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An Empirical Study on the Effects of Music and Sound Effects in Fiction E-Books

Alissa E. Strong

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Arts

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ABSTRACT

An Empirical Study on the Effects of Music and
Sound Effects in Fiction E-Books

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Master of Arts

Research indicates that music has a unique and powerful ability to affect how listeners react to a story (Schaefer, 1998). Publishing houses are increasingly incorporating music and other multimedia effects into their products, with companies such as Booktrack now including novel-length soundtracks with e-books. The present study aimed to empirically investigate the relationship between music and text by examining whether readers' enjoyment of and distraction from a fiction e-book is affected by the inclusion of music or sound effects.

One hundred and twenty undergraduate students at Brigham Young University completed an e-book reading task (either accompanied by sound effects, music, or nothing at all) and completed a post-task survey that measured their enjoyment of and distraction from the task. It was found that multimedia-enhanced e-books were significantly more enjoyable ($M = 4.555$) than e-books alone ($M = 4.035$). Both sound effects and music (Ms = 4.512 and 4.594, respectively) led to higher levels of enjoyment than the control condition ($M = 4.035$), although later analyses indicated this effect was primarily found in females. Only the multimedia e-books incorporating sound effects significantly lowered distraction levels compared with the control (Ms = 1.698 and 3.621, respectively). The amount of time a participant spent engaged in multimedia behaviors (e.g., watching television, playing video games) did not consistently affect the relationships investigated. It was concluded that music and sound effects may be an enjoyable and interesting feature of e-books without detracting from the story. In some cases, the addition of multimedia made e-books as enjoyable for those who typically did not enjoy fiction as it was for those who enjoy fiction. It is recommended that publishers continue investigating this relationship, as multimedia e-books may open access to a new marketable audience for publishers.

Keywords: e-books, publishing, multimedia, music, sound effects, reading, fiction.

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Chapter 1: Introduction

Music has a unique and powerful ability to affect how listeners react to a scenario (Schaefer, 1998). One of the best examples of this is music in film. When paired with the narrative of a film, music can foreshadow events to come, set a mood, highlight climactic events, and ultimately help move the audience to the emotion the screenwriter intended (Schaefer, 1998). Given the positive impact of music on film, one might wonder whether similar results may be found with a combination of specially composed music and fiction text. Such a coalescence of genres could both enhance the enjoyment of the reading experience for listeners and give authors an additional medium with which to move their readers. This combination is now also increasingly possible due to the astronomical rise of e-books and electronic reading technology. The present study seeks to examine whether music acts as a significant distractor from a fiction e-book and also whether readers enjoy a music-enhanced fiction e-book more than a regular fiction e-book.

Twenty-first century readers are finding themselves increasingly bombarded with electronic text (Brown, 2001). Currently the fiction publishing market appears to be moving rapidly and decisively to the e-book format, which, according to researchers, represents "a logical step in the timeline of publishing" (Anuradha & Usha, 2006, p. 663). However, it is evident from current sales figures that e-books are yet to hit their full stride (Chu, 2003). While previous sales figures from the turn of the century were low, prediction estimates regarding the future of e-books are always glowingly optimistic (Fischer & Lugg, 2001)—and the market seems to have picked up in recent years. Wholesale revenue for e-books in the first quarter of 2012 alone was US$282.3 million, compared with US$229.6 million for print books (Vaughan, 2012). E-books have proven to be popular, and their popularity looks set to

increase as more and more people acquire electronic reading devices and discover the advantages of the e-book format.

Currently, consumers are turning to e-books primarily because of affordability, convenience of purchase, and the ability to store many books in a small device, to name a few. However, readers may be hesitant to invest in the e-book market because there is not as yet any standardized format for e-books. The various e-books and e-book readers currently being sold by the primary market players are typically incompatible with each other, to encourage customers to keep buying products sold by individual companies. As a result, it is clear that the format of e-books has not yet been set, and it is possible that e-books will one day be published in formats that are completely novel to the authors, editors, and publishers of the traditional printing industry (Dillon, 2001).

Every year, the information and multimedia technology available to consumers grows (Dillon, 2001). We are being bombarded with multimedia, and it is increasingly becoming integrated into our lives (Dillon, 2001). An obvious advantage of e-books is their ability to be more than just a printed text (Brown, 2001) and instead contain audio and video content (Rao, 2003). E-books allow publishers the opportunity to serve consumers to a new degree by creating "living books, which incorporate text, audio, video, and other resources, such as dictionaries" (Anuradha & Usha, 2006, p. 663).

One way that e-book developers have been experimenting with multimedia e-books has involved the addition of music. An example of this is the company Booktrack. According to the company's website, "Booktrack creates synchronized soundtracks for e-books that automatically matches music, sound effects and ambient sound to your reading speed to create an immersive reading experience" (Booktrack, n.d., para. 1).

Booktrack's sales figures seem to indicate that this new, enhanced format is meeting with considerable success—their enhanced Sherlock Holmes story, "The Adventure of the Speckled Band," was downloaded more than 100,000 times from the Apple iTunes App Store in over one hundred countries, proving it to be one of the most globally downloaded e-books, multimedia or not, of 2011 (evolver.fm, September 24, 2012, interview). Other companies currently moving into the multimedia e-book market are Simon & Schuster, Hachette, and Penguin. It is clear that many of the big-name publishing companies are intrigued by the idea of enhancing e-books with multimedia features.

In order to consider the impact that music may have on fiction e-books, it is important to consider the history of the relationship between music and text. The relationship between text and music is a complex one that has evolved over the years. In modern days, music and written text are most frequently combined when people listen to music while studying or working. However, in these situations the music is a background feature with little to no relationship to the text. As yet, it appears that music has not yet developed its place as an active participant accompanying the task of reading.

The reason for music's lack of role in fiction reading is unclear, because the two seem by their very nature to be suited for artistic combination. Calvin S. Brown once claimed that "music and literature are intended to be heard," and that their privileged media of presentation is "the audible," that "literature is an art presented to the ear rather than to the eye" because when we read we mentally hear the sounds (Brown, 1948, pp. 8–9). Authors themselves have also long wished for an artistic medium in which they could bring to life the entire work of their imaginations. The overriding feelings of many researchers in this area (see Guimarães, 2012) are clearly that music would enhance texts by adding another medium with which to impart the author's intended emotions.

Many studies have investigated the effect of music with written text on related variables. The majority of these studies have focused on background music and its impact on various text-related behavior and performance; however, there is yet to be a consensus in the literature regarding music's effects. A thorough examination of these studies and their results and methodology is needed to discover what is currently known about the combination of music and written text.

In general, the research on the effect of music on text-based performance is currently inconclusive. However, it does seem clear that the effect is either null or detrimental to performance in nature—none of the studies investigated found a significant positive effect of music on performance after reading a text. However, there was one study (Smith, 1961) that found a positive effect of music on readers' enjoyment. While the effects of music on readers' distraction from a fiction e-text certainly warrants investigation, so too may music's effect on readers' enjoyment of a fiction e-text.

A significant body of research has found that music is capable of having an emotional effect on a listener. It is widely known that loud, fast-tempoed, complex music can arouse listeners to action and even to the point of anger, and that simple, soft, slow-tempoed melodies can soothe (see, for example, Konecni, 1982; North & Hargreaves, 1996). But does this effect hold true even in the presence of a written text?

Early research aiming to answer this question (Smith, 1961) found that background music led to more positive attitudes in employees toward their work while resulting in no particular detrimental effect on work performance. This result was mirrored by Gladstones (1969) and Oldham et al (1995), who found positive emotional results of music and unimpeded work performances in their participants. It seems there is plentiful scope for

readers to enjoy the addition of music to a fiction e-book; however, the effect has not yet been tested with a fiction text.

In considering the effects of music on fiction text, then, perhaps the closest one could come to determining its effects would be examining the impact music has had on another storytelling medium—film. Music in film today has a considerable effect on the viewers. It adds to the emotional quality of the film (Meyer, 1956), provides a subtext and omniscient commentary to the visual story (Schaefer, 1998), and bridges cultures and languages in its ability to communicate with all members of an audience (Schaefer, 1998). For these and other reasons, most people would concede that music is a vital and effective part of film (Schaefer, 1998).

Film as a storytelling medium "positions music and musicality as parts of a fictional world" (Goldmark, Kramer, & Leppert, 2007, p. 6). Once music is linked with a visual narrative, it takes on elements beyond that of simply musicality—it takes on a character of its own, becoming almost as another player in the story, one with its own perspective, voice, and interrelations with other characters. Given the positive impact of music on film, one might wonder whether similar results would be found when combining specially composed music with a fiction text. To address this question the present study will review some of the research investigating the relationship between music and text and identify the central issues that have been raised, paying particular attention to questions that seem to remain unanswered. It will then outline the research methods to be used when addressing some of these questions, review results of the studies so far conducted, and discuss the implications for further research.

Limitations of Scope

Due to the currently untapped potential of multimedia e-books, there are several multimedia features that could be investigated during the present study, as well as many demographic variables that could be compared. The present study was designed to be an exploratory investigation, the first to research whether there may be significant effects of multimedia on the reading experience; it was not intended to fully explain which multimedia features are best for a universal audience. As such, the scope of the study has been limited to merely including the multimedia effects of music and sound effects—not animation, graphic design, autoscrolling technology, or videos—on a written text. The study aimed to investigate the historical relationship found between music and written text and continue this research by investigating the relationship using an e-book format. Because the text variable of interest is written text, audiobooks will not be investigated in the present study.

The time constraints surrounding the testing phase of the present study also pose limitations on the scope of the study. At this time, and due to the exploratory nature of the study, the e-book involved will comprise a short story, rather than a full-length fiction novel. If results are significant in this exploratory study, it will be recommended that additional time and resources be spent on replicating the study with a full-length text. Additionally, testing constraints also allowed for only college-aged students to participate in this experiment. If the results are significant, recommendations will be made to test participants of a variety of different ages, to allow for age effects (and possibly exposure to technology variables) to be examined.

Chapter 2: Literature Review

The relationship between text and music is a complex one that has evolved over the years. While both reading and listening to music used to be social or public events (reading in the form of recitations, theatre productions, etc., and music in the form of listening during social gatherings or attending the orchestra), both have now become largely private matters. Reading is primarily an individual pastime, and music more frequently occurs in the background of our daily affairs (for example, while doing chores, exercising, or driving a car) than at the forefront of them (Nebauer, 1992). Music and written text are most frequently combined when people listen to music while studying or working. However, in these situations the music is a background feature with little to no relationship to the text. As yet, it appears that music has not yet developed its place as an active participant accompanying the task of reading.

The reason for music's lack of role in fiction reading is unclear, because the two seem by their very nature to be suited for artistic combination. Calvin S. Brown once claimed that "music and literature are intended to be heard," and that their privileged media of presentation is "the audible," that "literature is an art presented to the ear rather than to the eye" because when we read we mentally hear the sounds (Brown, 1948, pp. 8–9). More recently, Scher added that music and literature "are viewed as closely akin because they both are auditory, temporal, and dynamic art forms" (Scher, 2004, p. 180). Guimarães agreed with these arguments, stating that although the medium is very different, both word and tone have "organised sound" as the basis of their form (Guimarães, 2012, p. 22). With such similar basic structure, music and text should theoretically blend well with one another, creating an overall pleasing effect for the listener.

Agawu (1992) also believes that text and music blend well together, but his belief is based upon the theory that they work symbiotically to convey the intent of the author. He claims that words exist on the top of the structural pyramid of an artistic work, providing the reader with access to meaning. Music, on the other hand, forms the base of the pyramid, working to signify the text. If one is found without the other, meaning is possible, but it is most fully and intricately grasped when the two are created to work together to best convey the intent of the author/composer.

Music's Place in an Author's Vision

Authors themselves have long wished for an artistic medium in which they could bring to life the entire work of their imaginations. Antretter (2001) discusses the melopoetic approach taken by the early twentieth century poet E. E. Cummings, who created a musical notation to accompany his poetry. For Cummings, music (and its associated sound effects) was "a structural principle of [his] verbal art" (Antretter, 2001, p. 185). Cummings's text, music, and visual imagery combined into what he himself termed the "New Art" (p. 186)—a threefold representation of the ideas he wanted to express. Sculpture, architecture, poetry, and music all comprised "melody" in Cummings's mind; the ideal expression of melody, then, incorporated all these elements in one synergistic artwork. Cummings did not just believe this; he put it into action—Antretter (2001) details a number of his poems, including "two brass buttonsoff," that incorporate musical notations (with interpretive explanations) into the text.

Guimarães (2012) describes the "orchestral quality" also found in Emily Brontë's novels—specifically Wuthering Heights. The character of Heathcliff, she claims, resonates throughout the novel like a dissonant chord, and the story's structure alternates between conflict and release, dissonance and resolution, like a "symphonic crescendo" (p. 26). It is

almost as if Brontë herself "hears the music above everything else, puts her trust in it, and follows where it leads" (Williams, 2008, in Guimarães, 2012, pp. 25–26). The narrative of Wuthering Heights, then, which acutely conveys a sequence of specific emotions for the reader over a relatively short period of time, appears highly suited to receive a musical accompaniment. The overriding feelings of Guimarães are clearly that music would enhance the text by adding another medium with which to impart the intended emotions. And indeed, Wuthering Heights has been enhanced with music in a number of different venues, including several operas, musical theatre, the soundtrack for a feature film, poetry settings, and even a pop song (Guimarães, 2012).

Music as a Distractor from Text-based Tasks

Many studies have investigated the effect of music with written text on related variables. The majority of these studies have focused on background music and its impact on various text-related behavior and performance; however, there is yet to be a consensus in the literature regarding music's effects. These empirical studies (see, for example, Etaugh & Ptasnik, 1982; Fendrick, 1937; Freeburne & Fleischer, 1952; Furnham & Allass, 1999; Furnham & Bradley, 1997; Henderson, Crews, & Barlow, 1945; Kallinen, 2002; and Madsen, 1987) have found a variety of effects, from music having a beneficial influence on performance, to no effect, to a detrimental effect. A thorough examination of these studies and their results and methodology is needed to discover what is currently known about the combination of music and written text. A summary of these studies can be found in table 1.

Fendrick (1937) was among the first to look at the influence of music as a distractor to a reading task. He investigated the effect of music on participants' reading efficiency. In

Table 1

Summary of research studies investigating the relationship between music and distraction from a written text

Researchers	N	Reading task	Music conditions	Results
Fendrick (1937)		12-page comprehension task	No music; Lively semi-classical	Scores were lower in music condition
Henderson, Crews, and Barlow (1945)	50 females	Written test	No music; Classical music; Popular music.	Popular music condition scored lower in one section of test
Freeburne and Fleischer (1952)	200 students	1315 lines of Russian history and 50-item comprehension test	No music; Classical music; Semi-classical music; Popular music; Jazz music.	No significant differences in scores between any of the conditions
Smith (1961)	22 female workers	Simple work task (processing routine information); complex work task (processing a variety of information)	No music; Classical music	No difference in task performance across conditions (although all employees preferred the music condition)
Etaugh and Michals (1975)	32 students (16 male, 16 female)	Reading comprehension task	No music; Music of student's choosing	No difference in scores for males; females' scores significantly worse in music condition
Furnham and Allass (1999)	48 participants (24 introvert, 24 extrovert)	Reading comprehension task, observation task, and recall task	No music; Simple music; Complex music	Introverts scored better in the simple music condition than the complex; extroverts were the opposite. Both groups scored highest with no music
Jäncke and Sandmann (2010)	77 participants	16-minute verbal memory task	No music; In-tune music (slow and fast tempos); Out-of-tune music (slow and fast); Pure noise	No effect of background music for any of the conditions
Kämpfe, Sedlmeier, and Renkewitz (2011)	680 participants (meta-analysis)	Several tasks	Several music conditions	Overall, as music became present, subjects' reading performances decreased.

Fendrick's study, students were asked to read a twelve-page passage with or without music playing and then answer a series of true/false questions. The music played was classified as "lively semi-classical" (p. 265). Fendrick found that the students' scores were worse in the music (distractor) condition than in the non-music control. In analysis of Fendrick's methodology, though, it should be noted that, while the reading passage was substantial and would give a good indication of participants' reactions to the music with text over time, the reading material was nonfiction and the music was not selected to match the text.

Henderson, Crews, and Barlow (1945) performed a similar investigation, looking at whether or not music distracts students from their usual reading efficiency. They invited 50 freshman women to participate in a pre- and post-test study where the statistically matched groups listened either to classical, popular, or no music while completing a written test. Henderson, Crews, and Barlow (1945) found that none of the groups displayed distraction effects, with the exception of the popular music group, who demonstrated worse scores on the paragraph portion of the test. Whether or not the women usually studied to music had no effect on the results. As with Fendrick's (1937) study, the text was nonfiction and the music was not matched in style to the text.

Freeburne and Fleischer (1952) performed a similar study to Fendrick's (1937) pioneering one, only this time investigating the effect of different types of music. They gave a large passage of academic reading material (1315 lines on the topic of Russian history) to five independent groups, each consisting of approximately forty students. All groups except the control group studied the passage while music was playing at a fairly loud volume in a neighboring room. The four music conditions listened either to classical, semi-classical, popular, or jazz music. All groups were then given a fifty-item comprehension test. Freeburne and Fleischer found no significant differences in the comprehension test results between any

of the music groups, or between any of the music groups and the non-music control condition, although the jazz group did read significantly faster than the others.

Smith (1961) investigated the effects of background music on tasks differing in cognitive complexity. He played classical background music periodically in the work environment of twenty-two female employees while they were performing first a simple task (data processing routine information) and then a complex mental task (data processing information from a variety of sources in different formats). Performance was measured by examining employees' output cards and total daily errors. It was hypothesized that music would benefit employees' performances in simple, monotonous tasks (through relief from boredom) while hindering performance on tasks that required greater mental attention. However, Smith found a null effect—while all employees preferred the presence of music during work, no significant difference was found in their performance of simple and complex mental tasks. This study is significant because it is the first of many to find that music has no distracting effect even on complex mental tasks, but that it does add greatly to the enjoyment of the participants in said tasks. Such a finding could be used to support the future addition of music to popular e-book fiction.

Etaugh and Michals (1975) empirically investigated the effects of background music on a performance act—reading comprehension. They invited 32 students (16 male and 16 female) to complete a reading comprehension task while listening to a record of the student's own choosing. The comprehension task required the participants to read a passage for ten minutes and then answer comprehension questions without referring back to the text. The task was completed twice with two different reading passages: one accompanied by music and one without it. To avoid practice effects, the two conditions were counterbalanced during the study. Subjects were then asked to rate how often they studied to music on a three-point

Likert scale with points of ‘Frequently,’ ‘Occasionally,’ and ‘Never.’ The experimenters found that listening to music while studying had no effect on the comprehension scores of males, but did severely affect females’ comprehension scores. However, this effect was possibly caused by the frequency with which the students listened to music—the males in the study reported listening to music frequently, occasionally, and never in approximately equal numbers, as opposed to the females, who mostly reported never listening to music while they studied. A larger number of females than males may thus have been distracted by the unfamiliar listening scenario with which they were faced during the task.

The Etaugh and Michals (1975) study is interesting because it found that music does distract readers, in contrast to the finding by Smith (1961). A possible explanation for this may relate to the fact that in almost every case in the Etaugh and Michals (1975) study, the record contained pop music. Music involving words, such as popular music, may lead to a higher rate of distraction for participants unfamiliar with music while they perform text-based tasks.

Furnham and Allass (1999) investigated the effects of complexity of music on the reading comprehension of introverts and extroverts. They invited 24 introvert and 24 extrovert participants to perform a reading comprehension task, an observation task, and a recall task accompanied by a simple music distraction, a complex music distraction, or silence. The researchers found that extroverts performed better in the complex music condition than the simple music condition, whereas the introverts produced the opposite results. The interaction was significant for all tasks except for reading comprehension. Both groups, however, scored the highest scores in the silence condition, despite this effect not reaching significance. While the sample size for this study is small, it is another set of empirical results supporting the fact that music may distract readers from a written text. More

important, however, is the fact that it is the first study that showed the impact of personality differences on this particular effect—participants with different core traits preferred and performed better with different styles of music. This finding may have an impact on the e-book publishing industry if composers wish to tailor music to the primary audience the book is likely to attract.

Jäncke and Sandmann (2010) also investigated the effect of music listening on learning. They had 77 participants perform a 16-minute verbal memory task in the presence of various music conditions, including in-tune at slow and fast tempos, out-of-tune at slow and fast tempos, and a pure noise condition. Each group also completed the task without music, to serve as a repeated measures control. Jäncke and Sandmann found no effect of background music on verbal learning, even in the pure noise group. They concluded that not only was music not a distractor from a text-based task, neither was even a background of pure noise. Their experiment results left the researchers confident that music would not distract from a text-based task. However, once again, their task did not involve fiction writing.

Kämpfe, Sedlmeier, and Renkewitz (2011) aimed to condense the lack of consensus surrounding this effect by conducting a meta-analysis of eight separate studies that investigated the impact of background music on reading performance. The overall effect of eight empirical studies, which together tested 680 participants, found an overall negative effect of music on reading performance—as music became present, subjects' reading performance decreased. However, as the authors acknowledge, this result may be due to an accumulation of other specific effects that were not accounted for in the methodology of the respective studies (e.g., frequency of studying to music). More research with a more specific methodology to account for other possible effects or biases in the data will need to be

conducted before researchers can state unequivocally that music does in fact impede reading performance.

In general, the research on the effect of music on text-based performance is currently inconclusive. However, it does seem clear that the effect is either null or detrimental to performance—none of the studies investigated found a significant positive effect of music on performance after reading a text. However, there was one study (Smith, 1961) that found a positive effect of music on readers' enjoyment. While the effects of music on readers' distraction from a fiction e-text certainly warrants investigation, so too may music's effect on readers' enjoyment of a fiction e-text.

Music Enhances Enjoyment of Text-based Tasks

A significant body of research has found that music is capable of having an emotional effect on a listener. It is widely known that loud, fast-tempoed, complex music can arouse listeners to action and even to the point of anger, and that simple, soft, slow-tempoed melodies can soothe (see, for example, Konecni, 1982; North & Hargreaves, 1996). But does this effect hold true in the presence of a written text?

Early research aiming to answer this question found that background music led to more positive attitudes in employees toward their work while resulting in no particular detrimental effect on work performance. Gladstones (1969) studied the effect of background music on keyboard operators' work rates and found that the rates were unaffected when music was played. He also found that the presence of background music was significantly preferred by the employees.

Gfeller, Asmus, and Eckert (1991) studied people's emotional responses to the combination of music and text. The text involved was a poetry text read aloud on a cassette tape. The researchers randomly assigned 150 university students to listen to the poetry text

alone, the text read with accompanying commercial background music, the text read with accompanying atonal music, the commercial background music alone, or the atonal music alone. All participants were non-musicians. Mood was measured before and after the task. The researchers found that all experimental conditions led to a decrease in mood except for the background music alone condition.

Because this change was measured for the text alone condition as well, the change in mood cannot be attributed to the combination of text and music. A more likely explanation is that the depressed mood is due to the particular selection of text used in this particular experiment, making this an isolated effect and result. The researchers specifically chose the poem *Barbed Wire* (a short poem involving strong physical imagery of barbed wire) to use for their experiment after pilot studies indicated that public opinion on this poem is very middle-of-the-road. This left potential for the poem to elicit either happier or sadder feelings during the experiment, which would not have been possible by a poem that had the ceiling effect of being universally liked. However, such a controversial poem as *Barbed Wire* may by its own nature have been unpleasant enough to result in a decreased mood for participants across all conditions who were exposed to the text. Consequently, the effect found in this study may not be generalizable to tasks involving other texts.

Oldham et al. (1995) investigated the effects of background music played through personal headsets on office performance, organization, satisfaction, and mood. Two hundred and fifty-six participants were asked whether or not they preferred to listen to music while working; from these ratings the groups were matched, so that both the music and non-music conditions contained equal amounts of participants who prefer or do not prefer music while working. Participants in the music condition were allowed to select their own music and were instructed to listen to music while completing their regular work tasks for a period of four

weeks. Participants' performances were measured by weekly output sheets obtained from supervisors (both groups were also matched on performance pre-experiment), and task complexity was rated by a member of the company's human relations department. Oldham et al. (1995) found that music had a significant positive effect on the outcome variables, particularly mood, when the work task performed was simple, but no effect (detrimental or otherwise) on performance when the task was complex.

The overall trend in the studies reviewed to this point is that most of the text involved has been nonfiction and all of the music involved has been composed independently of the text. The music added to fictional e-books would be composed specifically to match the mood of the text. As a result, it is also worth considering another medium where music is specifically composed to match the story—movie soundtracks. Investigating the history of music in film and its effects on audiences may provide a better idea of how music will impact readers of fictional e-books.

Music in Film: The Effect of Music on Viewing Audiences

Music in film owes its origins not to any artistic inspiration, but rather to the "dire need of something which would drown the noise made by the projector" of early films (London, in Albright, 2004, p. 96n40). In the early days of film, the projector was located in the same room as the auditorium, not behind a soundproof window as it is today. The noise of the projector "disturbed visual enjoyment to no small extent" (London, in Albright, 2004, p. 96n40). The natural reaction for film screeners was to add music to their screening space, typically the sound of a piano or organ (Wierzbicki, 2009), to neutralize the noise of the projecting equipment. Records state that a pianist was present on the opening day of a film as early as 1895, although at this time the instrumentalists continued to play music from famous composers rather than a specially composed score (Wierzbicki, 2009).

In addition to the need for music to mask the sounds of the film projector, early film critics seemed to sense the need for both vocal and musical accompaniment to the story. After seeing a silent film in early 1896, Russian novelist and poet Maxim Gorsky wrote the following:

> It all moves, breathes with life, and suddenly, having reached the edge of the screen, disappears one knows not where. This is all strangely silent. Everything takes place without your hearing the noise of the wheels, the sound of the footsteps or of speech. Not a sound, not a single note of the complex symphony which always accompanies the movement of a crowd. Without noise, the foliage, gray as cinder, is agitated by the wind and the gray silhouettes—of people condemned to a perpetual silence, cruelly punished by the privation of all the colors of life—these silhouettes glide [over the gray ground] in silence. (Wierzbicki, 2009, pp. 20–21)

It is clear from Gorsky's writing that audiences somehow feel the need for sound to enhance the story they are experiencing. Sound denotes realism and action; it brings the story to life for the audience. It also detracts from the audience's ability to talk during the screening (Schaefer, 1998). With all of these clear motivations for adding music to cinema, the scene was set for soundtracks to become a permanent fixture of the moviemaking scene. The first score composed specifically for use with a film was composed by Camille Saint-Saëns in 1908 (Albright, 2004).

Music today has several roles within film: functioning as part of the story (such as in musicals), as background music within the story (such as when a character turns on the radio), or as background music only available to the viewing audience (Schaefer, 1998). Schaefer (1998) outlines the following findings which have been acquired in relation to film music (pp. 1–2):

The following list contains assumptions made by most people inside and outside of the film industry regarding film scores:

- Music adds to the emotional quality of the film. There is some empirical evidence to support this: fast and loud music arouses, slow and soft music calms. Motion and emotion are often entwined (Meyer, 1956).
- The most effective scores are those which operate just below the consciousness of the moviegoer.
- Many in the film industry, including the composers, feel that music offers a kind of sub-text; it serves as thought bubbles on screen. When stories are transferred from the page to the screen, inner thoughts and commentary are lost, a major reason why many people feel a film version of a story is far inferior to the book. This sort of commentary is somewhat replaced by the music.
- Music is generally thought of as a universal language.
- Instrumental cliches are common in the industry. According to Kalinak, strings are thought to be the most expressive instrument because they are closest to the human voice in "range and tone" (Kalinak, 1992).
- The eye is generally thought to be superior to the ear in our culture (Kalinak, 1992), though Aristotle and Theophrastus feel "[h]earing is the sense that most deeply stirs our emotions" (in Kalinak, 1992) and Hermann Helmholtz thinks that aural art "stands in a much closer connection with pure sensation than any of the other arts" (in Kalinak, 1992).
- Some people love the score to a movie within the context of the movie, but if they hear it outside of the context of the movie, they do not like it.

For these and other reasons, most people would concede that music is a vital and effective part of film (Schaefer, 1998). It can have a drastic impact on the movie in its totality. As an example, viewers laughed during initial screenings of "The Lost Weekend"—but after its score was changed, it won "Best Picture" (Karlin, 1994). If an effective score can add so much to the impact of a film, could it possibly add the same amount to a written text?

As an accompaniment to film, music, both in score and soundtrack form, can enhance a plot, complement the scenery, create and foreshadow mood and atmosphere, and engage with the visual and narrative elements of the story. Film as a storytelling medium "positions music and musicality as parts of a fictional world"; as such, the music "becomes thickly textured. . . . It resonates with intertextual polyphony, including meaning, agency, and identity" (Goldmark, Kramer, & Leppert, 2007, p. 6). In other words, once music is linked with a visual narrative, it takes on elements beyond that of simply musicality—it takes on a character of its own, becoming almost as another player in the story, one with its own perspective, voice, and interrelations with other characters.

This development of music from accompaniment to character is evident in Reyland's (2012) analysis of the film score and sound effects present in a climactic scene in the movie Mystic River (2003), directed and produced by Clint Eastwood. Early in the film, Reyland states, a father discovers that his eldest daughter has been murdered. The sudden contrast in the musical score disrupts the previously introduced conservative tone of the film, breaking the existing calm of the narrative musically as well as visually and textually and establishing the score's role as an omniscient character with the ability to foreshadow the story. The score thus provides a second emphatic avenue of delivering the message of the story—a second character's voice—serving to enhance its emotional impact. Sound effects play a role, too—the sound of a lone bird tweeting at the moment the daughter's body is first seen creates a

metaphorical tone (what/where is the bird? What is its symbolic significance to the death?) that additionally adds to the impact of the discourse in the movie (Reyland, 2012). Music acts as both a second character in the film and as a second medium to convey the message, both of which apparently enhance the story quality for the viewer.

Given the positive impact of music and sound effects on film, one might wonder whether similar results would be found when combining specially composed music with a fiction text. The present study seeks to examine whether music and sound effects in this situation would act as a distractor from the text-based task at hand (i.e., reading the story), and whether viewers enjoy a fictional e-book text more with multimedia compared to without it. Demographic variables such as gender will also be measured to see if the effects are different for different groups of people. Because several studies have taken into account participants' familiarity with music while, for example, studying, the present thesis will take into account participants' familiarity with other multimedia behavior that incorporates music/sound effects and text (such as video gaming, television, and movies).

Hypotheses

Based on the literature review, several questions about the relationship between music and fiction text remain. While much research has investigated music's effects on non-fiction texts, none has yet considered the impact on a fiction text. Consequently, the present study aims to answer this question and posits the following hypothesis:

Hypothesis 1: Overall, the inclusion of multimedia effects will enhance reader enjoyment of and minimize distraction in a fiction e-book.

The experiment will include test conditions of both music and sound effects; these will henceforth be classified as "multimedia effects." It is hypothesized that both the music and sound effect conditions will enhance reader enjoyment of a multimedia e-book and minimize

distraction relative to a text-only control. A lack of significant relationship would represent the null hypothesis, indicating that readers experience no difference in enjoyment or distraction if the e-book involves multimedia effects or not. A significant relationship in the opposite direction to that hypothesized would indicate the contrary hypothesis: that the inclusion of music leads to a decrease in enjoyment of the book and an increase in distraction from the book.

Due to the fact that no previous researchers have considered the impact of multimedia on a fiction text, there has thus been no research investigating the effects of different types of multimedia on fiction text. As well as music composed to fit the mood of the story, sound effects can also enhance a text and may be particularly suited to this study as a middle ground between no music and constant music. As a result, the following hypothesis is posed:

> *Hypothesis 2: There will be significant differences in enjoyment and distraction levels between the three experimental conditions: text with music, text with sound effects, text alone, and text with music and sound effects.*

It is expected that there will be differences between the different experimental conditions. A lack of significance in the results will indicate the null hypothesis: that the addition of music, sound effects, or both makes no difference to the enjoyment and distraction levels of readers.

An ongoing theme in the research has been the comparison of differences between men and women when considering the relationship between music and text. As the present study extends the previous research by examining fiction texts, it is needful that it continues the investigation of gender differences.

> *Hypothesis 3: There will be significant differences between gender groups for at least some of the conditions listed in hypothesis 2.*

It is expected that males and females will react differently to the inclusion of multimedia effects in a fiction e-book. A lack of significant results would indicate a null hypothesis: supporting the notion that there are no significant differences between the genders from the control group.

Past research has found that differing personality traits in the participants lead to differing enjoyment of and distraction from texts accompanied by music (Furnham & Allass, 1999). The present study aimed to build on this research by measuring individual differences between the participants in areas of interest and assessing the impact these differences have on participants' reactions to music and sound effects in a fiction e-book. Because the present study adds multimedia to the text, a consideration of whether other "multimedia behaviors" affect the relationship is warranted. Thus, the following two hypotheses are posited:

> *Hypothesis 4: Participants' pre-existing enjoyment of fiction and propensity to read fiction will be positively correlated with enjoyment of and negatively correlated with distraction from a multimedia e-book in the multimedia conditions, relative to a text-only control.*

It is expected that readers who enjoy reading fiction and typically choose to read fiction will enjoy a multimedia e-book more and be distracted less than participants who enjoy fiction less and thus choose to read fiction less. A lack of significance would indicate no relationship between pre-existing enjoyment of fiction and propensity to read it with enjoyment of and distraction from multimedia e-books. Significant results in the opposite direction would indicate a detrimental effect on the dependent variables.

> *Hypothesis 5: Participants' propensity to be engaged in multimedia behaviors will be positively correlated with their enjoyment of a multimedia e-book and negatively correlated with distraction from a multimedia e-book.*

It is hypothesized that the more familiar a participant is with multimedia behaviors combining music and text, the more likely they will be to enjoy a multimedia e-book and the less likely they will be to be distracted from it. A lack of significance found in these statistics will indicate no relationship between the variables. A significant relationship in the opposite direction will indicate that propensity for multimedia behaviors has a detrimental effect on reader enjoyment of a multimedia e-book and a greater likelihood of distraction from the book.

Chapter 3: Method

Participants

Participants were 120 undergraduate students from Brigham Young University (66 male, 54 female). Ages ranged from 17 to 25, with an average age of 21. All participants spoke English as their native language; this was a deliberate choice on the part of the experimenter as the experiment involved reading in English. Each experimental condition had at least one male and one female. The participants' majors represented ten of the eleven academic colleges available at BYU, ensuring a wide range of interests and attitudes toward reading.

Measure

The testing instrument contained three parts: a preliminary survey, an electronic e-book reading task, and a post-task survey. In addition to these measures, two different multimedia soundtracks were chosen to accompany the reading task.

Preliminary survey. The preliminary survey requested demographic information including age, gender, and major, as well as questions about participants' enjoyment of fiction reading in general and the time they spend engaged in reading or multimedia behaviors both in a regular (i.e., school) week and a free time week. Participants rated how much they enjoyed reading fiction, how likely they were to choose to read fiction in their free time, and how much time they spent engaged in reading and multimedia behaviors on Likert scales ranging either from 1 to 6 ("I don't enjoy reading fiction at all" to "I love reading fiction") or from 1 to 5 ("I spend <1hr/week playing video games" to "I spend 10+hrs/week playing video games"). At the conclusion of the survey, participants were instructed to complete the experiment task. A copy of the preliminary survey can be found in Appendix A.

Electronic e-book reading task. All conditions contained the same fiction text, which was presented on a laptop in e-book format. The e-book was six pages long and can be seen in Appendix B. The book allowed readers to click through the pages at their own pace. The reading task was accompanied by one of three conditions: no music (control), sound effects (SFX), and music.

Multimedia/music selections. The music and sound effects were chosen to match the somber theme of the text passage, which depicts the last moments of a man's life in an alley. The SFX condition contained the sounds of rain as well as slow footsteps. The selected music was classical and involved a slow-tempo cello and piano duet. All multimedia was played at a consistent volume set by the experimenter to avoid potential bias effects. The juxtaposition of sound effects and music with the story text can be seen in Appendix C.

Post-task survey. The post-task survey required participants to rate, on a six-point Likert scale, how much they enjoyed reading the passage and how distracted they were while reading. It also asked for information regarding the source of their distraction, including specific features of the music that may have contributed to the distraction. The survey can be found in Appendix D.

Methodology

Participants were randomly approached on the university campus and asked to participate in the study. To avoid any biasing effects that participants' program of study could have on a reading-based experiment, participants were recruited from eight different buildings around the university campus and randomly assigned to one of the three experimental conditions.

Participants first completed the preliminary survey. Next, all participants completed the e-book reading task indoors using the same laptop. All participants, including those in the

control (no music) condition, wore noise-reducing headphones during the task to ensure consistency of testing, eliminate as much external noise and distraction as possible, and allow for greatest involvement in the reading experience. After reading the e-book, participants completed the post-task survey. No reward or compensation was given for participating in the experiment.

Analysis

Hypothesis 1 will be tested with a one-way analysis of variance (ANOVA), which will identify if the two conditions (multimedia and control) differ significantly in their enjoyment of the fiction e-text. A second one-way ANOVA will investigate whether the two conditions differ significantly in their distraction from the fiction e-text. This analysis will answer whether or not the multimedia variables overall have a significant effect on reader enjoyment of or distraction from a fiction e-book.

Hypothesis 2 will also use one-way ANOVAs, which will identify if one or more of the three conditions (music, SFX, and control) differ significantly from the other conditions in their enjoyment of or distraction from the fiction e-text. Post-hoc tests will be used to identify which of the three groups is different from the others. This analysis will answer whether one or both of the multimedia variables have a significant effect on reader enjoyment of or distraction from a fiction e-book.

Hypothesis 3 will be tested with a two-way ANOVA, which will test main effects of condition and gender (i.e., does one gender score significantly higher/lower than the other, across all conditions) as well as whether the interaction of gender and condition is significant (i.e., do the genders respond significantly differently across the three conditions). This analysis will investigate how the genders respond individually to the multimedia conditions

and shed light on whether one gender prefers one type of multimedia compared with the other.

Hypotheses 4 and 5 will find the baseline relationship between the multimedia variables and enjoyment/distraction by finding the linear correlations of the control group. These baseline correlations will then be compared against the linear correlations of the music and SFX groups and tested for significance (i.e., to see if the addition of multimedia caused a significant change in the baseline relationship between multimedia behaviors and distraction/enjoyment). These analyses will firstly indicate whether there is an overall consistent baseline relationship between multimedia behaviors and enjoyment of or distraction from a fiction e-book. They will then demonstrate whether or not multimedia effects significantly affect these relationships.

Chapter 4: Results

Preliminary Analyses: Differences Between Participants

Demographic variables and enjoyment of fiction. The number of participants in each condition can be seen in Table 2. The average ages, enjoyment of fiction scores, and choice to read fiction scores for each group were compared using a one-way analysis of variance (ANOVA) to ensure similarity between the groups and ensure no results were affected by any within-group biases. The mean scores are located below in Table 3, along with the tests for statistical differences between the groups. No significant differences were found between the groups on these measures.

Table 2

Number of male and female participants in each condition.

	Control	SFX	Music	Total
Male	19	19	28	66
Female	10	24	20	54
Total	29	43	48	120

Table 3

Group means and tests for significance for age and enjoyment of fiction. No significant differences existed between the experimental groups, indicating that the groups are comparable.

	Mean age (years)	Enjoyment of fiction	Choice to read fiction
Control (n = 29)	21.38	4.793	3.793
SFX (n = 43)	20.51	5.372	4.419
Music (n = 48)	21.25	5.333	3.917
Test for significance	$F(2, 117) = 1.91$, $p = .153$.	$F(2, 117) = 2.63$ $p = .076$	$F(2, 117) = 2.03$, $p = .136$.

Table 4

Comparison of group means for propensity for multimedia behaviors in a regular week. No significant differences were found, indicating that the groups are comparable.

N = 120	Reading (fiction)	Reading (other)	Watching TV	Watching movies	Playing video games	Listening to music
Control (*n* = 29)	2.103	2.586	2.069	1.828	1.551	3.241
SFX (*n* = 43)	2.209	2.907	1.605	2.163	1.140	3.047
Music (*n* = 48)	2.083	3.167	1.667	2.167	1.250	3.333
Test for significance	$F(2, 117) = .12$, $p = .887$.	$F(2, 117) = 2.37$, $p = .098$.	$F(2, 117) = 2.25$, $p = .110$.	$F(2, 117) = 1.51$, $p = .225$.	$F(2, 117) = 2.99$, $p = .054$.	$F(2, 117) = .58$, $p = .562$.

Table 5

Comparison of group means for propensity for multimedia behaviors in a free time week. The SFX group read significantly less nonfiction and watched significantly less TV.

N = 120	Reading (fiction)	Reading (other)	Watching TV	Watching movies	Playing video games	Listening to music
Control (*n* = 29)	3.276	2.138	2.138	2.793	1.655	3.828
SFX (*n* = 43)	3.674	1.814	1.930	2.791	1.465	3.163
Music (*n* = 48)	3.333	2.333	2.396	2.833	1.500	3.667
Test for significance	$F(2, 117) = .91$, $p = .405$.	$F(2, 117) = 3.1$, $p = .049$*.	$F(2, 117) = 3.23$, $p = .043$*.	$F(2, 117) = .05$, $p = .951$.	$F(2, 117) = .33$, $p = .720$.	$F(2, 117) = 3.91$, $p = .023$*.

* $p < .05$

Propensity for multimedia behaviors. One-way ANOVAs were also conducted to compare group mean scores of propensity for multimedia behaviors, both for a regular and free time week. The scores and tests for significance can be found in Tables 4 and 5. None of the groups were significantly different from the others in their propensity to read fiction, read non-fiction, watch TV, watch movies, play video games, or listen to music in a regular week (Table 4). In a free time week (Table 5), the SFX group read significantly less nonfiction than the other groups, watched less TV, and listened to less music.

Analyses of Hypotheses

Hypothesis 1. It was hypothesised that, overall, the inclusion of multimedia effects will enhance reader enjoyment of and minimize distraction in an e-book. To test this expectation, the music and SFX conditions were combined to make one multimedia condition ($N = 91$), which was then compared against the control condition ($N = 29$). A one-way ANOVA was conducted to compare the mean enjoyment and distraction scores of the multimedia and control groups, which were rated on a Likert scale from 1 to 5. The analysis found a significant effect on enjoyment, $F(1, 118) = 4.89$, $p = 0.029$. The presence of multimedia ($M = 4.555$) in a fiction e-book led to significantly higher enjoyment than an e-book without multimedia ($M = 4.035$). This result was consistent with the hypothesis.

A second one-way ANOVA was performed to test the effects of multimedia on reader distraction. Again, a significant effect was found, $F(1, 118) = 3.99$, $p = 0.048$. A fiction text that incorporated any type of multimedia ($M = 2.901$) led to significantly lower feelings of distraction from the text than a non-multimedia control ($M = 3.621$). This was again in support of the hypothesis.

Hypothesis 2. It was hypothesised that there would be significant differences in enjoyment and distraction levels between the three experimental conditions: text with music,

text with sound effects, and text alone. A one-way ANOVA was conducted to discover if there were significant differences in enjoyment of an e-fiction text between the control, SFX, and music conditions. The analysis found no significant effect of condition on enjoyment, $F(2, 117) = 2.49$, $p = 0.087$. Although as a combined condition there had been a significant difference between the multimedia and control conditions, post-hoc Tukey tests found that on their own the music ($M = 4.594$) and SFX ($M = 4.512$) conditions were not significantly different from the control condition ($M = 4.035$). The effect was, however, approaching significance.

A second one-way ANOVA was conducted to assess the effect of condition on distraction from the e-text. This analysis rendered a significant result, $F(2, 117) = 37.64$, $p < 0.001$. Post-hoc Tukey tests found that SFX ($M = 1.698$) led to significantly lower levels of distraction than either the control ($M = 3.621$) or music ($M = 4.042$) conditions (both ps < 0.01). Music was more distracting than the control condition; however, this difference was not significant.

Hypothesis 3. It was hypothesised that males and females would react differently to the inclusion of multimedia effects in a fiction e-book, such that significant differences would be found between the genders for at least some of the conditions listed in hypothesis 2. To test this hypothesis, a two-way ANOVA was conducted, comparing enjoyment scores by gender and music condition. A simple main effect was found for condition, $F(2, 114) = 14.62$, $p < 0.001$. Enjoyment of a written text differed for both genders across conditions of no music, music, and sound effects. Additionally, a simple main effect of gender was found, $F(1, 114) = 3.38$, $p = .038$. Enjoyment across all conditions was higher for females ($M = 4.796$) than for males ($M = 4.129$). Additionally, a significant interactive effect was found, $F(2, 114) = 15.00$, $p < .001$. It appears that the different conditions affect males and females

differently. As can be seen in Figure 1 below, females' enjoyment of the text increased with the addition of SFX ($M = 4.667$) relative to the control ($M = 3.5$), and with music ($M = 5.6$) relative to the SFX and control conditions. All three increases were significant, according to a post-hoc Tukey test. Males' enjoyment of the text was consistent across all conditions, lowering slightly in the music condition. However, this difference was not significant.

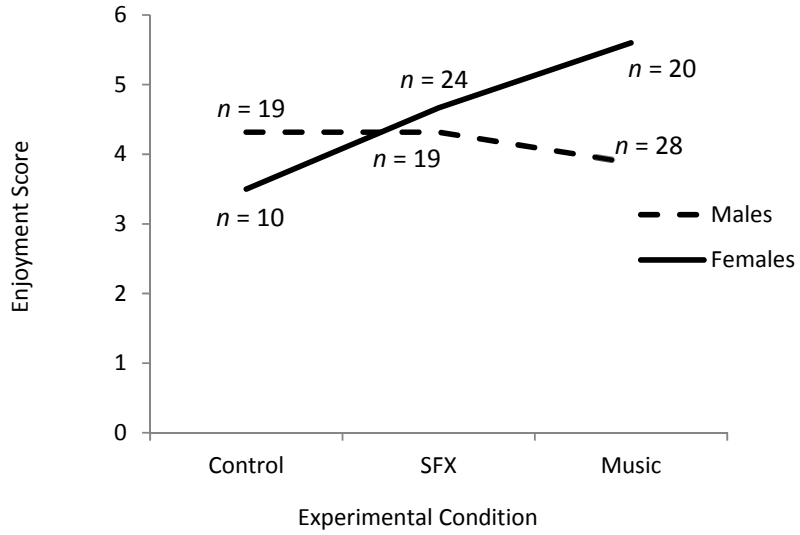


Figure 1. Enjoyment of e-fiction text by condition and gender ($N = 120$). While females' enjoyment increased with the intensity of the multimedia conditions, males' enjoyment remained statistically constant. The interaction was significant.

A second two-way ANOVA was conducted to compare distraction scores by gender and music condition. A simple main effect was found for condition, $F(2, 114) = 53.88$, $p < 0.001$. Distraction from a written text differed for both genders across conditions of no music, music, and sound effects. Additionally, a simple main effect of gender was found, $F(1, 114) = 8.13$, $p = .005$. Distraction across conditions was higher for males ($M = 3.364$) than for females ($M = 2.778$). Additionally, a significant interactive effect was found, $F(2, 114) = 22.67$, $p < .001$. It appears that the different conditions distract males and females differently. As can be seen in Figure 2 below, females' distraction from the text remains constant for the

control (*M* = 1.700) and SFX (*M* = 1.708) conditions, but increases significantly ($p < .01$) with the addition of music (*M* = 4.600). Males' distraction is high for the control condition (*M* = 4.632) and the music condition (*M* = 3.643), but lowers with the addition of only SFX (*M* = 1.684). All conditions were significantly different from each other.

The high level of distraction for the male control group was an unexpected finding. Due to distraction being one of the major dependent variables in the present study, participants were asked to rate not only the level of their distraction (distraction score) but also the source of their distraction, commenting on specific features where possible. Thus it is possible to state that the distractions experienced by members of the male control group included external noise (4 participants, 22%), friends sitting adjacent to participants in the testing situation (1 participant, 6%), and hunger (2 participants, 11%). These distractions were not mentioned by participants in either the SFX or music conditions. A possible interpretation of these results is that such distractions are noticeable in the absence of multimedia but can be ignored when sound is present to cancel the noise and provide a more involving reading experience.

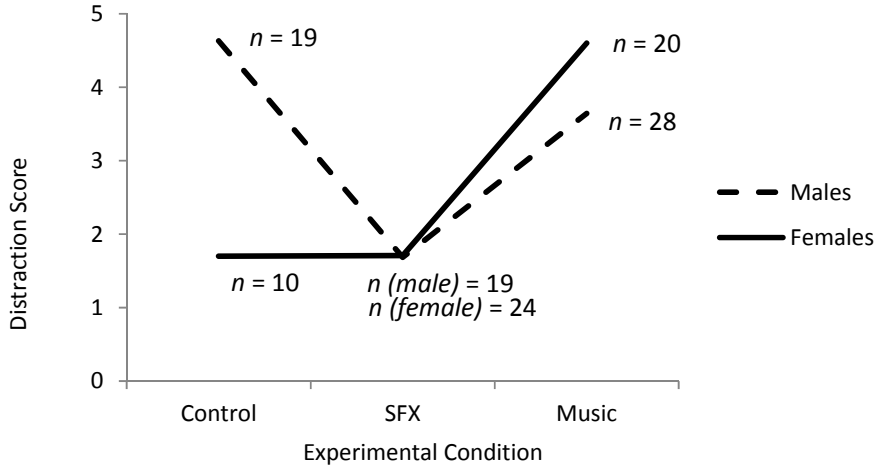


Figure 2. Distraction from e-fiction text by condition and gender (*N* = 120).

Hypothesis 4. It was hypothesized that participants' pre-existing enjoyment of fiction and propensity to read fiction will be positively correlated with enjoyment of and negatively correlated with distraction from a multimedia e-book in the multimedia conditions, relative to a text-only control. Readers who enjoy reading fiction and typically choose to read fiction were assumed to be more likely to enjoy a multimedia e-book more and be distracted less than participants who enjoy fiction less and thus choose to read fiction less.

To test this hypothesis, several linear correlations were performed within each of the multimedia conditions comparing firstly pre-existing enjoyment of fiction and secondly pre-existing propensity to read fiction with enjoyment of the e-fiction text. These correlations were then compared with the control group's correlation and tested for statistical significance. The results can be found in Table 6.

Table 6

Correlations between pre-existing enjoyment of fiction and propensity to read fiction with enjoyment of e-text.

N = 120		Control (*n* = 29)	SFX (*n* = 43)	Music (*n* = 48)
Pre-existing enjoyment of fiction	Enjoyment	.601	.808	-.071*
	Distraction	.540	-.840**	-.351**
Pre-existing propensity to read fiction	Enjoyment	.493	.643	.331
	Distraction	.363	-.550**	.120

* $p < .01$

** $p < .001$

The results indicate that the addition of both SFX and music to a multimedia text has a significant effect on the dependent variables of distraction and enjoyment. The baseline (control) relationship between pre-existing enjoyment of fiction and enjoyment of a fiction e-book was a moderately strong positive relationship—the more a participant enjoyed reading fiction in general, the more likely he or she was to enjoy reading a fiction e-book (r = .601, see Figure 3). While the addition of SFX served to enhance this relationship (r = .808), this new relationship was not significantly different from the control. An interesting result was found with the addition of music. In this condition, the previously existing positive relationship was completely—and significantly—neutralized (r = -.071, p < .01). This new relationship is surprising until one considers the graph of the results (see Figure 4 below). Although the relationship has been neutralized, the addition of music has served to bring enjoyment levels for those who previously did not enjoy reading fiction up to the level of those who regularly enjoy reading fiction. A fiction e-book with music added thus appears to be highly enjoyable for any reader, regardless of his or her previous enjoyment of fiction in general.

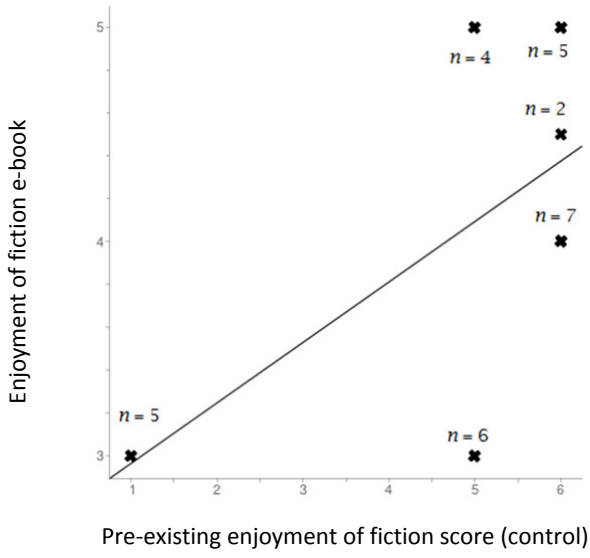


Figure 3. The moderately strong positive relationship between pre-existing enjoyment of fiction and enjoyment of the fiction e-book for the control group (N = 29).

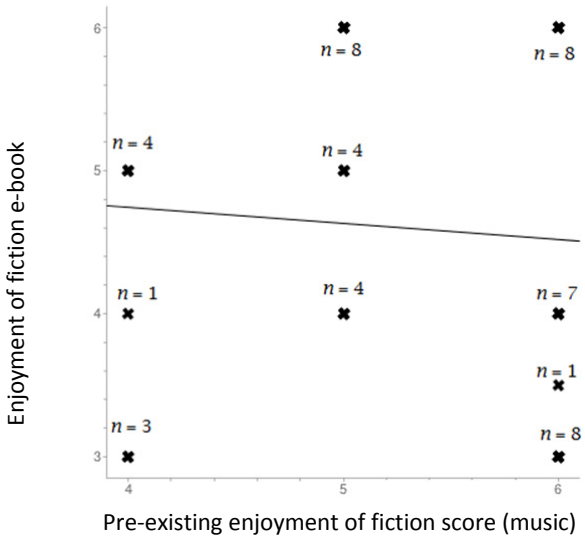


Figure 4. The neutralized relationship between pre-existing enjoyment of fiction and enjoyment of fiction e-book for the music condition ($N = 48$). The relationship exists at a high enjoyment score (between 4.4 and 4.8). The addition of music has thus made the e-book highly enjoyable for all participants.

When looking at the effects of pre-existing enjoyment of fiction on distraction, the baseline relationship was again a moderately positive one—the more a reader enjoyed fiction in general, the more likely he or she was to be distracted when reading a fiction e-text. However, the addition of music and SFX strongly and significantly reversed this relationship—when multimedia was added to the e-book, readers who enjoyed fiction more were less likely to be distracted from the text (SFX $r = -.840$, $p < .001$; music $r = -.351$, $p < .001$). Even though the reader is experiencing more stimuli from the e-text, the additions are unlikely to be distracting unless the reader doesn't typically enjoy reading fiction.

The pre-existing relationship between propensity to read fiction and enjoyment of a non-music e-text was, again, a moderate positive relationship (r = .493). The addition of SFX and music did not affect this relationship significantly (rs = .643 and .331, respectively; ns). A moderate positive relationship was also found between propensity to read fiction and distraction from a fiction e-text (control $r = .363$). Music again had no effect on this

relationship (r = .120, *ns*); however, SFX had a large and significant effect. The addition of SFX to a fiction e-text resulted in a moderate negative relationship between propensity to read fiction and distraction (r = -.550, p < .001). The more likely a participant was to choose to read fiction, the less likely he or she was to get distracted by a fiction e-book with SFX added.

Hypothesis 5. It was hypothesized that participants' propensity to be engaged in multimedia behaviors will be positively correlated with their enjoyment of a multimedia e-book and negatively correlated with distraction from a multimedia e-book. It was expected that the more familiar a participant is with multimedia behaviors combining music and text, the more likely they will be to enjoy a multimedia e-book and the less likely they will be to be distracted from it.

As with hypothesis 4, this hypothesis was tested by correlating multimedia behaviors with enjoyment and distraction for each of the multimedia testing conditions and comparing them to the control to test for differences. These analyses were performed for both regular week and free time week multimedia behaviors. The results can be found in Tables 7–10.

Reading fiction. The baseline (control) relationship between reading fiction (regular week) and enjoyment of a fiction e-book was slightly negative and almost negligible (r = -.124). The addition of SFX and music made this relationship positive (such that the more participants read fiction in a regular week, the more they will enjoy a multimedia fiction e-book), but this difference was not significantly different from the control.

A similar result was found for the relationship between reading fiction (regular week) and distraction from a fiction e-book. The baseline relationship was neutral (r = -.037). While the addition of multimedia affected this relationship slightly (especially music, where the correlation strengthened to -.317), these differences were not significant.

As can be seen in Table 9, the baseline relationship between fiction reading and enjoyment in a free time week is strong and positive (r = .766). This relationship was maintained when SFX were added, and the difference was not significant. However, music neutralized the relationship significantly (r = .277, p < .01). This neutralization served to bring the enjoyment of participants who do not read much fiction in their free time up to the level of enjoyment of those who choose to read much fiction in their free time.

The baseline relationship between fiction reading in a free time week and distraction from an e-book is small and positive (r = .219). The addition of SFX and music, however, both significantly resulted in a negative relationship (rs = -.498 and -.488, respectively; both ps < .01). The addition of multimedia effects resulted in participants who read much fiction in a free time week being distracted less than those who read little fiction.

In sum, participants who engage in high levels of reading fiction are not impacted in their enjoyment of a fiction e-book by the addition of SFX. The addition, however, does minimize distraction from an e-text for those who engage in more hours of reading fiction in a free-time week.

Reading (other than fiction). The baseline relationship between reading books other than fiction (regular week) and enjoyment of a fiction e-text is slightly negative (r = -.128). Interestingly, SFX and music both had significant effects on this relationship, but in opposite directions. SFX led to a stronger negative relationship between the variables (r = -.290, p < .05), indicating that the more hours participants spent reading books other than fiction in a regular week, the less likely they were to enjoy a fiction e-book with SFX. Contrastingly, music switched the relationship to be moderately positive (r = .429, p < .05), such that the e-book now became more enjoyable for the more voracious nonfiction readers. No effect was found as a result of the multimedia on distraction.

Table 7

Correlations of multimedia behaviors (regular week) with enjoyment of an e-fiction text (N = 120). Multimedia correlations are asterisked if significantly different from the control correlations above.

Regular week	Reading (fiction)	Reading (other)	Watching TV	Watching movies	Playing video games	Listening to music
Control (*n* = 29)	-.124	-.128	-.626	-.578	-.030	-.743
SFX (*n* = 43)	.246	-.290*	.076**	.376**	-.179	-.608
Music (*n* = 48)	.240	.429*	-.313	.083**	-.409	.253**

* p </= .05

** p < .01

Table 8

Correlations of multimedia behaviors (regular week) with distraction from an e-fiction text (N = 120). Multimedia correlations are asterisked if significantly different from the control correlations above.

Regular week	Reading (fiction)	Reading (other)	Watching TV	Watching movies	Playing video games	Listening to music
Control (*n* = 29)	-.037	-.225	-.286	.092	.382	-.188
SFX (*n* = 43)	.074 (.883)	.223 (.070)	-.271 (.949)	.032 (.811)	.166 (.351)	.769**
Music (*n* = 48)	-.317 (.237	.010 (.332)	-.004 (.239)	.345 (.278)	-.364**	-.320 (.566)

* p </= .05

** p < .01

Table 9

Correlations of multimedia behaviors (free time week) with enjoyment of an e-fiction text (N = 120). Multimedia correlations are asterisked if significantly different from the control correlations above.

Free time week	Reading (fiction)	Reading (other)	Watching TV	Watching movies	Playing video games	Listening to music
Control (*n* = 29)	.766	.952	-.249	-.235	.561	-.284
SFX (*n* = 43)	.741 (.818)	.474**	-.326 (.739)	.474**	.161 (.061)	-.266 (.938)
Music (*n* = 48)	.277**	.270**	-.254 (.983)	-.248 (.955)	-.361**	.162 (.065)

* *p* </= .05

** *p* < .01

Table 10

Correlations of multimedia behaviors (free time week) with distraction from an e-fiction text (N = 120). Multimedia correlations are asterisked if significantly different from the control correlations above.

Free time week	Reading (fiction)	Reading (other)	Watching TV	Watching movies	Playing video games	Listening to music
Control (*n* = 29)	.219	.609	-.500	-.009	.353	-.736
SFX (*n* = 43)	-.498**	-.149**	.140**	-.149 (.575)	-.085 (.072)	.208**
Music (*n* = 48)	-.488**	-.008**	-.079 (.056)	-.169 (.512)	-.502**	-.228**

* *p* </= .05

** *p* < .01

When considering multimedia behaviors in a free time week, the baseline relationship between reading books other than fiction and enjoyment of the e-book was strong and positive (r = .954). Both SFX and music maintained this positive relationship, just less strongly (rs = .474 and .270, respectively; both ps < .01). These significant results, however, are likely to be more an effect of the exceptionally strong control relationship than of the addition of multimedia. A positive relationship was maintained between the variables for all three conditions.

The baseline relationship between reading books other than fiction (free time week) and distraction from an e-book was a moderately strong positive one (r = .609). The addition of both SFX and music neutralized this relationship significantly (rs = -.149 and -.008, respectively; ps both < .01). Those who read more nonfiction in a free time week are less or equally likely to be distracted by SFX and music in a fiction e-book than those who read minimal nonfiction.

In sum, the effects of SFX and music on participant enjoyment are mixed—in some situations enjoyment was significantly enhanced, in other cases it was diminished. When looking at distraction, SFX and music significantly neutralized or reversed the pre-existing relationship, such that participants who engage in more of this particular multimedia behavior are less likely to become distracted when reading a multimedia e-book.

Watching TV. The baseline relationship between hours spent watching TV (regular week) and enjoyment of a fiction e-text was moderately negative (r = -.626), such that the more hours participants watched TV in a free time week, the less likely they were to enjoy a fiction e-book. The addition of music maintained this relationship (albeit producing a weaker relationship); however, adding SFX significantly neutralized the relationship. With the addition of SFX to the fiction e-book, the book was just as enjoyable for participants who

watched a significant amount of TV as for those who watched little. No changes to the baseline relationship (r = -.249) between watching TV in a free time week and enjoyment of a fiction e-book were found with the addition of SFX or music.

The baseline relationship between TV watching (regular week) and distraction from a fiction text was slightly negative (r = -.286). Neither the addition of SFX nor music affected this relationship significantly.

The addition of multimedia did, however, affect the relationship between watching TV (free time week) and distraction. The baseline relationship was moderately negative (r = -.500)—the more participants watched TV in a free time week, the less likely they were to be distracted from a fiction e-text (see Figure 5). However, the addition of music neutralised this relationship (r = -.079, p = .056)—all participants got distracted at the same relatively high level (see Figure 6). The addition of SFX made the relationship positive (r = .140, p < .01); however, the level of distraction was low compared with the control or music conditions (see Figure 7).

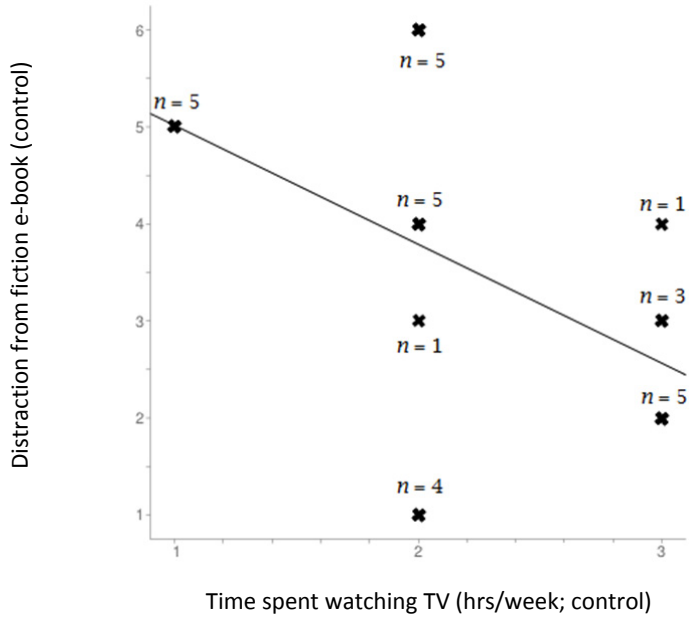


Figure 5. Strong negative relationship between watching TV (free time week) and distraction from e-book for the control group (N = 29).

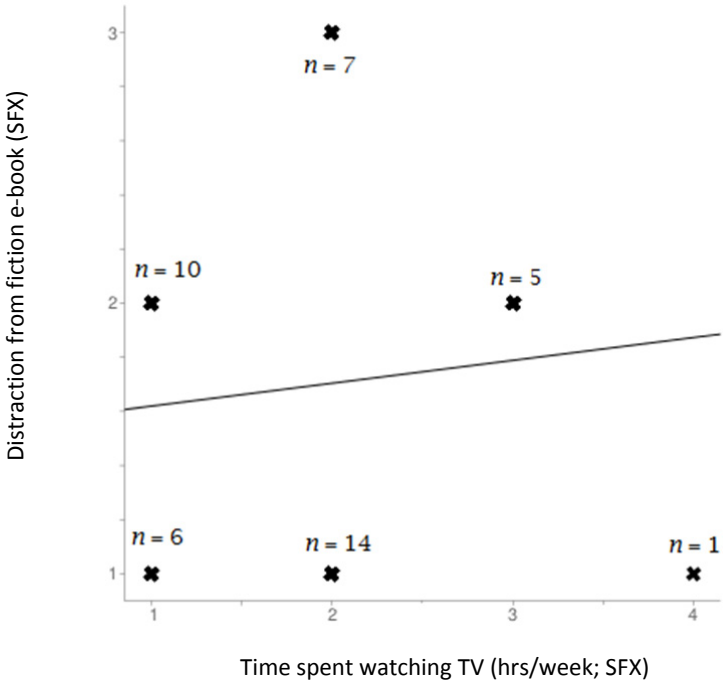


Figure 6. Positive relationship between watching TV (free time week) and distraction from e-book, SFX group ($N = 43$).

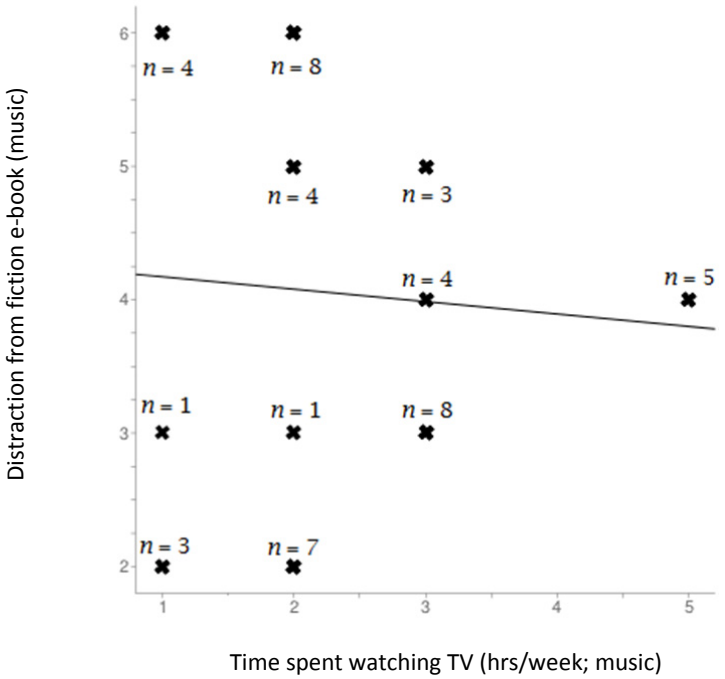


Figure 7. Neutralized relationship between watching TV (free time week) and distraction from e-book, music group ($N = 48$).

Watching movies. The baseline relationship between watching movies (regular week) and enjoyment of a fiction e-book is moderately negative (r = -.578)—the more participants choose to watch movies in a regular week, the less likely they are to enjoy a fiction e-book. However, the addition of SFX significantly reversed this relationship (r = .376, p < .01), such that those who watch more movies now enjoy the e-book more than those who watch movies less. Music neutralized the relationship (r = .083, p < .01), indicating that in the presence of music, the e-book is equally enjoyable for all.

Similar results were found regarding movie watching in a free time week. The initial negative relationship was significantly and positively affected by the addition of SFX (r = .474, p < .01). This time, however, music had no effect on the slightly negative original relationship.

The relationship between movie watching and distraction from a fiction e-text was approximately neutral in both regular and free time weeks. The addition of multimedia effects did not impact this relationship.

Playing video games. The addition of multimedia to a fiction e-book had no significant effect on the slightly negative relationship between playing video games (regular week) and enjoyment of a fiction e-book (r = -.030). However, the correlation did increase (albeit not significantly) with the addition of music (r = -.409). The addition of music likewise affected the free time week relationship to make the relationship negative; while the baseline relationship between playing video games (free time week) and enjoyment was initially moderately positive (r = .561), when music was added it became moderately negative (r = -.361, p < .01). It appears that the addition of music to an e-book makes the text increasingly unenjoyable the more hours the participant chooses to play video games in a free time week.

Music also has a significant effect on the relationship between video game playing and distraction. As the results for regular and free time weeks are comparable, they will both be considered together. The baseline relationship between these variables is moderately positive (*r*s = .382 and .353 for a regular and free time week, respectively), indicating that the more hours a participant chooses to play video games, the more likely they are to get distracted while reading a fiction e-text. However, the addition of music significantly reverses these relationships (*r*s = -.364 and -.502, respectively; *p*s < .01). Thus, while the addition of music makes the book less enjoyable for those who spend more hours playing video games, they are also less likely to be distracted from the text than their non-video gaming counterparts.

Listening to music. The baseline relationship between time spent listening to music (regular week) and enjoyment of a fiction e-book is a strong negative one (*r* = -.743)—the more hours a participant spends listening to music in a regular week, the less likely he or she is to enjoy a fiction e-book. The addition of SFX maintained this relationship. Perhaps unsurprisingly, the addition of music to the e-book significantly reversed the correlation (*r* = .253, *p* < .01). This result was maintained for free time week results, with the music condition correlation approaching significance (*r* = .162, *p* = .065).

The baseline relationships between time spent listening to music (regular and free time weeks) and distraction from a fiction e-book were negative (*r*s = -.188 and -.736, respectively). The more time participants spend listening to music, the less likely they are to be distracted from a fiction e-book. The addition of music to the text maintained the negative relationships, albeit with smaller magnitudes (none of the differences were significant). It seems that SFX, however, are more distracting for participants who listen to more hours of music in a week. For the regular week, the correlation between time spent listening to music

and distraction from a fiction e-book became strongly positive ($r = .769$, $p < .01$). The relationship was likewise positive for the free time week ($r = .208$, $p < .01$). The more a participant listened to music, the more they got distracted in a SFX-enhanced fiction e-book.

Chapter 5: Discussion

As fiction e-books follow their current trends and become an increasingly dominant sector of the publishing market, more and more publishing companies are investigating the multimedia features they can incorporate to make fiction e-books most appealing to readers. Independent companies such as Booktrack and existing publishing houses such as Simon & Schuster, Hachette, and Penguin have identified music as the first multimedia feature they would like to add to e-books, and they have already begun releasing music-enhanced titles.

However, while considerable research has investigated the effect that background music has on the reading of non-fiction texts, none has yet focused on the impact of soundtrack-style music and sound effects (selected to match the text) on readers' reactions to a fiction e-text. The present study aimed to fill this gap in the literature and provide the first empirical evidence of the effects that such multimedia can have on readers. This information has the potential to greatly impact the e-book publishing industry by helping publishers identify what multimedia appeals to viewers, what distracts them from the text, and what features of the multimedia are preferable to different audiences.

The results of previous research studying music's relationship with reader distraction were mixed. While many researchers found that music was distracting for participants who were reading a text (see Fendrick, 1937; Etaugh & Michals, 1975), many others found that it did not distract participants (see Freeburne & Fleischer, 1952; Henderson, Crews, & Barlow, 1945; Jäncke & Sandmann, 2010). However, in all of these situations the music was arbitrarily chosen by researchers (in order to provide more of a "music for noise's sake" type of distractor) or it was pop music chosen by the participants themselves, for enjoyment's sake but not to particularly match the text. No research to date had been performed investigating this relationship between music and text when the music or other type of multimedia has been

specifically composed or selected to match the fiction text.

The results of research investigating the relationship between music and reader enjoyment was much more consistent: the majority of researchers found that music enhances enjoyment of a text (or a textual task performed while listening to music, see Gladstones, 1969; Oldham et al., 1995; Smith, 1961). However, none of these studies have investigated whether specifically selected or composed music enhances enjoyment of a fiction text. Music increasing the enjoyment of a monotonous text-based task is one thing; enhancing the enjoyment of an actual fiction text may be a different case.

When considering situations where music has been selected to match the fiction story—movie soundtracks—the effect of music upon the viewers has been mostly assumed, but it is consistent: the majority of people feel that music enhances the emotional impact of the film (Meyer, 1956; Reyland, 2012; Schaefer, 1998). In general, the addition of music to film has been thought to be a positive one, helping the story "breathe. . . with life" (Wierzbicki, 2009, p. 20). The current research has extended these assumptions not only by examining music's effects in the sphere of fiction text, but by providing for the first time empirical evidence to validate the effects instead of relying solely on anecdotal evidence.

Primary Hypothesis

The present research aimed to fill this gap in the literature, hypothesizing that overall, the inclusion of multimedia effects (i.e., both music and sound effects) would enhance reader enjoyment of and minimize distraction in an e-book. This primary hypothesis was supported by the research, which found that the presence of multimedia in a fiction e-book led to both significantly higher enjoyment and significantly lower levels of distraction in readers than an e-book without multimedia. These empirical findings agree with many researchers who have previously studied the relationship between music and text, but in particular, these findings

extend the possible interpretations of this relationship to the fiction and e-book sphere.

The present study is the first to provide empirical support for the idea that multimedia e-books may be an enjoyable and popular reading alternative in the future. While more research would be needed to corroborate these results and provide further support for such a development in the publishing industry, these results indicate that the development of a multimedia e-book may well be a viable move for publishers in the twenty-first century.

Second Hypothesis

The second hypothesis in the present study aimed to break down the general results of the first hypothesis, considering the effects of both music and sound effects separately on enjoyment and distraction. It was hypothesized that significant differences would occur between the music, sound effects, and control conditions. An approaching significant effect was found when enjoyment was the dependent variable—both music and sound effects appeared to lead to a higher level of enjoyment than the non-enhanced control. While the result was not statistically significant, it is interesting to note that the direction of the findings was in the direction predicted by the hypotheses, and that the mean enjoyment levels for the music and sound effect conditions were both higher than that of the control condition. These findings are in line with those of hypothesis 1 and have the same promising applications to the use of multimedia e-books in the publishing industry.

A significant effect was found between the three conditions when considering distraction as the dependent variable. Sound effects led to significantly lower levels of distraction than either the control or music conditions (of which music had the highest levels of distraction). This result has interesting implications—if both music and SFX proved enjoyable to readers, but only SFX was significantly less distracting, should the multimedia e-book additions come only in the form of SFX? Or should the lack of difference between

music-enhanced e-books and the already-existing non-music e-books mean that the music addition should also be pursued? These are interesting questions worthy of future research. A noteworthy conclusion that can be derived from the present study, however, is that the addition of neither music nor SFX is more distracting to readers than a non-music e-book. This conclusion supports the addition of such multimedia effects to fiction e-books.

Third Hypothesis

The investigation of gender effects across the conditions produced results indicating that, as hypothesized, males and females did react differently to the addition of music and SFX to a fiction e-book. Females were found to have an overall higher level of enjoyment of the fiction e-book across conditions than males (they did not initially have higher levels of pre-existing enjoyment of fiction or propensity to read fiction). Additionally, females' enjoyment increased with the intensity of multimedia (lowest enjoyment in the control condition, middle enjoyment in the SFX condition, and highest enjoyment with music), whereas males' enjoyment was statistically consistent across all three conditions (still high, hovering at the "4 out of 5" level).

These results can be extrapolated to the publishing industry. Based on these findings, e-books that have a primarily female target audience may benefit greatly from the addition of music and SFX. If the enjoyment level is no greater in the multimedia conditions for males, it may be better to save the time and monetary investment needed to compose and implement music and SFX for novels with a primarily male audience and just publish the book as a regular e-book. However, more research is needed to discover whether these trends hold true for all genres and lengths of e-book.

Significant gender effects were also found when considering distraction. Distraction levels were different across all conditions, and they were significantly higher for males than

females. While the male participants in this study reported high levels of distraction in the control condition, this could be an aberration in the data. Additionally, the result could be a distraction effect as a result of males tending to view electronic formats more as a medium for accessing immediate information; the extended nature of reading fiction may mean they get bored and distracted purely because of the electronic format. Alternatively, males may just be more prone to distraction in general. More research is needed to verify this result. What is clear, though, is that distraction levels spiked markedly for both males and females in the music condition, and were lowest in the SFX condition. Again, this may lead publishers to consider SFX as an alternative to full music composition additions to their e-books, if distraction from the text is a major concern for them.

Fourth and Fifth Hypotheses

The final two hypotheses were concerned with audience appeal of multimedia fiction e-books: whether or not multimedia e-books would appeal mostly to those with a pre-existing love of fiction and propensity to read fiction, and whether a pre-existing penchant for multimedia behavior (reading, TV and movie watching, and video game playing) would increase enjoyment of and minimize distraction from a multimedia e-book. These hypotheses stemmed from research that has found that differing personality traits in the participants lead to differing enjoyment of and distraction from texts accompanied by music (see Furnham & Allass, 1999).

Fourth hypothesis. The baseline relationships between pre-existing enjoyment of fiction and enjoyment of and distraction from a fiction e-book were established in the control condition. It was found that both relationships were positive—as readers had a higher pre-existing enjoyment of fiction, they were more likely both to enjoy and to be distracted from the fiction e-book. The same results were found for participants with a pre-existing

propensity to read fiction. Based on these results, one could infer that the fiction e-book market would best be aimed at those who were already voracious readers who highly enjoyed reading.

Adding music and SFX to the fiction e-book, however, produced some fascinating results. While SFX served only to strengthen the relationship (compared to the control condition) between pre-existing enjoyment of fiction and enjoyment of a fiction e-book (i.e., making the SFX e-book more enjoyable mainly only to those who already highly enjoyed fiction), music served to enhance enjoyment regardless of whether or not readers reported pre-existing enjoyment of fiction. When examining this effect on a chart, it could be seen that, while the positive relationship no longer existed, this was because all readers' enjoyment had been elevated to approximately the same level as that of those readers with the highest pre-existing enjoyment of fiction. With the addition of music, now all readers were highly enjoying the fiction e-book.

This has amazing implications for the publishing industry. Instead of their e-book audience consisting primarily of those who were already keen readers, the addition of multimedia has the possibility to open up that audience to all readers—even those who may previously have not enjoyed reading. Multimedia fiction e-books, then, could be the next step in revolutionizing the reading industry, providing a novel form of entertainment to an audience that may previously have been lost to the world of smartphone apps and video games.

Promising results were also found when considering the relationship between pre-existing enjoyment of fiction and distraction from a fiction e-book. While the baseline (control) relationship was positive, the addition of both SFX and music significantly changed this relationship to be negative—particularly in the case of SFX. Where previously those who

most enjoyed fiction were the most distracted from the text, the addition of multimedia has allowed this cohort to be the least distracted. The lack of distraction among what would probably be the greatest purchasers of fiction e-books is also a positive result for the publishing industry, because it indicates that the development of multimedia e-books would not be too novel or confusing for their largest section of target audience.

The addition of multimedia had no effect on the already-positive relationship between pre-existing propensity to read fiction and enjoyment of the e-book. In each case, those readers who were more likely to read fiction were those most likely to enjoy the e-book, regardless of condition. A positive baseline relationship also existed between pre-existing propensity to read fiction and distraction from a fiction e-book—the more likely participants were to choose to read fiction, the more distracted they were from the text.

When adding multimedia, music decreased this positive relationship (though not significantly), but SFX had a drastic result—the presence of SFX significantly reversed the relationship, such that those participants who chose to read fiction more often were now less likely to be distracted from the e-book than those who chose to read fiction less. This is further evidence in support of the fact that e-books with SFX are less likely to distract those people who are most likely to buy fiction e-books—another positive result for the publishing industry.

It is interesting to note the seeming lack of relationship between distraction and enjoyment. In the control condition, the readers with the highest pre-existing enjoyment of fiction were the most distracted, but they also enjoyed the text most. In the music condition, the readers with the lowest pre-existing enjoyment of fiction were the most distracted, but they also highly enjoyed the e-book. The level of distraction from the text does not seem to impact readers' enjoyment of the e-book. It would be interesting to note in future research

whether or not distraction affects readers' decisions to purchase the e-book (or other variables of interest to publishers).

Fifth hypothesis. Hypothesis 5 proposed that participants' propensity to be engaged in multimedia behaviors will be positively correlated with their enjoyment of a multimedia e-book and negatively correlated with distraction from a multimedia e-book. While the full results are detailed in the previous chapter of the present thesis, the overall conclusion that can be grasped from the results is that they are scattered. There were many situations where the addition of SFX and music had no effect on the control relationships between multimedia behaviors and enjoyment/distraction (e.g., when considering reading fiction or playing video games in a regular week). There were others where SFX and music both had significant effects, but in opposite directions (e.g., reading other than fiction in a regular week). And there were still other situations where either SFX and music or both had significant effects but in the same direction (e.g., reading non-fiction on distraction in a free time week).

While these results supported the findings of previous researchers—that differing personality factors lead to differing levels of enjoyment and distraction—the application to the hypothesis was different. Essentially, the results of this hypothesis are inconsistent across categories of multimedia behavior and across the categories of regular vs. free time week. While there are some interesting findings gathered here, the hypothesis did not seem to be supported—a propensity for multimedia behavior did not increase enjoyment of and minimize distraction from a multimedia e-book across the board, and the addition of SFX and music did not allow this to be the case, either. The implication for the publishing industry is that it may not be possible to target potential audiences for multimedia fiction e-books based on readers' pre-existing propensity for multimedia behaviors, as no consistent relationship seems to exist between the variables.

An interesting observation across all conditions is the fact that enjoyment and distraction did not seem to be opposite variables. That is, an increase in distraction from the e-book text did not necessarily manifest itself by a corresponding decrease in enjoyment. Instead, it was frequently seen that participants may find the multimedia e-books distracting but still experience a high level of enjoyment from reading them. This observation may be more easily understood by considering the purpose of both fiction texts and music/SFX. Fiction texts in general are meant to be diverting—allowing readers to escape the world around them. Multimedia also is meant to be diverting. However, in the case of the e-books used in this experiment, where the music and sound effects were designed to match the text, the multimedia and text are diverting the reader together—with purpose. There is a clear reason behind the potentially distracting noise, and thus the multimedia e-books are more enjoyable than, for example, a reading task performed to unrelated popular music. The purpose behind the fusion of fiction and multimedia allows for the reader to be swept away into the story's world, in a highly enjoyable way.

Limitations

While the results of the present study have exciting and important implications for the publishing industry, the study was limited in its ability to answer many questions. These limitations, and how they could be addressed in future research, will be listed in the following paragraphs.

The present study was limited to a relatively small number of participants (especially the control group) taken from a pool of university students. University students as a cohort, even if they do not particularly enjoy reading, are mostly skilled readers used to reading substantial amounts of text comprehensively and regularly as part of their education. As a result, there may not have been an adequate representation of truly unskilled readers who do

not enjoy reading in the sample. Additional research should replicate this study using a broader sample of readers at different ages across the community.

A broader age range would also help to get a better picture of how multimedia e-books would appeal to a wider audience range. Investigations could be done regarding the typical breakdown of ages of people purchasing e-books, and a sample selected to be representative of this population. Multimedia e-books may not be as popular to generations who did not grow up with the amount of technology present today. Additionally, they may be more appealing to younger readers. This is an interesting area of further research that should be investigated.

For the ease of performing the experiment, the story used in this study was necessarily short. The story in general took participants less than three minutes to read. Thus, the participants' experience with the music and SFX may not be generalizable to the effects of such multimedia on participants reading a full-length novel. Further research could use longer texts enhanced with multimedia to arrive at more representative results.

It is possible that the interest in and enjoyment garnered from the multimedia e-book could be due to a novelty effect—interest in and enjoyment of the book simply because it is something never before seen. A way of accounting for this possibility and eliminating it in the future could be to perform this experiment as a longitudinal study—perhaps over a period of two or more weeks. As participants become more familiar with the e-book, the risk of enjoyment purely due to the multimedia e-book's novelty would be minimized and a more accurate view of the relationship between the variables could be acquired.

Additionally, the e-book text used in this experiment was a suspenseful murder-mystery. This subject matter and associated music/sound effects may not elicit the same reactions as other genres. Additional studies replicating this one but investigating different

genres and incorporating different music and sound effects should be conducted to see if the results are maintained across genres.

Finally, the present study delimited the scope to continue the investigation of the relationship between music/sound effects and a written text. While there are several facets of multimedia e-books that could have been investigated in this thesis (e.g., animation effects, autoscrolling, embedded video, and audiobooks, to name a few), the present thesis limited its scope solely to an investigation of the effects of specially composed music and sound effects on a fiction e-book short story text. These other multimedia features could be investigated in future studies to more fully assess the impact of multimedia e-books on readers.

Summary

In sum, the present study is the first to investigate the empirical effects of sound effects and music on readers' enjoyment of and distraction from a fiction e-book. While the study was limited in some aspects by its population pool, the length of the e-book, and the testing of only one fiction genre in the experiment, it has found that multimedia may indeed enhance reader enjoyment of fiction e-books and minimize distraction. It has also found that the use of multimedia features in fiction e-books may appeal to a wider audience of readers than fiction e-books alone, potentially allowing publishers to target a previously untapped market. These results have enormous implications for a publishing industry that is increasingly affected by new technologies, and future research into this exciting sphere of reading technology is highly recommended for modern readers to experience text to the greatest extent possible.

Chapter 6: Conclusion

Research has indicated that music has a unique and powerful ability to affect how listeners react to a scenario. The present study aimed to investigate the relationship between music and text by examining whether music or sound effects can act as distractors from a fiction e-book and whether readers enjoy music- or sound effects-enhanced fiction e-books more compared with regular fiction e-books. This study aimed to build on previous research, which had mostly focused on music as a distractor to participants comprehending non-fiction texts, by extending the scope of the research to fiction texts, with music and sound effects specifically tailored for the text genre (similar to film scores).

The present study investigated this relationship by presenting three equivalent and randomly assigned participant groups with a fiction e-book, either on its own (control condition), accompanied by sound effects (SFX condition), or accompanied by music (music condition). After reading the e-book, participants rated their enjoyment of and distraction from the e-book on six-point Likert scales. The means were compared to assess the impact of the multimedia on the reading experience. It was found that multimedia-enhanced e-books were significantly more enjoyable ($M = 4.555$) than e-books alone ($M = 4.035$). The multimedia e-books were also significantly less distracting ($M = 2.901$) than e-books alone ($M = 3.621$). When considering the individual conditions, it was found that both SFX and music (Ms = 4.512 and 4.594, respectively) led to higher levels of enjoyment than the control condition ($M = 4.035$), although this effect was only approaching significance. Of the two multimedia conditions, only SFX significantly lowered distraction levels compared with the control (Ms = 1.698 and 3.621, respectively).

Individual differences between the participants were then considered, beginning with gender. While enjoyment for males remained constant across conditions, females' enjoyment

increased successively from control to SFX, then from SFX to music. Each difference was significant, as was the interaction between gender and e-book condition on enjoyment. A significant interaction was also found when considering distraction as the dependent variable. While both groups were low in distraction for the SFX condition and high in the music condition, males were high in control while females were low. It is unknown whether this is an aberration in the data due to testing factors.

Finally, participants' propensity to be engaged in multimedia behaviors was investigated. It was hypothesized that participants who spent more hours engaged in multimedia behaviors would enjoy the multimedia e-book more and be distracted less; however, the results were scattered. There were many situations where the addition of SFX and music had no effect on the control relationships between multimedia behaviors and enjoyment/distraction (e.g., when considering reading fiction or playing video games in a regular week). There were others where SFX and music both had significant effects, but in opposite directions (e.g., reading other than fiction in a regular week). And there were still other situations where either SFX and music or both had significant effects but in the same direction (e.g., reading non-fiction on distraction in a free time week). It was concluded that the hypothesis was not supported and that no overarching claims can be made about participants' individual propensity for multimedia behaviors and their effects on enjoyment of and distraction from a multimedia-enhanced fiction e-text.

Implications

The results of this study have important implications for the publishing industry, particularly as it increasingly turns to publication of e-books. The most important implications are outlined below:

- The addition of multimedia does significantly impact reader enjoyment of and distraction from fiction e-books. Further research in this field is warranted.
- While both music and SFX significantly increase enjoyment, only SFX decreased distraction. Perhaps this may be a cost-effective option for publishers wishing to add multimedia to e-books but without the budget to compose or implement complete novel-length musical scores.
- The addition of multimedia had the greatest effect on fiction e-book enjoyment for females. Male enjoyment was not affected across conditions, although both genders experienced low distraction in the SFX condition.
- Music neutralized the previously existing positive relationship between enjoyment of fiction and enjoyment of the fiction e-book. Instead of fiction e-books being enjoyable only to already avid readers, the addition of music made them highly enjoyable to all readers. This effect was found several times throughout the research, indicating that the addition of music to fiction e-books may open up potential reading audiences to a much wider market.
- Propensity to engage in multimedia behaviors, however, did not affect how much readers enjoyed or were distracted from a multimedia-enhanced fiction e-book.

Thus, the "ideal e-book," based on the results of this study, would probably involve music for a text targeted at females and sound effects for a text aimed at males. The book would likely involve modular playback options allowing readers to control access to music and sound effects. The books would be enjoyable for all readers regardless of their previous enjoyment of or choice to read fiction.

The present study is the first to support the notion that publishers may have much to gain from the publication of multimedia-enhanced fiction e-books. Such books may appeal to a wider audience than currently targeted, and they may increase the enjoyment of the reading experience for many individuals. However, it is important to follow up the present study with research addressing some of the limitations identified in this study. Future studies could consider testing for the novelty effect of enjoyment of multimedia e-books by conducting a similar experiment to the present study over time, perhaps by performing a series of readings. Enjoyment may last over time (indicating a true effect of multimedia on reader enjoyment of a fiction e-book) or fade over time (indicating that perhaps early enjoyment was the result of the novelty of a fiction e-book). Additionally, immigrants to digital technology, such as older participants or those unfamiliar with multimedia, should be studied to see whether they respond as college-aged students familiar with technology do. Finally, future research could continue the present experiment with participants representative of the most common fiction e-book readers (based on research). This sample, comprising the biggest market population for the product, would be invaluable in providing their reactions to multimedia e-books. Such research, like this study, could provide important information to the publishing industry and perhaps revolutionize reading experiences as publishing moves further into the twenty-first century.

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Appendix A

Sociolinguistics Survey (Condition ___)

Age: □ < 18 □ 18–20 □ 21–23 □ 24–26 □ 27+

Gender: □ Male □ Female

Major: □ Business □ Education □ Engineering □ Family, Home, & Social Sciences
□ Humanities □ Law □ Life Sciences □ Nursing
□ Science & Mathematics

How much do you **enjoy reading** fiction books?

Not at all					I love reading fiction
1	2	3	4	5	6

When you have free time, how likely are you to **choose to read** a fiction book?

Not at all					It's my favorite pastime
1	2	3	4	5	6

Please estimate the amount of time (in hours) that you spend engaged in the following activities **in a regular week**:

Reading fiction	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+
Reading (other than fiction)	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+
Watching TV	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+
Watching movies	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+
Playing video games	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+
Listening to music	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+

Please estimate the amount of time (in hours) that you spend engaged in the following activities **in a "free time" week** (e.g., during summer; while on vacation):

Reading fiction	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+
Reading (other than fiction)	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+
Watching TV	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+
Watching movies	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+
Playing video games	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+
Listening to music	□ <1	□ 1–3	□ 4–6	□ 6–10	□ 10+

You may now complete the experiment. When you are finished, please answer the questions on the reverse of this page.

Appendix B

Chapter One

An Alley of Endings

The ghostly passage was dark and forsaken, shrouded by an uncounted number of lifeless vapors drifting lazily up from the grated gutters below. In the distance, one could hear the occasional scream of a siren, or perhaps the pleading, unanswered cry of some disembodied voice soon to be silenced.

For this was an alley of endings, a place where life and love often came to die. And it was to this very alley of endings that the unfortunate man in the suit had chosen to run.

1

His heart was pounding. His breath, caught deep in the back of his throat. Stumbling around a corner at the neck of the road, he suddenly lost his balance and slipped in the grimy slush of one of the roads many half-frozen puddles.

His head hit the ground hard, but the gash that followed was virtually undetectable among the spattering of cuts and bruises already littered across the frenzied man's face. He was quick to regain his footing and continue, but the merciless alley's interference was all the time needed for the suited man's assailants to close the gap that separated them from their quarry.

2

The shot rang out loud and clear; it was enough to bring the intended victim down a second time. And in the wake of the gun's dying echoes, all that could be heard were the frantic gasps of a wounded man too beaten to carry on.

And then footsteps. Slow and deliberate.

3

"Please know that we never wanted it to come to this."

A small cluster of silent figures came to stand behind the man whose voice had finally broken the uneasy quiet of the oft-abandoned street. The man on the ground turned with great pain to look his hunter in the eyes as a single bead of sweat dropped to mingle with the freezing blood caked across his battered face.

"Tell me, Judah," choked the fading man, desperate for even the slightest of breaths. "Where did we go wrong?" As he spoke, his will finally gave in to the overbearing strength of hopeless resignation.

"But that's just it, you see," came the whispered reply from up above. "We never did."

4

And then, darkness came to the palsied man lying on the icy floor of this alley of endings. The man called Judah gave a simple nod, and those waiting behind him moved immediately to retrieve their fallen target. They raised the limp body up from off the ground and carried him back to the head of the alley.

Judah limped slowly behind the rest, his long silver hair gleaming in the moonlight peering in from the open sky above.

"I tell you," he whispered to himself once more, closing his eyes tight. "We never did."

The suited entourage then disappeared around the corner, leaving the darkened street to linger once again in its unyielding state of vengeful purgatory.

Appendix C

Sound Effects	Text	*Music*
	An Alley of Endings	
Light rain falling (continues throughout)	The ghostly passage was dark and forsaken, shrouded by an uncounted number of lifeless vapors drifting lazily up from the grated gutters below. In the distance, one could hear the occasional scream of a siren, or perhaps the pleading, unanswered cry of some disembodied voice soon to be silenced.	*Slow piano and cello duet. Cello solo is prominent.*
	For this was an alley of endings, a place where life and love often came to die. And it was to this very alley of endings that the unfortunate man in the suit had chosen to run.	
	His heart was pounding. His breath, caught deep in the back of his throat. Stumbling around a corner at the neck of the road, he suddenly lost his balance and slipped in the grimy slush of one of the road's many half-frozen puddles.	
	His head hit the ground hard, but the gash that followed was virtually undetectable among the spattering of cuts and bruises already littered across the frenzied man's face. He was quick to regain his footing and continue, but the merciless alley's interference was all the time needed for the suited man's assailants to close the gap that separated them from their quarry.	*Cello increases in intensity and volume. Piano chord accompaniment becomes stronger.*
Gunshot.	The shot rang out loud and clear; it was enough to bring the intended victim down a second time. And in the wake of the gun's dying echoes, all that could be heard were the frantic gasps of a wounded man too beaten to carry on.	
Slow footsteps.	And then footsteps. Slow and deliberate.	
	"Please know that we never wanted it to come to this."	
	A small cluster of silent figures came to stand behind the man whose voice had finally broken the uneasy quiet of the oft-abandoned street. The man on the ground turned with great pain to look his hunter in the eyes as a single bead of sweat dropped to mingle with the freezing blood caked across his battered face.	*Piano fades; focus is on the solo cello.*
	"Tell me, Judah," choked the fading man, desperate for even the slightest of breaths. "Where did we go wrong?" As he spoke, his will finally gave in to the overbearing strength of hopeless resignation.	
	"But that's just it, you see," came the whispered reply from up above. "We never did."	

Sound Effects		*Music*
Light rain continues to fall.	And then, darkness came to the palsied man lying on the icy floor of this alley of endings. The man called Judah gave a simple nod, and those waiting behind him moved immediately to retrieve their fallen target. They raised the limp body up from off the ground and carried him back to the head of the alley. Judah limped slowly behind the rest, his long silver hair gleaming in the moonlight peering in from the open sky above. “I tell you,” he whispered to himself once more, closing his eyes tight. “We never did.” The suited entourage then disappeared around the corner, leaving the darkened street to linger once again in its unyielding state of vengeful purgatory.	*Piano fades. Cello becomes soft.*

Appendix D

How much did you enjoy reading this passage?

Not at all					I really enjoyed it
1	2	3	4	5	6

How distracted were you while you were reading this passage?

Not at all					Extremely distracted
1	2	3	4	5	6

If you were distracted, what was the source of your distraction?

- □ External noise
- □ My own thoughts
- □ The book was boring
- □ Music
- □ Sound effects
- □ Other _____