“IT’S NOT THE SAME” – DIFFERENCES IN THE CONSUMPTION OF DIGITAL AND PHYSICAL MUSIC

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Abstract

Digital music is present in the life of millions of music consumers worldwide. Although several studies have focused on digital music adoption, very little is known about the post-adoption behavior of digital music consumers. This study seeks to fill this gap by comparing the involvement of digital consumers with those of physical consumers. We assume that digital users’ involvement is lower due to the loss of haptic motives: digital music disappears somewhere in the mobile device and cannot be seen or felt. By using Amazon.com album reviews as an indicator for involvement, we show that reviews of digital music were shorter, more extreme in their star rating, and less helpful than reviews of physical music. Physical music listeners were generally more willing to write reviews than digital music listeners. Taken together, our results indicate that involvement differs significantly between digital and physical music consumers. In a post hoc analysis, we split the results into different genres and show that the most impressive differences occur in the genres pop, classical, and rock. We derive practical implications from our findings and discuss limitations for future research.

Keywords: Digital music, physical music, involvement, customer reviews.
ICT developments have given users access to more technologies that enable them to access and consume media. Especially in the music market, the digitalization of content has completely transformed users’ consumption behavior. In 1983, Philips introduced the compact disc (CD), which gradually replaced the analog vinyl record and the music cassette. A CD is read digitally; compared to a vinyl record, it is lighter and requires less physical storage. With the invention of the CD, digital music became portable for the first time: New devices, such as car CD players and portable CD players, allow users to listen to music whenever and wherever they wish (Straw, 2009). In 1995, ISO MPEG Audio Layer 3 (MP3) entered the music market. MP3 is a compression standard that eliminates sounds that humans cannot hear and therefore reduces storage (Zentner, 2006). The new music compression standard has also enabled new distribution channels. Even formerly slow internet connections allowed music to be shared in illegal peer-to-peer networks or on file-sharing websites. In 2003, Apple introduced its iTunes Store, becoming the first successful provider of legal music via the internet. Apple’s portable MP3 player – the iPod – has superseded the conventional CD player. These mobile devices have become smaller and music synchronization has become easier. Music can be consumed in new situations, such as while traveling or doing sports (Bull, 2005). However, the music industry continues to innovate. New on-demand streaming services, such as Spotify and radio streaming services such as last.fm, dispense with music downloading. These services have a new type of business model that provides music via the internet as a service without any ownership transfer (music as a service, MaaS). Instead of paying for each song separately, as is the case in an à-la-carte environment such as the iTunes Store or amazonmp3, the user pays periodic subscription fees. Users have access to their music and manage their playlists as long as they have an active internet connection. Thanks to mobile internet, users can listen millions of tracks on their smartphone while on the move (Dörr et al., 2010).

When the vinyl record was supplanted by the CD, Plasketes (1992) stated that “[t]o collectors, vinyl is an experience that embraces emotion, passion, and romance” (p. 120) and vinyl records would therefore not be completely replaced by CDs. However, the current shift has gone a step further with intangible MP3s and other digital music forms replacing physical formats such as the CD. Digital music has gained popularity over the years. Today, digital channels have become the dominant revenue stream in the U.S., the world’s largest market. Globally, digital channels generated 34% of record company revenues in 2012 (IFPI, 2013). However, between 2004 and 2009, the music industry’s global sales fell by 30% (IFPI, 2010). Reasons for this decline include the impacts of music piracy and the unbundling of songs through digitalization (Elberse, 2010). There may also be other reasons: The value of digital music differs from that of physical formats such as CDs or vinyl records. The free downloading of songs has led to users expecting music for free. Furthermore, downloaded songs have an inferior quality compared to the original wave file on CD, which led to further value degradation (Gopal et al., 2004). But even when these factors are controlled for, there may still be a difference in the consumption of digital and physical music due to the haptic experience: Vinyl records and CDs have a physical presence. They can be stored in a cabinet, can be seen and touched at any time, and offer added values such as sleeve art and booklets. Mobile devices such as the iPod offer the user a wide range of advantages. Thousands of songs can be stored on one device making music more transportable. However, the music disappears somewhere into the MP3 player and cannot be seen or felt. Therefore, listening to physical music is a rich tactile experience compared to listening to digital music, thus resulting in physical music having a higher value (McCourt, 2005; Styvén, 2007; Styvén, 2010).

While there is a great deal of research on the adoption behavior of music consumers, very little is known about their post-adoption behavior. Our study investigates whether new technologies and music digitalization have led to a different way of consuming music. Following McCourt (2005), we assume that the haptic experience, and therefore the overall involvement with the product, is less
intense in the case of digital music. Gotlieb et al. (1992) define 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)”. We therefore focus on a special aspect of post-adoption behavior: the involvement with the product. To answer the research question, we use reviews of an online music store as an indicator of the involvement with the product and compare the reviews of physical CDs and vinyl with those of digital MP3s. Compared to former studies, we use a data driven approach to test whether there are differences in the user’s involvement. In an explorative post hoc analysis, we test whether the differences are the same in all music genres and if not, we aim to identify the most important differences.

The remainder of the paper is structured as follows. The next section explains the research gap that our study seeks to fill. Section 3 describes the theoretical background of our paper and explains why we used Amazon reviews as an indicator. In Section 4, we develop the study hypotheses. Section 5 describes the data collection and data analysis methodology. We then describe the main results and show the results of our post hoc analysis. We conclude in Section 7 with the summary, the implications of our results, and the study limitations.

2 Related Work

There is a broad field of research on the field of digital music which can be classified into three streams: the impact of illegal file sharing on legitimate sales, acceptance of legal and illegal music distribution channels, and attracting consumer through better legal offerings. Motivated by the enormous success of Napster and other peer-to-peer file-sharing services in the early 2000s, researchers began to measure the impact of illegal file-sharing on record sales (e.g. Jaisingh, 2007; Zentner, 2006). Their results showed that file-sharing had a negative impact on music sales, but that the total effect is reduced by individuals who only download music in order to test certain songs before then deciding to buy them. A second literature stream deals with the acceptance of legal and illegal music distribution channels (e.g. Plowman and Goode, 2009). Usually, acceptance models such as the Technology Acceptance Model or the Theory of Planned Behavior were extended by technical (e.g. download quality, download speed, etc.) and consumer (e.g. perceived risk, ethical concerns, etc.) characteristics. The third literature stream studies how legal offerings can be better designed to attract more consumers. The results indicate that digital music providers should dispense with digital rights management (DRM) systems (e.g. Dörr et al., 2009; Jaisingh, 2007), should decrease the price per track (e.g. Buxmann et al., 2007), and offer longer song sampling times (e.g. Peitz and Waelbroeck, 2006). Music providers such as Apple and Amazon realized most of the suggestions from the literature.

While several studies compared digital and physical reading (e.g. Mangen, 2008; Wagner et al., 2012), there is very little literature on the interaction with different kinds of music transfer mediums. As a hedonic product, music plays a crucial role in many consumers’ daily lives and is consumed not once but repeatedly (Kahl, 2012). Digitally stored music has several advantages, such as immediate access and customization ability, and can therefore better fulfill several daily life desires. However, digital files cannot replace the physical interaction with recorded music (McCourt, 2005). While Hogg and Jackson (2009) find that the dematerialization of music will lead to new business models and a shift in consumer behavior, the authors do not stipulate how this shift could be designed. Styvén (2007) investigated music intangibility in the internet age. She identified problems resulting from music dematerialization and provided solutions from the marketing literature on how to deal with these problems. Many of her suggestions can be found in the concept of music as a service, such as the idea of gaining access to music for a monthly fee as one does with water. In a survey of 870 participants, Styvén (2010) found that people with high music involvement prefer physical formats like CDs, while people with lower involvement prefer digital formats such as MP3.

Besides the abovementioned studies, no studies address the impact of music’s digitalization on consumer behavior. Our study seeks to fill this gap by addressing the question: Is digital music
consumed in a different way than physical music? By using real data from an online store’s customer reviews, this study seeks an unbiased view of consumers’ involvement in music by comparing conventional vinyl records and CDs with MP3s. We followed and extended the approach of Wagner et al. (2012) who used customer reviews as indicator for the involvement with books. Compared to prior studies, we can be sure of the audio format (digital or physical) users prefer and do not refer to a specific tangibility preference scale. By drawing on real data, we can test whether a higher tangibility preference (choosing a physical medium) leads to a higher product involvement (which reviews measure as a proxy). We investigate whether technical innovations in the music distribution market have led to different consumption behavior. We want to gain new insights into the post-adoption behavior of digital and physical music consumers from a behavioral perspective. Thus, our study can be classified in a special literature stream concerning human-computer interaction.

3 Theoretical Background: Intangibility of Digital Music and Word of Mouth as Indicator for Involvement

Music – seen as piece of information – is completely intangible but becomes tangible through its medium. The on-going digitalization of mediums (LP → CD → MP3 → MaaS) has resulted in music becoming increasingly intangible due to its loss of haptic attributes. Browsing through a record collection, seeing the physical presence of plastic or vinyl, as well as the accompanying packaging is satisfying. All these features disappear in digital music collections where the interaction differs completely (McCourt, 2005). Generally, individuals with a high need to touch tend to gravitate towards physical channels (Peck and Childers, 2003; Peck and Wiggins, 2006). Peck and Childers (2003) divide the need to touch into two sub-dimensions: The instrumental factor describes the need to touch products before purchasing them. The autotelic factor involves a hedonic-oriented response seeking fun, sensory stimulation, etc. As we describe in our study on the post adoption behavior of music consumers, we try to figure out whether the differences in the autotelic factor of the need to touch lie. Keng et al. (2012) found differences in the product knowledge, depending on the level of the autotelic need to touch. A higher value allocated to the need to touch usually meant a higher product knowledge. This higher product knowledge is reflected in product reviews (Myers and Robertson, 1972). We now address the link between reviews and involvement.

The internet has become an important distribution channel for physical and digital products. According to Google’s consumer barometer, approximately 25% of all products are purchased online in Europe. The share of digitally purchased media products is already at 36% (Consumer Barometer, 2012). With the internet as growing distribution channel, users are confronted with a great deal of additional product information that they have to filter. The range extends from user recommendation systems to user-generated product reviews on sites such as Amazon.com. Such interpersonal communication (word of mouth) plays a crucial role in consumers’ adoption and purchase decisions (Arndt, 1967). Online customer reviews on retail websites such as Amazon.com are peer-generated product evaluations (Mudambi and Schuff, 2010). Individuals who persuasively convey information about a topic to others are usually called online opinion leaders (King and Summers, 1970; Sun et al., 2006). One of the main reasons for becoming an online opinion leader is the reviewer’s involvement with the evaluated product (Dichter, 1966; Engel et al., 1993; Summers, 1970). Zaichkowsky (1986) identified three antecedents of involvement in the literature: personal factors, stimulus factors, and situational factors. Thus, customer reviews can be seen as an indicator of user involvement with music activated by different stimuli: digital file (MP3) or physical format (CD, vinyl record).

4 Hypotheses Development

On Amazon.com, consumers can post open-ended reviews of the purchased products. In each review, they can also evaluate the products with stars (from 1 to 5 stars). After reading a review on Amazon.com, the reader of the review is asked, “Was this review helpful to you?” (Yes or No).
Amazon.com aggregates the answers and provides a measure of helpfulness, for example: “5 of 10 people found the following review helpful”. To write a review, the user must have an account on the website and must have bought the reviewed product in order to circumvent fake reviews. The user information can be seen by clicking on the review’s author name, for instance, user name, Amazon rank, number of reviews written, etc. According to the available data, reviews written on both digital and physical music can be differentiated according to four measures: review depth (characters per review), review extremity (stars per review), and review helpfulness (proportion of people who found the review helpful); at the reviewer level, we can compare the number of written reviews as an indicator of her overall review experience.

**Review Depth**

Each review on Amazon.com includes an open-ended review text as key element. Review depth is defined as text length and is supposed to have a positive effect on information diagnosticity: Longer reviews usually include more information about the product and therefore reduce the reader search costs. This is why review depth is supposed to make a review helpful and is seen as an indicator for the quality of a review (Mudambi and Schuff, 2010). People who want to share their knowledge via the internet (online opinion leaders) are characterized by a high level of knowledge in a topic, amount of discussion of it, and amount of interest in it (Myers and Robertson, 1972). If we assume that digital music consumers show a lower involvement with the product than physical music consumers, the former should be more willing to share their opinions in longer reviews. Therefore, we hypothesize:

**H1:** Review depth is higher in physical music than in digital music.

**Review Extremity**

Amazon.com users can also evaluate the purchased product by allocating stars (1 to 5). The scale’s margins indicate an extreme point of view, while the middle (3 stars) indicates a moderate view. Extremity is defined as the “extent to which an individual’s attitude deviates from the midpoint [of a scale]” (Moore and Benbasat, 1991). Choosing the middle of a scale can be seen as a result of indifference or ambivalence. While indifference shows a truly moderate view, ambivalence is the result of balancing positive and negative arguments (Kaplan, 1972; Presser and Schuman, 1980). Moore and Benbasat (1991) found – in three studies – the highest correlation between extremity and certainty, i.e. that individuals with a high knowledge of a certain topic and therefore certainty tend to be more extreme in their evaluations. Especially users with high involvement – defined through a high knowledge and interest in a topic – are supposed to be more extreme in their evaluations and therefore more willing to choose a scale’s margins (Bishop, 1990; Thompson and Zanna, 1995). Therefore, we hypothesize:

**H2:** Review extremity is higher in physical music than in digital music.

**Review Helpfulness**

Review helpfulness describes the extent to which the readers of a review rate it as helpful or not. Users with high involvement are supposed to be more successful in persuading others of their own opinion (Chaiken, 1980; Petty and Cacioppo, 1979). In this study, helpfulness is used as a proxy for persuasion because the actual review adoption behavior is not observable online. Prior research has found that perceived review helpfulness could predict review adoption (Sussman and Siegal, 2003). This leads us to hypothesize:

**H3:** Review helpfulness is higher in physical music than in digital music.

**Reviewer Experience**

Our last indicator for involvement is the reviewer experience, measured by the overall music reviews written per user. People with high involvement with a product are more willing to share their attitudes towards this product than people with low involvement (Dichter, 1966; Laurent and Kapferer, 1985). Considering physical music consumers’ higher involvement, they should generally be more willing to...
write reviews and therefore should exhibit a higher number of total written reviews. Finally, we hypothesize:

\[ H4: \text{The reviewer experience of physical music consumers is higher than that of digital music consumers.} \]

To summarize, our research model argues that the product involvement with digital music is lower than with physical music because of haptic motives. To test this relationship, we use review depth, review extremity, review helpfulness, and overall reviewer experience as proxies.

5 Research Methodology

For this study, we collected consumer music review data from Amazon.com available on November 12, 2012. Each Amazon.com review contains information on review depth, review extremity, review helpfulness, and type of audio good reviewed. We also parsed the reviewer page to get the reviewer ID and further information like the number of all written reviews on Amazon.com. Figure 1 shows the screenshot of a typical Amazon.com review and the measures we collected from the website.

![Figure 1. Amazon.com review: 1: Review helpfulness, 2: star rating, 3: audio type, and 4: depth](image)

We chose Amazon’s bestseller list of chargeable MP3 albums as basis for our data collection, since we could maximize the probability of raising data of albums that are available digitally (MP3) as well as physically (CD or vinyl). Amazon’s bestseller list is divided into 22 genres, with further subgenres with a bestseller list of 100 albums for each subgenre. We collected 82,666 reviews on 3,673 albums across all genres.

Review behavior changed over time and people are now generally more willing to share their attitudes on the internet. To reduce such historical effects, we decided to choose only reviews written since January 1, 2012. We retained 7,887 reviews: 3,443 (43.7%) of all collected reviews were written about music on MP3, 4,330 (54.9%) of reviews were written about music on CDs, and 114 (1.4%) reviews were written about music on vinyl. Other product types such as audio DVD or music cassettes were excluded in this study due to unpredictable attributes and a very small number of observations.

Review depth was measured according to review length (number of characters) (Figure 1: 4). Review extremity was measured according to the number of stars allocated per review (Figure 1: 2). To show rating extremity, we coded extreme opinions (1 and 5 stars) with the highest (most extreme) value of 3 and moderate reviews (3 stars) with the smallest (less extreme) value of 1. 2 and 4 star ratings were coded with 2. Review helpfulness was measured according to the percentage of people who answered yes to the question “Was this review helpful to you?” (Figure 1: 1). These data were collected directly from Amazon.com. Reviewer experience was measured according to the aggregation of the number of all reviews per reviewer in the collected music reviews by using the reviewer ID as key variable. So we could ensure that we measured only a reviewer’s music experience and not her overall experience on Amazon.com (as shown on the reviewer page; e.g. Amazon rank, list of all written reviews, etc.).

The most important variable for our analysis is type of the audio good (e.g. MP3 music, audio CD, vinyl, etc.). With each review, Amazon also provides the additional information which product type was bought by the reviewer (Figure 1: 3). According to previous qualitative studies, music involvement decreases with growing digitalization. To validate this assumption with our data, we
coded the product types with shrinking numbers for increasing digitalization: vinyl and audio CD with
their physical presence were coded with 1, and MP3 music (completely digital, intangible product)
was coded with 0.

We chose paired t-tests and correlation analysis to validate our hypotheses. The variable type was
dummy coded with the following values: 0 for digital and 1 for physical music. The correlation
between a continuous variable (depth, extremity, helpfulness, experience) and a dichotomous variable
(type) is called point-biserial correlation and is a special type of Pearson’s correlation (Tate, 1954).
For our post hoc analysis, we used paired t-tests to identify product involvement differences among all
22 subgenres. IBM SPSS Statistics version 19 was used for data analysis.

6 Results

6.1 Hypothesis Testing

An overview of means and standard deviations of the variables across all reviews as well as on
reviews on digital music and on physical music separately is depicted in Table 1. Furthermore the
mean differences and their significance levels of a paired t-test were added. The results of the point-
biserial correlation can be found in Table 2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Depth</th>
<th>Extremity</th>
<th>Helpfulness</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All reviews¹</td>
<td>Digital²</td>
<td>Physical³</td>
<td>Difference: Physical to digital</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Standard deviation</td>
<td>Mean</td>
<td>Standard deviation</td>
<td>Mean difference</td>
</tr>
<tr>
<td>Depth</td>
<td>572.43</td>
<td>918.870</td>
<td>390.83</td>
<td>495.923</td>
<td>713.13</td>
</tr>
<tr>
<td>Extremity</td>
<td>2.73</td>
<td>.559</td>
<td>2.75</td>
<td>.531</td>
<td>2.71</td>
</tr>
<tr>
<td>Helpfulness</td>
<td>.293</td>
<td>.423</td>
<td>.27</td>
<td>.421</td>
<td>.31</td>
</tr>
<tr>
<td>Experience</td>
<td>.170</td>
<td>3.091</td>
<td>1.30</td>
<td>1.330</td>
<td>2.01</td>
</tr>
</tbody>
</table>

¹n = 7,887, ²n = 3,443, ³n = 4,444
* significant at the .001 level (paired t-test, two-tailed)

Table 1. Descriptive results of depth, extremity, helpfulness and experience

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Depth</th>
<th>Extremity</th>
<th>Helpfulness</th>
<th>Experience</th>
</tr>
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<tr>
<td></td>
<td>All reviews¹</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Standard deviation</td>
<td>Mean</td>
<td>Standard deviation</td>
<td>Mean difference</td>
</tr>
<tr>
<td>Type</td>
<td>All reviews¹</td>
<td>Digital²</td>
<td>Physical³</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Depth</td>
<td></td>
<td>.174*</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Extremity</td>
<td></td>
<td>-.032*</td>
<td>-.094*</td>
<td>1</td>
<td>.118*</td>
</tr>
<tr>
<td>Helpfulness</td>
<td>.044*</td>
<td>.225*</td>
<td>.000</td>
<td>1</td>
<td>.087*</td>
</tr>
<tr>
<td>Experience</td>
<td>.114*</td>
<td>.182*</td>
<td>-.082*</td>
<td>.072*</td>
<td>.309*</td>
</tr>
</tbody>
</table>

¹n = 7,887, ²n = 3,443, ³n = 4,444
* significant at the .01 level (one-tailed)

Table 2. Matrix of the Pearson’s correlation output
The results of the paired t-test provide a first insight into differences between digital music consumers and physical music consumers. Across all variables there are significant differences in the means. Especially the differences in review depth (mean difference = 322.307, p < .001) and reviewer experience (mean difference = .710, p < .001) are conspicuous. On average, the length of a review written by listeners of CDs and a vinyl record was 713 characters, while for digital music listeners this was only 390. While physical music listeners wrote on average approximately 2 reviews, digital music listeners only wrote 1.3 reviews. The results indicate that physical music listeners are generally more willing to write music reviews and write longer reviews than digital listeners. The difference in the helpfulness of physical and digital reviews is small but also significant (mean difference = .037, p < .001), indicating that physical music reviews are more persuasive. Extremity of digital music reviews is higher than that of physical music reviews (mean difference = -.036, p < .001), which contradicts our hypothesis.

The correlation coefficient between review depth and review type is significantly positive (\( r_{pb} = .174, \ p < .01 \)). The more tangible the music, the more willing the users are to write longer reviews. We therefore found support for our assumption that physical users are more involved with the product and more willing to write longer reviews. Thus, hypothesis 1 can be supported.

The correlation between type and review extremity is significantly negative (\( r_{pb} = -.032, \ p < .01 \)). This result as well as our paired t-test indicates that digital music reviewers tend to be more extreme in their star rating than physical music reviewers. We therefore reject hypothesis 2. The correlation between review depth and review extremity is negative across the whole sample and the two subsamples digital music and physical music. One explanation could be that the authors balance positive and negative arguments in longer reviews and are in the end ambivalent and choose the middle of a scale. In previous studies, participants were not asked to write about their attitudes, but just had to rate them on different scales (e.g. Moore and Benbasat, 1991). We found support for this assumption by calculating a partial correlation between review type and review extremity and controlled for review depth. The coefficient was still negative (\( r_{pb} = -.016 \)), but not as high as before and only significant at a level of 10%.

Next, we look at the correlation between review type and review helpfulness. The coefficient is positive and very significant (\( r_{pb} = .044, \ p < .01 \)). Although the correlation is low, the result shows that a review is more convincing if it was written by a physical music listener. Thus, we can accept hypothesis 3.

Our last hypothesis relates not to the review, but to its author. The correlation coefficient between review type and reviewer experience is significantly positive (\( r_{pb} = .114, \ p < .01 \)). The comparison of means already showed that physical music reviewers wrote more reviews than digital music reviewers and can therefore be characterized as more proficient. Because there might be a positive correlation of the music experience and the general reviewer experience we calculated also a partial correlation between type and reviewer music experience while controlling for the overall experience on Amazon (measured by all reviews ever written on Amazon). The coefficient becomes smaller (\( r_{pb} = .064 \)) but is still significant at a level of 1%. We therefore found support for our last hypothesis.

### 6.2 Post Hoc Analyses

We assume that the general willingness to write reviews on music albums – i.e. the reviewer experience – can be considered as an indicator for the author’s overall involvement with music. Similarly, the length of the review, and the numbers of resulting arguments, describes an approximation of the extent of reviewer involvement. The biggest overall correlation coefficients also indicate this relationship.

A relatively large variation in our overall results for review depth and reviewer experience gives one reason to presume that these two indicators for involvement differ in their values for physical music and digital music across genres. We therefore took a closer look at this matter, and conducted a
comparison of means for independent samples for each genre separately. Thus, we were able to make further statements on the length and experience differences between physical and digital music per genre. Table 3 presents a selection of the results of the 7 genres with the most impressive differences between physical music and digital music.

<table>
<thead>
<tr>
<th>Genre</th>
<th>Variable</th>
<th>Type</th>
<th>Mean</th>
<th>n</th>
<th>Standard deviation</th>
<th>Mean difference</th>
<th>T-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative Rock</td>
<td>Depth</td>
<td>Digital</td>
<td>501.86</td>
<td>299</td>
<td>571.722</td>
<td>-211.516</td>
<td>-3.831**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical</td>
<td>713.38</td>
<td>430</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Experience</td>
<td>Digital</td>
<td>1.34</td>
<td>299</td>
<td>1.849</td>
<td>-0.503</td>
<td>-.887</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical</td>
<td>2.23</td>
<td>430</td>
<td></td>
<td></td>
<td>-.360**</td>
</tr>
<tr>
<td>Classical</td>
<td>Depth</td>
<td>Digital</td>
<td>405.86</td>
<td>364</td>
<td>504.368</td>
<td>-99.582</td>
<td>-2.007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical</td>
<td>796.08</td>
<td>167</td>
<td>1,000.542</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Experience</td>
<td>Digital</td>
<td>1.51</td>
<td>364</td>
<td>1.923</td>
<td>-0.413</td>
<td>-.779</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical</td>
<td>2.44</td>
<td>167</td>
<td></td>
<td></td>
<td>-.568</td>
</tr>
<tr>
<td>Dance &amp; DJ</td>
<td>Depth</td>
<td>Digital</td>
<td>490.22</td>
<td>270</td>
<td>567.299</td>
<td>-77.079</td>
<td>-1.360</td>
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<tr>
<td></td>
<td></td>
<td>Physical</td>
<td>695.43</td>
<td>210</td>
<td>959.181</td>
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</tr>
<tr>
<td></td>
<td>Experience</td>
<td>Digital</td>
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<td>1.398</td>
<td>-0.779</td>
<td>-.568</td>
</tr>
<tr>
<td></td>
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**/* significant at the .001/.01 level (paired t-test, two-tailed)

Table 3. Post hoc analysis

When split up by genre, we see that the physical-digital music mean differences are significant in a number of cases. Alternative Rock, Christian & Gospel, Classic Rock, Classical, Country, Dance & DJ, Hard Rock & Metal, Jazz, Latin Music, Pop, Rap & Hip Hop, R’n’B, and Rock all differed significantly in both review depth and reviewer experience. We will choose two of the genres with the most significant values and seek to explain the disparity in involvement. To get behind the results, we had to consider the reviews’ content levels and found interesting explanations.

Reviews for classical music CDs and vinyl are almost twice as long (796 characters compared to 406) and the reviewer experience is considerably higher (2.44 compared to 1.51). This higher involvement with physical products might be explained by the fact that listening to MP3s is accompanied by a loss of tones in the edges of acoustical frequency ranges. It can therefore be assumed that highly involved listeners prefer to listen to classical music at home on their stereos and prefer CDs to MP3s.

Hard rock and metal fans also show a much higher involvement with physical music than with digital music. Their reviews of CDs and vinyl records are on average more than twice as long as for reviews of MP3s (1,044 characters vs. 521) and their experience of physical media (2.75) is substantially higher.

1 Not all genres are depicted in Table 3.
higher than with digital products (1.39). A reason for the difference might be that CDs and vinyl, and especially their covers, are considered art. Particularly, older fans already disapproved of the change from vinyl to CD, since covers became smaller and the perceived quality decreased. Furthermore, the identification with bands playing this type of music is very high. Fans eagerly await new songs and CDs that might include a poster or a booklet with additional information. So, the CD is more than just the music it contains.

In two cases, the existence of different levels of involvement between physical and digital media is not clear. International music shows a significant difference in the reviewer experience but the average review depth does not vary much. The miscellaneous music, on the other hand, obtains significantly longer reviews for CDs and vinyl but the reviewers had very much the same experience. For the genres Blues, Broadway & Vocalists, Children’s Music, Folk, New Age, Opera & Vocal, and Soundtracks, no significant involvement differences between physical and digital music were found.

7 Conclusion, Implications, and Limitations

Music on MP3 and other digital music types (e.g. AAC, WMA, etc.) are an important part of the life of millions of music consumers. They are downloaded and placed on a portable MP3 player where they can be consumed wherever and whenever the user wishes. However, our study shows that digital music is consumed in a different, less involved way than physical music. By using Amazon.com reviews as an indicator of user engagement with the music, we could show that physical music listeners write more and longer reviews, are less extreme in their star rating, and more successful in persuading others of their opinion. The most impressive differences were found in the genres pop, classical, and rock. Our results support the results of previous qualitative and empirical studies with small sample sizes that compared digital and physical music listeners (McCourt, 2005; Styvén, 2010). However, compared to these studies, our results are more general, because we used a large number of reviews as a proxy for involvement. By showing that there are differences in the consumption of digital and physical music, we provide helpful insights into the post adoption behavior of music listeners. Future studies can focus on the effect of this difference on aspects like the willingness to pay for digital content.

Although MP3 and other digital formats show an increasing sound quality, they still cannot satisfy consumers in the same way as CDs or vinyl can due to the loss of haptic motives. Labels and music store providers try to create digital bundles with additional content, remixes, etc. to increase their value, but overall, digital music prices are lower than those of physical music. To increase users’ involvement with the product, labels and providers should try to imitate haptic attributes as far as possible and may therefore stimulate users’ willingness to pay. Creating a virtual record collection, which e-book providers have already done, could be a solution. Based on our results, shop-owners could split consumers into high involvement users and low involvement users according to their review behavior and optimize their recommender systems.

As with any study, there are limitations that present opportunities for future research. According to Zaichkowsky (1986), there are three antecedents of involvement: personal factors, stimulus factors, and situational factors. Our study only addresses stimulus factors by comparing digital music and physical music. Persons who listen to MP3s can consume music in different situations (e.g. while travelling). Furthermore, MP3 users could be a special user type who never listens to physical music, and vice versa. Furthermore, we could not control for demographic attributes like gender or age. As long as we do not control for these factors, a final conclusion cannot be drawn concerning involvement. We could also not control completely for fake reviews. Though we were able to filter paid power reviewers and Amazon tries to filter fake reviews, it is still possible that there are some fake reviews in the sample. Finally, we did not measure involvement directly, but used Amazon.com reviews as proxies. A qualitative analysis of the reviews may provide new insights into reviewer feelings. The combination of a questionnaire and our real data in future studies could also strengthen our results.
References


