articulated goals such as synthesizing material to produce a report [5-7]. In educational settings, readers often try to achieve a deep understanding of the content and engage the material through annotation or note-taking in an active reading process [8, 9]. Learning to read is similarly a social process, and reading together between an adult and a child is a common way to impart literacy skills [3, 10].

Reading for pleasure is no exception, and is often performed in the home with family and friends. E-readers are increasingly available in this social context, but may lack characteristics that make them appropriate for co-located social reading. For example, one study found that 81% of respondents preferred printed books over e-books for reading with a child [1]. Of course, children are not the only types of people with whom one might sit down and read; reading together can be a pleasurable activity for people of any age. Other examples include reading with senior citizens who might have visual or motor impairments [11], or simply sharing a book with a friend sitting next to you. E-reading in the home for purposes of pleasure is still underexplored, despite the success of e-readers for individuals reading on their own.

Part of the pleasure derived from co-located reading is social [3, 4, 10]. The activity of reading provides a shared form of entertainment that can form the basis of conversation, and perhaps co-located reading can contribute to the strength of the relationship between readers. Reading aloud to another person also offers an opportunity to entertain and delight others. Even reading performed separately but in the presence of others can be a relaxing way to spend time together.

Despite the richness of co-located reading for pleasure, it remains a relatively underexplored area in the HCI literature. This paper contributes to what is known about digital reading by describing this practice in more detail, and in particular, by identifying design successes and challenges associated with using an e-reader for co-located pleasure reading activities. We find that e-reading for pleasure requires coordination between reading partners, and there are issues with respect to pacing and visibility of reading activities. E-reading for pleasure constitutes its own form of entertainment, but competes against a growing set of leisure activities available on tablet computers. These findings underpin implications that may improve the design of e-reader hardware, software, and associated services.

2 Background

Several studies concern the design and evaluation of reading devices, especially in comparison to reading from paper [5, 6, 12]. We first turn to the bulk of work in HCI, which has focused on how to improve productivity measures such as comprehension or reading speed. These fall under a process called active reading [8, 9, 13, 14]. Active reading refers to a set of strategies for engaging with written material and is "the combination of reading with critical thinking and learning, and involves not just reading per se, but also underlining, highlighting, and commenting" [15].

Designing digital systems that can support active reading techniques has been a fruitful research area [9, 16], and many commercial e-readers now permit at least some of these active reading techniques to occur [17-19]. Ongoing work has identified ways in which commercial e-readers present usability problems [20], and how users overcome these limitations in pursuit of academic research [21]. Other work explored how the availability of multiple reading surfaces – paper, computer monitors, tablets, slates, and so on – can be understood in work practice in order to optimize the reading and/or writing experience [12, 14]. Document manipulation techniques like navigation and page turning also become important when working across multiple devices [22].

While active reading can be performed with texts chosen for pleasure (e.g., a novel) it is often performed with a particular goal in mind. Adler et al. identify four kinds of reading goals they observed in the workplace: extracting information, integrating information, consistency checking, and critiquing or making comment [5]. For example, a researcher might read hundreds of papers and synthesize them into a literature review. Achieving these goals often involves working with others.

2.1 Social Reading

Social reading research has focused on productivity goals, often in the workplace, university, or other educational settings. Pearson notes that collaborative (or social) reading is not a single activity, but comprises a set of different types of reading tasks [23]. Most devices have been deployed to support a specific kind of reading environment. For example, the XLibris e-reading device allows users to share annotations like highlighting and e-ink [15]. This technology was deployed in an academic reading group where members would meet weekly to discuss conference or journal articles [24]. Pearson et al. created a laboratory scenario where participants were asked to use their BuddyBooks prototype in order to complete reading comprehension tasks, and with particular emphasis on supporting mutual navigation of documents [23].

At a Distance. Other work has focused on how to support social reading despite geographical and temporal distance. Kaplan and Chisik developed a desktop application called the Sociable Digital Library Book that allows groups of young adults between 10 and 14 to read independently but share notes and markings through the internet with remote others [25]. In a field deployment they found that their application encouraged conversation and interaction among readers.

Other work has focused on reading at a distance with children. The "Storytime with Elmo" system allows a distant relative to read a story to a child via the internet [10]. Children read using a physical copy of the book and a video of the remote relative is displayed in a case above the book. Relatives can monitor the child's reading in their interface, and are shown potential discussion points to raise with the child.

Commercial systems have also taken advantage of social media to share information about readers' habits and activities. For example, Kobo's Reading Life platform allows users to publish information about what they're reading to Facebook

[26]. They can additionally track their reading statistics (e.g., number of pages turned, time spent reading) and participate in online discussions.

2.2 Reading for Pleasure

In the present study we focus on reading for pleasure. By this we mean the pursuit of reading as a way to spend time and for entertainment. Reading for pleasure, described by Ross as "nongoal oriented transactions with texts" [27] is undertaken for many reasons. In a study consisting of 194 interviews, Ross found that those who read for pleasure do so to make sense of their own experiences in a variety of ways (e.g., identifying role models, finding new perspectives on the world).

Reading for pleasure is quite varied: it can mean reading a romance novel on a beach, studying the memoir of a prominent politician, skimming a magazine at the doctor's office, or any of a wide range of potential settings and materials. Nell uses the term "ludic reading" to refer to "an enormously complex cognitive act that draws on an array of skills and processes in many different domains – attention, comprehension, absorption, and entrancement; reading skill and reading-rate variability; readability and reader preference; and reading physiology" [28]. Indeed, while one may read in order to relax, it is not always a soothing process. As O'Hara notes, "[s]ometimes, when reading texts such as thrillers or mysteries, reading for enjoyment is characterized by concentration and high emotional involvement with the text. Such reading may involve trying to anticipate what is ahead in the text and finding relationships among specific ideas and events. This kind of reading will be in a linear fashion and require a high investment in time" [2].

Reading for pleasure can be a complex process to characterize. Relatively little work in HCI has focused on reading for pleasure in a social context however, with the exception of Rouncefield and Tolmie who provide rich accounts of how reading takes place in the domestic space, and especially among family members [4]. As they point out, reading is a richly embodied process, and there are many cues that indicate reading habits, such as how books are held, where they are placed, and how they are stored. Indeed, Ross notes that "reading is in fact motivated and sustained by social relations and embedded in a social context…we need to pay more attention generally to the communal and social aspects of the information encounter and build opportunities for collaboration among users into system design" [27]. As e-readers become more prominent, there become more opportunities for designers to leverage the social context in which reading takes place.

3 Study

The present study is an attempt to unpack some of the social relations that exist around reading, with the goal of moving towards more specific design directions. As mentioned above, there are numerous types of social reading activities available for study. In our case, we became interested in how pairs of co-present readers can read together from a single device. This scenario, unexplored in the literature, is a familiar

activity – parents may read with their children, or we may read a book with a loved one as a way to pass the time. In order to better understand how this particular type of partnered reading occurs and is changed by the presence of an e-reader, we conducted an interview study and deployed a custom e-reader application for the iPad called ALLT (Accessible Large-print Listening and Talking).

3.1 Participants

Eleven participants were recruited by distributing flyers to community libraries, academic buildings, and by posting online classified advertisements. To be eligible for the study, participants were required to have an established practice of using an e-reader to read together with a friend or family member. Participants owned e-readers of many varieties, and several different types of relationships were represented in the sample (Table 1). All participants rated themselves "frequent" readers.

Table 1. Participants.

ID	Current e-Reader(s)	Age	Gender	Occupation	Partner(s)	Sessions
P1	Kobo Touch	22	F	Student	Cousin (7 yrs.), friends	3
P2	Kindle	23	M	Volunteer	Boyfriend	6
P3	iPad 2	30	M	Sales	Girlfriend	6
P4	iPad 2, Sony e-reader	62	F	Retired	Husband	14
P5	Kobo Touch	24	F	Student	Mother (learning English), sisters	7
P6	iPad 1	21	F	Student	Boyfriend, sister	6
P7	iPad 2	19	F	Student	Mother, brother	7
P8	Kindle	27	M	Student	Mother (learning English), son	6
P9	iPad 2	19	M	Student	Sister, friends	6
P10	Kobo	20	F	Student	Friends	6
P11	Kindle, Android phone	44	M	Actor	Volunteer at community center	2

3.2 System

All participants used a custom prototype e-reader iPad app called ALLT (Figure 1). While participants had experience using their usual e-readers, distributing a common platform to all participants offered two benefits. First, it standardized the experience across participants and allowed us to make reference to a common user interface dur-

ing analysis. Second, it offered the ability to collect additional data through an embedded on-device questionnaire.

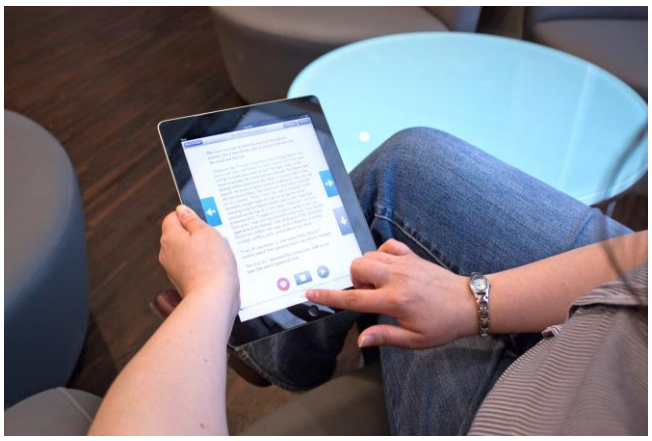

Fig. 1. ALLT e-reader prototype in use.

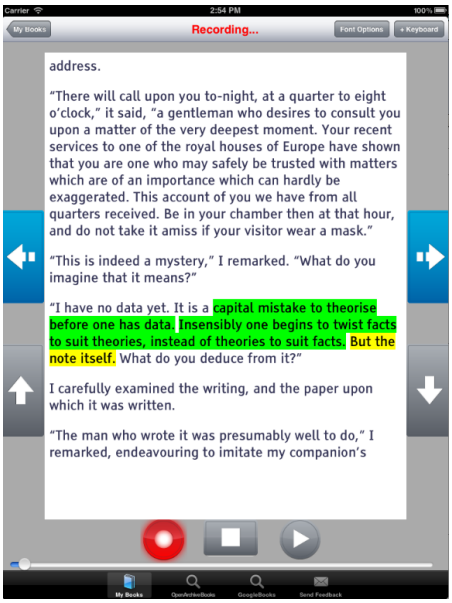

Fig. 2. ALLT user interface. The left and right arrows turn pages, while the up and down arrows control highlighting of text. Voice playback controls are located along the bottom. The current sentence is highlighted in yellow and user recorded sentences are highlighted in green.

ALLT contains a standard set of e-reader features, including: page forward/backward, font size increase/decrease, white on black/black on white contrast modes, table of contents listing, and a slider indicating book progress (Figure 2). ALLT also provides a mode where audio can be recorded through the iPad's microphone. Audio is then synchronized with a highlighted sentence in the book. After the user is done recording the audio for a sentence, they must push a button on the touch screen to progress to the next sentence, and ALLT continues to record. In this way, arbitrary lengths of selected text can be synchronized with user-recorded audio.

ALLT can then later play back the audio track for a selected book. Playback can be performed in one of two modes: using a synthesized text-to-speech (TTS) engine, or by playing back synchronized user-recorded audio. If user-recorded audio is available, ALLT will play it; otherwise, it falls back to the TTS engine (which our participants sometimes called the "computer voice"). This record and playback mode was included in order to support activities where individuals chose to read aloud together, or to create a recording that could be accessed later [11].

ALLT can download books from two sources: the Open Library, and Google Books. Downloaded books are then reformatted before being presented in the ALLT interface. Although books downloaded from outside sources (such as Amazon) were not available in the prototype for copyright reasons, the provided sources contain a large selection of public domain reading material suitable for pleasure reading.

3.3 Method

Each participant participated in a 2-week long deployment study. Participants were initially met in the laboratory where they were interviewed about their existing e-reading habits and preferences. The participant was then given an iPad 2 with the ALLT software pre-installed. If the participant already owned an iPad, the software was installed on their own device.

Participants were instructed to use ALLT with a reading partner for 6 different sessions over the course of 2 weeks. We asked participants to read for at least 10 minutes per session to ensure that participants had at least 1 hour of accumulated usage. Aside from these instructions, participants were encouraged to use ALLT in a way that felt comfortable and mimicked their present use of e-readers. Immediately following each reading session, ALLT prompted the user to complete a post-reading questionnaire.

The questionnaire collected data about who was reading during the session, what they were reading, and the relative utility of features of the system, along with any additional comments that participants wanted to share. At the end of the 2 week period, participants completed an interview with the researcher about their experiences using ALLT. This interview asked participants to comment on the features of ALLT and the process of using an e-reader to read with a co-located partner.

In total, approximately 8 hours of interviews were audio recorded, yielding 96 pages of transcribed material. Transcripts were then analyzed by using affinity diagramming to generate 110 initial concepts. Concepts were then reviewed by the research team and grouped based on thematic connections.

4 Session Characteristics

Across all 11 participants, 70 post-session questionnaire responses were successfully completed. Session times ranged from 10 minutes (minimum) to 60 minutes (maximum). The average reading time was 19.9 minutes, with a standard deviation of 10.6 minutes. Of these sessions, 24 (34%) were completed alone, with the remainder (46) with a reading partner. Sessions alone were, on average, 21.8 minutes, while sessions with a reading partner were on average 18.9 minutes (an insignificant difference, $p = 0.28$). Of the 46 sessions with a reading partner, the participant read aloud more than the reading partner in 14 sessions (30%). In 9 sessions (20%), the participant and partner read aloud in equal amounts, while the partner read more than the participant in 9 sessions (20%). In the remaining 14 sessions (30%), partners read silently.

Each participant read 1 or 2 different books during the study, yielding a total of 17 unique titles. Ten of the 11 participants read works of fiction during the study such as The Call of the Wild, Pride and Prejudice, Grimm's Fairy Tales, and The Adventures of Sherlock Holmes. P3 and P10 also read two non-fiction titles: The Idiot and The Art of Controversy. P10 was the only participant to exclusively read non-fiction.

The relationship between reading partners varied from participant to participant, and included family (parents, siblings, spouses), boyfriends/girlfriends, and in one case, a co-worker. In one instance, P1 read aloud to two children, while all other cases involved only the participant and one other reading partner.

5 Interview Findings

We now report on the findings from our interviews and provide richer characterizations of the reading sessions outlined above. We also provide suggestions of what these findings could mean for the design of e-readers and e-books.

5.1 Reasons for Reading for Pleasure

Entertainment. In the study we chose to use an Apple iPad as the platform for our ALLT software. The iPad is not a dedicated e-reading device, and can provide many forms of entertainment beyond reading, including games, movies, YouTube, and so on. Because entertainment options are more readily available than ever before, we saw that participants sometimes chose other options instead of reading. For example, P11 took ALLT to a community senior center where he volunteers to read.

"Well it definitely brings people together because of the technology… but the seniors asked if there was poker on it…That's a plus." – P11

This quote shows that reading for pleasure is part of a larger set of potential forms of entertainment. Reading on a multi-function device like a tablet opens up new ways of interacting across devices and systems. For example, P5 downloaded and read

Sherlock Holmes in all 6 sessions. When asked why he chose that title he responded, *"I just started watching Sherlock [the television show] so I decided 'why not?'"* For designers of e-readers and e-books, there are many opportunities to take advantage of reading's positioning within an entertainment ecosystem. E-books might reference games and videos also available on the device. Thinking about reading as part of a broader home entertainment could lead to compelling situations where devices work together to deliver new entertainment experiences (e.g., a television that plays mood music and background visuals depending on what book is being read).

Entertainment does not occur strictly on the device. P11, an actor, recorded a narrative that he then played for an audience at the senior center. Reading aloud prompted participants to try on voices and add depth to the reading through performance.

"Because you're concentrating and reading out loud… I was a little more conscious of adding drama to it." – P4

While most e-readers do not support the ability to record and synchronize voices with text, ALLT's support of this feature led to other playful behavior. Because ALLT falls back to TTS when there is no user-recorded voice available, participants could juxtapose the artificial computer voice and their own sounds, as with P7:

"I was blow-drying my hair and I pushed the voice recording button…It was like white noise for that section, and first it was the computer voice, and then the white noise – blow-drying – and then computer voice again and that's funny." – P7

Because e-reading for pleasure is not necessarily beholden to the same goals of reading for comprehension, speed, or summarization, the range of purposes for the technology can also grow. Incorporating devices not usually associated with reading – like cameras or microphones – gives users the opportunity to "mess around" with different aspects of the system for entertainment and blend these aspects into the greater activity of reading for pleasure. Tablet games that incorporate multiple players have been relatively successful in the past, and perhaps reading applications could be improved by taking cues from gaming.

Edu-tainment. As described in Table 1, two participants used their e-reader in order to read with their mothers who were learning English as a second language. One other participant used the e-reader to read a book aloud with children learning to read. In both of these examples the primary activity was reading for pleasure, but at the same time, there was an educational component. While there is a rich literature on dedicated devices for second-language acquisition and for childhood literacy, these are outside of the scope of this paper [29, 30]. Instead, we focus on the specific ways that ALLT permitted participants to engage in pleasure reading in new ways.

Building on the idea of reading alongside television, P5 described one way her mother used her e-reader to learn English through entertainment.

"My mom, she just came to the country. Her English is ok but it could be better. They have a lot of things that are meant for primary school kids, but it's easier to read with her. Or sometimes we will get books about a teenage show – Pretty Little Liars. It's easier for her to watch it and read it and compare. She actually writes down stuff and shows me and my sister to look it over and see if she did a good job and can understand the difference between the book and the TV show." – P5

As shown above, reading for pleasure can be one technique for acquiring new language skills. While our sample included few sessions of reading with children, 5 different participants suggested that reading aloud as an educational program for kids would be an effective use of the recording feature. In particular, the ability to record voices creates a useful model that allows learners to check their pronunciation.

"Both of us would read the same paragraph. Also she is trying to get rid of her accent. So when she hears me she is… trying to say it the way I am saying it." – P5

These statements support the possibility of e-reading for both entertainment and education. P3 and P4 used the voice recording feature to annotate their e-books to mark specific passages for later review. This would suggest that reading for pleasure can sometimes involve deeper processing of text, and might benefit from annotation functionality in the same way that reading for work or school purposes might [5, 12].

5.2 Reading as Relationship Work

Reading, like any social activity, is influenced by pre-existing relationship dynamics. Decisions about what, how, and when to read are controlled by how the relationship works. For example, when asked who chose what content to read, P2 said *"I chose what to read. A kind of overarching theme for our relationship,"* indicating the carryover from pre-existing relationships into the reading activity.

Reading together on an e-reader came more easily to some participants than others depending on the relationship. Three participants (P2, P5, and P6) reported using an e-reader together with a partner improved parts of the reading experience. P2 and P5 enjoyed opportunities for "literary discussion" they otherwise would not have had.

These kinds of conversations, as byproducts of reading, can form the basis for stronger relationships. While this kind of benefit is not limited to e-readers, this is a potential place for designers to innovate. For example, e-readers might track a reader's place in a story and suggest discussion topics in order to stimulate conversation.

Gifting and Digital Work. Giving someone else a book as a gift is a common practice. Our findings showed that this kind of behavior persists in e-reading environments. While most participants selected reading material together with their partners or chose books of interest to themselves, P2 and P7 reported browsing the collection of content available in their e-readers for topics that would be of interest to their reading partners as well, and downloaded books for their partners to read later.

"To save my boyfriend some time and effort I tried to look through all of them and downloaded maybe 10 or 15 books that I thought he might also like." – P2

Similarly, P11 reported printing out paper copies of e-books that he was reading in order to share them with friends. E-readers allow users to download a baffling number of books; sifting through books and providing them to others in a preferred format constitutes a form of benevolent "digital work." As noted in the literature, technology can sometimes reduce effort and in so doing, devalue the meaning of the exchange [31]. Designers might consider how downloading and preparing a book to be read can be considered an act of caring. A system might allow a user to modify or extend the digital text (e.g., adding audio narration) in order to personalize the book as a gift.

Equality, Negotiation, and Ownership. Participants remarked on how they negotiated their reading by engaging in common relationship-building practices that affirmed equality. For example, P2, P3, P6, and P7 would alternate back and forth, taking turns reading aloud. P2, P4, P5, and P7 demonstrated a similar form of equality and negotiation around their e-reading by browsing and selecting the reading material together. In all other situations, the participant/owner of the iPad would choose the reading selection (or, as mentioned above, on behalf of their reading partner).

With print books, ownership of the book is usually well-understood. In this situation, however, where books are jointly acquired and jointly read, these principles of ownership become blurred. P1, P6, and P7 reported that they chose what to read because they were the owners of the iPad. For other participants, the iPad was a shared device – P3 was forced to share with others because they only had one tablet. In these situations, the same device might hold multiple books that "belong" to multiple people. Additionally, multiple people might be reading the same book at different times.

Many current e-reading systems are designed based on a model where there is a single user, a single device, and an associated account with an online retailer (e.g., a user has an Amazon account and reads on his Kindle). In reality, multiple people may use the same device and share the account. In initial interviews, P2, P5, and P11 reported that digital rights management software impeded their ability to share books with household members during their e-reading. Bringing a book "into the house" is now changed as a result of e-readers. Use models where each person has an account, or where each person has their own device, do not always exist.

5.3 Pragmatics

All participants reported that reading with a partner was something they do less frequently than reading alone, and that reading together was not always ideal. In this section we detail some of the practical concerns that participants raised regarding their reading experiences. When asked if he enjoyed reading with a partner, P3 noted:

"It's definitely a social experience. I don't know if I can say it's more fun. It's more like reading, based on the person, it's a very solemn pastime." – P3

Indeed, while all participants said that overall they prefer to read alone, they all also saw the value of partnered e-reading in specific cases (e.g., reading to a child, or to someone in hospital). In these kinds of situations there is an existing social and physical setting that makes them conductive to reading. In all cases there was a perceived need to fit reading into existing household routines [4]. Where these routines did not already exist, participants needed to carve out the time from their schedules. This was often done by adding them to existing events, such as reading together before bedtime (P2), after dinner (P6), or after classes (P7). However carving out these times could be difficult. P4, for example, commented on the overhead involved in reading together.

"It's hard unless you book it, almost, make an appointment to do it. Like 'I'll be there in a few minutes' and then you're sitting there waiting. That was the hardest part of reading together." – P4

Because the point of reading is for pleasure, P1, P4, P8, and P10 all reported that they would read on their own and then allow their partner to catch up later, rather than deal with scheduling an appointment. While the questionnaire data showed that reading partners stayed stable during the study, P10 noted that this scheduling could be exacerbated by the challenges associated with finding a reading partner.

Systems that reduce the overhead with scheduling could potentially be helpful here, as would systems that allow people to find reading partners more easily. For example, routine learning systems might track of family and friends' reading patterns and use that to suggest a set of times to read together [32].

Pacing. P3, P5, P6, and P7 remarked on the difficulties they encountered in setting and maintaining an appropriate reading pace with their partner. One of the two partners would read faster than the other and would have to wait for their partner to finish before turning the page. Participants responded in different ways:

- *Use TTS to establish a reading pace*. P7 would turn on the TTS playback in order to establish a shared reading speed for both partners.
- *Reading aloud to maintain reading pace*. One of the two partners would read aloud in order to establish the shared reading pace. P1, P2, P5, P9, and P11 also noted that the person reading aloud would turn the page.
- *Reading silently and then confirming at the end of the page*. P6 and P7 described situations where both partners would read silently to themselves, and then verbally confirm that their partner was ready to turn the page.
- *Use sentence highlighting*. ALLT's voice recording feature highlights one sentence at a time, and allows users to advance sentences using the arrow keys. P1, P2, P5, and P6 used this highlighting (sometimes in conjunction with other methods) to provide a visual indication of their reading progress to their partner.

P2 and P6 encountered situations where their reading partner would read ahead independently, and used the voice recording as a way to catch up.

"If we were sharing a book and he was ahead of me… I could just hit play and it would be like he was reading to me when he was at work." – P2

Participants suggested that novel hardware configurations could address pacing.

"The option to split the screen… so if two people are reading together if the screen was able to split one person based on the other person's reading speed you can flip ahead or back, otherwise you're still looking at the same screen, you know." – P3

Multiple devices for reading activities has been explored before in work settings [14, 22], and future work might explore how multiple displays fare for co-located reading for pleasure as well. Additionally, user interfaces that can better support the communication of pacing through a page or a book could be beneficial; for example, future systems might be able to automatically identify what sentence is being read, and leverage this information to automatically adjust reading pace and page turns.

Interest, Choice, and Distraction. A common theme among participants (P2, P3, P7, P9, and P11) was that their reading interests differed from those of their reading partners. Unlike work or school where the material is often determined by an instructor or work outcome, reading for pleasure introduces choice. If one does not enjoy reading fantasy novels, then there is no need to do so (and indeed would be antithetical to the activity of reading for pleasure). Additionally, the variety of reading materials for pleasure is much greater than for work purposes. Without the demands of school or the workplace, there is relatively little "glue" holding together adults who are reading together (aside from the value found in socialization).

Difficulties maintaining interest in reading together was noted by several participants. Five participants described occasions when they lost interest during the session, and would become distracted with other activities or fall asleep.

"[My] two little sisters, they have a short attention span. They were really quiet and eventually they sort of fell asleep." – P1

In addition to losing interest, some participants felt that partnered reading introduced too many distractions. P2, P3, P4, and P6 felt that having someone else commenting on the text as they read made it difficult to concentrate. P4 believed that the mere presence of another person distracted her from her reading. This corroborates the findings from the questionnaire, which indicated that partnered reading sessions were shorter in duration than individual reading sessions (although not significantly).

E-readers may potentially handle this situation in a number of ways. For example, a lack of a shared book of interest can be a good opportunity for the system to recommend texts that could be of interest to both readers (e.g., by consulting past reading history). E-readers could also more specifically support partnered reading by introducing prompts for different partners to perform different tasks, as in collaborative video games. For example, the e-reader could indicate when to switch reading aloud, or present challenges and awards for continued reading.

Awareness. Reading together requires that both partners have an awareness of where their partner is in their own reading. Unlike print books, e-readers may make it more difficult to identify what household members are reading, where in their books they are, and what their intentions are for the book (e.g., leaving a book in the bathroom vs. the kitchen table) [4]. Current e-readers mark the last page read and return to that page when the book is reopened. When multiple people are reading the same book, however, this kind of bookmark forces the user to flip forwards or backwards to find their spot again. While this has some usability problems for users who do not share a device [20], this may help to provide some context about others' reading activities.

Additionally, because e-books are "invisible" in the sense that they do not have a clearly identifiable physical form, members of the household could not always tell what books others were reading. To handle this situation, P4, P5, and P6 designated particular books as being "for together" and others "for alone." In this way, if one person wanted to read when the other did not, they could continue on their own until both partners were ready to read their shared book.

"I came home once and she was definitely reading something, but it wasn't the book we were reading together, just because then we wouldn't be in the same spot and that wouldn't be fun." – P6

This type of reading practice where multiple people are reading multiple texts is what Pearson calls "parallel reading" [23]. Applications that tie into social media such as Facebook have been developed in order to support awareness in parallel reading environments. For example, the iPad app Subtext allows groups of users to share annotations to books as they read, and browse what other users are reading [33]. Kobo's Reading Life feature automatically publishes information about what the user is reading to Facebook friends [26]. Both of these applications also permit users to post to conversations regarding the material, taking the discussion of the text online.

While these kinds of apps can help to support awareness, there are additional features that might be helpful for co-located partnered reading. Being able to see how far someone else has read in a book can be one way to support awareness. Social reading applications might also consider how to support co-located reading when a device is shared among multiple people (e.g., handling multiple accounts).

Device Interaction. Aspects of the hardware and software affected the partnered e-reading experience in both positive and negative ways. P8 and P10 found the iPad's comparatively large screen to be helpful for partnered reading, so that both people could read the screen more easily. P2 thought that the device was too small to share, and would have preferred a larger screen. P3 suggested the system have adjustable margins so that line lengths were shorter, and shifting from line to line could be made easier. P7, P8, and P9 all suggested that the application flip from portrait to landscape so that the iPad could be held sideways and placed across two laps.

While overall there was a desire for larger screens, this may result in a tradeoff with respect to holding the device. P4 and P10 found that holding the device in a position that was comfortable for both reading partners to be physically awkward and

tiring, although they liked the fact that e-readers didn't require them to continually hold the book open to maintain the page, as with some printed books. P7 suggested that the e-reader should come with a stand so that it could be placed on a table (although add-on stands for the iPad are already commercially available). Four participants (P2, P4, P6, and P7) remarked on the need to adjust the font size and contrast in order to make reading more comfortable, while P5 and P6 additionally mentioned the need to find a location that had suitable lighting for the reading task. Importantly, the preferences for settings like font size and contrast could be different for each person.

How the device is held affects the way that screen interaction occurs. P8 noted that the touch screen of the iPad made it ideal for partnered reading. For page turns, some participants would pass the device back and forth, and whoever was holding the iPad would turn the page. P6 reported that in their reading sessions, whoever was sitting to the right would turn the page, since they were closer to the right edge of the screen.

These observations suggest opportunities to improve the design of e-readers for partnered reading. For example, reading settings (font size, contrast, etc.) could be stored for each of the two reading partners. When the device is then passed from one person to the other, the appropriate settings could be swapped in by pressing a button or by detecting the passing motion using an accelerometer. Screen layouts could also be optimized for different positions, such as reading from a stand or one's lap.

6 Implications for Design

While we have touched on some potential changes to e-readers in the themes above, we now present a distilled list of design implications from the findings. We note that these implications stem from our small-scale deployment study with ALLT and may not be suitable for generalizing across all device platforms and populations.

Support group discovery of shared reading material. Whether e-books are downloaded through a PC or to the e-reader directly, systems for acquiring books should support social reading activities such as giving books as gifts, identifying material that others might be interested in, and helping people to explore mutual reading interests.

Allow books to be personalized and passed on. Finding books of interest to others and passing them along can be a way to show thoughtfulness. Designers should consider how personal touches can be imbued into e-books, such as including custom recordings or notes, in order to facilitate giving or receiving an e-book as a gift.

Support coordination of reading activities. Readers may be in the process of reading multiple books at the same time – some of these might be read with others, while others are read alone. Systems should make reading progress visible in order to support the coordination needed to engage in partnered reading activities.

Provide short texts and divide long text into chunks. Partnered reading sessions in our study were shorter than individual reading sessions, and were subject to interruption and distraction. Providing brief reading materials and a clear sense of progress through a text can help readers stay on track and give opportunities for breaks. Longer materials such as books should be clearly divided into subsections.

Accommodate multiple reading paces. Some people read faster than others, and systems that are able to adapt to differing paces may better support partnered reading activities. For example, a system might have a split screen option that allows for two readers to read at difference paces while still reading together.

Settings should be quickly swapped in and out. With multiple people using the same device to read, settings for font size, contrast, and so on should be easily swapped out to suit the preference of the current reader. This could occur through a hotkey or by sensing the motion of passing the device from one person to another.

Consider hardware sizing, positioning, and fatigue. Users adopt many postures and positions when reading together. Stands, cushions, and other device add-ons can improve the comfort of a partnered reading experience.

Consider how reading fits into other forms of entertainment. Reading for pleasure is only one way to spend leisure time together, especially when games, TV, and movies are all available on tablet computers. Promote integration of reading into other forms of entertainment to enhance the shared reading experience.

Support creativity in the act of reading. Reading is a form of entertainment and has performative aspects to it, such as creating voices. Systems should help readers bring a story to life by providing tools to enhance the drama and storytelling, and bear in mind that reading can be the basis for "silly" forms of entertainment.

7 Conclusion

e-Reading is an increasingly common household activity, and reading for pleasure is a contributor to the adoption of e-readers. Right now, there is a trend towards each person having their own e-reading device, but sharing e-readers in order to engage in partnered reading is a practice that still has its place in the order of the household. Reading aloud with friends and family can be a way to pass the time and enjoy the company of others. Designers of e-readers and e-books should consider this rich type of activity in order to better support partnered reading.

In this paper we have touched on some of the opportunities for e-readers to improve this practice by making it easier to schedule, maintain, and enjoy partnered reading. We have found that there remain issues concerning awareness, presence, and pacing that can make e-reading together more difficult. At the same time, reading for pleasure is a way that people can connect and find entertainment value. Systems should support the creative and social aspects of reading together, while at the same time addressing physical and user interface characteristics that can make reading together uncomfortable in order to improve the quality of partnered e-reading.

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