Wiimote Possibilities: The Effects Technologically Advanced Game Controllers and Character Perspective on Presence, User Control and Attitude

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ABSTRACT

Julia Crouse: *Wiimote* Possibilities: The Effects of Technologically Advanced Game Controllers and Character Perspective on Presence, User Control and Attitude

(Under the direction of Sri Kalyanaraman)

This thesis explores the role of technological advancement and character perspectives in console-based video games. Specifically, it examines the effects of haptic feedback enabled game controllers and point-of-view character perspective on players' perceptions of presence, user control and attitudes toward the video game. This thesis details the methods and results of a 2 (game controller) x 2 (point-of-view perspective) between-subjects factorial design (N = 104). The findings revealed that predictions pertaining to the perspective variable were generally supported, such that players in the first-person point-of-view condition reported a greater sense of presence, user control and increased positive attitude toward the game. However, contrary to our hypotheses, the Wii did not elicit the same effects. Participants' attitudes toward the game as well as on the other measures were higher for the Xbox condition than for the Wii condition.

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TABLE OF CONTENTS

LIST OF FIGURES

Figure

CHAPTER 1

INTRODUCTION

Video games have become an increasingly popular way for people of all ages to have fun, with more than half – 53 % – of all adults over the age of 18 reporting to play video games, according to a recent memo released by the Pew Internet and American Life Project (2008). In fact, about 80 % of young adults and 97 % of teenagers reported playing video games (Pew Internet and American Life Project, 2008). Gaming also has increased among adults over the age of 50. Since 1999, the percentage of senior citizens who have played a video game has more than doubled, increasing from 9 % in 1999 to 25 % in 2007 (Pew Internet and American Life Project, 2008). Industry analysts attribute this growth primarily to increased technological sophistication, such as the introduction of the first home gaming console to include haptic feedback enabled game controllers, the Nintendo Wii (Madway, 2009).

In 2006, Nintendo released its Wii video game console with the first motion-sensitive game controller mass marketed to the public. Since then, the Wii console has been the top-selling video game console on the United States market, with at least 12 million sold in the United States (Madway, 2009). What makes the Wii gaming system different is that its motion-sensitive, haptic feedback enabled game controller allows people to use natural movements, such as swinging an arm to move a tennis racket, to control the gaming environment. Another likely explanation for the increased market

penetration of video games is the technological improvements, such as advanced graphics (Ivory & Kalyanaraman, 2007).

One of the most popular types of video games is the "shooter" game, in which the main character shoots or similarly incapacitates an adversary (Eastin, 2007). The Xbox 360, the second-most popular system with 11.6 million units sold, has made a name for itself by releasing well-received, critically lauded games, such as the *Halo* series. Games like *Halo* and the Xbox 360's *Halo II* are first-person shooter games. These types of games corner the market and remain the best-selling genre of all time. Because of the success of early video games such as *Doom* and later, *Halo,* the first-person perspective is one of the most popular formats for video games. Newsweek reports that six of the 10 best-selling games of all time are shooter-type games, the majority of which are shown through a first-person perspective (Newsweek, July 7, 2009). Besides shooters, many sports and racing games also utilize a first-person perspective.

The increased technological sophistication of video games has helped the medium rise in popularity across a wide swath of the population. Two specific technological innovations are starting to be utilized in greater frequency to maintain the popularity of games: 1.) Haptic feedback enabled controllers that allow players to control onscreen movement with real time body movement (Tamborini & Skalski, 2005), and 2). Video game perspectives that allow players to become more intimately involved with the characters (Eastin, 2007).

Motion-sensitive game controllers have been around for many years, used in arcade games and virtual reality laboratories. In fact, this technology had been introduced

into homes with certain video games packaged with specific controllers. For example, a motion-sensitive, guitar-shaped controller is issued with copies of *Guitar Hero,* available on multiple platforms. However, these game-specific controllers are not compatible with most other games across the console, i.e. the Xbox 360 *Guitar Hero* controller may not be used to play a different game on an Xbox 360, nor any other game console. The only games that use the *Guitar Hero* controller are its sequels and nearly identical *Rock Band* games. The Nintendo Wii was the first to produce motion-sensitive controller cheaply and easily enough to implement it in a commercial for all the games in its platform.

The Nintendo Wii controller, known as the Wii remote or "Wiimote," is shaped like a television remote control, which differs from the traditional gamepad controller used with most other consoles (See Appendix A, parts 1 & 2). The motion-sensitive sensors in the Wii's game controllers allow for more natural mapping of real-life movements to onscreen actions. This is in contrast to the traditional gamepad controller, such as that employed by the Xbox 360. Prior to the Wii, the gamepad style was the most common type of controller. A gamepad controller is held with both hands, typically using right-hand fingers to push buttons with the left-hand fingers control a joystick or direction pad (see Appendix A, part 2).

Enabling haptic feedback in game controllers is one of the newest ways for developers to tap into a player’s physical senses. Research has shown that improving the depth of sensory experiences for video game players also increases the intensity of being present in a game (Lombard & Ditton, 1997; Schneider, Lang, Sing & Bradley, 2004; Tamborini & Skalski, 2005; Eastin & Griffiths, 2006; Ivory & Kalyanaraman, 2007).

Presence, or "being there," is an essential component for modern games, which may require more than 30 hours to finish a game (Lee, 2004; Sherry, 2004). While research has examined the psychological effects of haptic feedback in virtual reality, until recently, little research has been done to examine the implications in home gaming consoles (Tamborini & Skalski, 2006; Eastin & Griffiths, 2006; Barlett, Rodeheffer, Baldassaro, Hinkin & Harris, 2008). Our psychological responses to a video game experience dictates whether we feel fully "present" in a gaming environment, satisfied with our playing experience and positively inclined toward video games themselves. Research into the psychological effects of haptic feedback enabled game controllers, therefore, may provide insight into how and why motion-sensitive controllers affect players' attitudes and gaming experiences and what implications that may have for presence theory and video game developers.

In addition to haptic feedback enabled game controllers, the type of game significantly impacts a player's experience (Eastin & Griffiths, 2006; Chory, Goodboy, Hixson, & Baker, 2007) as well as the character within the game (Eastin, Appiah, & Cicchirillo, 2007). As such, historically, video game developers have used a narrative device of first-person POV perspective to allow players to engage in the virtual environment as if they were actually there (Schneider, et al, 2004). The first-person perspective shows the onscreen action as seen through the eyes of the main character. People tend to identify with virtual characters found in storybooks (Bettelheim, 1976), films (Maccoby & Wilson, 1957), television (Cohen, 2001; Lin, 2008), and video games (Schneider, et al, 2004; Eastin, 2006; Eastin, et al, 2007). Video games offer a unique

vicarious experience as players directly control the actions of characters through the video game system controller (Schneider, et al, 2004). Thus, the first-person perspective will give video game players the ultimate vicarious, presence-inducing experience, as they virtually become another person.

Presence research has shown that the more technologically advanced a virtual environment is, the more a person perceives it to be real (Steuer, 1992; Biocca & Levy, 1995; Witmer & Singer, 1997; Biocca, 1997; Lombard & Ditton, 1997; Schneider, et al, 2004; Sherry, 2004; Lee, 2004; Tamborini & Skalski, 2005; Eastin & Griffiths, 2006; Eastin et al, 2007; Ivory & Kalyanaraman, 2007; Schubert, 2009). Similarly, research on the psychological sense of self indicates increased identification with the main character leads to a better understanding of the main character (Kalyanaraman, et al, 2009), therefore, increased involvement in the goals of the game. It stands to reason that the increased technological sophistication of a haptic feedback enabled game controller coupled with a first-person POV perspective will increase perceptions of presence.

As home gaming consoles evolve to become more like their virtual reality counterparts, it is increasingly important to understand the psychological effects of a virtual environment as it affects a much wider audience. The present study attempts to make a modest contribution to research on technological variables and video game effects by examining the psychological effects of advanced gaming controls and POV character perspective. Specifically, the study proposes to examine the relationship between video game systems with haptic feedback enabled game controllers and POV character

perspectives and the degree to which a player perceives presence, feels a sense of user control and affects attitude toward the game.

As haptic feedback enabled game controllers become increasingly common, and first-person POV perspective games continue to dominate the video game market, players will be increasingly exposed to a combination of technological media designed to increase perceptions of being within the gaming environment. This thesis presents the results of an experiment designed to test empirically the effects of haptic feedback enabled game controllers and POV perspective on players' perception of presence during a video gaming session. The study examined the interplay of haptic feedback enabled game controllers and POV perspective and sought to strengthen our knowledge of the mechanisms underlying presence in video gaming sessions. It addressed the specific research question: What is the relationship between haptic feedback enabled game controllers and POV perspective in video games and player perceptions of presence, user control and attitudes toward the video game? In addition, it explored the influence of a variable that was expected to mediate the relationship between haptic feedback enabled game controllers and attitude: technical control. In the following sections, the study first provides a review of relevant literature on technological advancement, presence and POV perspective, proposes hypotheses, details the methodology used in the experiment, reports and discusses the results, then offers suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

To examine prior research related to the two independent variables and provide a theoretical framework for this thesis, this section reviews relevant scholarly literature on interactivity (user control), presence, and its related dimensions of immersion, involvement, and identification.

Technological Advancement

Modern gaming systems' technology — high processing power and memory storage capability — has created a gaming environment in which speed, or how fast it takes to convey messages, and range, the extent and degree to which a player has control over the environment, are no longer major issues (Skalski, Lange, Tamborini & Shelton, 2007). Games instantly respond to players' actions and offer a seemingly limitless virtual environment. Modern video game systems allow players an interactive experience previously available only in virtual reality simulators. By their nature, video games are interactive: users send messages through the game controller and the video game system responds with coordinating action and a wide breadth of sensory information (Sundar, Kalyanaraman & Brown, 2003). With regard to presence, interactivity consists of three main components: speed, range and mapping (Steuer, 1992; Tamborini & Skalski, 2005;

Skalski, et al, 2007). As mentioned above, the speed and range of modern video game systems have become non-issues, when discussing presence.

Natural mapping is the ability for a player to match actions to the mediated environment in a natural and predictable way (Skalski, et al, 2007). Skalski, et al (2007) suggest that increases in natural mapping increase perceptions of presence, accordingly. Arcade games have provided natural mapping capabilities for games for years, such as driving games with real wheels and pedals or deer hunting games with mock shotguns. But video games at home have been "glaringly unreal" in terms of natural mapping capabilities (Skalski, et al, 2007). For example, instead of pulling a trigger to fire a gun, a player presses a button on the game controller. Natural mapping may be directional, kinesic, or real, tangible (Skalski, et al, 2007). Directional mapping is the simplest form of natural mapping, linking an action such as walking to the right with its directional equivalent (Skalski, et al, 2007). This is what game systems have typically done. Game characters walk to the right or left by pressing right or left on the direction pad or joystick. Similarly, they crouch when it is pressed down and look up or jump when it is pressed up. Kinesic takes this a step further by using real-life motions to influence actions. For example, to look up, one might tilt the game controller up. In the portable game *Guitar Hero* for the Nintendo DS, a person plays air guitar to create a strumming motion to play the game. Real, tangible natural mapping takes this even further by providing a mock controller. *Guitar Hero* for Xbox 360 or Wii provides a controller that looks like a guitar. *Wii Sports* baseball requires a player to hold its controller like a bat.

Since the development of modern video games, virtual reality environments have come closest to mimicking a person's natural movements. They offer the advanced technological ability to give virtual sensory information (auditory, visual, haptic, olfactory, or gustatory) such that a person feels the environment is not virtual (Blascovich, et al, 2002; Kalyanaraman, et al, 2009). The first video game systems offered basic auditory and visual information; players could see their characters and hear symbolic sounds for actions, such as a "boing" when jumping or a "pop" when shooting a gun. Modern video games offer much more in-depth sensory information with photo-realistic graphics and sounds to match – a gunshot sounds like a gunshot, and a jump onto gravel results in the expected crunch; rumble features in game controllers respond to onscreen actions, such as shooting a gun; and, most recently, haptic feedback, in which a player shoots a gun by pulling a trigger.

Although the Nintendo Wii is not the first game controller on the market to employ the use of haptic feedback, it certainly has had the deepest penetration. Nintendo's Wiimote is rectangular in shape with a direction pad on one end; action buttons on the opposite end a trigger button on the backside (See Appendix A, part 1). It includes motion sensitive sensors that allow for more natural mapping of real-life movements to onscreen actions, depending on the game. Sports games require players to mimic the motion of swinging a baseball bat or throwing a bowling ball while holding the Wiimote. Other games, such as action games, use the motion sensitivity to control character speed or action, by shaking the remote violently. Because players often lose themselves in the moment while playing the game system, each Wii game starts with a

reminder to use caution so that players do not hit something in their surroundings and, that they attach the Wiimote to their bodies with a wrist strap.

The Wiimote has a symmetrical design that allows for one-handed use in either hand. Onscreen movement is guided by moving the controller itself and action buttons are pushed with fingers. The controller features a rumble function and speaker that respond to action onscreen. It communicates wirelessly with the main console through Bluetooth technology. Most notably, it contains tilt sensors and three-dimensional pointing, which allows the system to understand all directions of movement (up, down, left, right, in, and out, etc.) and rotation (back and forth around the pitch, roll, and yaw axes). A controller attachment called a Nunchuk plugs into the Wii remote to allow for two-handed game play. When attached to the Wii remote through an about 4-foot long cord, the Wii Nunchuk resembles the traditional martial arts weapon of the same name, which consists of two sticks attached by a short rope or chain. The Wii Nunchuk features an analog joystick and trigger button.

The Xbox 360 uses a traditional gamepad controller, which prior to the Wii was the most common type of game controller. A gamepad controller is held with both hands, typically using right-hand fingers to push buttons with the left-hand fingers control a joystick or direction pad (see Appendix A, part 2). Although different games assign a variety of functions to the buttons, gamepad controllers tend to use the right-handed controls to control the camera angle and character actions, such as using a weapon, changing weapons or performing a specific action. The left hand tends to control onscreen direction. Many games also require coordination between the left and right hand

functions to perform certain activities, such as controlling the direction and timing of shooting a gun. Although different games assign a variety of functions to the buttons, gamepad controllers tend to use the right-handed controls to control the camera angle and character actions, such as using a weapon, changing weapons or performing a specific action. The left hand tends to control onscreen direction. Some more recent game systems, such as the Playstation 3, have included motion controls in its game controllers. In the Playstation 3 game *Little Big Planet*, the character is happy when the controller is rolled up and sad when it is held down. One way that some games have utilized a motion-sensitive controller is to show a 360-degree view of the environment. One piece of the motion-sensitive controller controls what is seen through the character's eyes. Tilting the controller to the left, right, up, or down makes the character move accordingly.

Increased vividness plus increased mapping capability combines to create an increased immersive experience, resulting in a heightened a sense of presence. Until recently, household video game consoles relied upon vividness and increased processing speed and virtual control of the environment (speed and range) to enhance a person’s immersive experience. Many of these factors are addressed with the technological advances of modern gaming systems. For example, the advanced processing of current video came consoles make loading time during games minimal. The advanced hardware allows for realistic graphics and environments that give players more range and freedom than ever before. However, few video games outside of a virtual reality laboratory have had the ability to map a player's motions onto the screen. The Wii is the first home

system that uses a motion-sensitive, haptic feedback enabled game controller to direct the movements of game characters.

Although the Wii offers the most technologically sophisticated game controller currently commercially available in the home, its haptic feedback enabled Wiimote is deceptively simplistic. The controller has fewer buttons and joysticks than the traditional gamepad. Additionally, the Wii console itself has slightly less processing power than the Xbox 360 console, which leads to less realistic graphics and a slower loading time. Despite these disadvantages, the Wii console offers many of the same game titles as the Xbox 360, many with haptic feedback enabled controller capabilities. It also has sold more consoles and has a wider penetration within the market.

Although the first-person POV is not new to most game players, it has dominated the market year after year remaining one of the most popular forms of the game. Game developers have taken notice and supplied the market with more first-person options than third-person options. Thus, many video game players are likely to associate the first-person POV with technological advancement.

A main effect is expected such that players will perceive the Wii's haptic feedback enabled game controller to be more technologically sophisticated than the Xbox 360's gamepad controller. Similarly, participants should report a higher sense of advancement with the first-person POV game.

> **H1:** Participants in the haptic feedback enabled game controller condition will report a higher perception of technological advancement than participants who are in the traditional gamepad controller condition.

H1 (a): Participants in the first-person point-of-view perspective condition will report higher advancement compared to participants who are in the traditional third-person controller condition.

Presence

Each video game player may experience games differently, depending on his or her individual differences. However, steps are taken at the development level to ensure a quality experience regardless of personality, cognitive, or affective differences. These types of steps maximize all users experiences by encouraging an immersive experience into the game. The goal of any game developer is to create a sense of presence for video game players. Presence essentially is "being there" (Steuer, 1992). It occurs when a game player feels that the virtual environment is real, the illusion of non-mediation (Lee, 2004). Virtual environments are generally conceptualized as allowing people to experience sensory components – auditory visual, haptic, etc. – as part of a "natural, real time experience using advanced technologies" that allow users to perceive the environment as if it were real (Kalyanaraman, et al, 2009, p. 7; Biocca & Levy, 1995). How strongly a player feels a sense of presence in a video gaming experience depends on several factors, including vividness and interactivity, or user control. Although many of these factors are psychological or internal, the physical aspects of any video game or console has a large impact on how much a player may feel a sense of presence.

Sherry (2004) suggested that media enjoyment is derived from flow experiences. He argued that people enjoy media because of flow experiences that occur when message content is balanced with the ability to understand the message. An autotelic, or self-motivating, experience occurs when someone doing an activity for the sake of doing it. In

the 1970s, Mihály Csíkszentmihályi conceptualized this phenomenon of losing oneself in the moment as "flow" (Csíkszentmihályi, 1990). Flow is a psychological phenomenon that occurs when a person is fully immersed in an activity. When the activity balances skill and task difficulty, a person may lose track of time because of the intense focus and concentration given to the activity (Csíkszentmihályi, 1990; Sherry, 2004). For example, a beginning piano player may experience flow when he finds a piece of music that corresponds to his skill level. To maintain a state of flow, a task must have concrete goals with specific rules; the opportunity to increase skill level as well as task difficulty, a clear indication of progress, and an environment without distractions. Sherry suggested that video games are ideal to elicit flow states because they have concrete goals and rules, difficulty that increases with skill, and a clear indication of progress (2004).

Similarly, Tamborini and Skalski (2005) suggest that, "electronic gaming is poised to become the *ultimate* presence-inducing medium" (emphasis theirs, p. 27). Subsequently, video game developers try to ensure a players' perception of presence in the gaming experience is high, correctly assuming that the more players feel presence, the greater their enjoyment and the more positively they rate the game and its console (Tamborini & Skalski, 2005; Schneider, et al, 2004; Lombard & Ditton, 1997). An increased sense of presence allows users to become more fully immersed in, involved with, and interact with a mediated environment. The most basic concept of presence is that feeling of "being there" (Steuer, 1992; Witmer & Singer, 1998; Lombard & Ditton, 1997) or feeling that "mediated representations are real," (Ivory & Kalyanaraman, 2007). This "perceptual illusion of nonmediation" occurs when a person fails to notice or

acknowledge the existence of the media and responds as if it were not there, as in, "you are there" or "it is here" (Lombard & Ditton, 1997; Witmer & Singer, 1998). In other words, presence is the media's ability to deceive the senses into believing that the mediated sensations are real (Eastin & Griffiths, 2006) in which virtual (para-authentic or artificial) objects are experienced are experienced as actual objects in either sensory or nonsensory ways" (Lee, 2004, p.37). Schubert (2009) takes this a step further, suggesting that spatial presence is not an experience, as previous definitions have determined. Rather, it's a cognitive feeling. It is the mind's attempt to locate the body in a virtual environment based on the sensory cues (onscreen action, sound, haptic feedback, environmental control, interactivity, etc.) that it's given. If spatial cognition process are "successfully able to locate the body in relation to the perceived environment, and construct possible actions in it, the feeling of spatial presence is fed back and becomes available for conscious processes" (p. 170).

Steuer (1992) identified several key determinants of presence, including vividness, involvement, and immersion. Vividness is the "intensity with which a mediated environment is able to present information to the senses (Li, Daugherty & Biocca, 2002, p.45). The richness of the experience depends on the breadth, the number of sensory dimensions affected simultaneously, and the depth, the quality of the information, of information to the senses (Li, Daugherty, & Biocca, 2002; Steuer, 1992). Although both screen size (Lombard, Reich, Grabe, Campanella, & Ditton, 2002) and image quality (Bracken, 2005) have been shown to increase the sense of presence,

television vividness remains limited, affecting only auditory and visual senses (Tamborini & Skalski, 2005).

Video gaming technology adds additional sensory dimensions with an interactive environment that responds to the player. Most modern gaming systems also include some form of physical responses to the gaming environment (Tamborini & Skalski, 2005). For example, a player falling onto the ground from a tall building might hear a loud thumping sound and feel vibrations in the hand-held game controller. New video games systems have more realistic and vivid representations of environments and characters, which has been shown to increase presence (Ivory & Kalyanaraman, 2007; Schneider, et al, 2004). Virtual reality technology's level of vividness goes even further by tapping into a player's physical sense. Players are able to fully interact with the environment, because the VR technology maps players' head, hand and body manipulation and integrates them into the game (Eastin & Griffiths, 2006). Presence is thought to have an "intensifying effect" on media users. These intense effects include enhanced enjoyment, involvement, task performance, memory and increased tendency to respond socially to media (Lombard & Ditton, 1997). Ivory and Kalyanaraman (2007) suggest that these intense presence side effects may have substantial implications on video game players.

Immersion and Involvement

Two necessary components for experiencing presence are immersion and involvement (Steuer, 1992; Lombard & Ditton, 1997; Witmer & Sinter, 1998). One of the physiological effects of presence is vection, the illusion of physical movement through a mediated environment (Lombard & Ditton, 1997). For example, while viewing a roller

coaster ride, people may feel they are swooping and speeding, as if they were actually on the ride. However, for some this may cause a type of motion sickness. When people lose themselves like this in a mediated experience, they become immersed, or feel as if they are enveloped by and included in an environment that provides a continuous stream in stimuli (Witmer & Singer, 1998). People who are fully immersed in an experience perceive that they are interacting directly with the environment, not indirectly or remotely; they feel transported to that new place (Witmer & Singer, 1998). Schubert describes this as a cognitive process of creating spatial presence (2009). The mind constructs a spatial model that includes "motor responses to the virtual environment, its objects, and its characters," subsequently causing unconscious thought to react in a similar way to that of the real world and result in a conscious experience of "being there" (p. 175). To be transported, player actions must have a nontrivial effect on the environment and the environment must respond similarly to the real world (McMahan, 2003; Schubert, 2009). In addition to affecting the virtual environment, a player must feel a sense of control over actions and events (Witmer & Singer, 1997). Mediating this feeling of presence is control over the virtual environment and physical gaming controls. Web-based research has shown that greater feelings of control over a virtual environment often result in increased feelings of satisfaction with the experience (Song & Zinkhan, 2008).

Involvement requires focused attention and energy on the stimuli. How involved a player becomes depends on how much significance or meaning they attach to the stimuli or activity (Witmer & Singer, 1998). Ivory and Kalyanaraman's (2007) conceptualization

of involvement stipulated that it pertained only to the "intensity of a user's engagement with a stimulus" (p. 535). They did not extend their definition to include antecedents to users' experience with the stimulus (motivation) or consequences (message evaluation outcomes) (p. 535). Research has shown that technological advancements have been shown to increase involvement in Web sites (Kalyanaraman & Sundar, 2006) advertising (Li, et al., 2002) and video games (Ivory & Kalyanaraman, 2007; Eastin & Griffiths, 2006). Similar to immersion, players are likely to become more engaged in a game using a motion-sensitive controller because their motions are shown onscreen.

Summary

To summarize the review of literature on presence, this concept is explicated as the media's ability to deceive the senses into believing that the mediated sensations are real (Eastin & Griffiths, 2006) in which virtual (para-authentic or artificial) objects are experienced are experienced as actual objects in either sensory or nonsensory ways" (Lee, 2004, p.37). Previous research has found that that improving the depth of natural mapping and sensory experiences, for video game players increases the intensity of being present in a game and generates more positive attitudes toward the video game itself (Lombard & Ditton, 1997; Schneider, et al,, 2004; Tamborini & Skalski, 2005; Eastin & Griffiths, 2006; Ivory & Kalyanaraman, 2007; Skalski, et al, 2007; Song & Zinkhan, 2008).

Based on the previous research concerning the effects of haptic feedback enabled game controllers on players' perception of presence and attitude (e.g., Skalski, et al, 2007; Tamborini & Skalski, 2005; Eastin & Griffiths, 2006), and on the findings of Song

and Zinkhan (2008) that increased feelings of control result in more positive attitudes toward the experience, the following predictions are made:

> **H2:** Participants in the haptic feedback enabled game controller condition will report a higher perception of presence within the virtual environment compared to participants who are in the traditional gamepad controller condition.
>
> > **H2 (a):** Participants in the haptic feedback enabled game controller condition will report a higher sense of control over the virtual environment compared to participants who are in the traditional gamepad controller condition.
>
> **H3:** Participants in the haptic feedback enabled game controller condition exhibit a more positive attitude toward the video game compared to participants who are in the traditional gamepad controller condition.

Point-of-view Perspectives

Identifying with others is central to the process of communication and achieving goals, whether the others are human (Kelman, 1961), television characters (Cohen, 2001; Lin, 2008), computers (Reeves & Nass, 1996) or video game characters (Schneider, et al, 2004; Eastin, 2007). Identification theory posits that people automatically assess how similar they are with another and adopt similar behaviors according to the intimacy level of the relationship (Kelman, 1961). This process begins in childhood when children vicariously experience the triumphs and defeats of storybook heroes (Bettelheim, 1976). Identifying with mediated characters continues through adulthood with audiences identifying with characters in films (Maccoby & Wilson, 1957), television (Cohen, 2001; Lin, 2008), and video games (Schneider, et al, 2004; Eastin, 2006; Eastin, et al, 2007). Video games offer the ultimate vicarious experience as players directly control the actions of characters through the video game system controller (Schneider, et al, 2004).

In the majority of the most popular video games, the main character's body is invisible to the player. Instead of watching a character move through an environment in a third-person perspective, the player sees through the eyes and hears through the ears of the character for a first-person POV perspective. Most commonly, these types of games are shooters, a genre of games in which the main character incapacitates an enemy by shooting or otherwise fighting him with a weapon. Typically, a first-person shooter game shows just the hands of the main character holding and interacting with a weapon at the bottom of the screen. The player sees and hears the onscreen action as the main character would. This differs from a third-person POV game, which positions a camera over the shoulder of the main character. Players may view the entire environment with either full or limited omniscience, depending on the game. However, in most third-person perspective games, a player sees the full body of the main character as well as his immediate surroundings, similar to watching a movie.

Video games give players the unique opportunity to virtually walk in someone else's shoes. In games with a first-person POV, the player essentially *is* the main character, sharing a virtual body and a virtual self. Through the main character, the player must be aware not only of his surroundings in the real world, but also his surroundings in the virtual world. This dual reflexive consciousness, or awareness of what is going on around us, may cause the player to focus more on his virtual self. Baumeister discusses reflexive consciousness as a feature of selfhood (1998). He suggests that it is a combination of self-awareness and "other" awareness, which leads to a deeper understanding of oneself. In this context, a player is aware of himself and his

surroundings in the real world, a living room, chair and television; simultaneously, he is aware of the "other," the main character in the virtual world of the video game. Baumeister suggests that this awareness of others heightens a person's self-awareness, forcing him to have a deeper understanding of himself and the differences from others (1998). Numerous television studies have found that identification with an other agent may often lead to stronger emotions. People who develop favorite characters are happy when good things happen to them and sad when bad situations develop (Raney, 2004). People believe they know how the characters feel and think (Cohen, 2001), as well as what may be best for them. Some studies suggest that the audience identifies strongly with the media characters, because they lose their own self when watching the television program (Hoffner, 1996; Lin, 2008). During this type of identification, audience members of both television (Cohen, 2001) and film (Maccoby & Wilson, 1957) put themselves in the media character's situation, and, subsequently, lose their own identities (Lin, 2008). Cohen suggested that increased identification with a television character might lead to increased affective responses toward the medium and increase enjoyment of the television show (2001).

The nature of a first-person POV video game eliminates cues of "otherness" by placing the player in the virtual head of the main character. The distance that typically exists between a media character and an audience member is eliminated, as a video game player has direct influence over the game character's actions. Schubert (2009) suggests that the brain tricks itself into believing that a virtual environment is real because spatial presence is a feeling fed to conscious thought through unconscious processes. This type

of POV gives immediate feedback from another character's perspective, unconsciously informing conscious thought that the player is the character. The first-person POV creates this loss of identity even more strongly because the video allows a player to see through the eyes and ears of the main character, fostering an even higher level of intimacy with the character.

When a player loses himself in a video game, becoming less aware of his physical self and surroundings, it is known as self presence, a type of presence (for more on presence types, see Lee, 2004; Biocca, 1997). Self presence is a "psychological state in which virtual (para-authentic or artificial) self/selves are experienced as the actual self in either sensory or nonsensory ways" (Lee, 2004, p. 46). This occurs when the self is experienced virtually, or encounters appropriate responses to input within the virtual environment (Lee, 2004; Biocca, 1997). Therefore, self presence is the psychological state in which the self is experienced virtually. Cognitively, the mind recognizes interactions with virtual agents and objects as potentially occurring the real world. Therefore, it allows itself to become spatially present in the virtual environment (Schubert, 2009). However, this spatial presence is contingent on the virtual environment behaving as its real-world counterpart (Lee, 2004; Biocca, 1997; Schubert, 2009). Players will be transported only if they feel a similar level of control over the virtual environment.

Slater and Usoh (1994) found that merely having a virtual body increases the level of presence for a player. Typically, video games embody characters with virtual avatars, giving players a point of reference for location, interaction with objects and other

characters in the game. When avatars respond quickly to player input, the sense of self presence increases, "creating a mental model of being inside the game environment" (Tamborini, et al, 2004, p. 17). The fewer distractions within the virtual or real environment, the more likely a person is to become spatially present. One distraction that is eliminated through the first-person perspective is the puppet master quality of the third-person perspective. Players are not controlling the movement and actions of an other (virtual) individual; instead they may transport themselves into the body of another. This level of intimacy allows players to more fully identify with a character in a first-person shooter than a character in a third-person shooter, heightening the sense of presence (Montavani, 1995; Tamborini, 2000). When players become a part of the video game environment like this, they report an increased sense of presence (Schneider, et al, 2004; Eastin, et al, 2006).

Summary

To summarize the review of literature on self presence, the concept is explicated as the psychological state in which the self is experienced virtually. Previous research has found that the first-person POV may heighten a player's perception of self presence, which elicits more positive attitudes and a greater sense of satisfaction with the gaming experience. Based on the previous research concerning self presence, the following predictions are made:

> **H4:** Participants in the first-person point-of-view perspective condition report a higher perception of presence within the virtual environment compared to participants who are in the third-person point-of-view perspective condition.

H4 (a): Participants in the first-person point-of-view perspective condition will report a higher sense of control over the virtual environment compared to participants who are in the traditional gamepad controller condition.

H5: Participants in the first-person point-of-view perspective condition will exhibit a positive attitude toward the video game compared to participants who are in the third-person point-of-view perspective condition.

Game Controllers and Point-of-View Interaction

Falling into a state of increased perceptions of presence requires people to enter a state of flow (Csíkszentmihályi, 1990), in which they lose not only track of time and space, but also may lose an awareness of themselves. This loss of reflexive consciousness, or the awareness of what is going on around us, essentially is a loss of self (Baumeister, 1998). Baumeister suggests that reflexive consciousness is a combination of self-awareness and "other" awareness (1998). Schubert (2009) suggests that the brain is tricking itself into believing that a virtual environment is real because spatial presence is a feeling fed to conscious thought through unconscious processes. The first-person POV eliminates cues of "otherness" by showing a camera perspective through the eyes and ears of the main character. This POV gives immediate feedback from another character's perspective, unconsciously informing conscious thought that the player is the character. This may lead to an increased understanding of another person's worldview through an increased awareness of the self. Kalyanaraman, Penn, Ivory, and Judge found in their 2009 study that people who experienced a first-person POV of a schizophrenic person's perspective in a virtual reality session had higher levels of empathy toward those afflicted

with the disease. They suggested that the virtual environment exposure caused a hyper-awareness of self induced by interaction with an “other” self and increasing self-knowledge. Applying this rationale to the current study, this suggests that games with a first-person POV may not only increase presence by tricking the brain into believing it is in another space, it also may increase identification with the main character by heightening the sense of an "other" self. This hyper-awareness may cause a player to become more involved with the goals of the game.

Presence research has shown that the more technologically advanced a virtual environment is, the more a person perceives it to be real (Steuer, 1992; Biocca & Levy, 1995; Witmer & Singer, 1997; Biocca, 1997; Lombard & Ditton, 1997; Schneider, et al, 2004; Sherry, 2004; Lee, 2004; Tamborini & Skalski, 2005; Eastin & Griffiths, 2006; Eastin, et al, 2007; Ivory & Kalyanaraman, 2007; Schubert, 2009). Similarly, research of the self indicates increased identification with a person leads to a better understanding of both the self and the other agent, (Baumeister, 1998; Kalyanaraman, et al, 2009) This, in turn, allows for a higher level of involvement in the goals of the game (Eastin, 2007; Eastin & Griffiths, 2006; Tamborini & Skalski, 2006). It stands to reason that the increased technological sophistication of a haptic feedback enabled game controller coupled with a first-person POV perspective will increase perceptions of presence.

When Eastin and Griffiths (2006) pitted a standard video game console against a virtual reality simulator, they incorrectly predicted that the VR simulator would elicit higher levels of presence for all conditions. They expected VR would have the highest level of presence, because it more fully incorporated a player's senses into the gaming

experience. This was not the case, likely, because players were not familiar with the VR apparatus, therefore, could not lose themselves in the games as they could with the console (2006). However, Kalyanaraman, et al found in their 2009 study that participants exposed to the more sophisticated, technologically advanced virtual reality environment responded more empathetically and positively to the situation than participants who were not given the same depth of sensory information. Put into a video game console condition, the Wii allows for a much richer sensory experience by incorporating body movement with the familiarity of a home gaming console.

Schubert (2009) would argue that this suggests technologically sophisticated games with a first-person POV not only increase presence by tricking the brain into believing it is in another space. The more "plausible and richer the [spatial situation model], the more plausible and stronger the resulting medium-as-(real)" (p. 172). This trick of the mind also may increase identification with the main character by heightening the sense of an "other" self. This hyper-awareness causes a player to become more involved with the goals of the game. He suggested testing this by providing a rich virtual environment that has potential for manipulating motor responses in participants.

The Wii is one of the most technologically sophisticated home gaming consoles currently on the market, allowing for motion, or mapping movement to onscreen characters through its haptic feedback enabled game controller. This alone has been shown to increase a player's perception of presence (Tamborini & Skalski, 2005) and feeling of control over the environment (Song & Zinkhan, 2008), producing more positive attitudes toward the game (Ivory & Kalyanaraman, 2007). Games with a first-

person POV perspective too have resulted in higher levels of intimacy and identification with the main character (Montavani, 1995; Tamborini, 2000), resulting in increased involvement in the goals of the game (Schneider, et al, 2004; Eastin, et al, 2006) and a higher level of the perception of presence (Eastin & Griffiths, 2006). It stands to reason that the interaction between the technologically advanced haptic feedback enabled game controller and a first-person perspective would result in the highest level of presence and user control with an increased positive attitude toward the game. Therefore, the following predictions are made:

> **H6:** Participants in the first-person point-of-view perspective condition playing with a haptic feedback enabled game controller will report an increased perception of presence within the virtual environment compared to participants who are in other conditions.
>
> > **H6 (a):** Participants in the first-person point-of-view perspective condition playing with a haptic feedback enabled game controller will report a higher sense of control over the virtual environment compared to participants who are in the traditional gamepad controller condition.

> **H7**: Participants in the first-person point-of-view perspective condition playing with a haptic feedback enabled game controller will exhibit a more positive attitude toward the video game compared to participants who are in other conditions.

CHAPTER 3

METHOD

Design Overview

To test the hypotheses, a 2 (*Call of Duty: World at War, Dead Rising*) x 2 (Nintendo Wii, Microsoft Xbox 360) between-subjects factorial design (N = 104) was employed. Participants were randomly assigned to one of four conditions. They were paid $10 for their participation. Each participant was exposed to a video game carefully selected specifically for its suitability to the conditions of this study. Participants were exposed to a video game that was a.) Either a first-person shooter game (*Call of Duty: World at War*) or third-person shooter game (*Dead Rising*), and b.) Played on a game system with high haptic feedback (Nintendo Wii) or low haptic feedback (Microsoft Xbox 360).

Participants

A convenience sample of 104 students was recruited through the School of Journalism and Mass Communication at UNC-Chapel Hill. Students were recruited through fliers posted throughout the school building as well as in-class visits. Participants were compensated for their time with $10. The sample was 63.1 % female and 36.9 % male, with an average age of 22.9 years. Equal numbers of participants were randomly

assigned to each condition, giving each condition 26 participants. When asked whether they played video games or not, 60.4 % answered "yes," and 39.6 % answered "no."

Stimulus Materials

Participants were assigned to play either the Nintendo Wii or Microsoft Xbox 360. Each system features a two-handed, wireless game controller, a rumble function and speaker (See Appendix B for more information about the video game consoles). The Wiimote Nunchuk attachment was required for both stimulus games. Both Wii stimulus games employed similar movement, requiring players to control movement with the Nunchuk joystick and shoot the gun with the remote's trigger button. Both Xbox 360 stimulus games featured similar use of the Xbox 360 controller's buttons and joysticks.

One of the most popular types of video games is the shooter game, in which the player or players typically are pitted against an army of enemy combatants. Shooter games are widely available across the various video game genres and on each of the existing commercial gaming consoles. The stimulus materials were carefully selected from existing video games to allow the perspective factor to be manipulated effectively. This study targeted Nintendo Wii and Xbox 360 versions of two shooter games, commercially released games with linear objectives, comparable graphic violence, and character movement to keep the format as uniform as possible. Because the study specifically examined how haptic feedback affects a player's experience, it was necessary to allow discrepancies in participants' familiarity with the controller interface. Great care was taken to ensure that the games were comparable not only in graphic nature, but also level of difficulty. A pre-test demonstrated that participants found both games

equivalently difficult, regardless of player experience. Shooter games were thought to be the most appropriate types of games for the study's short exposure time, giving participants enough time to finish one level of the game with an infinite number of lives.

Although many video games developed also are available for personal computers, computers were eliminated from the possible gaming console. PCs were determined less than suitable for this study because they cause players to interact differently with the gaming machine. For example, most computer games use a mouse and keyboard instead of hand-held game controller and require players to sit much closer to the screen. Sony's Playstation 3 also was eliminated from the study, because a third-person perspective game that met the stimulus material standards was not available for all three gaming systems.

The operationalization of shooter games was informed by media research involving identification (Montavani, 1995; Tamborini, 2000), the virtual self (Lee, 2004; Biocca, 1997; Tamborini, et al, 2004; McMahan, 2003), and video game advancement (Ivory & Kalyanaraman, 2007). To manipulate the perspective variable and hold others as constant as possible, we found similar types of shooter games released within the last several years on both consoles with comparable levels of violence, graphic gore and game play. Participants assigned to the Xbox 360 condition played either *Call of Duty: World at War* or *Dead Rising*. Likewise, those assigned to the Nintendo Wii console condition played either *Call of Duty: World at War* or *Dead Rising: Chop 'till You Drop*, a version of the Xbox 360 game modified to better suit the movement capabilities of the Wii controller. In both of these shooter games, the player plays against an enemy army

and tries to kill as many enemies as possible in order to advance through the level. If the player is not quick enough to target and shoot the enemy – Japanese troops in *Call of Duty* and zombies in *Dead Rising* – damage is inflicted on the player and their life is lost, causing them to restart the level at a previous position. Both games feature a similar level of graphic gore and a game rating of Mature for violent content (See Appendix B, parts 1-4 for more information about the stimulus games).

Dead Rising is seen from a third-person perspective, with a camera positioned behind the shoulder of the main character (See Appendix B: Parts 1 and 3). Players view the entire environment and may choose to reposition the camera to face the main character from the front or the back, as well as change its distance from the action. In this game, the main character is charged with helping survivors stay alive in a zombie-infested shopping mall. Participants began playing at a level in which the main character must make his way through the mall, across a courtyard and into the food court to kill a human psychopath. The main character uses a range of different weapons to kill zombies while making his way forward. The second stimulus game, *Call of Duty*, has a first-person perspective, in which the camera is positioned equivalent to the main character's head (See Appendix B: Parts 2 and 4). Players see only the main character's hands, gun and shoes, if they look down. In this game, the main character is a marine in World War II, recently rescued from a Japanese prisoner-of-war camp. He and his computer-controlled teammates make their way across Makin Atoll to an awaiting helicopter, whilst shooting Japanese enemies. He has access to several different types of guns and

grenades while making his way forward. Of the participants, 13 % reported having played the stimulus game previously and 3 % were unsure.

Dependent Measures

The primary dependent measures of attitude toward the game, presence, and user control were assessed by asking participants to respond to statements on a 7-point Likert scale. Participants also were asked to rate their perceived technological sophistication of the gaming hardware and games themselves. They were asked to assess their attitude toward video games both before exposure and after the test.

Technological Sophistication

Seven items were used to check to see whether participants thought the hardware was technologically sophisticated. The technological checks required participants to rate the advancement of the games and system, as well as check for how distracting they found the game and console controller, using seven Likert-type items in the post-test questionnaire (1 = “strongly disagree,” 7 = “strongly agree”). The advancement checks, based on Ivory and Kalyanaraman's 2007 study about video game advancement, asked participants to rate whether they thought the games were technologically advanced based on agreement with each of six statements about “The video game that I just played:” that it “had high-quality graphics,” “had high quality sound,” “had high-quality play control,” “was technologically advanced,” “was technologically sophisticated,” and “was new.” These items combined to for a single, reliable index (Cronbach’s $\alpha = .90$).

Presence

Presence was measured by three 7-point items from Ivory and Kalyanaraman (2007) and Witmer and Singer (1997): "While playing the game, how much did you feel like you were really 'there' in the game environment?" (1 = "*there,*" 7 = "*not there*"), "While playing the game how much did you feel like the game environment was a real place" (1 = "*real,*" 7 = "*not real*"), and "While playing the game, how much did you feel like the other characters in the game were real?" (1 = "*real,*" 7 = "*not real*"). These items were combined to form a single "presence" index (Cronbach's α = .88).

User Control

Participants were asked to assess how much control they felt over the gaming environment and their performance (Song & Zinkhan, 2008). They were asked to agree with the following statements on a 7-point scale (1 = "strongly disagree," 7 = "strongly agree"): "When I was playing I was always aware of where my character was in the game environment;" "When I was playing I always knew what was going on;" "When I was playing, I was always able to go where I wanted to go;" "I feel that I had a great deal of control over my gaming experience;" and "The game is very manageable." These items combined into a single "user control" index (Cronbach's α = .87).

Control Measures

Based on the work of previous experimental research of video games (Eastin & Griffiths, 2006; Ivory & Kalyanaraman, 2007; Barlett, et al, 2009), participants were given a pre-test questionnaire that included items assessing age, gender, hours spent playing video games per week, familiarity with video games (1 = "*not at all familiar,*" 7

= "*very familiar*"), familiarity with video game systems: Nintendo Wii, Playstation 3, Xbox 360, Nintendo Gamecube, Playstation 2, Xbox, Nintendo 64 and Playstation, (1 = "*not at all familiar*," 7 = "*very familiar*"), and experience playing video games (1 = "*much less than most people*" 7 = "*much more than most people*").

In addition, participants' attitudes toward the video game they played were assessed using 12-item affective attitude measure adapted from Sundar and Kalyanaraman's 2004 study. Participants were asked to rate which of the following words better described their feeling toward video games: appealing/unappealing; informative/uninformative; unexciting/exciting; boring/interesting; good/bad; pleasant/unpleasant; dull/dynamic; attractive/unattractive; favorable/unfavorable; likeable/dislikeable; ordinary/sophisticated; low quality; high quality. These items combined to form a single index called "attitude" (Cronbach's $\alpha = .88$).

Other Measures

In their 1998 presence questionnaire, Witmer and Singer proposed several other measurements to gauge a person's perception of presence, including technical controls. In the given context of video games, we determined that it was necessary to include measures designed to see whether participants felt they had control over the game system interface, the controller itself. Adapted from Witmer and Singer's 1998 questionnaire, participants were asked four 7-point questions: "How distracting was the game controller?" (1 = *very distracting*, 7 = *not distracting at all*); "How much did the game controller interfere with game play?" (1 = *not at all interfering*, 7 = *very interfering*); "How quickly did you adjust to using the controller? (1 = *very quickly*, 7 = *very slowly*);

and "How quickly did the environment respond to your video game controller? (1 = *very slowly*, 7 = *very quickly*). These items were combined into a single "technical control" index (Cronbach's α = .79).

Procedure

All participants took part in the experiment in individual sessions in a small, private classroom in the School of Journalism and Mass Communication at the UNC-Chapel Hill. At the experimental session, all participants were greeted by the researcher and asked to write their names on a sign-in roster. The researcher then asked the participant to have a seat at the table. The researcher then explained the nature of the study, explained the importance of obtaining informed consent, and reminded participants of their rights while participating in research. She then asked the participant to read carefully and sign an informed consent form before participating in the experiment (see Appendix C for the consent form). Participants were instructed to sign the back sheet if they wished to participate in the research session and keep the informational pages for their records. Participants were given the opportunity to ask questions regarding the study or the procedure (see Appendix D for a full script of the researcher's instructions during the experimental session).

Next, the researcher described for each participant the basic purpose of the study and provided an overview of the tasks they would be asked to participate in during the experimental session. The researcher asked the participant to complete a pre-test questionnaire designed to obtain demographic information as well as previous experience with video games and consoles, and existing attitudes toward video games (Ivory &

Kalyanaraman, 2007). The participant was instructed to indicate when he or she was finished with the paper-and-pencil pre-test questionnaire.

The participant was asked to be seated on a chair positioned four feet in front of a 42-inch, flat-panel, high definition television mounted on the room's wall. The television was hooked up to a gaming console equipped with a game controller. The appropriate stimulus game was queued to the appropriate starting point. The participant was given a one-page sheet containing instructions for the video game (See Appendix F, parts 1-4). After reading the instructions, participants were asked to learn how to play the game first by watching a 2-minute demonstration from the researcher. Sitting next to the participant, the researcher explained the rules of the game, how to use the controller and move through the gaming environment. Participants were encouraged to ask any questions they had about game play. After the demonstration, participants were allowed a 3-minute practice session with the experimenter sitting alongside to guide them through the game. When this guided play ended, the researcher restarted the game at the pre-selected point, and participants played alone for 10 minutes. When a game ended during the session, it restarted from a previous point of play. Although the frequency of these restarts during a session varied depending on participants' skill, most participants went through at least one restart during their session. After 10 minutes of game play, the researcher paused the game and asked the participant to return to their seat at the table to fill out a paper-and-pencil questionnaire (See Appendix G). Participants completed the post-test questionnaire including a thought-listing task; assessment of presence, immersion, involvement, interactivity, control, and satisfaction (Ivory & Kalyanaraman, 2007; Witmer & Singer,

1998; and Song & Zinkhan, 2008). After completing the questionnaire, participants gave the questionnaire to the researcher and were thanked for their time and provided with a debriefing form (Appendix G). Finally, participants were given $10 for participation, asked to sign a form indicating they'd received the money and were given a receipt. Each experimental session lasted no longer than 45 minutes.

CHAPTER 4

RESULTS

For all of the results, a series of two-way, between subjects Factorial Analysis of Variance tests were conducted, using the POV perspective and game condition as independent variables and the dependent measure as the dependent variable. This section will discuss the results as applicable to the dependent measures.

Technological Advancement

H1 predicted that participants would perceive the haptic feedback enabled Wii game system to be more technologically advanced than the gamepad controller Xbox 360. Similarly, H1 (a) predicted that players would rate the first-person POV game as more technologically advanced than the third-person game. Results indicated statistically significant main effects for the POV game condition, but no statistical significance for either the main effect of the game system condition or the interaction effects on the manipulation check items. The results revealed a statistically significant main effect for the POV condition, $F(1, 99) = 20.4$, $p < .001$]. Specifically, the mean scores for participants in the first-person POV perspective condition ($M = 5.7$, $SD = .97$) were significantly higher than for participants in the third-person POV perspective condition ($M = 4.8$, $SD = .87$). The main effect of game system condition and the interaction effect between POV perspective and game system were not statistically significant. This

demonstrates that participants felt that the gamepad controller was more technologically sophisticated than the haptic feedback enabled controller, disconfirming H1. However, the results support H1 (a).

Attitude toward the Game

H3 predicted that the Wii, with its haptic feedback enabled game controller, would induce increased positive attitudes toward the video game in players. An ANOVA with the attitude index as the dependent variable, revealed a statistically significant main effect for the game system condition [$F(1, 99) = 13.83$, $p < .01$]. Specifically, the mean scores for participants in the Xbox 360 game system condition ($M = 4.35$, $SD = 1.03$) were significantly higher than those in the Wii condition ($M = 3.65$, $SD = .9$). These results disconfirm H3.

Next, H5 predicted that the first-person POV game also would elicit increased positive attitudes toward the video game. A factorial ANOVA, using the POV perspective and game system conditions as the independent variables and the attitude index as the dependent variable, revealed a significant main effect for the POV condition [$F(1, 99) = 21.8$, $p < .001$]. The means demonstrate that players reported significantly higher positive attitudes for the first-person POV condition ($M = 4.4$, $SD = 1.02$), compared to the third-person POV condition ($M = 3.5$, $SD = .82$). These results support H5.

Finally, H7 predicted that participants in the first-person POV condition with the Wii would exhibit the most positive attitude toward the video game. A factorial ANOVA revealed a significant interaction effect [$F(1, 99) = 5.91$, $p < .05$]. The means scores for

players in the first-person POV, Xbox 360 condition (M = 4.5) were significantly higher than the mean scores in the first-person POV, Wii condition (M = 4.3). Similarly, the mean scores for participants in the third-person POV, Xbox 360 condition (M = 4.15) were significantly higher than participants in the third-person POV, Wii condition (M = 3.05). These results indicate that those in the first-person POV have a more positive attitude regardless of the technological advancement of the game controller, disconfirming H7 (See Figure 1).

Presence

H2 predicted that participants would have a higher sense of presence using the haptic feedback enabled game controller than the gamepad controller. Likewise, H4 predicted that participants in the first-person POV condition would report a greater sense of presence than those in the third-person POV condition. Finally, H6 predicted an interaction effect such that participants playing a first-person POV with a haptic feedback enabled game controller would report the highest perception of presence. An ANOVA with the index presence as the dependent variable revealed a statistically significant main effect for the POV condition, [$F(1, 100) = 4.98$, $p < .05$]. Specifically, the mean scores for participants in the first-person POV perspective condition (M = 3.75, SD = 1.58) were significantly higher than for participants in the third-person POV perspective condition (M = 3.1, SD = 1.42). These results support H4. The main effect of game system condition and the interaction effect between POV perspective and game system were not statistically significant. Thus, H2 and H6 are not supported.

User Control

H2 (a) predicted that participants using a haptic feedback enabled game controller would report the highest sense of user control over their virtual environment. H4 (a) predicted that participants in the first-person POV condition would report the higher sense of user control. H6 (a) predicted an interaction effect such that participants playing a first-person POV game with a haptic feedback enabled game controller would report the highest sense of user control. An ANOVA, using the user control index as the dependent variable, found a significant main effect for the POV condition *[F(*1, 100) = 8.5, $p < .01$]. Mean scores indicate that participants in the first-person POV condition reported a higher level of control ($M = 3.95$, $SD = 1.24$) compared to those in the third-person POV condition ($M = 3.17$, $SD = 1.45$). These results support H4 (a). No significant main effects were found for the game condition or interaction effects. Thus, H2 (a) and H6 (a) are not supported.

Other Findings

To assess whether participants had difficulty navigating the technical aspects of the game controller itself, a two-way factorial ANOVA was run with the POV perspective and the game system condition as the independent variables and the technical control index as the dependent variable. The ANOVA results revealed a significant main effect for the game system condition [$F(1,99) = 19.43$, $p < .001$], specifically the mean scores for the Xbox 360 ($M = 3.92$, $SD = 1.09$) are significantly higher than the scores for the Wii ($M = 3.02$, $SD = 1.11$). This demonstrates that users reported having more technical difficulty using the nontraditional Wii game controller.

Additional analyses using the control measures as covariates were essentially redundant, suggesting that these did not impact the relationship between the IVs and DVs in this study. Similarly, it was confirmed that the variable "technical control" was found to be significantly different from the variable "user control."

Summary of Results

In brief, the results show that the first-person POV perspective increased players' sense of presence and feeling of user control over the virtual environment as well as influenced participants' attitudes toward the games, supporting H4, H4 (a) and H5. Contrary to the predictions, the game condition did not have a significant effect on presence or user control, failing to provide support for H2, H2 (a) or H6. In fact, participants reported more positive attitudes toward the Xbox 360 than the Wii, demonstrating opposite expectations. This reversal disconfirms H3 and H7. These results may be explained, at least in part, by the failure to find significance in participants' perceptions that the gamepad controller system is more technologically advanced than the haptic feedback enabled controller system, a finding that disconfirms H1.

CHAPTER 5

DISCUSSION

Research has long established that a close relationship with an other agent increases identification with that agent, as well as positive feelings not only toward the agent, but the encounter, too. But what if that agent is the main character within a video game? Video game players virtually exist in another agent's shoes, taking on their environment, storyline and personalities. Until recently, little research has investigated the psychological effects of this agent identification on player attitude toward a video game. However, the existing research supported the notion that the intimate an interaction with a virtual agent, the more positively a person would react toward and engage in the medium.

This thesis sought to build on such research by extending our knowledge of the effects of increased character identification through video games (Eastin, et al, 2007) and increased technologically sophisticated video game equipment (Ivory & Kalyanaraman, 2007) to examine whether the same effects would be found in the context of POV character perspectives. It sought to strengthen our understanding of the mechanisms underlying perceived presence by examining user control and the potential mediator of technical control. Further it sought to explore POV perspective's effects on affect (attitude). Finally, it examined the interplay of POV perspective with another

independent variable, haptic feedback enabled game controllers, in order to investigate the power of its influence.

Identification with a virtual agent has been shown to result in increased perception of presence (Eastin, et al, 2007; Yee & Bailenson, 2007; Schubert, 2009), as well as greater perceived user control, which in turn resulted in more positive attitudes toward the media (Song & Zinkhan, 2008). These studies used the theoretical framework of presence to demonstrate that increased intimacy with a virtual medium was likely to lead to a more positive evaluation.

Theoretical Implications

Technological Advancement

Previous research also has indicated that increased technological sophistication heightens a player's experience by increasing perceived presence (Ivory & Kalyanaraman, 2007). However, research also has demonstrated that players may not be comfortable with newer technology (Eastin & Griffiths, 2006). Some even have suggested that the content of the video game outweighs technological sophistication to the extent that the advancements are moot (Barlett, et al, 2008). The underlying reasons for these differences, however, had not been sufficiently examined from a theoretical perspective. This thesis sought to contribute to our understanding of the influence of technological sophistication recommendation source by examining its role in presence. In order to explore how the process by which technological advancements affect player attitudes, this thesis examined their influence in concert with POV perspective. This

factorial design allowed an examination of the effects of both POV perspective and technological advancement as predicted factors in the perception of presence and attitude. Findings from this thesis offer several insights into the functioning of POV perspective and technological advancement that deserve discussion. The first point to emphasize, however, is the effectiveness of the manipulations of the two independent variables. The technological advancement variable items showed statistical significance for POV perspective, demonstrating that participants believed that the first-person POV perspective was significantly different than the third-person POV perspective. This is an important point, given that a). first-person perspectives were subsequently shown to result in significantly more positive attitudes toward the video game, and b). the strength of POV perspective influence was shown to be much greater than the effects of the technological advancement.

However, we did not find statistical significance for technological advancement. This finding perhaps demonstrates that participants gauged the gamepad controller of the Xbox 360 system to be just as technically advanced as the haptic feedback enabled controller of the Wii system. This could stem from the fact that the Xbox 360 made its debut in 2005, just a year before the Wii came onto the market. Upon the suggestion of Witmer and Singer's 1998 questionnaire, we included a technical control variable to measure whether players had difficulty using the Wii interface. Indeed, the results indicate a significant effect for the Xbox 360, demonstrating that they found the interface simple to use. The Wii did not show a significant effect, indicating that perhaps players found it more unwieldy than its counterpart. There also were no significant effects for the

POV conditions, indicating that players had no technical control trouble with either of the games.

The haptic feedback enabled game controller had little effect on players' perceptions of presence or user control. This disconfirms H2 and H2 (a), which suggest that the Wii, with its motion-sensitive controller, would elicit higher levels of presence and user control. Ivory and Kalyanaraman (2007) found that increased technological advancement within video games has a significant effect on players' gaming experiences. However, the current study's results are more in line with Eastin and Griffith's 2006 study that found players preferred a traditional, less advanced gaming console over the technically advanced virtual reality machine. Likewise, Barlett, et al, determined in their 2008 study, that a progression of increasing technologically sophisticated gaming systems had little effect on players' perceptions of the video games themselves. These findings support the notion that the content has more effect on players than sophisticated hardware (Schneider, et al, 2004; Tamborini, et al, 2004).

In fact, the present study's results also disconfirm H3 and H7, which found the opposite interaction effect than predicted. The results indicate that while first-person POV had the predicted effect on players' attitudes, supporting H4, the reverse was found for H2: players reported increased affect toward the Xbox 360 compared to the Wii. Indeed, an interaction effect found that the first-person POV Xbox 360 condition positively increased attitude over the first-person POV Wii condition, disconfirming H6. Similarly, players reported increased positive attitude toward the third-person POV Xbox 360 condition compared to the Wii condition. It stands to reason that players responded

more positively to the Xbox 360, because it was a familiar format, while the Wii's controller altered the traditional dual-handed gamepad by forcing players to hold the pieces of the controller separately. This would be similar to the results of Eastin and Griffiths's 2006 study.

Point of View

As predicted by H3, H4 and H6, the first-person POV perspective was found to increase player's perceptions of presence, user control and attitude toward the game, regardless of the technological advancement of the game controller. These findings lend support to existing research that suggests increased intimacy with a media character agent elicits increases positive affect in a virtual environment (Cohen, 2001; Raney, 2004). Much research has been devoted to ascertaining the psychological effects of a video game's content on a player; however, relatively little has examined the effects of the perspective through which a player views a game. The results indicate that POV perspective has important effects that are similar to those that occur in other media (Cohen, 2001; Raney, 2004). The theoretical link between POV perspective and presence, user control and positive affect seems to be strong enough to occur over several media, including video games.

In exploring the relationship between first-person POV and video game players, several variables were considered. First, the finding that first-person POV led to greater perceptions of presence is consistent with identification and self-presence literature that suggests that increased intimacy with a media (or virtual) agent results in increased

immersion and involvement in the experience (Eastin & Griffiths, 2006; Eastin, 2007; Schubert, 2009). These findings support H3.

When Krcmar and Farrer (2009) examined a video game's first-person POV's effect in the context of aggressive behaviors, they found that third-person POV led to increased violence. They speculated that this was because in the first-person POV, players felt little or no identification because they could not see the character's full body. However, the results of the current study suggest that the first-person POV allows players to more fully lose themselves in the environment, experiencing a higher perception of presence. In light of this experiment's findings, we suggest that players more fully identify with the character in a first-person POV to the extent that they engage in less risky (and violent) behavior in the video game environment than they would seeing the third-person POV.

Presence research has shown that the more a virtual environment responds like the natural environment, the more likely a player will lose themselves in the experience (Witmer & Singer, 1998; Tamborini, et al, 2004; Tamborini & Skalski, 2006). This loss of self coincides with increased identification with the main character, often brought about by a high level of intimacy and understanding, or empathy (Cohen, 2001; Lin, 2008; Kalyanaraman, et al, 2009). This level of intimacy may be influenced by the degree to which a player feels control over the virtual environment. The results of this study indicate that the first-person POV offers a player the highest degree of user control over the environment, supporting H3.

Television and film studies have shown that the more empathetic a character, the more likely an audience member will report high identification with the character (Maccoby & Wilson, 1957; Cohen, 2001). Kalyanaraman demonstrated that seeing through the eyes and ears of a mentally disturbed character in a virtual reality environment also elicited higher levels of feeling toward a character. In the current study, the user control results indicate that players in the first-person POV felt they had a direct impact on their environment. This bolsters the findings of a higher level of presence by indicated that players might have developed a keener understanding with the main character through first-person POV.

Practical Implications

This study provides useful insights for developers aiming to produce popular games and how to maximize positive affect toward the games. The well-established game library of the Xbox 360 indicates that Microsoft and other Xbox 360 game developers already have realized the potential for first-person POV games, as they greatly outnumber the available third-person POV games. However, the game catalogue of the Wii is still developing. Although the results of the interaction effects of first-person POV video games and the Wii controller, the results still indicate that first-person POV was more popular than the third-person POV regardless of the hardware. Efforts to produce more first-person POV games would be justified by our findings that these types of games increase the feeling of "being there" as well as increase the amount of control a player feels over the virtual environment.

The study's failure to observe significant effects for the game controllers is also instructive for game developers as well as players. For Wii developers, it is indicative that the Wiimote does not give players the feeling of technical control. This may lessen with time, or it may be indicative that game developers have failed to capitalize on the Wiimote's capabilities. For game players, the results indicate that they may have a more positive experience purchasing first-person POV games, regardless of which gaming system they already own. Although affect toward the Wii was lower than the Xbox 360, it was less than two-tenths of a point away.

Limitations

As Ivory and Kalyanaraman stated in their 2007 study on video games, this study also used commercially available video games and home gaming consoles. These may have provided realistic and natural stimulus materials with enhanced external validity, but they also forced looser controls over stimulus dimensions. The video game market has a vast selection of games available, however, finding two different games that were precisely equal in difficulty, spanned the two gaming consoles, utilized similar game controller actions, and met the POV criteria, while holding other dimensions constant, proved unobtainable. Therefore, the games used were carefully selected to manipulate first-person and third-person POV on the Wii and Xbox 360. A pre-test of the games indicated that players found the two games to be equal in difficulty as well as typify the first-person and third-person POV. The manipulation checks support the claim that players found the first-person and third-person POV manipulations to be successful. These findings also may not be extrapolated beyond for all first-person and third-person

POV games, given the broad range of video games on the market. Nor may are the results generalizable to other game systems, such as the Playstation 3 or any number of handheld, personal gaming systems. Ivory and Kalyanaraman pointed out that no set of video game stimulus material has "unlimited generalizability" (2007).

Another limitation involves the content of the games themselves. Because the available choices were limited, *Dead Rising* and *Call of Duty: World at War* were chosen to represent their genres. However, *Dead Rising*'s story deals with a fantastic element of a zombie uprising, while *Call of Duty: World at War* is more realistic, with an imagined historically based story of the WWII battle on the Pacific front. For some players, this may have caused increased interest or disinterest in the game, depending on their interests in horror fiction or war history. In the future, it may be possible to find two games with similar storylines as they appear on the market.

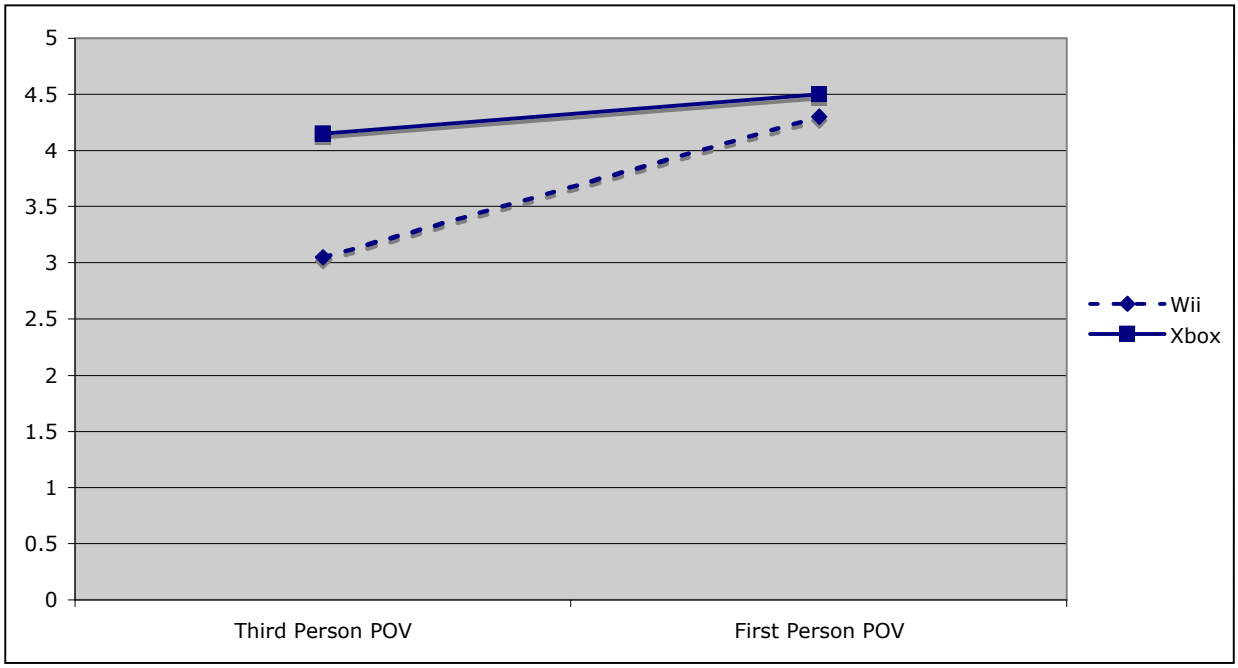
Another limitation was the limited use of haptic feedback technology in the Wii games. Few games on the market that are available for more than one video game console offer full utilization of the haptic feedback technology, instead relying on the familiar two-handed, gamepad-like setup. Future games developed for the Wii are likely to enable players to make better use of the haptic feedback enabled controllers.

Another limitation of the study is the demographic makeup of participants. The participants were college-aged and likely inclined to be more familiar with video games and their consoles. However, this appears to be changing as 97 % of teenagers, 80 % of young adults, and nearly 25 % of senior citizens reported playing a video games as of 2008, (Pew Internet and American Life Project).

Future Research

The insights gained in this study may provide a springboard for future research concerning the effects of increased technological advancement and POV perspectives. Based on the evidence that POV perspective impacts characters in the shooter genre, it would be worthwhile to investigate whether that holds true in other video game genres, such as action/adventure or role playing fantasy. In these types of games, players also have the opportunity to create their character's personality based on a series of choices through the game. Future research could investigate whether choosing a character destiny of good or evil impacts the perception of presence or affect toward the game. It might also prove worthwhile to give the Wii a chance to mature, allowing players to become as comfortable with its nontraditional game controller as they are with the Xbox 360's gamepad controller. Looking at the Wii games on a one-to-one basis would provide the chance to fully examine the haptic feedback enabled capabilities without risking alienation due to comfort with another gaming system. The Xbox 360 has built its reputation of gaming excellence on its best-selling first-person POV series Halo. The Wii has yet to find a first-person POV game with similar success to Halo. It would be interesting to repeat the study when the Wii has developed a game with similar qualities.

Figure 1. Interaction effect between point-of-view perspective and game system on attitude toward the video game.



APPENDIX A

Stimulus Materials

Part 1: Video Game Consoles: Nintendo Wii Controller

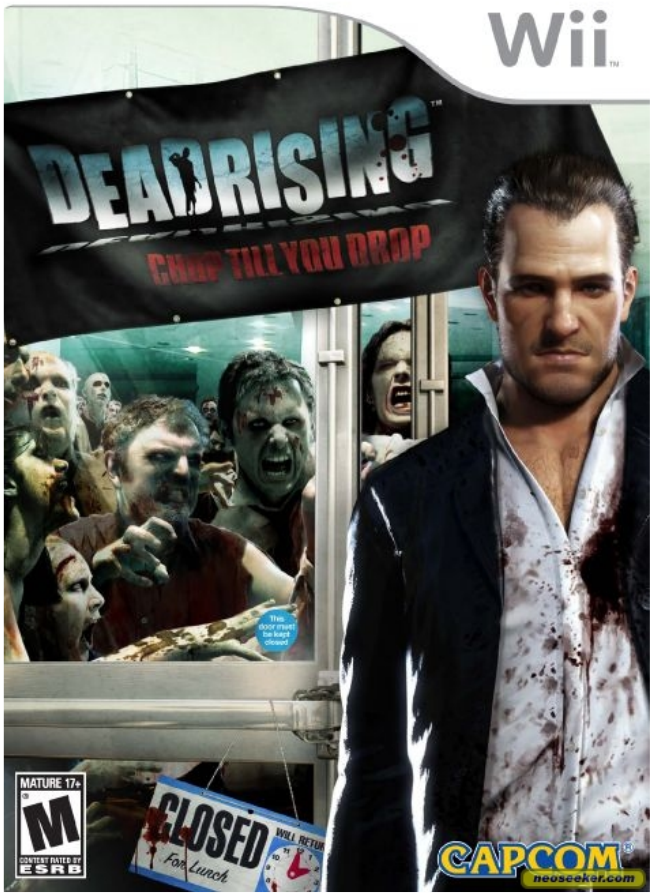
The Wii Nunchuk and Wii remote allow for two-handed control of onscreen action. Most users hold the Wii remote in their right hand and Wii Nunchuk in their left hand

Part 2: Video Game Consoles: Xbox 360 Controller

The Xbox 360 gamepad-style controller requires players to grip the controller with both hands.

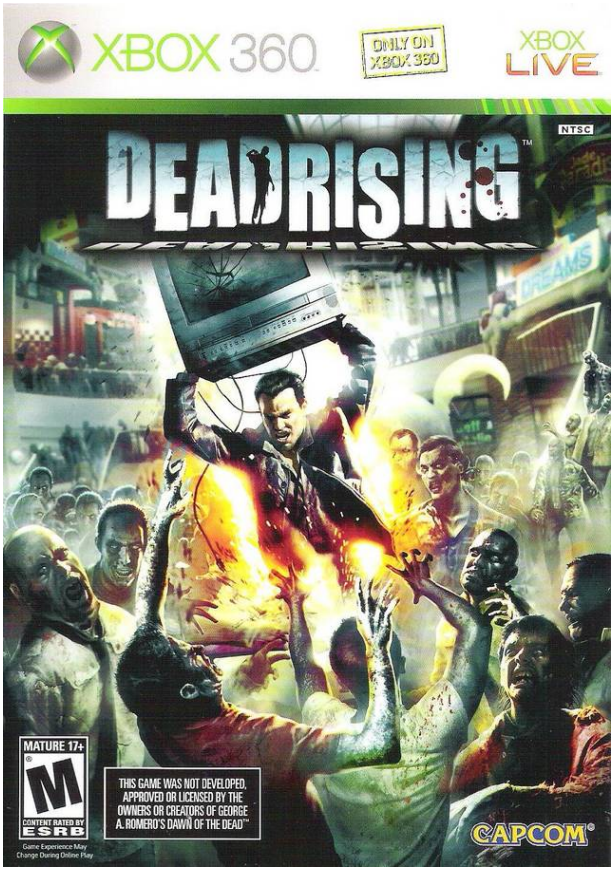
APPENDIX B

Part 1: Video Games: Dead Rising: Chop 'Til You Drop, Nintendo Wii



Developer: Capcom Co., Ltd.
Publisher: Capcom Entertainment Inc.
Genre: Action, Horror
Release Date: 2/29/2009
Console: Nintendo Wii
Game Rating: Mature: blood and gore, intense violence, language,

Part 2: Vide Games: Dead Rising, Xbox 360



Developer: Capcom Co., Ltd.
Publisher: Capcom Entertainment Inc.
Genre: Action
Release Date: 8/8/2006
Console: Xbox 360
Game Rating: Mature: blood and gore, intense violence, language, partial nudity, use of alcohol

Part 3: Video Games: Call of Duty: World at War, Nintendo Wii

Developer: Activision
Publisher: Activision Publishing, Inc.
Genre: Shooter
Release Date: 11/11/2008
Console: Nintendo Wii
Game Rating: Mature: blood and gore, intense violence, strong language

Part 4: Video Games: Call of Duty: World at War, Xbox 360

Developer: Treyarch
Publisher: Activision Publishing, Inc.
Genre: Shooter
Release Date: 11/11/2008
Console: Xbox 360
Game Rating: Mature: blood and gore, intense violence, strong language

APPENDIX C

Informed Consent Form

University of North Carolina-Chapel Hill
Consent to Participate in a Research Study
Adult Participants
Social Behavioral Form

IRB Study #: 09-0350
Consent Form Version Date: 2/26/09

Title of Study: A study on the differences in point-of-view perspective game play on the Xbox 360 and Wii.

Principal Investigator: Julia Crouse
UNC-Chapel Hill Department: School of Journalism & Mass Communication
UNC-Chapel Hill Phone number: (919) 962-1204

Faculty Advisor: Sri Kalyanaraman
UNC-Chapel Hill Department: School of Journalism and Mass Communication
UNC-Chapel Hill Phone number: (919) 843-5858
Email address: sri@unc.edu

Study Contact telephone number: (863) 255-2810
Study Contact email: jcrouse@unc.edu

What are some general things you should know about research studies?

You are being asked to take part in a research study. To join the study is voluntary.
You may refuse to join, or you may withdraw your consent to be in the study, for any reason, without penalty.

Research studies are designed to obtain new knowledge. This new information may help people in the future. You may not receive any direct benefit from being in the research study. There also may be risks to being in research studies.

Details about this study are discussed below. It is important that you understand this information so that you can make an informed choice about being in this research study.
You will be given a copy of this consent form. You should ask the researchers named above, or staff members who may assist them, any questions you have about this study at any time.

What is the purpose of this study?

The purpose of this research study is to learn about advanced video game effects.

Are there any reasons you should not be in this study?
In order to study video game effects, participants must be willing and physically able to play a first-person shooter video game. Those who are not able to do this, due to motion sickness, physical handicap, or aversion to video game violence may be dropped from the study.

How many people will take part in this study?
If you decide to be in this study, you will be one of approximately 120 people in this research study.

How long will your part in this study last?
Participants will complete the study only once and the procedure will take about 45-50 minutes.

What will happen if you take part in the study?
You will be asked to answer a group of questions, play the game *Call of Duty 4: World at War* or *Dead Rising* for up to 20 minutes, and complete another set of questions.

What are the possible benefits from being in this study?
Research is designed to benefit society by gaining new knowledge. You may not benefit personally from being in this research study.

What are the possible risks or discomforts involved from being in this study?
Participants may feel some mental or emotional discomfort as a result of playing a graphic video game that incorporates shooting enemies in a World War II setting, or the undead. Participants who feel extreme unease will be encouraged to stop playing at any time. However, the wide market penetration of the selected gaming stimulus as well as the historic nature of the game is expected to alleviate most participants' discomfort.

There may be uncommon or previously unknown risks. You should report any problems to the researcher.

How will your privacy be protected?
Information that is printed out will be stored in a locked filing cabinet in the locked office of the principal investigator and destroyed when analysis is complete. Data that is downloaded will be stored on a single computer that has password protected log-on and the files will be password protected as well.

Initially identifying information will be linked to responses. However, upon receipt of the surveys, this information will be stripped from the data and stored in a separate, password-protected file to be used only for the incentive drawing.

Participants *will not* be identified in any report or publication about this study. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies for purposes such as quality control or safety.

Will you receive anything for being in this study?
You will be receiving $10 for taking part in this study.

Will it cost you anything to be in this study?
There will be no costs for being in the study

You may choose not to be in the study or to stop being in the study before it is over at any time. This will not affect your class standing or grades at UNC-Chapel Hill. You will not be offered or receive any special consideration if you take part in this research.

What if you are a UNC employee?
Taking part in this research is not a part of your University duties, and refusing will not affect your job. You will not be offered or receive any special job-related consideration if you take part in this research.

What if you have questions about this study?
You have the right to ask, and have answered, any questions you may have about this research. If you have questions, or concerns, you should contact the researchers listed on the first page of this form.

What if you have questions about your rights as a research participant?
All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research subject you may contact, anonymously if you wish, the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

- -

Title of Study: A study on the differences in point-of-view perspective game play on the Xbox 360 and Wii.

Principal Investigator: Julia Crouse

Participant's Agreement:

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily agree to participate in this research study.

_____ _____

Signature of Research Participant Date

_____

Printed Name of Research Participant

_____ _____

Signature of Person Obtaining Consent Date

_____

Printed Name of Person Obtaining Consent

APPENDIX D

Script for Administration of Test

[greet participant]
[have him/her sign in to the roster and be seated]

Thank you for participating in my study. My name is Julia Crouse, and I'm a master's student in the School of Journalism and Mass Communication.

I am looking at how different camera perspectives affect the gaming experience. There are a lot of games to use. However, in the interest of time, I'm only asking you to play one game.

The study should take no more than 45 minutes. First, you'll be asked to sign a consent form, then complete a pre-test questionnaire to get some demographic information. Then, you'll play *Call of Duty: World at War* or *Dead Rising* on the Wii or Xbox 360 for about 15 minutes. After that, I'll ask you to answer a questionnaire about your experience. You will be paid $10 for your participation.

The game you are playing is categorized as a shooter games, and rated Mature for blood, violence and language. Because of that, any discomfort as a result of playing the game, please let me know, and we can stop the session.

First, review and sign this informed consent form for this study. This is designed to let you know your rights as a research participant.

[watch participant read and sign informed consent form]

Please fill out this pre-test questionnaire about your current video game habits and demographic information. Please let me know if you have any questions, and let me know when you are done.

[wait for participant to finish pre-test questionnaire]

Now, I'd like you to familiarize yourself with the game for the next 5 minutes or so. Here is an instruction sheet that shows what buttons perform which actions on the game controller. Let me show you how to play the game by going through the instruction sheet and demonstrating how to play the game. If you have any questions, feel free to ask during this time.

After about 5 minutes, I'll ask you to play the game by yourself without any additional help. Or you can let me know when you are ready.

[sit next to participant and demonstrate how to play the game for 2 minutes. Allow participant to play for 3 minutes]

Now that you have a handle on how to play the game, please play by yourself for the next 10 minutes. I'm going to restart the game to the beginning of this level.

[watch participant play game, note how many times died and whether he/she has extreme difficulty. Stop the game after 10 minutes of playing time.]

Okay, your 10 minutes are up. Please fill out this questionnaire about your video gaming experience.

[instruct participant to begin post-test questionnaire]

You are finished, here is a sheet that describes what the study is attempting to accomplish and your $10 for participation. Do you have any final questions?

[give participant debriefing form and $10]

Thanks for participating!

APPENDIX E

Prequestionnaire

Pre-test questionnaire

Age: _____

Gender: M F

Do you play video games? Yes No

What video game systems do you own? Check as many as apply:

_____Nintendo Wii
_____Sony Playstation 2
_____Playstation 3
_____Xbox 360
_____Nintendo DS
_____Playstation portable
_____Other, please specify _____

Please rate your familiarity with the following video game consoles on a scale of 1-7.

	Not at all						Extremely
Nintendo Wii	1	2	3	4	5	6	7
Planstation 3	1	2	3	4	5	6	7
Xbox 360	1	2	3	4	5	6	7
Nintendo Gamecube	1	2	3	4	5	6	7
Playstation 2	1	2	3	4	5	6	7
Xbox	1	2	3	4	5	6	7
Nintendo 64	1	2	3	4	5	6	7
Playstation	1	2	3	4	5	6	7

On average, how many hours per week do you spend playing video games? _____hrs/week.

What is the reason you do not spend more time playing video games? _____

Please rate your overall interest in video games on a scale of 1-7, where "1" means *no interest* and "7" means *very interested.* Circle one:

1 2 3 4 5 6 7

Please rate your overall skill in video games on a scale of 1-7, where "1" means *never/rarely played* and "7" means *expert*.

1 2 3 4 5 6 7

How many years have you been playing video games? _____years.

Please provide an overall evaluation of your attitude toward video games using the scale below. Circle the number that indicates how well each term describes your attitude video games, where "1" means the term describes *strongly disagree*, and "7" means the term describes *strongly agree*.

	Strongly disagree						Strongly agree
Appealing	1	2	3	4	5	6	7
Useful	1	2	3	4	5	6	7
Positive	1	2	3	4	5	6	7
Good	1	2	3	4	5	6	7
Favorable	1	2	3	4	5	6	7
Attractive	1	2	3	4	5	6	7
Exciting	1	2	3	4	5	6	7
Pleasant	1	2	3	4	5	6	7
Likeable	1	2	3	4	5	6	7
High Quality	1	2	3	4	5	6	7
Interesting	1	2	3	4	5	6	7
Sophisticated	1	2	3	4	5	6	7

Please let the study administrator know when you are finished with this questionnaire.

APPENDIX F

Instruction Sheet for Stimulus Games

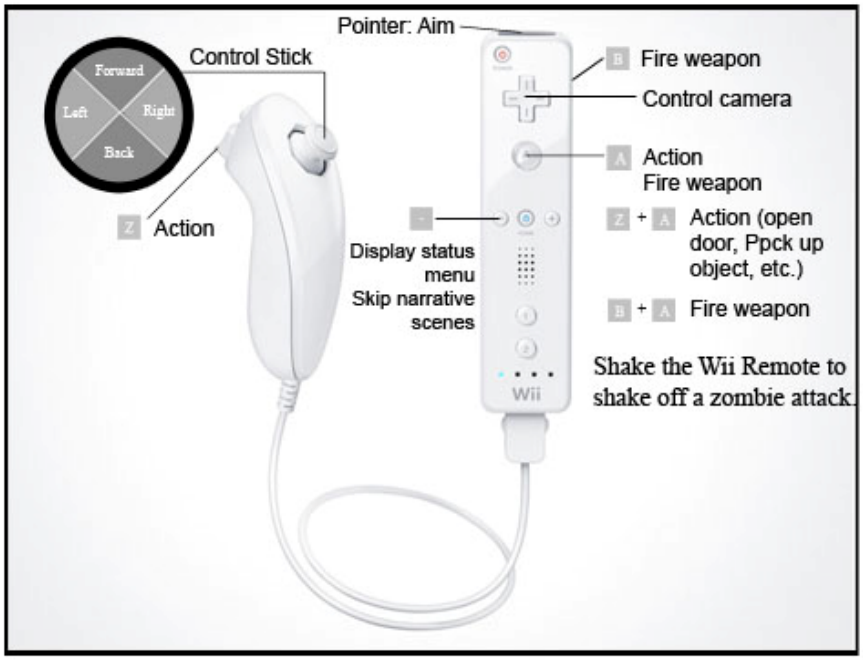
PART 1

OBJECTIVE: Make your way through the mall and courtyard to the food court. Kill as many zombies as possible. Help your fellow survivor defeat the human psychopath.

STORY: You are freelance photojournalist Frank West, who is working on a story about a zombie phenomenon in Willamette, Colo. Frank has joined a group of survivors in the mall, helping them rescue others and secure the mall.

GAME PLAY: Besides your gun, use nearly any object in the mall as a weapon by holding Z + A . Press A to attack.

Target your weapon or gun by pointing the remote at the screen and hold B .
Fire your gun by pressing B while holding A .



Part 2

OBJECTIVE: Make your way through the mall and courtyard to the food court. Kill as many zombies as possible. Help your fellow survivor defeat the human psychopath.

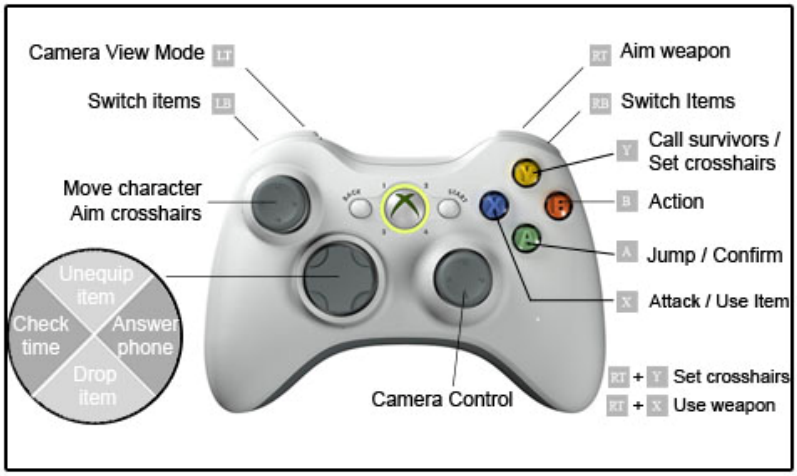
STORY: You are freelance photojournalist Frank West, who is working on a story about a zombie phenomenon in Willamette, Colo. Frank has joined a group of survivors in the mall, helping them rescue others and secure the mall.

GAME PLAY: Besides your gun, use nearly any object in the mall as a weapon by holding B.

Press X to attack with the object. Use the direction pad to release item.

Target your weapon or gun by holding RT.
While holding, RT press Y to target cross hairs and X to shoot.

Click the camera control joystick and move the left joystick to escape from zombies.

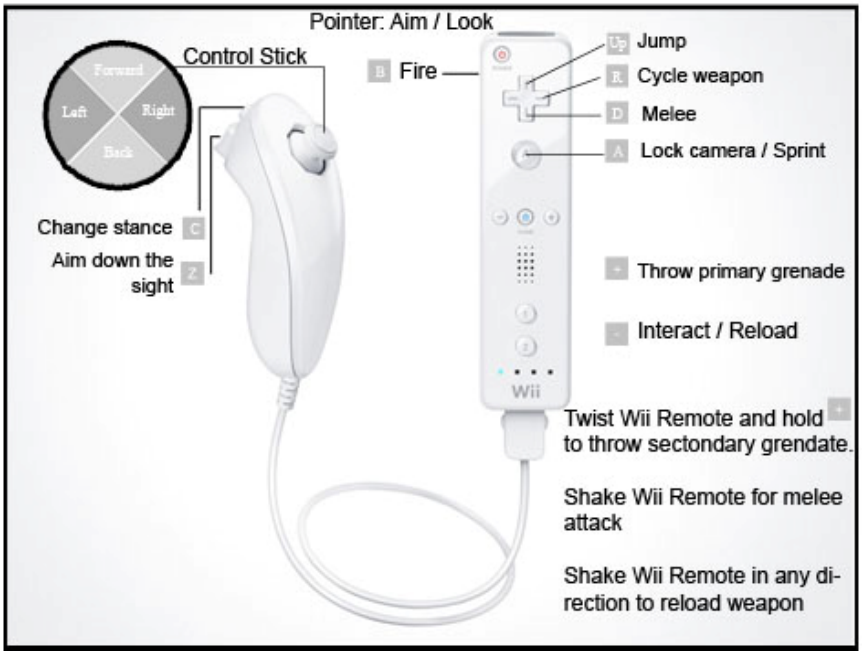


Part 3

OBJECTIVE: Help your fellow marines secure Makin Island for American and Allied forces by making your way forward through the enemy camps and kill as many Japanese troops as possible.

STORY: On Aug. 17, 1942 Private Miller was rescued by his fellow marines from a Japanese prisoner camp. As Miller, you are helping to assault Makin Island in the Pacific campaign of World War II.

GAME PLAY: Pick up a weapon by holding on the right-hand control.
Use the Z to take careful aim at enemies.
Change your character's stance to hide from enemy gunfire.
Use the C to crouch behind objects (fences, buildings or embankments) or recover from a wound.
Watch for grenades. A grenade danger indicator will show in the center of the screen. Toss the grenade back or run.

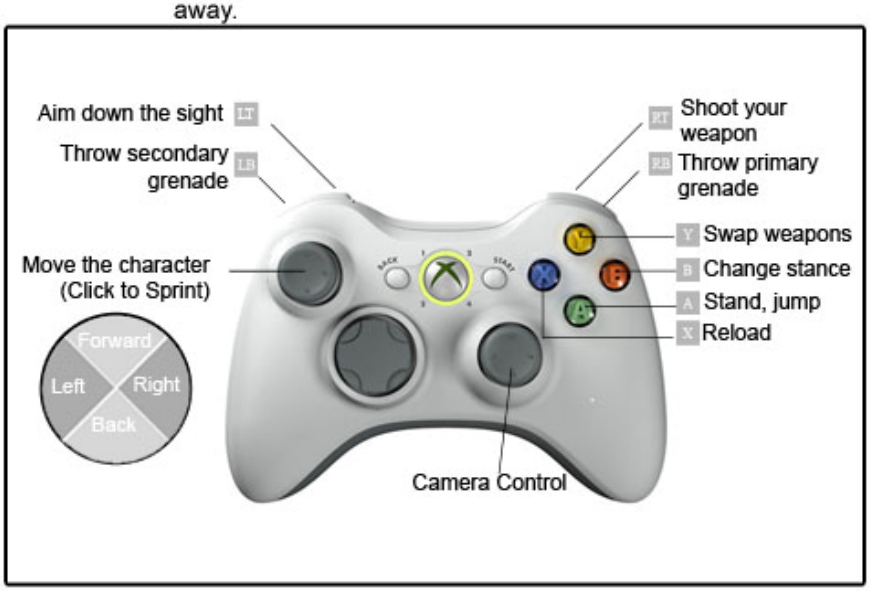


Part 4

OBJECTIVE: Help your fellow marines secure Makin Island for American and Allied forces by making your way forward through the enemy camps and kill as many Japanese troops as possible.

STORY: On Aug. 17, 1942 Private Miller was rescued by his fellow marines from a Japanese prisoner camp. As Miller, you are helping to assault Makin Island in the Pacific campaign of World War II.

GAME PLAY: Pick up a weapon by holding Y .
Use the LT to take careful aim at enemies.
Change your character's stance to hide from enemy gunfire. Use B to crouch behind objects (fences, buildings or em-bankments) or recover from a wound.
Watch for grenades. A grenade danger indicator will show in the center of the screen. Toss the grenade back or run away.



APPENDIX G

Post-test Questionnaire

Post-test questionnaire

Which game did you play today? _____.

Please rate your familiarity with the game that you played on a scale of 1-7, where "1" is *not at all familiar* and "7" *is extremely familiar*. Circle one:

1 2 3 4 5 6 7

Have you played this game before today? Circle one:

Yes No Unsure

Have you played a game similar to the one you played today? Circle one:

Yes No Unsure

If so, what game or games? _____

In this section, please indicate how much you agree with the following statements about the game you just played on a scale of 1 – 7, where "1" means the term describes *strongly agree*, and "7" means the term describes *strongly disagree.* Please circle the number that indicates how well each term describes your agreement with the statement.

The video game I just played:

	strongly disagree						strongly agree
Had high-quality graphics.	1	2	3	4	5	6	7
Had high-quality sound.	1	2	3	4	5	6	7
Had high-quality play control.	1	2	3	4	5	6	7
Was technically advanced.	1	2	3	4	5	6	7
Was technologically sophisticated.	1	2	3	4	5	6	7
Was new.	1	2	3	4	5	6	7

Thought-listing Scale

We are interested in everything that went through your mind as you played the video game.

For approximately three minutes, please list these thoughts (**positive** thoughts, **negative** thoughts, and **neutral** thoughts) regarding the video game (and game play). You may use single words or full sentences. Ignore spelling, grammar and punctuation.

We have deliberately included more space than we think people will need to ensure that everyone would have plenty of room.

Please be completely honest. Your responses will be anonymous.

The next page contains the form we have prepared for you to record your thoughts and ideas. Simply write down the first thought you had in the first box, the second thought in the second box, etc.

Please put only one idea or thought in a box.

Please continue to the next page.

1.	2.
3.	4.
5.	6.
7.	8.
9.	10.
11.	12.
13.	14.
15.	16.
17.	18.
19.	20.

	Not at all						Extremely
How confident are you in your thoughts?	1	2	3	4	5	6	7
How certain are you of your thoughts?	1	2	3	4	5	6	7

How valid is your answer?	1	2	3	4	5	6	7
How convinced are you of your thoughts?	1	2	3	4	5	6	7

Please answer the following questions about your experience with the game you played today. Circle the number that indicates how well each term describes your experience, where "1" means that you *strongly agree* with the statement and "7" means that you *strongly disagree* with the statement.

	strongly disagree						strongly agree
I was extremely focused on this game when I was playing.	1	2	3	4	5	6	7
I've become so involved in the video game that I just played that it's as if I'm inside the game rather than using a game controller.	1	2	3	4	5	6	7
I experienced emotion while playing this game	1	2	3	4	5	6	7
I wasn't paying a lot of attention to this game when I was playing.	1	2	3	4	5	6	7
When watching the game I just played on screen, I became so involved in the game that I react as if I'm one of the characters.	1	2	3	4	5	6	7
I've gotten so involved in the game that I just played that I'm not aware of what is happening around me.	1	2	3	4	5	6	7
When playing the video game, I became so involved that I lost track of time.	1	2	3	4	5	6	7
I found myself responding strongly to the game.	1	2	3	4	5	6	7
I got involved in the goal of this game.	1	2	3	4	5	6	7
I got really excited during the shooting and fighting in the video game.	1	2	3	4	5	6	7
While I was playing, I was always aware of where my character was in the game environment.	1	2	3	4	5	6	7
While I was playing, I always knew what was going on.	1	2	3	4	5	6	7

While I was playing, I was always able to go where I wanted to go.	1	2	3	4	5	6	7
I feel that I had a great deal of control over my gaming experience.	1	2	3	4	5	6	7
The game is very manageable.	1	2	3	4	5	6	7
I was pleased with my performance in the game.	1	2	3	4	5	6	7
I think I did a better job than other players.	1	2	3	4	5	6	7
This gaming experience was exactly what I needed.	1	2	3	4	5	6	7

Please provide an overall evaluation of your attitude toward the game you played today using the scale below. Circle the number that indicates how well each term describes your attitude the game you played today, where "1" means the term describes *strongly disagree*, and "7" means the term describes *strongly agree*.

	strongly disagree						strongly agree
Appealing	1	2	3	4	5	6	7
Useful	1	2	3	4	5	6	7
Positive	1	2	3	4	5	6	7
Good	1	2	3	4	5	6	7
Favorable	1	2	3	4	5	6	7
Attractive	1	2	3	4	5	6	7
Exciting	1	2	3	4	5	6	7
Pleasant	1	2	3	4	5	6	7
Likeable	1	2	3	4	5	6	7
High Quality	1	2	3	4	5	6	7

Interesting	1	2	3	4	5	6	7
Sophisticated	1	2	3	4	5	6	7

In this section, please indicate how much you agree with the following statements about the game you just played on a scale of 1 -7. Please circle the number that indicates how well each term describes your agreement with the statement.

While playing the game, how much did you feel like you were really 'there' in the game environment?	*Not there*	1	2	3	4	5	6	7	*There*
While playing the game how much did you feel like the game environment was a real place?	*Not real*	1	2	3	4	5	6	7	*Real*
While playing the game, how much did you feel like the other characters in the game were real?	*Not real*	1	2	3	4	5	6	7	*Real*
How distracting was the game controller?	*Very distracting*	1	2	3	4	5	6	7	*Not at all distracting*
How much did the game controller interfere with game play?	*Not at all interfering*	1	2	3	4	5	6	7	*Very interfering*
How quickly did you adjust to using the controller?	*Very quickly*	1	2	3	4	5	6	7	*Very slowly*
How easy was it to move or manipulate objects in the environment?	*Very difficult*	1	2	3	4	5	6	7	*Very easy*
How closely did your movements in the game resemble your movements in real life while playing the game?	*Not at all*	1	2	3	4	5	6	7	*Very closely*
How well could you concentrate on playing the game?	*Not at all*	1	2	3	4	5	6	7	*Very well*
How satisfied are you with the gaming experience?	*Not at all satisfied*	1	2	3	4	5	6	7	*Very satisified*
How much fun was this game?	*Not at all fun*	1	2	3	4	5	6	7	*Really fun*

APPENDIX H

Debriefing Form

A study on the differences in point-of-view perspective game play on the Xbox 360 and Wii

DEBRIEFING FORM FOR STUDY #: 09-0350

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Thank you for participating in this session. We'd like to share some information about the research and questions we were seeking to answer.

- Research begins with a compelling question. In this session, we wanted to learn about:
  - how a motion-sensitive game controller affects a player's sense of enjoyment and attitude toward the game.
  - how a motion-sensitive game controller affects a player's sense of presence in a game.
  - how different video game perspectives (first-person and third-person) affect a player's sense of presence in a game.

- Next, a research design is created to try and answer the questions.
  - First, we asked you to answer a pre-test questionnaire to gauge your experience with video games.
  - Second, we asked you to play either *Call of Duty: World at War* or *Dead Rising* on the Xbox 360 or Wii for up to 30 minutes.
  - Finally, we asked you to answer a post-test questionnaire to measure your sense of presence in the game. Presence is how much you felt like you were actually within and part of the video game environment.
  - Later, we'll enter the responses of everyone who participated into a computer and see whether the responses help to answer the research questions.

In order to make sure everyone's responses are not biased by outside influences, **please do not speak with anyone about the study**. It is very important that others who may participate in the next couple of weeks *do not* know the purpose of the study beforehand.

If you would like to learn more about this topic, you may be interested in reading:

- Ivory, J.D. & Kalyanaraman, S. (2007). The effects of technological advancement and violent content in video games on players' feelings of presence, involvement, physiological arousal, and aggression. *Journal of Communication*, 57, 532-555.

- Eastin, M.S. & Griffiths, R.P. (2006). Beyond the shooter game: Examining presence and hostile outcomes among male game players. *Communication Research*, 33, 448-466.

Thank you for your participation! We appreciate your help!

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