Using Emotional Attachment as a Lens to Improve User's E-reading Experience

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Abstract: This paper explores ways to improve e-reading by examining the experience of people who have developed a sense of attachment to their e-readers. Nine participants who reported experiencing emotional attachment completed a semi-structured interview asking them about their experiences with e-readers and e-reading. Thematic analysis led to three main themes being identified as important to their experiences: projection of identity, control over the device, and environmental factors. We examine how these themes suggest that people's experiences of reading in traditional and electronic formats are heavily interlinked. We also discuss how these themes resonate with the wider attachment literature. Based on our findings we suggest the need to support the expression of identity through configuration and display in the e-reader experience, as well as exploring ways devices can be used to control and personalize the reading environment.

Keywords: e-books; digital reading; emotional attachment; user experience.

1   Introduction

Reading electronic books (e-books) using dedicated reading devices (e-readers), tablet computers, and other handheld devices such as mobile phones has become increasingly popular and commonplace as device ownership has experienced explosive growth [27, 34]. However, recent statistics show a decline in e-reader sales [1], while print books appear to be regaining market dominance over e-books [25]. Research on electronic reading and e-readers in HCI has traditionally addressed the advantages and disadvantages of reading on paper versus on screen, device features, and improved productivity [16]. With few exceptions, these studies have focused on work-related tasks. Very little work has focused on understanding the e-reading experience, often neglecting key dimensions of reading outside the workplace, e.g. emotional, hedonic, embodied, and/or situated nature of leisure reading have largely been ignored [8]. This is an issue as work has suggested that the e-reading experience is poor, especially when compared to reading physical books [32].

Previous studies in HCI focusing on emotional attachment have produced valuable insights for improved design [18, 22]. Our work is similar in approach to other attachment based HCI work in this regard. Books are amongst the objects that people most frequently become attached to and see as special [2, 3]. However, we are not

aware of any studies in the HCI literature to date that focus specifically on emotional attachment in the context of devices for electronic reading. Understanding those that have strong emotional attachment to e-reading allows us to gain insight into how to improve this experience by shedding light on what helps or hinders their bond with e-reading. Understanding what drives emotional attachment in e-reading contexts helps us to design with this in mind. To understand attachment in this context, this study employs a semi-structured interview method with participants who expressed a high level of emotional attachment to their e-reader devices. Through thematic analysis of the data, our research findings contribute to a better understanding of how the electronic reading experience becomes a meaningful part of everyday life. Based on these empirical findings, design recommendations aimed at supporting more satisfying, pleasurable, and engaging e-reading experiences are presented.

2   Background

2.1   Electronic Reading

Early research focused specifically on differences between reading electronically and on paper by comparing dimensions like reading speed, visual fatigue, and levels of reader comprehension (see [5] for a review). Work on e-readers specifically has tended to address usability and interface concerns including reading performance, visual fatigue [10], and the design of specific e-reader functionality [30]. Previous studies have also examined the types of reading techniques adopted when reading electronically [31], along with how reading digitally affects user interpretations of narrative coherence, transportation, and empathy in texts [15]. However, there is little work on understanding people's experiences with e-readers and e-reading more generally. Some authors have argued that e-books are poor in comparison to conventional books [32]. Nevertheless, there are people who become deeply engaged in the practice of reading e-books and become emotionally attached to their e-reader devices. Similar effects are seen in mobile device use more broadly [17, 21]. Like previous attachment work in HCI [22], we feel that understanding attached users' experiences in this context could lead to valuable insight into how to improve the e-reading experience.

2.2   Attachment to Interactive Technologies

The concept of attachment emphasizes the development of a positive emotional link between a person and a possession, as it becomes an integral part of a user's life (see [13] for a detailed review on attachment). Adapting commonly cited definitions focused on emotional attachment to mobile phones and products [18, 19], we define emotional attachment as: *an emotion-laden target-specific bond between a person and a technology which is dynamic in nature and varies in intensity over time*. As people interact with these artifacts over time, they become associated with meaningful experiences, and can become imbued with a variety of meanings. In this way, objects may become physical tokens that support the user's own process of defining and communicating their self-image, or symbolize their relationships with others. These

objects may also act as concrete representations of important places, times in their lives, and remind them of cherished memories [13].

Emotional attachment to devices and products has received increased attention in the field of HCI. It has contributed to definitional work on user experience [7, 11], research on virtual possessions [23], and sustainable interaction design [9, 22], as well as several studies specific to mobile technologies [17, 24, 33] and digital possessions [4]. In this context, the bond is formed through meaningful interactions, and includes bonds with the physical device, apps, software, services provided, and/or the content consumed through the device [18]. Designers capture this type of emotional bond through concepts like ensoulment [9] and heirloom status [22].

2.3 Research Aims

Our research aims to address the current lack of HCI research focusing on electronic reading outside of the workplace by focusing on electronic fiction reading with handheld e-reader technologies. This study also aims to explore underexamined aspects of this experience, including emotional, hedonic, embodied, and situated factors that are central to meaningful interactions with e-reader technologies in everyday life. We attend to these aims by studying the experiences of users who have developed emotional attachments to their e-readers. In so doing, we focus on which aspects of participant's experiences are most meaningful to them. Crucially, we look to identify how those meanings contribute to emotional attachment in order to uncover ways of improving e-reader design.

3. Methods and Data Analysis

3.1 Participants

9 participants (5 female, 4 male- between 29 and 56 years old) participated in the study. Our recruitment strategy was devised to ensure that we recruited users with high levels of attachment. It involved three-stages. Firstly, we recruited potential participants at a literary event where avid fiction readers who place a high value on their reading practices would likely be in attendance. Secondly, we collected demographic information from potential participants, specifically their e-reader ownership and usage information. Attachment is more likely to occur with things we own, and grow in strength over time [13]. We therefore selected only those who had the highest period of e-reader ownership (averaging more than 2 years), and read with the greatest duration (averaging approximately 3 hours) and frequency (averaging 3 sessions) per week as potential participants. Finally, people were then asked to report on their perceived level of emotional attachment to electronic reading and to the device itself. This was achieved by asking questions which included: "*Do you feel any emotional bond to electronic reading?*" "*Can you think of a time when you described your e-reader or e-books as special or cherished belongings, if so, why?*". Only those who reported demographics that suggest a high likelihood of emotional attachment, and also described themselves as emotionally attached through their answers to these questions were invited to participate in the interview study.

3.2 Procedure

We conducted 60-minute semi-structured interviews with each participant. In the interviews, participants were asked about their experiences during digital reading, as well as owning and using e-readers. The critical incident technique [6] was used to focus interviews on particular episodes of importance, and to elicit details about specific experiences. More specifically, prompts were used to focus on incidents where participants expressed a sense of emotional bonding with their e-reader while reading. The interview protocol was designed to begin with a general focus on any meaningful bonding experiences that participants recalled during electronic reading. For example, participants were asked "Have you ever felt an emotional bond or connection with the act of reading electronically, or with the e-reader itself?" General questions were followed by more specific prompts used to better understand *why* participants felt a sense of attachment. For example, when participants described attachment in the context of social relationships, they were asked "In the experiences you have mentioned, do e-books do they ever remind you of other people?" Thematic analysis was used to identify the key themes in the data.

4. Findings

4.1 Projecting Identity

The strongest recurrent theme in the data was the role of identity in people's e-reading experiences. This related to how they influenced a person's views of their own identity as well as their use as a communication tool for self-presentation and impression management when others were present. For example, one participant highlighted how the e-reader acts as a symbol of self-improvement and empowerment on an intrapersonal level. Critically, this reminded them of the feeling of self-improvement they get from reading more generally:

> *Participant: So yeah, I would use books as a function to challenge myself, to challenge my ideas - to see if I'm right or wrong. Maybe not answer the question, but just to get a perspective that would open my mind a bit... It allows me to question, and I guess there's a certain sense of empowerment there.*
>
> *Interviewer: Did that experience change the way that you think about e-books?*
>
> *Participant: Yes, I would say that I feel a bit better about reading that way because you know, when I look at the e-reader it sort of reminds me of challenging my own ideas and who I want to be.*

For another participant, ideas of identity and selfhood were also important, but the e-reader acted as a barrier to displaying them. Again, thinking about reading more widely, people felt that reading gave them the power to express aspects of themselves to others. The public display of a book one is reading was seen as a badge or a marker of personal identity:

Participant: You know when you see a person reading a book that you love, and you feel a weird sort of connection with that person? Even if it's a total stranger and they're reading a book you love, you can strike up a conversation, even if you wouldn't normally approach a stranger. It's weird, it's almost like a badge – what you read says a lot about who you are.

When asked about how they felt this experience related to e-reading, one participant expressed the following:

Participant: It's one thing you don't see with the Kindle: what they're reading. So if you see people in public, with a book, you can see what they're reading. You can get an idea of what that person is like, because you see it on the book cover. You don't know what they're reading on the Kindle, it's more private. Maybe that's a shame.

Based on data from this study, the display of what one is reading in public is an important act of expression. However, for participants that ability is inadequately supported by e-readers currently.

4.2 Mastery and Exerting Control

Physical aspects of their e-readers were also important to our participants. People often focused on the affordances of the device itself. Common considerations included size and weight of the device, size and shape of buttons, and screen brightness. Each of these factors was discussed in relationship to how it supported actions for reading, such as holding the object for longer periods of time, the ability to use one hand without it getting tired, concerns with qualities of light from the screen (including glare and brightness).

Participants experienced frustrations with e-reader hardware, difficulties that clearly impacted their engagement and ability to achieve a desired goal. For instance, one participant spoke about the difficulties of using their device for reading to encourage sleep:

"This mainly has to do with the devices themselves. I'm pretty aware of how the light tends to keep you up and interrupts your sleep, so I've had to fiddle around with making it less obvious or less bright... I'm reading in bed with the intent of going to sleep and I know that this is actually not conducive to helping me sleep, the light and stuff. That sort of ruined it for me because as I'm reading, I'm thinking this isn't going to help me accomplish what I'm trying to do."

People also suggested that there was sometimes a certain level of satisfaction with overcoming challenges and issues that accompanied the e-reader. Having to "*fiddle*" with brightness controls, and in one case creating a custom light filter, resulted in people perceiving that they had a stronger sense of control and mastery over the software and hardware functions. In this way, even activities that were frustrating could, after time and reflection, lead to an increased sense of mastery and control once a solution to the immediate problem was reached.

4.3 The Importance of Environment and Setting the Scene

All of the participants interviewed talked extensively about the environments in which they choose to read as important to their e-reading experience. Importance was placed on comfortable lighting, temperature, and furniture.

> *"I like it to be relatively dark, softly lit, comfortable chair, nice and warm."*

Some participants also mentioned the importance of family members, even pets, in the vicinity. The presence of these members and the setup of the environment brought up memories and feelings related to homeliness and comfort:

> *"Reading at night is a ritual for me and all those things around me are important elements of it for me. I like it to be warm and comfy, and dimly lit. When I have my cat with me, it makes me feel motherly, it definitely gives me a feeling of home."*

Of all of the factors mentioned, lighting was discussed most frequently. Most participants talked about a need for a reading environment that was neither too bright, nor too dim. Another environmental factor discussed was temperature. Many participants mentioned a need to be "warm and cozy". All of the participants that were interviewed mentioned furniture as an important feature of the environment during bonding experiences. Again, these concerns with furniture were usually about comfort such as focusing on the type of chair that they liked to sit in while reading.

5. Discussion

5.1 Reading and E-reading Experiences Are Interlinked

Our work clearly demonstrates that there is a symbiosis between device, content and reflections on conventional reading experiences at play leading to attachment in this context. Conventional reading experiences and the feelings they elicit were critical frames for users to make sense of their e-reading user experience. People discussed how the e-reader acted as a trigger for feelings they had towards reading. We show that the nature of attachment in this context seems intrinsically linked to memories and emotions of the act that it facilitates (reading) and the previous analogue object (physical book). Attachment in the e-reader context must therefore be considered as a combination of content, device, the behavioural goals it facilitates and the emotions the digital object elicits about the analogue equivalent. We saw this consistently in our data. Indeed, the following sections on the importance of identity and reading environment clearly show this symbiosis.

5.2 Exerting Control Through Problem Solving Promotes Bond

Our findings related to developing attachment through exerting control highlights both conflict and opportunity for e-reader experience designers. On one hand, people's experience of challenges when attempting to complete basic tasks may lead some users to disengage. On the other hand, a certain investment of attention to

problems may help promote a bond between user and device as they get to know them in an in-depth way. The role of control in developing user attachment has been noted when designing to support attachment with products more generally [18, 20, 35]. Our work shows the feeling of mastery through investment in solving problems is potentially more satisfying than problem-free e-reading experiences for those whom are heavily engaged in e-reading.

5.3 Identity Display is Currently Not Facilitated by E-Readers

The creation and maintenance of identity in public through e-readers is also a source of palpable tension. A number of our participants saw the book they were reading as a badge of identity used to publicly display who they are to others. Yet our participants also saw e-readers as private devices, hiding the content they were reading from others. This made it difficult to communicate any symbolic or cultural meanings that contribute to identity. The important role of objects (e.g. cars or books) and devices [17] for intra and inter personal identity construction is well established [2]. Owning and displaying items and collections are commonly used to gain social status, define and experiment with dimensions of self [2, 3], as well as to symbolize group membership [12, 23]. Public display of identity through the digital content they were consuming was seen as a major issue with e-readers. This seems detrimental to developing stronger attachment with the experience.

5.4 The Environment is Key to Experiencing Attachment

People also placed importance on environment in creating a positive e-reading experience. The dimly lit, comfortable, and warm environmental qualities enjoyed by users who are attached to their e-readers provides evidence for the importance that people place on their environment during digital reading. Similar findings exist about the importance of comfort in the home and reading [28]. Lighting, warmth and comfort seem very important to people when e-reading as they would be when reading a physical book, showing a strong parallel between these two experiences (although recent work has noted changing rituals when reading digital texts [29]). When considering attachment in this context and the wider e-reader experience we must be aware of the role environment plays.

6. Design Recommendations

6.1 Support Configuration and Personalization

Our data shows that devices that enable a high degree of configuration, while not forcing this process on all users, may enhance attachment. As discussed by our participants, this mastery seems to engender a feeling of control in the user over the device. However, a balance must be struck between design that supports a degree of customization and configuration and a positive general user experience for those that do not wish to engage in such customizations.

6.2 Support Identity

Making book cover information visible to facilitate conversation and show identity was important to our participants. E-readers currently lack the ability to do this. Based on our results we suggest including a display on the back of the device so that the covers of the books being read or stored on the device can be displayed. The screen could also display personalized or curated collections, thus supporting the projection of identity to others. Such a display could also allow users to experiment with different identity presentations through displaying different titles, cover artworks, or collections. The building and sharing of private collections to share with others could also be included to support self-expression.

6.3 Use E-Readers to Control the Reading Environment

With the growth of the Internet of Things and connected environments, designers could now have the ability to alter and control a user's reading environment. This type of control could be used to support a person's environmental preferences and rituals when reading. Supporting rituals and control over space have been noted as an important way to include product attachment in the product design process [35]. One could envisage highly personalized, connected, reading spaces being controlled from within the e-reader software. The e-reader could control light levels and temperature, even storing pre-defined data to automatically adjust to an individual's preferences.

7. Future Work & Limitations

Our exploratory study includes a small sample focused mostly on fiction reading. Work is therefore needed to compare findings across reading genres. Although these were not seen in our current data, future work could extend from our study to explore other aspects known to be important for emotional attachment to objects. Examples of these dimensions include an object's role as a memory aid for existing social ties and relationships through gift giving [26], objects acting as reminders of a person's past [14], and the role of costs, superior aesthetics, or utility [19] could all play a role in e-reader attachment.

Related to the size of the sample, recruiting participants with strong levels of attachment is a significant challenge in emotional attachment work. Our three step method of recruitment improves on previous standard approaches used to ensure highly attached participants are recruited. We note that future work could look to further improve recruitment strategy by incorporating psychometric measures of attachment so as to quantify the levels of attachment in potential participants, and recruit based on these scores.

Our study did not focus on the dynamics of how attachment develops over time but it is likely that the strength of emotional attachment is not static. Therefore, it is important to explore the dynamic nature of attachment for e-readers in future work. People do stop using or interacting with cherished objects, shifting the type of emotional bond they have. For instance, after years of disuse a device may move from being a symbol of current identity, to being one that triggers memories or feelings of

nostalgia [18]. Self-representational roles of (both material and immaterial) cherished objects also change as people age [13]. Longitudinal studies of attachment over the product and user lifespan may also be a fruitful area of further work.

8. Conclusions

This study shows the promising influence of understanding experiential qualities of attachment to e-readers and electronic reading. Through understanding what leads people to be attached to e-reading we discovered it is important for the experience to support *exerting of control, projection of identity, and the setting of a comfortable external reading environme*nt. The symbiosis between the object, the act of reading, and the analogue equivalent in this context are integral to understanding the complex emotional attachment people have to their e-reading experiences. Indeed, how this develops over time is an important area for further work. Using attached users has allowed us a window into how to facilitate user attachment to e-reading whilst also improving the e-reader experience for all.

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