Playing the Story: Transportation as a Moderator of Involvement in Narratively-Based Video Games

Thesis

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Abstract

Though video games are typically discussed in terms of presence, or the experience of a virtual environment as real, this concept alone cannot account for the narrative component present in many of today’s modern video games. Transportation, a concept that specifically addresses immersion into a story, could apply well to video game narratives. This study examines transportation as a moderator of the relationships between narrative and four outcome variables – presence, enjoyment, identification, and parasocial interaction – in a narratively-based video game. Though transportation was not demonstrated to be a significant moderator, post hoc analyses revealed that transportation did significantly mediate the relationships between narrative and the outcome variables of interest.
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Table of Contents

Abstract .......................................................................................................................... ii
Acknowledgements ...................................................................................................... iii
Vita ............................................................................................................................... iv
List of Tables ............................................................................................................... vi
List of Figures ............................................................................................................. vii
Literature Review ....................................................................................................... 1
Method ......................................................................................................................... 16
Results ......................................................................................................................... 22
Discussion ................................................................................................................... 29
References ................................................................................................................... 35
Appendix A: Table and Figures .................................................................................. 42
Appendix B: Measurement Items .............................................................................. 46
List of Tables

Table 1. Correlation Matrix.................................................................34
List of Figures

Figure 1. Indirect relationship between narrative and presence…………………………35

Figure 2. Indirect relationship between narrative and enjoyment…………………………35

Figure 3. Indirect relationship between narrative and enjoyment for frequent players of violent video games........................................................................................................36

Figure 4. Indirect relationship between narrative and enjoyment for infrequent players of violent video games........................................................................................................36

Figure 5. Indirect relationship between narrative and identification…………………………37

Figure 6. Indirect relationship between narrative and parasocial interaction………………37
Literature Review

Although the inclusion of narrative in video games is not a new phenomenon (Lowood, 2006), this component has been relatively unaddressed in previous research. The examination of video game involvement typically focuses on the concept of presence (see Eastin, 2006; Eastin & Griffiths, 2006; Ivory & Kalyanaraman, 2007; Lee, Jin, Park, & Kang, 2004; Schneider, Lang, Shin, & Bradley, 2004), defined as the experience of a virtual environment as real (Lee, 2004). However, presence alone cannot account for immersion into the stories of narratively-based video games, as it only focuses on the environment of the game world.

Transportation, a concept typically applied to non-interactive media, could account for this narrative component (Green & Brock, 2000). Defined as absorption into a story, transportation entails emotional response, focused attention, and mental imagery. The narratives present in modern video games could likely invoke all of these dimensions.

As modern games increase in narrative sophistication (Shapiro, Pena-Herborn, & Hancock, 2006), examination of their unique contribution becomes important for understanding the impact of video games. The application of transportation to video game narratives could be an important step in developing a body of research, serving as a foundation on which to expand. If transportation proves to be a significant moderator of
the relationship between video game narratives and various aspects of the gaming experience, much of the previous research concerning transportation may be applicable to video games (e.g., the role of transportation in persuasion). This study will examine the effect of a transportive experience on other types of media involvement (presence, identification, and parasocial interaction) and enjoyment of a narratively-based video game.

**Presence**

Video game research has typically examined the concept of presence (see Eastin, 2006; Eastin & Griffiths, 2006; Ivory & Kalyanaraman, 2007; Lee et al., 2004; Schneider et al., 2004). Lee (2004) defines presence as “a psychological state in which virtual (para-authentic or artificial) objects are experienced as actual objects in either sensory or nonsensory ways” (p. 37). This definition has a few components of note. First, objects may be artificial (computer characters, components of the physical virtual environment) or para-authentic (real people who are represented by characters, often known as avatars [Shapiro et al., 2006]). Whether or not the objects are representative of things that exist in the real world, they are experienced as real. Second, the inclusion of the phrase “sensory or nonsensory ways” (p. 37) is included to encompass any sense of presence that may be experienced while using low-tech media (e.g., books).

Within presence, many typologies have been theorized (see Heeter, 1992; Biocca, 1997; Lombard & Ditton, 1997; Tamborini & Skalski, 2006). Though the number of types and labels affixed to each type of presence within these typologies differ, Lee (2004) proposes a three-part typology in his explication of presence that neatly
summarizes these other typologies. Lee’s three dimensions include physical, social, and self-presence. When experiencing physical presence, media consumers are not aware of the para-authentic or artificial nature of the mediated environment. The virtual world feels like the real world. Social presence is the extent to which one feels that social actors within the mediated environment are real. Finally, self-presence is the experience of the virtual self as real. In other words, the character representing the media user feels authentic. These three dimensions combined make for a strong sense of presence within a mediated environment.

Narrative

Few studies have examined the effect of narrative on experience of presence during video game play (Lang, Schneider, & Dietz, 1999; Lee et al., 2004; Schneider et al., 2004), though the application of narratives to video games has interesting implications for the study of media involvement. Lee, Park, and Jin (2006) define narrative as “a representation of events that provides a cognitive structure whereby media users can tie causes to effects, convert the complexity of events to a story that makes sense, and thus satisfy their primitive urges to understand the physical and social worlds” (p. 265). Like most past definitions of narrative, this one contains the basic notions of sense-making and cause-effect relationships. However, unlike most definitions of narrative, this conceptualization applies easily to interactive media.

The majority of narrative definitions assume a static storyline that cannot be altered (see Abbott, 2002; Lowe, 2000; Mallon & Webb, 2000). The structure of the narrative is predetermined, not allowing for interactivity. Clearly, such a definition could
not be applied to video games. The definition proposed by Lee et al. (2006) and presented above accounts for the role of the media consumer in the flow of a storyline. A fixed narrative is not essential; rather, a general cohesiveness of events and overall comprehensible flow are all that is needed to constitute a narrative.

*Narrative in video games*

Inclusion of narratives in video games is not a new phenomenon. In fact, Willy Crowther’s *Adventure*, considered the prototype for a narrative genre of games, was released in 1976 (Lowood, 2006). The game was a text adventure, played by typing simple responses to text generated by the computer program. Text descriptions of rooms allowed players to navigate through the game environment. Players completed specific tasks through various actions and puzzle-solving.

Though an argument could be made that the storylines in the narratively-based games of today are similar in amount of detail to narrative games of the past, modern games are much more realistic (Kramer, 1995; Newman, 2002). They play more like movies in a sense, with cut-scenes that advance the storyline. This higher level of realism, combined with detailed narrative, makes modern games a unique medium for study.

In one of the earliest attempts to empirically study narratives in the context of video games, Lang et al. (1999) examined story in the form of sequential actions. They labeled the four stages that regularly occur in combative video games: hunt (looking for or avoiding opponents), see (opponent spotted but not engaged), fight (player attempts to kill opponent), and kill (either player or opponent dies). In general, game players
experienced different levels of physiological arousal as a function of stage. This finding also differed across gender, in that men and women were more aroused at different stages. Though not explicitly referred to as narrative, the ordering of set actions and examination of their effects on physiological arousal provided a sense of how narrative may impact video game players.

Continuing this research, Schneider et al. (2004) found that games containing narrative increased feelings of identification, presence, and physiological arousal. However, there are a few limitations to this study. First, narrative was never clearly operationalized. Several definitions were cited, indicating that at least two causally and temporally sequential events were necessary to constitute narrative. In regard to the stimulus games used, however, the authors never addressed what was used to differentiate between the narrative and non-narrative games. The only information provided was the genre of all four games (first-person shooter). In addition, their use of four different games (two narrative, two non-narrative) would have likely confounded their results due to differences between the games. Second, participants only played each game for eight minutes. It seems highly unlikely that players could make cause-effect connections and gain an overall understanding of the story after only eight minutes of play. Third, presence was measured using three semantic differential scales and a 9-point pictorial Self-Assessment Manikin (SAM). Three semantic differential scales are unlikely to capture the complexity of all three dimensions of presence. In addition, the SAM was poorly correlated with the semantic differential scales ($r = .50$), indicating that their assessments of presence were not likely accurate. Finally, the narrative games employed
(Outlaws, Half-Life) are limited in terms of realism and narrative detail compared to modern video games. Today’s modern narrative games play more like movies and are likely to produce even stronger results with respect to the experience of presence.

More recently, Lee et al. (2004) found that narratives increased feelings of presence by showing 30 minutes of a film before participants played a game related to that film clip. Subjects played the game Max Payne after being randomly assigned to either watch 30 minutes of a movie about the life of the main character or not. Those who watched the video clip before playing the game involving the main character of the clip experienced more presence than those who played the game without watching the video clip. However, the authors did not account for the narrative present in the game. Max Payne “is a relentless story-driven game about a man on the edge, fighting for his justice while uncovering plot twists and twisted thugs in the gritty bowels of New York during the century’s worst blizzard” (Rockstar Games, n.d.). Therefore, the study did not examine narrative vs. non-narrative experiences, but rather film and game narrative together vs. game narrative only. Though the narrative used in the study was not actually part of the video game, the results demonstrate that playing a video game with an accessible narrative in mind facilitates an experience of presence.

Transportation

Though video games have been examined in regard to presence and narrative, the concept of transportation has yet to be applied to the gaming experience. Transportation is defined as absorption into a story, which would logically apply to video games containing narrative. As developed by Green and Brock (2000), transportation consists of
three components. The first component is attention. All of the viewer’s cognitive energies are focused on the narrative, resulting in a loss of access to the real world. This loss of real-world access occurs on two levels: the physical level, wherein the viewer does not notice occurrences in the surrounding environment, and the psychological level, in which the viewer does not experience any interruption of extraneous mental activity. The transportive experience reduces counterarguing and scrutinizing of the content (Bilandzic & Busselle, 2008). The second component is an experience of mental imagery. When transportation was originally conceptualized for application to print media, mental imagery referred to the extent to which the reader was able to imagine the events described taking place. As applied to visual media, it is more accurately expressed as the extent to which the viewer can imagine him/herself in the narrative. Finally, transportation involves emotional response to a narrative. Emotion of the receiver is invoked through the power of the story.

Transportation vs. Presence

Though Green, Brock, and Kaufman (2004) cite presence as being conceptually similar to transportation, some very basic differences exist. Both transportation and presence do entail immersion with media and the experience of a virtual world. However, the two concepts differ as to the focus of immersion. As laid out in the above summary, presence is about experience of the virtual environment as though it was real. The characters, objects, and even the self feel authentic to some degree. Presence is experienced to the extent that media users can visualize themselves within that separate, virtual environment. Those experiencing presence can imagine themselves touching
objects in the virtual world, walking through the environment, and interacting with characters. Transportation, on the other hand, is about full absorption into the narrative. The viewer is able to imagine him or herself in the story, while feeling completely immersed and responding emotionally to the content. The actual physical environment in which the story occurs is not of much importance. The events that transpire and contribute to the overall narrative induce a feeling of transportation. In addition to this fundamental difference, further distinctions can be made between these two concepts and other similar terms.

*Cognitive vs. Affective Feeling.* Transportation and presence can be differentiated as two different types of feeling. Schubert (2009) made a distinction between cognitive and affective feelings. Cognitive feelings are “experiences that arise from perceptual and cognitive processes that are not specifically concerned with evaluations” (p. 166). In other words, these types of feelings have no positive or negative association. For example, one may feel uncertain or distracted, but these feelings are not affectively tied to a particular stimulus. Affective feelings, on the other hand, are defined as “positive and negative feelings about a person, an object, a situation, or the self, which can be short-lived or enduring” (p. 165). Unlike cognitive feelings, affective feelings are evaluative of a particular stimulus. It is important to note that all types of feelings share a number of characteristics, but most important in this context is that they result from unconscious mental processes.

Presence, in terms of Schubert’s (2009) definition, is a cognitive feeling resulting from unconscious spatial cognition processes. The subjective experience of presence is
feedback produced by the construction of a mental model of the self within the virtual environment. Rather than a feeling produced in evaluation of the game (which would be an affective feeling), media users feel as though they are in a different world.

Transportation, on the other hand, may be considered an affective feeling. Though Schubert does not specifically discuss transportation, the concept seems to fit the description of an affective feeling he provides. The emotional response involved in transportation is an evaluative reaction to the narrative. People feel sad while watching a tragedy, happy while watching a comedy, and excited while watching a thriller. These are all positive and negative feelings generated by situations presented in the narrative. Schubert’s theorizing has created a clear and interesting distinction between presence and transportation.

Flow. Though they share some similarities, transportation and presence may be differentiated from the concept of flow, which Lee and LaRose (2007) define as “a psychological state in which an individual experiences a feeling of transcendence, or oneness, with one’s activity so that nothing else seems to matter” (p. 635). Both flow and transportation involve loss of awareness of the surrounding physical environment to some degree, but transportation possesses one attribute unique from flow: the creation of an alternative world. Though flow certainly covers the loss of real world awareness, it cannot account for the mental imagery inherent in narrative absorption. The two concepts are related but seem to apply to different experiences.

Unlike flow, presence does not require complete attention to the task at hand. One does not necessarily need to be focused entirely on interaction with a virtual world in
order to experience presence. Though flow could perhaps be applied to video games, transportation seems a better explanation of such focus due to the experience of an alternative world.

Past research has found narrative to increase presence (Lee et al., 2004; Schneider et al., 2004); however, the limited success of this previous research points to an additional variable. Transportation, because it addresses narrative involvement specifically, may serve to moderate the relationship between narratively-based games and presence, thus uncovering a stronger relationship. Therefore, the following hypothesis is proposed:

H1: Those who play a video game with high narrative and experience transportation will experience greater presence than those who play a video game with low narrative.

Enjoyment

Enjoyment may be broadly defined as a pleasurable affective response to a stimulus (Green et al., 2004). Raney (2002), in his discussion of an integrated theory of media enjoyment, suggests that both affective and cognitive responses are necessary to an evaluation of media as enjoyable. In other words, individuals must feel emotionally affected and cognitively assess various aspects of the medium, including character actions and message themes.

The widespread popularity of video games is certainly indicative of the enjoyment they provide. Indeed, research by Schneider et al. (2004) found that narratively-based video games led to more positive affect and arousal than non-narrative games. Lee et al.
(2004) also found that viewing a narrative video clip prior to video game play (when the video clip included the same characters as the game) increased enjoyment during game play. In addition, transportation has been found to be highly correlated with enjoyment (Green, Brock, & Livingston, 2004). As with presence, the application of transportation to the narrative could more accurately explain increases in enjoyment, particularly because of transportation’s high correlation with enjoyment.

However, one factor must be taken into consideration: desensitization (Rudy, 2006). A violent, narratively-rich video game environment could affect people differentially depending on their past exposure to violent media. Because desensitization is the result of repeated exposure to violent media, prior experience with violent games should serve as an indicator of desensitization. For those who frequently play violent video games, deeper immersion into a violent narrative should only serve to increase enjoyment, based on previous research (Przybylski, Ryan, & Rigby, 2009). Conversely, individuals who are not often exposed to violent gaming experiences may find such an immersion to be frightening and overly violent. Therefore, experience of transportation during violent, narratively-based video game play may not lead to greater enjoyment for individuals who do not often play violent video games.

H2: Frequent violent video game players who play a video game with high narrative and experience transportation will experience greater presence than infrequent violent video game players who play a video game with low narrative.

RQ1: How will transportation moderate the effect of violent narratively-based video game play on enjoyment for infrequent violent video game players?
Identification

Arguably the most accepted definition of identification today is that developed by Cohen (2001). His exploration and definition of identification are much more detailed and thorough than most of the past. According to Cohen, identification may be defined “as a process that consists of increasing loss of self-awareness and its temporary replacement with heightened emotional and cognitive connections with a character” (p. 251). This definition consists of four components: empathy, perspective sharing, understanding motivations, and absorption. First is a feeling of empathy with the character. One must feel emotions, not on behalf of the character, but as though s/he were that character him or herself. Perspective sharing, the second component, is defined as the degree to which one internalizes the motivations of the character. Understanding motivations denotes the extent to which one understands the goals of a character. Finally, absorption entails complete attention to the text and loss of self-awareness. Cohen notes that identification should be considered both in terms of intensity and frequency. The more one experiences these dimensions, the more s/he should identify. This is different from transportation, which entails involvement with the story as a whole, rather than a specific character or characters. One could be immersed in a story without a strong feeling of identification with any of its characters. Though transportation and identification are related, they are distinct concepts (Cohen & Talor, 2008).

Identification in video games has not been studied much in the past, likely due to the lack of research involving video game narratives. In one study, Schneider et al. (2004) found that video games with narrative did increase feelings of identification.
However, identification was operationalized in an unusual way, with items that assessed identification with the protagonist, the protagonist’s goal in overcoming the opposition, and the protagonist’s goals in general. In addition, Schneider et al. never provided the definition of identification that inspired these measures. Operationalization of the concept should be clear and justified in order to properly interpret the results. Based on Cohen’s (2001) definition, a video game would need to contain well-developed characters with clear motives and emotions in order for players to identify. Now that video games with narratives and high levels of realism are more common, identification can be realistically examined. The mere presence of a narrative and the resulting character development should allow for identification that would not have been possible in games without narrative.

**H3:** Those who play a video game with high narrative will experience greater identification with characters than those who play a video game with low narrative.

Though not strictly necessary for identification, transportation into a narrative may increase feelings of identification with characters due to immersion. In fact, Mahood and Moyer-Gusé (2009) found transportation to be a mediator between empathy and identification, indicating the impact of transportation on identification. The narrative element that allows for transportation would likely include characters with which players may identify.
H4: Those who play a video game with high narrative and experience transportation will experience greater identification with characters than those who play a video game with low narrative.

*Parasocial Interaction*

Parasocial interaction involves mass media users responding to media figures as though they are in a typical social relationship (Giles, 2002). This relationship includes both behavioral responses (e.g., speaking to the media figure out loud) and cognitive responses (e.g., making inferences about how the media figure will behave). Just like identification, this type of media involvement needs a narrative with well-developed characters. One cannot experience parasocial interaction without characters that are imbued with some type of personality.

Previous research has not examined parasocial interaction in the context of narrative video games. However, based upon research that has found narratively-based video games to increase other types of involvement (identification: Schneider et al., 2004; and presence: Lee et al., 2004; Schneider et al., 2004), it is inferred that a similar relationship would likely be observed with parasocial interaction. Since narratively-based video games include developed characters with which players may interact, the following hypothesis is proposed:

H5: Those who play a video game with high narrative will experience greater parasocial interaction with characters than those who play a video game with low narrative.
Additionally, transportation may present as a significant moderator of the relationship between narratively-based video games and parasocial interaction. As with identification, the narrative element that allows for immersion into a narrative might provide characters with which players might interact.

RQ2: How will transportation moderate the effect of narratively-based video game play on parasocial interaction with characters?
Method

Overview

In order to examine the effects of narrative on experience of various kinds of video game involvement, an experiment was conducted. After completing a pretest assessing transportability, game experience, game preference, and demographic variables, participants were randomly assigned to one of two conditions – high-narrative or low-narrative. Participants in both conditions played the same video game for 30 minutes, either with a full narrative storyline to accompany game play or with a minimal narrative storyline. Finally, a posttest was administered measuring transportation, presence, enjoyment, identification, parasocial interaction, and experience with the stimulus game. In addition, items on the posttest assessed participants’ perceptions of the game and emotional reactions in order to control for potential covariates during analyses. A more detailed explanation follows.

Participants

Participants were 132 communication undergraduates at a large, Midwestern university who were given extra credit in exchange for their participation. The sample was 50% male with an average age of 21 (SD = 2.56).

Stimuli
The game *Fallout 3 (Game of the Year Edition)* was utilized for both conditions. Released in 2009, *Fallout 3 (Game of the Year Edition)* is a graphically-advanced game with a well-developed narrative. Set in the area around Washington D.C. after a devastating nuclear war, the game begins with the player being born in an underground vault. The player then grows up gradually and engages in a number of missions that advance the storyline, meeting characters along the way (Bethesda Softworks, n.d.)

In the high-narrative condition, participants played the game from the very beginning in order to experience the origin of the narrative. Participants in the low-narrative condition began the game on an add-on level (similar to typical first-person shooter games) so that they were isolated from the narrative that led them to that point. Indeed, one reviewer stated that this particular add-on, titled *Operation Anchorage*, “strips out most of the RPG [role-playing game] elements and feels more like a shooter” (Villoria, 2009). In this way, they experienced the same level of realism, the same main character, and the same setting, but were exposed to minimal narrative. Game difficulty was set on the normal setting to control for potential discrepancies between conditions. Participants in both conditions played for 30 minutes.

*Procedure*

After signing consent forms, participants were led to private gaming environments where the questionnaires and game were already prepared. These gaming environments had been randomly assigned to either the high-narrative or low-narrative condition before the participants’ arrival. Participants were first asked to complete the pretest questionnaire, which assessed a number of items that could prove useful as
significant covariates during analyses. This questionnaire measured transportability, video game-playing experience, game preference, and demographic variables (age, gender, and race). After completing the pretest questionnaire, participants then played the game for 30 minutes. Following game play, participants completed the posttest questionnaire assessing transportation, presence, enjoyment, identification, parasocial interaction, and experience with the game *Fallout 3*.

**Measurements**

*Demographics.* In order to control for any potential moderating effects of participants’ age, gender, and race, items on the questionnaire assessed these variables. These items could prove essential during analyses.

*Transportability.* Dal Cin et al.’s (2004) 20-item transportability scale was administered to measure how easily and regularly participants are transported (*M* = 4.71, *SD* = .70, *α* = .85). This transportability scale has been supported as a reliable predictor of transportive experiences (Bilandzic & Busselle, 2008). Items included “When watching movies/videos for pleasure, I find myself accepting events that I might have otherwise considered unrealistic” and “When watching movies/videos for pleasure, I can easily envision myself in the events described in a story” (p. 184). Controlling for transportability will eliminate any differences that might arise between participants who are not usually absorbed into narratives and those who are.

*Game preference.* To assess video game playing preference, participants were presented with a list of the ten most popular video game genres (Smith, 2006) – action-adventure, driving, fighting, flight simulation, offline role-playing, online role-playing,
puzzle, shooting, sports, and strategy – and asked to indicate how much they enjoy playing games from each genre. Each genre was assessed by a single item, with responses recorded on a seven-point scale from “not at all” (1) to “very much” (7). Enjoyment of video games is included as a potential covariate, which would prove particularly useful in analyzing enjoyment of the stimulus game.

*Game experience.* Video game experience was assessed in much the same way as preference. Participants were presented with the same list of video game genres and asked to indicate how often they play games from each genre. Each genre was measured by a single item, with answers recorded on a seven-point scale from “never” (1) to “very often” (7). This was intended to assess the amount and nature of participants’ gaming experience, which could present as a significant covariate during analysis. Also, experience with eight of the ten video game genres was used to compute an experience variable as an indicator for desensitization \((M = 2.01, SD = .61, \alpha = .75)\), because those who play games from violent genres most often are likely to be more desensitized. The only two genres excluded from this computation (puzzle and strategy) are chosen due to their lack of violent content.

*Transportation.* Transportation was measured using 11 adapted general items from Green and Brock’s (2000) 15-item transportation scale \((M = 3.51, SD = .94, \alpha = .77)\). The four questions specific to the narrative used in that particular study were dropped. The remaining questions included “The narrative affected me emotionally” and “I was mentally involved in the narrative while (playing the video game)” (p. 704).
Responses were indicated on a seven-point Likert scale, ranging from “strongly disagree” (1) to “strongly agree” (7).

*Presence.* Presence was measured through a 16-item scale developed by Lee et al. (2004) \( (M = 2.85, SD = 1.19, \alpha = .94) \). The scale covers four dimensions of presence: physical, spatial, self, and social. Items include “While you were playing the game, how much did you want to escape when objects on the screen seemed to be heading toward you?” and “While you were playing the game, how much did you feel as if you could talk to the people on the screen?” Responses were recorded on a seven-point scale from “not at all” (1) to “very much” (7).

*Enjoyment.* Enjoyment was assessed using Bowman and Tamborini’s (2008) nine-item enjoyment scale, with responses indicated on a seven-point Likert-type scale from “strongly disagree” (1) to “strongly agree” (7) \( (M = 3.82, SD = 1.76, \alpha = .97) \). Items included “I enjoyed playing this game” and “I would recommend this game to a friend” (p. 33). Through factor analysis by Bowman and Tamborini, these nine items were found to have great internal reliability \( (\alpha = 0.96) \) and are therefore a viable measurement choice.

*Identification.* Identification was measured using Cohen’s (2001) 10-item scale \( (M = 3.79, SD = 1.37, \alpha = .93) \). Rather than the television viewing-based state, items were reworded to apply to video games. Questions included “While playing the game, I wanted my character to succeed in achieving his or her goals” and “I was able to understand the events in the game in a manner similar to that in which character my character understood them”. Responses were indicated on a seven-point Likert scale, ranging from “strongly disagree” (1) to “strongly agree” (7).
Parasocial interaction. An adapted version of Rubin and Perse’s (1987) 10-item parasocial interaction scale was applied ($M = 3.13, SD = 1.32, \alpha = .94$). Items included “My character makes me feel comfortable, as if I am with a friend” and “If my character was a real person, I would like to meet him/her.” Responses were recorded on a seven-point Likert scale from “strongly disagree” (1) to “strongly agree” (7).

Experience with game. Finally, participants’ experience with the game Fallout 3 was assessed. Frequency of play with this specific game was indicated on a single seven-point scale from “never” (1) to “very often” (7).
Results

All hypotheses and research questions were tested using linear regression. Gender, experience with the offline role-playing genre, and experience with the game *Fallout 3* were included as potential covariates in each regression. In addition, transportability was included as a potential covariate in the analyses that involved transportation as a moderator. These covariates are noted below only when significant.

Hypothesis 1 predicted a narrative by transportation interaction such that those who played the high narrative game and experienced high levels of transportation would report the highest levels of presence. A regression analysis revealed that the interaction between narrative and transportation was not a significant predictor of presence ($\beta = -0.17$, $p = 0.53$). The only significant predictors of presence were transportability ($\beta = 0.18$, $p < 0.01$) and transportation ($\beta = 0.70$, $p < 0.001$). Thus, H1 was not supported.

Hypothesis 2 predicted that for frequent players of violent video games, greater experience of transportation while playing the high narrative game would lead to the most enjoyment. To calculate a prior experience variable, items assessing experience with the eight video game genres that typically include some violence were averaged. Puzzle and strategy games were excluded due to their lack of violent content. Using a median split, participants were divided into frequent and infrequent gaming groups. Enjoyment was then regressed on narrative condition for only frequent players of violent
games, including transportation as a moderator. The interaction between narrative and transportation was not a significant predictor of enjoyment for those who play violent games frequently ($\beta = -.40, p = .28$). However, experience with the genre was a significant predictor of enjoyment ($\beta = .22, p < .05$) such that those with more experience playing offline role-playing games tended to enjoy the game more. Also, transportation was a significant positive predictor of enjoyment for frequent players of violent games ($\beta = .81, p < .001$). Thus, H2 was not supported.

Research question 1 asked whether transportation would moderate the relationship between narrative and enjoyment for those who do not frequently play violent video games. Enjoyment was regressed on narrative condition again including transportation as a moderator, this time only for the infrequent players of violent games. As before, the transportation by narrative interaction was not a significant predictor of enjoyment ($\beta = .11, p = .81$). Thus, transportation does not moderate the relationship between narrative and enjoyment. Transportation was the only significant predictor of enjoyment in the analysis ($\beta = .64, p < .01$), with increased levels of transportation correlated with increased levels of enjoyment.

Hypothesis 3 predicted that those who played the high narrative game would experience greater identification. This hypothesis was supported with a significant relationship between narrative and identification ($\beta = .26, p < .01$). Those in the high narrative condition reported greater identification with their character than did those in the low narrative condition. In addition, gender was a significant covariate ($\beta = -.19, p < .05$) in that men identified more with their character than did women.
Hypothesis 4 predicted that transportation would moderate the effect of narrative on identification. The interaction between narrative and transportation was not a significant predictor of identification with the main character ($\beta = -.02, p = .94$), indicating a lack of support for hypothesis 4. However, transportation was a significant predictor of identification ($\beta = .71, p < .001$), with increased levels of transportation correlated with more identification.

Hypothesis 5 predicted that greater experience of transportation while playing the high narrative game would lead to the most parasocial interaction. As expected, regression analyses revealed a significant positive relationship between narrative and parasocial interaction with the main character ($\beta = .45, p < .001$). The results showed that those in the high narrative condition did indeed experience more parasocial interaction than those in the low narrative condition. Thus, hypothesis 5 was supported.

Research question 2 asked whether transportation would moderate the relationship between narrative and parasocial interaction. The interaction between narrative and transportation was not a significant predictor of parasocial interaction with the main character ($\beta = .40, p = .13$), indicating a lack of support for transportation as a moderator. Higher transportability predicted more parasocial interaction ($\beta = .20, p < .01$), and transportation was a significant positive predictor of parasocial interaction with the main character ($\beta = .40, p < .001$).

Taken together, these findings reveal that transportation does not significantly moderate the effect of narrative on immersion (specifically presence, identification, and parasocial interaction) or enjoyment of video games. However, narrative does directly
predict immersion in terms of presence ($\beta = .24, p < .01$), enjoyment ($\beta = .21, p < .01$), identification, and parasocial interaction, indicating that level of narrative does impact the gaming experience.

*Post Hoc Analyses*

After noticing the significant direct relationships mentioned above between transportation and each of the outcome variables (presence, enjoyment, identification, and parasocial interaction), several post hoc analyses were conducted to probe for evidence of transportation as a mediator. A mediation macro developed by Preacher and Hayes (2008) was used to examine the potential indirect relationship between narrative and presence, enjoyment, identification, and parasocial interaction. For each analysis, four criteria were used to support a mediation relationship: significant association between the independent variable and proposed mediator, significant association between the proposed mediator and the dependent variable, a significant indirect effect, and a 95% confidence interval that does not include zero. All confidence intervals are based on a 5000 sample bootstrap estimate. The same four covariates used in the analyses above (gender, experience with the offline role-playing genre, experience with the game *Fallout* 3, and transportability) were included in each test and are only mentioned when significant.

Transportation was first tested as a mediator between narrative and presence (Figure 1). The analysis revealed that playing the high narrative game was associated with greater transportation ($b = .53, p < .001$) and transportation predicted increased presence ($b = .83, p < .001$). The indirect effect of narrative on presence was significant
as well ($b = .52, p < .01$). The 5000 sample bootstrap estimate provided further support for an indirect relationship (95% CI: .21 to .72). All of these indicators combined offer support for transportation as a mediator between narrative and presence. Also, as seen in the examination of transportation as a moderator of the relationship between narrative condition and presence above, more transportability was also correlated with more presence in this case ($b = .32, p < .01$).

The next analysis examined transportation as a mediator between narrative and enjoyment for all individuals (Figure 2). Significant positive relationships between narrative and transportation ($b = .53, p < .001$) and transportation and enjoyment ($b = 1.29, p < .001$) were observed. The significant indirect effect ($b = .70, p < .01$) and 5000 sample bootstrap estimate (95% CI: .33 to 1.08) supported transportation as a mediator between narrative and enjoyment for the group of participants as a whole. In addition, those who were more experienced with the game genre tended to enjoy the game more ($b = .35, p < .01$).

Because frequent and infrequent players of violent video games were analyzed separately for evidence of moderation, individual mediation tests were conducted for these two groups as well. First, for the frequent players (Figure 3), the test of indirect effect showed a significant positive relationship between narrative and transportation ($b = .43, p < .05$) and transportation and enjoyment ($b = 1.33, p < .001$). The confidence interval was also within an acceptable range (95% CI: .03 to 1.16). However, the indirect effect of narrative on enjoyment through transportation was not significant ($b = .49, p = .21$), indicating a lack of support for transportation as a mediator between narrative and
enjoyment for frequent violent video game players. For this group, more experience with
the game genre was associated with greater enjoyment.

Next, transportation was examined as a mediator between narrative and
enjoyment for infrequent violent video game players (Figure 4). As with the test for
frequent players, the results demonstrate a significant positive relationship between
narrative and transportation \((b = .62, p < .01)\) and transportation and enjoyment \((b = 1.15, \ p < .001)\). However, unlike with the frequent players, there is a significant indirect effect
of narrative through transportation on enjoyment \((b = .98, p < .05)\). An appropriate
confidence interval lends further support to the mediated relationship (95% CI: .28 to
1.28).

Transportation was next examined as a potential mediator between narrative and
identification (Figure 5). Each of the four requirements for mediation was met, providing
support for this relationship. The associations between narrative and transportation \((b = .53, p < .001)\) and transportation and identification \((b = 1.03, p < .001)\) were both
significant. In addition, the indirect effect of narrative through transportation on
identification was significant \((b = .66, p < .01)\) and the confidence interval was within the
necessary range (95% CI: .26 to .86), supporting the mediation.

Finally, transportation was tested as a mediator between narrative and parasocial
interaction (Figure 6). Again, all four criteria were met. Narrative was significantly
associated with transportation \((b = .53, p < .001)\), and transportation was significantly
associated with parasocial interaction \((b = .72, p < .001)\). The indirect effect of narrative
on parasocial interaction through transportation was significant \((b = 1.14, p < .001)\), and
the confidence interval did not include zero (95% CI: .19 to .65). This supports transportation as a mediator between narrative and parasocial interaction. Transportability was a significant covariate in this relationship \( (b = .37, p < .01) \), with higher levels of transportability correlated with more parasocial interaction.
Discussion

Consistent with previous research, hypothesis testing and post-hoc analyses revealed that narrative did have direct effects on the outcome variables. Narrative positively predicted presence, enjoyment, identification, and parasocial interaction. These direct effects of narrative on presence and identification replicate the findings of Schneider et al. (2004), and the effect on enjoyment is consistent with the increase in positive affect and arousal found in that same study. However, the current study is stronger due to a cleaner manipulation and more thorough operationalizations. The Schneider et al. study utilized four different video games that likely differed substantially from one another in ways other than narrative (2004). Our use of a single game for both conditions reduced the number of potential confounding differences, including such elements as game realism and graphics. In addition, our description of the differences between conditions should make the results easier to interpret than those of the previously mentioned study, which did not include any operationalization of narrative. Finally, the presence scale used in our study was much more reliable ($\alpha = .94$) than the Self-Assessment Manikin and three semantic differential scales used by Schneider et al. ($\alpha = .50$), leading to greater confidence in the results. Overall, these results certainly suggest that stronger narratives create a more enjoyable and immersive gaming experience.
Perhaps most interesting is the finding that playing a high narrative game led to greater parasocial interaction than did playing a low-narrative game. As mentioned above, parasocial interaction has previously not been examined in the context of narrative video games. The results provide support that players of narratively-based games do feel a sort of friendship with the characters that represent them on screen. Now that the possibility of parasocial interaction in video games has been demonstrated, future research could explore this idea further. Due to the interactive component, might video games create stronger parasocial relationships than media with no feedback, such as television or film? Could narrative game players view the artificial characters as a social network, a group of friends? Many questions remain to be investigated.

The main contention of this paper – that transportation would moderate the relationship between narrative and immersion – was not supported. The interaction between narrative and transportation did not predict enjoyment, presence, identification, or parasocial interaction. Instead, transportation proved to be important to those relationships in a different manner: as a significant mediator between narrative and the four outcome variables of interest. The failure of transportation to moderate is not surprising in light of the successful mediation analyses. Involvement and enjoyment are not directly impacted by narrative, but instead are determined by the extent to which video game players are absorbed into the story. In reality, it is the transportation itself that creates a more immersive experience, not the mere presence of narrative. The experience of transportation could be influenced by a number of factors, such as a player’s goals/expectations of a game. For example, someone who plays a game simply
because they want to engage in violence or feel a sense of accomplishment by beating the game may not be concerned with the storyline at all. If they feel no motivation to thoroughly process the story, they will likely not experience transportation. Lack of attention to the narrative negates any potential effect it may have had on outcome variables, therefore indicating that we should be focused on attention to the story rather than the story itself. Transportation is more important to the relationship between narrative and involvement than the role of moderation would indicate. Rather than explaining only the relationship variance, transportation accounts for the relationships between narrative and the dependent variables. Transportation does not influence the strength of the associations, but is the mechanism through which the relationship flows.

The discovery of transportation as a mediator in these relationships provides a better understanding of how to approach the study of narrative video games in the future. We know that this area should not be explored without considering absorption into the story. With that in mind, many of the important topics examined in video games previously, such as violence, could be revisited in the context of narrative games. The power of transportation to increase immersion may also impact the outcomes of studies in these subject areas. For example, most studies on violent video games have found them to increase aggressive behavior and reduce empathy and prosocial behavior (Anderson, Shibuya, Ihori, Swing, Bushman, Sakamoto, Rothstein, & Saleem, 2010). It is feasible that deeper immersion into a narratively-rich story could amplify these effects. Might the stronger sense of presence and identification with the character that result from
transportation lead to more aggressive behavior and further decrease empathy and prosocial effects post-game play? A series of studies could examine this possibility.

As with most video game research, concerns arise regarding confounding differences between conditions. Unlike previous research on narrative in video games that used different games across conditions (e.g., Schneider et al., 2004), the manipulation used in this study was strong in that the same game was utilized for both high-narrative and low-narrative game play. Because of this, the cosmetic elements (realism, graphics, etc.) were consistent across conditions. However, the lack of complex story and character interaction left little more than violence in the low-narrative condition. Participants spent the entire thirty minutes killing members of the opposition army in rather gory ways. Many in the high-narrative condition experienced no more violence than a couple of fist fights and the use of a BB gun on metal targets. A small percentage in the high-narrative condition actually made it to more violent portions of the game, but this was not the norm. Therefore, it is possible that the amount of violence experienced during game play could have impacted any of the outcome variables differentially across conditions. For example, research has shown that violence in television actually leads to less enjoyment (Weaver, & Wilson, 2009), which may have contributed to participants’ greater enjoyment in this study’s high-narrative condition. However, research on this effect in video games has not produced significant results (Przybylski et al., 2009), indicating that the difference in violence likely did not confound the enjoyment results. As for the other dependent variables, no research has examined how they may be impacted by violence, so no other conclusions can be drawn at this
point. Realistically, the difference in violence across conditions is to be expected; many offline role-playing games are based around combat. When stripped of the narrative elements (time spent interacting with other characters, learning relevant story information, etc.), the violence is all that is left. Even though it would be extremely difficult to match the conditions in terms of violence, this difference is troublesome.

Our reliance on frequency of violent video game play as indicator of desensitization may also be considered a limitation. In most studies on desensitization, it is examined as the outcome variable of interest rather than a predictor. As such, no trait desensitization scale could be found. We therefore averaged scores on frequency of play for the eight violent video games genres, a choice which may raise concerns. Within those eight genres, some are certainly more violent than others. Most fighting games contain more violence than most driving games, and sports games contain a different, more socially-sanctioned type of violence than shooters. Therefore, someone who plays first-person shooters often would likely have a different outlook than a frequent player of driving games. However, we do not believe our use of prior experience as an indicator to be a great threat given past research demonstrating that desensitization is a function of repeated exposure to violent media (Dexter, Penrod, Linz, & Saunders, 1997; Linz, Donnerstein, & Adams, 1989; Linz, Donnerstein, & Penrod, 1988). Despite this, if desensitization is to be examined as a trait rather than state in the future, a reliable scale will need to be developed.

Overall, these findings support the importance of narrative transportation for story-based games. We were able to replicate the direct effects of narrative on involvement as found
in the past (Schneider et al., 2004) but with a cleaner manipulation and stronger measurements. Also, for the first time, parasocial interaction was found to be a significant result of game narrative. However, the more important contribution of this study is the discovery of transportation as a significant mediator between narrative and presence, enjoyment, identification, and parasocial interaction. This demonstrates the necessity of the transportation concept to the study of narrative games. As these types of video games increase in popularity and frequency of production, it becomes necessary to understand how they affect those who play them. This study is only a small step in that knowledge-building process. As noted above, future research should further address the experience of immersion in narratively-based games and the cognitive processes underlying it.
References


reactions. Paper presented at the annual meeting of the Association for Education in Journalism and Mass Communication, Boston, MA.


Appendix A: Table and Figures

Table 1. Correlation matrix.

<table>
<thead>
<tr>
<th></th>
<th>Transportation</th>
<th>Presence</th>
<th>Enjoyment</th>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presence</td>
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<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoyment</td>
<td>.74***</td>
<td>.54***</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Identification</td>
<td>.76***</td>
<td>.74***</td>
<td>.71***</td>
<td>---</td>
</tr>
<tr>
<td>Parasocial</td>
<td>.66***</td>
<td>.66***</td>
<td>.59***</td>
<td>.63***</td>
</tr>
</tbody>
</table>

*** = p < .001
NOTE: All coefficients are unstandardized. The dotted line indicates the total effect of narrative condition on presence. The solid line between narrative condition and presence represents the direct effect, controlling for transportation.

** = p < .01, *** = p < .001; 95% CI: .21 to .72

Figure 1. Indirect relationship between narrative and presence (5000 bootstrap samples)

NOTE: All coefficients are unstandardized. The dotted line indicates the total effect of narrative condition on enjoyment. The solid line between narrative condition and enjoyment represents the direct effect, controlling for transportation.

** = p < .01, *** = p < .001; 95% CI: .33 to 1.08

Figure 2. Indirect relationship between narrative and enjoyment (5000 bootstrap samples)
NOTE: All coefficients are unstandardized. The dotted line indicates the total effect of narrative condition on enjoyment. The solid line between narrative condition and enjoyment represents the direct effect, controlling for transportation.

* = $p < .05$, *** = $p < .001$; 95% CI: .03 to 1.16

Figure 3. Indirect relationship between narrative and enjoyment for frequent players of violent video games (5000 bootstrap samples)

NOTE: All coefficients are unstandardized. The dotted line indicates the total effect of narrative condition on enjoyment. The solid line between narrative condition and enjoyment represents the direct effect, controlling for transportation.

* = $p < .05$, ** = $p < .01$, *** = $p < .001$; 95% CI: 0.28 to 1.28

Figure 4. Indirect relationship between narrative and enjoyment for infrequent players of violent video games (5000 bootstrap samples)
NOTE: All coefficients are unstandardized. The dotted line indicates the total effect of narrative condition on identification. The solid line between narrative condition and identification represents the direct effect, controlling for transportation.

** = p < .01, *** = p < .001; 95% CI: .26 to .86

Figure 5. Indirect relationship between narrative and identification (5000 bootstrap samples)

NOTE: All coefficients are unstandardized. The dotted line indicates the total effect of narrative condition on parasocial interaction. The solid line between narrative condition and parasocial interaction represents the direct effect, controlling for transportation.

*** = p < .001; 95% CI: .19 to .65

Figure 6. Indirect relationship between narrative and parasocial interaction (5000 bootstrap samples)
Appendix B: Measurement Items

*Pretest Questionnaire Items*

**Demographics**

1. Age
2. Gender
3. Race

**Transportability**

(“Strongly disagree” [1] to “Strongly agree” [7])

When watching/reading/hearing a story:

1. I can easily envision the events in the story.
2. I find I can easily lose myself in the story.
3. I find it difficult to tune out activity around me.
4. I can easily envision myself in the events described in a story.
5. I get mentally involved in the story.
6. I can easily put stories out of my mind after I’ve finished reading them.
7. I sometimes feel as if I am part of the story.
8. I am often impatient to find out how the story ends.
9. I find that I can easily take the perspective of the character(s) in the story.
10. I am often emotionally affected by what I’ve read.
11. I have vivid images of the characters.
12. I find myself accepting events that I might have otherwise considered unrealistic.
13. I find myself thinking what the characters may be thinking.
14. I find myself thinking of other ways the story could have ended.
15. My mind often wanders. (Reversed)
16. I find myself feeling what the characters may feel.
17. I find that events in the story are relevant to my everyday life.
18. I often find that reading stories has an impact on the way I see things.
19. I easily identify with characters in the story.
20. I have vivid images of the events in the story.

**Game preference**

Please indicate how much you enjoy playing video games from each of the following genres.

(“Not at all” [1] to “very much” [5])

1. Action-adventure
2. Driving
3. Fighting
4. Flight simulation
5. Offline role-playing games
6. Online role-playing games
7. Puzzle
8. Shooting
9. Sports
10. Strategy

Game experience

Please indicate how often you play video games from each of the following genres.

(“Not at all” [1] to “very often” [5])

1. Action-adventure
2. Driving
3. Fighting
4. Flight simulation
5. Offline role-playing games
6. Online role-playing games
7. Puzzle
8. Shooting
9. Sports
10. Strategy
Posttest Questionnaire Items

Mood

(“Strongly disagree” [1] to “Strongly agree” [7])

1. I feel aggravated.
2. I feel agreeable.
3. I feel furious.
4. I feel irritated.
5. I feel frustrated.
6. I feel kindly.
7. I feel outraged.
8. I feel angry.
9. I feel like yelling at somebody.
10. I feel friendly.
11. I feel amiable.
12. I feel mad.
13. I feel mean.
15. I feel like banging on a table.
16. I feel like swearing.
17. I feel cruel.
18. I feel good-natured.
19. I feel disagreeable.
20. I feel enraged.

**Transportation**

(“Strongly disagree” [1] to “Strongly agree” [7])

1. While I was playing the game, I could easily picture the events in the narrative taking place.
2. While I was playing the game, activity going on in the room around me was on my mind. (R)
3. I could picture myself in the narrative’s events.
4. I was mentally involved in the narrative while playing the game.
5. After finishing the game, I found it easy to put it out of my mind. (R)
6. I wanted to learn how the game ended.
7. The narrative in the game affected me emotionally.
8. I found myself thinking of ways the game could have turned out differently.
9. I found my mind wandering while playing the game. (R)
10. The events in the game narrative are relevant to my everyday life.
11. The events in the game narrative have changed my life.

**Presence**

(“Not at all” [1] to “Very much” [7])

1. While you were playing the game, how much did you feel as if objects on the screen were real?
2. While you were playing the game, how much did you feel that you could reach out and touch the hardness or softness of objects on the screen?

3. While you were playing the game, how much did you want to escape from when objects on the screen seemed to be heading toward you?

4. While you were playing the game, how much did you feel as if you and the objects on the screen were in the same place?

5. While you were playing the game, how much did you feel as if the technological boundary (e.g., monitor, headset, and keyboard) between you and the objects on the screen had blurred or disappeared?

6. While you were playing the game, how much did you feel as if you were inside the buildings?

7. While you were playing the game, to what extent were there times when you almost forgot about the fact that you were inside the game?

8. When you finished the game, how much did you feel as if you had visited the places in the game?

9. While you were playing the game, how much did you feel as if the people on the screen were real?

10. While you were playing the game, how much did you feel as if you could talk to the people on the screen?

11. While you were playing the game, how much did you feel as if you were interacting with the people on the screen?
12. While you were playing the game, how much did you feel as if the technological boundary (e.g., monitor, headset, and keyboard) between you and the people on the screen had blurred or disappeared?

13. While you were playing the game, how much did you feel as if the people on the screen were not created by computer programs or technological devices?

14. While you were playing the game, how much did you feel as if you were your character?

15. While you were playing the game, how much did you feel as if you were walking when your character walked?

16. While you were playing the game, how much did you feel as if you were hitting enemies when your character hit enemies?

**Enjoyment**

(“Strongly disagree” [1] to “Strongly agree” [7])

1. This game was fun.

2. I enjoyed playing this game.

3. I would recommend this game to a friend.

4. Overall, I would rate this game positively.

5. I would play this game longer if I had the opportunity.

6. I felt absorbed by this game.

7. This game held my attention.

8. I felt like I was part of the game.
9. I was caught up in the game.

**Identification**

(“Strongly disagree” [1] to “Strongly agree” [5])

1. While playing the game, I felt as if I was part of the action.
2. While playing the game, I forgot myself and was fully absorbed.
3. I was able to understand the events in the game in a manner similar to that in which character X understood them.
4. I think I have a good understanding of character X.
5. I tend to understand the reasons why character X does what he or she does.
6. While playing the game I could feel the emotions character X portrayed.
7. During playing, I felt I could really get inside character X’s head.
8. At key moments in the game, I felt I knew exactly what character X was going through.
9. While playing the game, I wanted character X to succeed in achieving his or her goals.
10. When character X succeeded I felt joy, but when he or she failed, I was sad.

**Parasocial Interaction**

(“Strongly disagree” [1] to “Strongly agree” [5])

1. Character X makes me feel comfortable, as if I am with a friend.
2. I see character X as a natural, down-to-earth person.
3. I would look forward to seeing character X if I play this game again.
4. If character X appeared in another game, I would want to play that game.
5. Character X seems to understand the kinds of things I want to know.
6. If I saw a story about character X in a newspaper or magazine, I would read it.
7. I would miss seeing character X if I could no longer play the game.
8. If character X was a real person, I would like to meet him/her.
9. I feel sorry for character X when she makes a mistake.
10. I find character X to be attractive.

**Overall Reactions**

*(Seven-point semantic differential scales)*

<table>
<thead>
<tr>
<th>Not Enjoyable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Enjoyable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boring</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Intense</td>
</tr>
<tr>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>Violent</td>
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<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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<tr>
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<td>3</td>
<td>4</td>
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<td>4</td>
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<td>4</td>
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<td>6</td>
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<td>6</td>
<td>7</td>
<td>Difficult</td>
</tr>
</tbody>
</table>
Experience with Stimulus Game

(“Never” [1] to “Very Often” [5])

Have you ever played the game *Fallout 3* before today?