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THE ROLE OF PRODUCT INVOLVEMENT IN DIGITAL AND PHYSICAL READING - A COMPARATIVE STUDY OF CUSTOMER REVIEWS OF EBOOKS VS. PRINTED BOOKS

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THE ROLE OF PRODUCT INVOLVEMENT IN DIGITAL AND PHYSICAL READING - A COMPARATIVE STUDY OF CUSTOMER REVIEWS OF EBOOKS VS. PRINTED BOOKS

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Abstract

eBooks offer the reader a wide range of advantages compared to printed books. They are cheaper, lighter and, based on new e-ink technology, quite as good readable as printed books. Nevertheless, in important book markets such as Europe eBook acceptance is still relatively low. One reason for this reluctance is seen in the lack of haptic attributes by reading an eBook. But even if a person decides to read an eBook, she seems to read it in a different way than she would read a printed book. Flipping through pages, feeling the reading progress or touching the spine is not possible. The aim of this study is to show that the intangibility of eBooks leads to a lower involvement with the book. We used Amazon.com customer reviews as an indicator for the individual involvement of the review’s author. We could show that reviews of eBooks were shorter, more extreme in their star rating and rated as less helpful than reviews of printed books. Taken together, our results indicate that product involvement significantly differs between readers of digital and printed books. Practical implications are derived from our findings to reduce this gap in the future and limitations for further research are discussed.

Keywords: Digital Reading, eBooks, Involvement, Customer Reviews.
1 Introduction

Today’s eBooks offer a wide range of advantages over traditional printed books. They can be downloaded easily, quickly and with modern eReaders at any place in the world – as long as an active Internet connection is available. Because of the compressed format the user can carry nearly unlimited books with her and doesn’t have to carry pounds of books what makes them very convenient when travelling. Finally, eBooks are usually less expensive than their printed counterparts and therefore they might reach more readers than traditional expensive printed books (Clark et al., 2008; Siriginidi Subba, 2004). Despite these advantages, innovative displays and similarities with printed books, there is still a widespread lack in the acceptance of eBooks (Gerlach and Buxmann, 2011; Rowlands et al., 2007). Haptic motives play a very important role in reading. Reading a digital eBook is affected by clicking and scrolling through the content. By reading a digital text, the reader is distant from the content because she cannot touch the material. On the other hand, the reader of a printed book can touch the material itself. She is confronted with a tactiley richer experience while flipping through the pages of a printed book (Mangen, 2008). The technology-driven navigation of eBooks is seen as an advantage in scientific work, because it facilitates search and navigation processes. At the same time, the usage of these technologies disturbs the involvement with the book while reading in the spare time.

In this paper, involvement refers to the degree of personal relevance or importance of the book to the reader (Park and Young, 1986). Users are distracted by clicking and scrolling through the content of an eBook and have problems to concentrate on the main goal: reading (Gregory, 2008; Hurst et al., 2009). But new mobile devices like the Amazon Kindle and a considerable number of available eBooks, should originally appeal spare time readers. It raises the question whether these digital books are perceived the same way like their printed versions and if so, whether they can substitute them in the future. The issue is relevant for the publishers of eBooks and eReaders as well as for researchers in the area of digital reading. Practitioners get implications whether there is need to design future eBooks as a better imitation of printed books or to add specific features to increase involvement while researchers obtain new insights in differences between physical and digital reading.

Previous studies which investigated reading of digital texts have been conducted largely with qualitative approaches, small numbered experiments or took place in a scientific environment. Thus their results cannot be generalized. To our knowledge, there are no large-scale empirical studies that compare reading of digital and physical books using real data and making no restrictions on the content level. Our study aims to fill this gap by addressing the following research question: Are there differences in the involvement with books between the readers of eBooks and printed books?

The remainder of the paper is structured as follows. The next section develops the background of our research question by drawing on literature on digital reading. After that, section 3 describes the theoretical background of involvement and explains why we used Amazon reviews as an indicator. Furthermore, we develop in section 3 the hypotheses of our study. Section 4 describes the methodology we used for data collection and data analysis. We then describe the main results and conclude in section 6 with the summary and implications of our results as well as some limitations of the study.

2 Literature Review

The interaction with an eBook is a totally different experience for the user compared to the reading of a printed book: The digital text is intangible and disappears into the computer, tablet or mobile phone. The user needs a computer mouse, scrollbar or further utilities to interact with the content. In contrast to this, the printed book: With flipping through the pages of a printed book, the user feels and sees the printed sheet of paper and realizes her reading progress all the time (Mangen, 2008). Previous
literature which compared digital reading and physical reading investigated three different perspectives: reading speed, reading accuracy and comprehension (Noyes and Garland, 2008).

Dillon (1992) described a diminished reading speed of 20 to 30% while reading digital texts compared to reading printed texts. Especially older studies which dealt with reading on screen confirm these results (e.g. Belmore, 1985; Mayes et al., 2001). Considering that former displays had a lower resolution and lower contrast, these results do not surprise. However, other studies at that time concluded that the exposure to computer screens has a minor or no impact at all on reading speed (e.g. Askwall, 1985; Creed et al., 1987; Siegenthaler et al., 2010).

For reading accuracy previous studies have showed better results for printed text compared to digital text. In proof reading tasks, much more mistakes could be found using printed text (e.g. Creed et al., 1987; Muter and Maurutto, 1991). However, Askwall (1985), Gould et al. (1987) and Picking (1997) found no significant difference between screen and paper for accuracy.

Next to reading speed and reading accuracy, reading comprehension had also been studied in the context of the presentational medium. Most of the studies have only found little or no differences between digital and physical reading concerning reading accuracy. Usually participants had to answer questions after reading a text either on screen or on paper to show differences in comprehension (e.g. Cushman, 1986; Garland and Noyes, 2004; Mayes et al., 2001). However, Askwall (1985) concluded that subjects searched almost twice as much information in the paper based situation as they did in the computerized situation. Weldon et al. (1985) tested in an experiment the differences between online computer manuals and paper manuals. The results showed that the given problem was solved faster with the paper manuals. Wästlund et al. (2005) tested in two sets of experiments the physiological and psychological factors of using digital text versus paper based text. Subjects were confronted with a dual-tasking problem: reading in a low-resolution environment and manipulating the electronic device. The results indicated higher levels of stress and tiredness in the computerized situation and as a consequence reduced comprehension. This reduced comprehension was measured using a read test and a headline test. The read test showed that consumption of information is more difficult when material is presented on a screen instead of paper. The headline tests concerned the production of information after reading a text. The test showed that the production of headlines from paper was superior (in terms of quantity not quality). In Liu (2005) 45% of the participants of a qualitative interview indicated that especially online hypertext reading resulted in decreasing in-depth reading.

<table>
<thead>
<tr>
<th>Study</th>
<th>Reading speed</th>
<th>Reading accuracy</th>
<th>Reading comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muter et al. (1982)</td>
<td>Print &gt; Screen</td>
<td>Not tested</td>
<td>Print ~ Screen</td>
</tr>
<tr>
<td>Wright and Lickorish (1983)</td>
<td>Print &gt; Screen</td>
<td>Print ~ Screen</td>
<td>Not tested</td>
</tr>
<tr>
<td>Gould and Grischkowsky (1984)</td>
<td>Print &gt; Screen</td>
<td>Print ~ Screen</td>
<td>Not tested</td>
</tr>
<tr>
<td>Switchenko (1984)</td>
<td>Print &gt; Screen (for difficult articles)</td>
<td>Print ~ Screen</td>
<td>Print ~ Screen</td>
</tr>
<tr>
<td></td>
<td>Print &gt; Screen (for easy articles)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Askwall (1985)</td>
<td>Print ~ Screen</td>
<td>Print ~ Screen</td>
<td>Not tested</td>
</tr>
<tr>
<td>Belmore (1985)</td>
<td>Print &gt; Screen (if text on screen was presented first)</td>
<td>Not tested</td>
<td>Print &gt; Screen (if text on screen was presented first)</td>
</tr>
<tr>
<td>Weldon et al. (1985)</td>
<td>Not tested</td>
<td>Not tested</td>
<td>Print &gt; Screen</td>
</tr>
<tr>
<td>Cushman (1986)</td>
<td>Print ~ Screen</td>
<td>Not tested</td>
<td>Print ~ Screen</td>
</tr>
<tr>
<td>Creed et al. (1987)</td>
<td>Print ~ Screen</td>
<td>Print &gt; Screen</td>
<td>Not tested</td>
</tr>
<tr>
<td>Gould et al. (1987)</td>
<td>Print &gt; Screen</td>
<td>Print ~ Screen</td>
<td>Print ~ Screen</td>
</tr>
<tr>
<td>Oborne and Holton (1988)</td>
<td>Print ~ Screen</td>
<td>Not tested</td>
<td>Print ~ Screen</td>
</tr>
<tr>
<td>Muter and Maurutto (1991)</td>
<td>Print &gt; Screen (for skimming)</td>
<td>Not tested</td>
<td>Print ~ Screen</td>
</tr>
<tr>
<td></td>
<td>Print ~ Screen</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1. Comparison of printed and eBooks: Summary of findings in previous literature

<table>
<thead>
<tr>
<th>Study</th>
<th>Reading Speed</th>
<th>Reading Accuracy</th>
<th>Reading Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picking (1997)</td>
<td>Not tested</td>
<td>Print ~ Screen</td>
<td>Not tested</td>
</tr>
<tr>
<td>Mayes et al. (2001)</td>
<td>Print &gt; Screen</td>
<td>Not tested</td>
<td>Print &gt; Screen</td>
</tr>
<tr>
<td>Noyes and Garland (2003)</td>
<td>Print ~ Screen</td>
<td>Not tested</td>
<td>Print &gt; Screen</td>
</tr>
<tr>
<td>Velde and Grünau (2003)</td>
<td>Print ~ Screen</td>
<td>Not tested</td>
<td>Print &gt; Screen</td>
</tr>
<tr>
<td>Garland and Noyes (2004)</td>
<td>Not tested</td>
<td>Not tested</td>
<td>Print &gt; Screen</td>
</tr>
<tr>
<td>Liu (2005)</td>
<td>Not tested</td>
<td>Not tested</td>
<td>Print &gt; Screen</td>
</tr>
<tr>
<td>Wästlund et al. (2005)</td>
<td>Not tested</td>
<td>Not tested</td>
<td>Print &gt; Screen</td>
</tr>
<tr>
<td>Siegenthaler et al. (2010)</td>
<td>Print ~ Screen</td>
<td>Not tested</td>
<td>Not tested</td>
</tr>
</tbody>
</table>

Print > Screen: Printed books/ texts are superior to digital books/ texts.
Print ~ Screen: Printed books/ texts are equal to digital books/ texts.

As the literature review shows (for a summary see Table 1), the studies have revealed mixed findings concerning reading speed, reading accuracy and reading comprehension. Most of the studies compared reading text on paper with reading text on screens (e.g. Video Display Terminals) while the majority of studies comes from the time before the year 2000. Mostly, participants had to read texts in different experimental settings and the reading time was measured. For reading accuracy, they had to identify mistakes in proof reading tasks. To test reading comprehension, they were asked questions about the text. The sample sizes of these experiments were usually small and the presented texts had been standardized. However, digital displays have become more sophisticated and are increasingly present in everyday life. New e-ink technology and high resolution displays as they are used in Amazon’s Kindle or Apple’s iPad make it difficult to compare the results of those former studies with today’s situation (Siegenthaler et al., 2010). Furthermore, it is difficult to generalize former findings, since most research on eBooks carried out in academic settings with small sample sizes, standardized texts and often in an experimental environment.

By using real data of customer reviews from an online bookstore this study aims at getting an unbiased view of readers’ involvement in books – comparing conventional printed books with new digital eBooks which can be read on modern eReaders. Thus, our study can be classified in the literature of digital reading in general, but uses a new point of differentiation: the involvement with the book.

3 Theoretical Background and Hypothesis Development

By using real data from an online bookstore it is not possible to observe reading time or to check reading accuracy and comprehension by asking the reader questions, record her brain activity or eye movements. But the review written by the reader of a book, either physical or digital, on a retail platform like Amazon.com can be seen as an indicator for the involvement with the book. In past studies involvement and comprehension were positively correlated which means higher involved persons achieved better results in performance tests (Baker and Wigfield, 1999; Wang and Guthrie, 2004). In our study we want to approximate involvement by the engagement of the writer of a review. This engagement we want to measure by the depth, extremity and helpfulness of a review.

The Internet has become an important distribution channel for physical and digital products. With its growth, users are confronted with a lot of additional product information they have to filter. The range extends from recommendation systems of the supplier to user generated product reviews on sites like Amazon.com. Such interpersonal communication (Word of Mouth, WoM) plays a crucial role in the adoption and purchase decisions of consumers (Arndt, 1967). In particular, Online Opinion Leaders play a key role in the decision process (Myers and Robertson, 1972; Summers, 1970). Online Opinion Leaders are defined as individuals who transmit information about a topic to other people, in terms of the extent to which information is sought by those people (Online Opinion Seeker) (King and Summers, 1970; Sun et al., 2006). One of the main reasons to engage as an Online Opinion Leader is seen in the involvement with the evaluated product (Dichter, 1966; Engel et al., 1993; Summers, 1970). Gotlieb et al. (1992) defined involvement as an association”[...] with the level of personal
relevance or importance of the product to the consumer (Park and Young, 1986). That is, involvement is an internal state activated by a stimulus (Cohen, 1983). Zaichkowsky (1986) identified three antecedents of involvement in the literature: Person factors, stimulus factors and situational factors. Thus, customer reviews can be seen as an indicator for the involvement of the user with the book - activated by two different stimuli: eBook or printed book. Existing literature differentiates between enduring and situational involvement. In contrast to situational involvement, enduring involvement is motivated by the hedonic pleasure of the product itself (Richins and Bloch, 1986). Because reading is a continual process, we describe here a kind of enduring involvement.

The intangibility of the eBook let the user read in a less focused way because she tends to scan the text only on screen (DeStefano and LeFevre, 2007; Mangen, 2008). In the comparison of digital intangible music (MP3) and digital tangible music (CD) Styvén (2010) found that people with a high involvement with music prefer the tangible version of music. So readers should be less involved with the content when reading an eBook than reading a printed book.

Online customer reviews on retail websites like Amazon.com can be defined as peer generated product evaluations (Mudambi and Schuff, 2010). Amazon.com offers consumers the opportunity to post open ended reviews and to evaluate the bought product with stars (from 1 to 5 stars). After reading a review the reader of the review is asked, “Was this review helpful to you?” and you can choose between “yes” and “no”. Amazon.com cumulates the answers and gives a measure of helpfulness, for example: “10 of 15 people found the following review helpful”. According to the available data, reviews written on both types of books can differentiate in three measures: Review Depth (characters per review), Review Extremity (given stars per review) and Review Helpfulness (proportion of people who found the review helpful). Figure 1 describes our research model which we derive in the following paragraphs.

**Figure 1. Research model and hypotheses**

**Review Depth**

The first indicator for the reader’s involvement with a book is the depth of the written review. Review Depth is commonly defined as the length of a review (character count) and can have a positive effect on information diagnosticity and help users evaluate the product without additional search costs (Johnson and Payne, 1985; Mudambi and Schuff, 2010). Longer reviews often include more information about the book, for example comments about the quality of writing or a detailed summary of the action within the book. Online Opinion Leaders are characterized through a high level of knowledge in a topic, discussion about it and the amount of interest in it (Myers and Robertson, 1972). Considering a lower involvement of the readers of digital books we assume that the readers of physical books are more willing to give longer reviews than the readers of digital books. Therefore, we hypothesize:

\[ H1: \text{Review Depth of physical books is higher than of digital books.} \]

**Review Extremity**

Besides the opportunity to post open ended reviews, consumers can evaluate products with stars. A very low rating (one star) and a very high rating (five stars) indicate an extreme view of the product while a three-star rating indicates a moderate view. Prior studies have found two explanations for such moderate ratings: A three-star rating can be seen as an indicator for a truly moderate review
(indifference) or as the result of balancing positive and negative arguments (ambivalence) (Kaplan, 1972; Presser and Schuman, 1980). Past findings indicate that individuals with high product involvement tend to be less ambivalent and more extreme in their evaluation of products (Bishop, 1990; Thompson and Zanna, 1995). If we assume that the readers of digital books show a lower involvement with the book than the readers of printed books, digital readers should be more ambivalent and thus, more moderate in their star rating. Therefore, we hypothesize:

\[ H_2: \text{Review Extremity of physical books is higher than of digital books.} \]

**Review Helpfulness**

Review Helpfulness describes the degree to which the readers of a review rate it as helpful or not. People with high involvement with a product are more willing to share their own attitudes towards this product than people with low involvement (Laurent and Kapferer, 1985). It was shown that involvement had a positive effect on the success in persuading others of the own opinion (Chaiken, 1980; Petty and Cacioppo, 1979). In this study, helpfulness is used as a proxy for persuasion because the actual behavior of review adoption is not observable online. Prior research has found that perceived review helpfulness could predict review adoption (Davis, 1989; Sussman and Siegal, 2003). Considering a higher involvement of the readers of physical books, they should be more successful in persuading others of their opinion. This leads us to hypothesize:

\[ H_3: \text{Review Helpfulness of physical books is higher than of digital books.} \]

To summarize, our research model argues that the Product Involvement (PI) with eBooks is lower than with printed books because of haptic motives. To test this relationship, we use Review Depth (RD), Review Extremity (RE) and Review Helpfulness (RH) as proxies.

4  **Research Methodology**

4.1  **Data Collection and Measures**

For this study, we collected consumer review data on books from Amazon.com available on July 28, 2011. Each review on Amazon.com contains information on RD, RE, RH and the type of the reviewed book. Figure 2 shows the screenshot of a typical Amazon.com review and the measures we collected from the website.

![Amazon.com book review: helpfulness, star rating, booktype and depth](image)

We chose all books which were at this time available in Amazon’s bestseller list of the Kindle Store (4,446 books). For each book we collected all posted reviews (overall 667,990 reviews).

RD was measured by the number of characters per review. This indicator was collected directly from Amazon.com as well as RE. RE was measured by the star rating the reviewer gave the product and was later manipulated in that way, that extreme reviews (1 star and 5 stars) were coded with the
highest value of 3 while moderate reviews (3 stars) were coded with the lowest value of 1. Star ratings of 2 and 4 stars were coded with a moderate value of 2.

To measure RH we collected the number of people who answered the question: “Was this review helpful to you (yes/no)?” and the number of people who found the review helpful. RH was then defined as the percentage of people who found the review helpful (number of helpful votes/ number of all votes).

Amazon.com gives to each review the additional information which type of book was reviewed. In our analysis we just considered two types of books: Digital book (Kindle edition) and physical book (Hardcover, (Mass Market/ Perfect) Paperback). The variable Type was dummy coded for the later analysis (digital: 0, physical: 1). Furthermore, we collected the Amazon Book-ID of each book to be able to assign each review to the corresponding book.

We excluded reviews which were written on special book types like leather bound or audio books because we assume a not predictable involvement. For example, buyers of an expensive leather bounded book could indicate a high involvement with the book in general, why they would bias the analysis. After that reduction we kept 574,228 reviews. In order to reduce historical effects, we decided to consider only reviews which were written since January 1, 2011. Thus, we kept 45,798 reviews on digital books and 80,928 reviews on physical books. Next we aggregated the data using the Amazon Book-ID as break variable. By using the means across the variables RD, RE and RH we were able to reduce outlier and compensate unequal distribution of reviews. After the aggregation, we received for each book two datasets: one for the digital and one for the physical edition of a book. Books which were only available in a digital or physical format had been excluded. In the end we obtained 2,797 datasets of the digital and 2,797 of the physical edition of a book which could be compared to each other.

4.2 Analysis Method

Datasets were weighted with the overall number of written reviews per book in the specified time period. That means books with more reviews (e.g. “Heaven is for Real: A Little Boy's Astounding Story of His Trip to Heaven and Back” with 1,429 reviews) were given greater attention than books with only few reviews (e.g. “Treasure of Eden” with only 2 reviews). Usually sample weights are ignored because even if point estimates are biased, relations between the variables would be approximately unbiased (Purdon and Pickering, 2001). But in our data the weights correlate significantly in two of three cases with the explaining variables (RE and RH) and they show a very wide range (2 to 1,429). By weighting the variables with the number of written reviews we want to avoid a biased analysis.

To compare digital and physical books, we chose correlation analysis and paired t-tests. In the present data set, the book type is a binary variable with the following values: 0 for digital and 1 for physical books. This type of correlation between a continuous variable (RD, RE and RH) and a binary variable (Type) is called point-biserial correlation and is a special type of Pearson’s correlation (Tate, 1954). IBM SPSS Statistics version 19 was used for data analysis.

5 Results

5.1 Hypothesis Testing

An overview of means and standard deviations of all variables across the two book types is depicted in Table 2. Furthermore mean differences, T-Values and significance levels of a paired t-test were added. The results of the point-biserial correlation can be found in Table 3.
### Table 2. Descriptive results of Review Depth, Review Extremity and Review Helpfulness

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>N</th>
<th>Standard deviation</th>
<th>Mean Difference</th>
<th>T-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD</td>
<td>Physical Books</td>
<td>1,019.777</td>
<td>110,270</td>
<td>422.018</td>
<td>327.599</td>
</tr>
<tr>
<td>Digital Books</td>
<td>692.178</td>
<td></td>
<td>355.771</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE</td>
<td>Physical Books</td>
<td>2.512</td>
<td>110,270</td>
<td>.258</td>
<td>-.016</td>
</tr>
<tr>
<td>Digital Books</td>
<td>2.538</td>
<td></td>
<td>.308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RH</td>
<td>Physical Books</td>
<td>.639</td>
<td>101,181*</td>
<td>.197</td>
<td>.038</td>
</tr>
<tr>
<td>Digital Books</td>
<td>.600</td>
<td></td>
<td>.245</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Reduced N because of casewise deletion of missing values: Reviews which had no rating had been excluded.

** significant at the 0.001 level (paired t-test, 2-tailed).

### Table 3. Matrix of the Pearson's Correlation output.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Pearson Correlation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD</td>
<td>Pearson Correlation</td>
<td>.387**</td>
<td>220,540</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE</td>
<td>Pearson Correlation</td>
<td>-.028**</td>
<td>220,540</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td></td>
<td>110,270/110,270</td>
</tr>
<tr>
<td>RH</td>
<td>Pearson Correlation</td>
<td>.087**</td>
<td>209,986</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td></td>
<td>107,336/102,650</td>
</tr>
</tbody>
</table>

1 Person correlation & N: Printed books/ eBooks
2 Reduced N because of casewise deletion of missing values: Reviews which had no rating had been excluded.

** Correlation is significant at the 0.001 level (1-tailed).

A review which was written by readers of physical books was associated with a longer review, indicated through a positive correlation coefficient between Type and RD ($r_{pb} = .387, p < .001$). Comparing the mean difference of the variable RD across Type, a paired t-test comes to the same result. The mean of RD of physical books is significantly higher than those of digital books (mean difference = 327.599, $p < .001$). Thus, hypothesis 1 can be supported.

The correlation between Type and RE is significantly negative ($r_{pb} = -.028, p < .001$). This result as well as the comparison of the two means of RE indicate that reviewers of digital books tend to be more extreme while reviewers of physical books are more moderate in their star rating (mean difference = -.016, $p < .001$). Although the correlation between Type and RE and their mean difference is quite low, the results indicate a more extreme rating behavior of digital readers than of physical readers. This contradicts our theory and we have to reject hypothesis 2.

Finally, we look at the correlation between Type and RH. The coefficient is positive and highly significant ($r_{pb} = .087, p < .001$). Again the correlation is low, but indicates that reviews of physical books are rated as more helpful than reviews of digital books. The paired t-test shows that the mean difference of RH across Type is positive and therefore this result can be confirmed (mean difference = .038, $p < .001$). Thus, we can accept hypothesis 3. A summary of the results is provided in Table 4.

<table>
<thead>
<tr>
<th>Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 Review Depth of physical books is higher than of digital books.</td>
<td>Supported</td>
</tr>
<tr>
<td>H2 Review Extremity of physical books is higher than of digital books.</td>
<td>Not supported</td>
</tr>
<tr>
<td>H3 Review Helpfulness of physical books is higher than of digital books.</td>
<td>Supported</td>
</tr>
</tbody>
</table>

### Table 4. Summary of findings
5.2 Post-Hoc Analyses

Considering other correlations depicted in Table 3, we can find further interesting results. RD influences positively RH for both, printed books and eBooks. That means longer reviews are seen as more helpful than shorter ones \( (r = .042/.106; p < .001) \). RD correlates negatively with RE \( (r = -.267/-1.03; p < .001) \). People who are willing to write a long review tend to be more moderate in their star rating than people who write a short review. This negative correlation is independent from the booktype. One reason could be that the longer text contains more positive and negative arguments and the writer is in the end ambivalent. This may explain why we had to reject hypothesis 2. The higher involvement with the physical book could lead to a critical confrontation with the book content considering positive and negative aspects. In the end, the user is ambivalent and decides to chose a moderate view. The last interesting correlation can be found between RE and RH. More extreme reviews are rated as more helpful than moderate ones. This relation is valid for printed books as well as for eBooks \( (r = .061/.041; p < 0.001) \). With this result, we agree with the findings of Forman et al. (2008) who investigated the influence of star ratings on helpfulness for books. Nevertheless, this result is surprising considering the findings of Mudambi and Schuff (2010). Their results showed that for experience goods, reviews with extreme ratings are less helpful than reviews with moderate ratings. They used in their study the reviews of a music CD, an MP3 player, and a video game, all products they identified as experience goods. Per definition, an experience good is characterized through the need to use the product to evaluate its quality. The authors argue that "consumers are more open to moderate ratings of experience goods, as they could represent a more objective assessment" (p. 189). But according to the findings of Forman et al. (2008) the authors argue that although books can be seen as experience goods, they represent a unique product category.

6 Conclusion, Implications, Limitations

The study focused on differences in the involvement of the readers of digital and physical books. By using Amazon.com reviews as an indicator for the involvement with a book, we could show that the readers of eBooks are less involved with the book than the readers of printed books. The results showed that the readers of physical books wrote longer and more helpful reviews than the readers of digital books therefore we found support for hypothesis 1 and 3. Nevertheless, we had to reject hypothesis 2. The collected data contradicted our theory and indicated that the readers of printed books are more ambivalent in their star ratings than the readers of eBooks. We ascribed this result to the negative correlation between review depth and extremity, meaning that longer reviews were associated with a less extreme star rating. We assume that in longer reviews the reviewer uses more positive and negative arguments and finally, she is because of her own argumentation ambivalent and chooses a moderate star rating. Furthermore, we could show that longer reviews as well as more extreme reviews were seen as more helpful. With the latter one, we contradicted the results of Mudambi and Schuff (2010) who found an opposite relationship. To our knowledge, this study is the first study which compares the involvement of digital and physical reading by using real data.

Modern eReaders with e-ink technology like the Amazon Kindle claim they would reach a higher resolution in presentation and a higher reading experience than traditional printed books. However, our results show that there is still a gap concerning the involvement between those two presentation formats. Manufacturers should try to design new eReaders and eBooks as an imitation of a printed book as far as possible, for example through an intuitive flipping mechanism. Personalized News Aggregation Applications (PNAAs) like Flipboard already use such mechanisms. But even if so, there could still remain a difference between digital and physical books. To close this gap, publishers of eBooks should try to create a higher involvement by making books more interactive, e.g. by embedding videos, games, voting polls or quizzes. Through the interaction the reader is forced to concentrate on the book and its content and as a result of this she is higher involved with the book. Another option could be to publish books with more trivial content (e.g. cookbooks or other guides) in an eBook format and to publish books with more challenging content (e.g. novels or academic texts).
predominantly in a printed format. If we assume that a short review indicates a low involvement, distributors like Amazon could optimize their recommender systems by analysing the user’s past review behavior. Therefore, users who write mainly short reviews should be recommended books which can be read more superficially, e.g. very short books or books with more trivial content. Furthermore, distributors could identify very high involved readers and recruit them for a job as professional review writer or product tester.

As with any study, there are several limitations that present opportunities for future research. According to Zaichkowsky (1986) there are three factors which influence involvement: personal factors, stimulus factors and situational factors. With our study we only addressed stimulus factors by comparing the two stimuli digital book and physical book. By this we left out that the readers of digital books could be persons, who would never read a physical book or persons who read their books in completely different situations, for example by travelling by train or plane. A final result concerning the divergent involvement is not possible, as long as those two aspects are not considered. Second, the generalizability of our findings is limited to those consumers who wrote reviews. Writing a review indicates a principle involvement with the book. So our analysis is biased by a self-selection of the reviewers. We do not know how much people are involved with a book who did not write a review. Finally we did not measure involvement in a direct way but used RD, RE and RH as quantitative proxies for involvement. We used a data driven approach with the advantage of being more objective. Nevertheless, qualitative analysis of the reviews opens up new insights into the readers’ feelings.

References


