Effects of female videogame character body-idealization exposure

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Abstract

Video games are a multibillion-dollar industry that has been researched scantily when it comes to body image effects. Much of the existing literature on video games focuses on aggression effects and has minimally expanded to explore other effects. This study expands upon the current literature by exploring body image perception and self-esteem effects from idealized character body gameplay. Factors affecting these responses were also investigated.

A lab-based experiment was conducted using 36 participants from the School of Journalism and Mass Communication Subject pool. Only female participants were used. Results indicated that participants experienced *fewer* issues with weight concern when playing the idealized game character compared to the less idealized character. However, the manipulation check was only marginally significant and cell sizes were small, so the pattern found is underpowered and unreliable. Implications for the video game industry practitioners and directions for future research are discussed.

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Chapter 1: Introduction

Studies on media effects have shown a relationship between exposure to idealized bodies and body image dissatisfaction and lowered self-esteem (Irving, 1990). The topic of media images has been a controversial topic for decades and numerous studies have explored the media's effects on both men and women. Since the topic's inception during the 80's, it has been concluded that there are lasting effects for females in regards to thin-idealness motivation (Tiggeman, 2004). The thin ideal is defined as a thin standard of ideal beauty that has become westernized. Since the negative effects from the media have been fairly well established in popular mediums such as television and advertising, it's important to explore this area in video games as well, a prominent platform of media that has scantily been researched in this regard.

Video games have become a prominent part of American culture. With over 155 million Americans playing games, over 50% of households owning a dedicated gaming console, and over $22 billion spent on the games industry by consumers in 2014, it is important that we understand how this form of media affects its audience (Essential Facts about the Computer and Video Game Industry, 2015). Video games have also been on record for passing the motion picture box office sales (Williams, 2002). Video games are one of the most popular forms of media and yet research areas have been hyper focused and lack well-rounded effects compared to more traditional forms of media

Video game literature has long focused on aggression effects from video games. Much of this literature posits that violent video games have detrimental effects on increasing aggression (Anderson & Dill, 2000), although it is argued that these claims are exaggerated (Ferguson, 2015). As stated above, with video games being a big part of American culture, it is important to understand the effects that video games have on their audience. This included effects outside of aggression, such as body-idealization effects. Males have, for a long time, been the dominant gender for video game players. Now that the gender ratio for players is nearly equal for males and females, it is also important to understand the effects that video game playing may have on female players from exposure to super-slim, less realistically proportioned female characters (Essential Facts about the Computer and Video Game Industry, 2015). In particular, literature has shown that female characters are portrayed less often than male characters within video games and are often portrayed to be more sexualized than males (Dietz, 1998). There is a need to not only further explore the content of games themselves, but to understand the consequences of these character dynamics and use of traditional gender roles in games.

Idealized bodies are bodies that females look at as the social standard for what is an acceptable body shape. In American culture, the idealized body is very thin and modelesque, which can only be naturally achieved by a small percentage of the population. Although this body type can only be achieved naturally by a minority, perhaps this is still enough for others to engage in comparison. Idealized

bodies are not uncommon in media in both television and video games alike

(Dietz, 1998; Fouts & Buggraf, 1999) Previous literature has shown that exposure

to idealized female bodies can have a negative effect on body image

dissatisfaction (Garner, 2002) and can increase disordered eating (Harrison &

Cantor, 1997). For example, it has been shown in other media that exposure to

idealized females within advertisements can negatively impact self-esteem and

body image perception for females and males (Champion & Furnham, 1999; Leit,

Gray & Pope, JR., 2002). Although this area of research has been explored

through advertisements, television, and social media, this area of research has

only scantily been explored in the context of video games (Matthews, Lynch, &

Martins, 2016).

One may wonder why videogames are necessary to research separately

than other media forms when it comes to body image perception. Some

researchers say that videogames are immersive in their progressing levels of

resemblance to reality (Mierlo & Bulck, 2004). Other literature argues that video

games are unique due to their level of interactivity. Vorderer, Hartman & Klimmt

(2003) explain that competition is an important part of enjoyment in games,

which differs from other forms of media. Immersion is also a unique aspect of

games. Immersion felt is referred to as a state of "presence" (Lee, 2004). Presence

is the personal meaning that gamers extract from the experience of playing and

find immersion that way opposed to the gameplay simply being similar to reality

(Mirelo & Bulck, 2004). Players have a chance to literally act through their

videogame character, which is unique to video games (Durkin, 2006). Overall, video games are very interactive; more so than advertisements or a television show. Therefore, the potential negative body-image effects that were observed in other media studies could be intensified by the interactive nature of video games.

Despite concerns over female character representation within games, the effects have only recently been studied. For example, gender effect-related research that has been done in video games shows that adolescents will more often choose to not play as a female character that are portrayed as highly sexualized compared to more perceptively competent male characters, and playing those female characters decreases female player's own self-efficacy (Behm-Morawitz & Mastro, 2009). The effects of idealized bodies have been studied through the lens of social comparison for both male and female players (Matthews et al., 2016). Insights from this study will be discussed in future sections.

The question remains as to how exposure to idealized female videogame characters affects one's own body-image perception. In addition, since the average age of gamers is 32, it is important to understand these gender effects on adults as well as adolescents, who have been highly researched in this area of research in video games (Essential Facts about the Computer and Video Game Industry, 2015).

This study specifically analyzes the effects of physically idealized female videogame characters on female player's body image dissatisfaction (body image

dissatisfaction) and self-esteem. This is done through the lens of Social Comparison theory (SCT). Self-esteem is defined as the overall feeling of happiness and self-worth (Rosenberg, 1965). Self-esteem and body image dissatisfaction have been selected for measurement since body image dissatisfaction is significantly correlated with self-esteem (Barlett, Harris, Smith, & Bonds-Raacke, 2005).

Similar to Matthews, Lynch, and Martins (2016), SCT sets a clear pathway for understanding the relationship between body image dissatisfaction and exposure to idealized bodies in video games. SCT proposes that people compare themselves to others using social cues since objective comparison is not easily feasible. SCT also contends that the comparison must be to something that is similar enough to the self to be perceived as achievable, although Matthews et al. (2016) state that females will still make a comparison even if images are exaggerated using airbrushing, therefore skewing perception as to what an attainable figure is.

Purpose of this Study

The purpose of this study is to explore how playing a less realistically proportioned female affects body-image dissatisfaction and self-esteem compared to a more realistically proportioned female character. In addition, it will build off previous literature by asking about how participants compare themselves to those in video games. Previous literature has shown mixed results for body-image effects related to games (Matthews et al., 2016).

   The next chapter will present a literature review. It will start with a history of female character representation within video games and their effects. Following that will be literature on body-image effects from the general media. Finally, social comparison theory will be discussed.

Chapter 2: Literature Review

Portrayals of female characters

One of the early studies done focusing on video game content was that by Braun and Giroux (1989). The study subjects were 21 of the most popular games in several of the most attended arcades in urban Montreal. The main focus of the study was violence but also included relevant gender representation findings. It was found that female characters were found in 2% of the games and males were found in almost 60% of the games. This would mark the beginning of gender-related research within videogames and videogame related items such as reviews and covers.

A study conducted by Dietz (1998) pioneered research on female representation within video games. It was found that females are represented far less often in video games and when they are represented, they are often represented in a highly sexualized way compared to their male counterparts. Not only are they less represented, but they are rarely in leading roles and are typically in more ornamental roles. Dietz (1998) examined 33 popular Nintendo and Sega Genesis video games. There were no female characters present in 41% of the video games studied. In the games that did have female characters, 28% of them were portrayed sexually (Dietz, 1998). This set the groundwork for gender representation within video games. In addition to video game content being studied as similar but separate stimuli than gameplay, video game box art has also been studied. Early research in this area has been conducted by Provenzo (1991),

which focused exclusively on Nintendo games. He analyzed the covers of 47 video games and found a large disparity between male and female character representation. Specifically, he found 92% of characters were male and 8% were female. Around 20% of the males were depicted in some powerful position, whereas females were not only excluded from being powerfully portrayed, but some were also depicted in a submissive manner (Provenszo, 1991). Glaubke, Miller, Parker, and Espejo (2001) confirmed a decade later that this masculine-dominated nature within video game and game covers still exists when it was found that 64% of the games featured male characters and 17% featured female characters.

In another study, one-hundred and fifty different video games were analyzed (Martins, Williams, Harrison, & Ratan, 2009). The researchers took screenshots of all female human characters in the games and then compared them against anthropometric data collected from American women. The research questions asked in the study are very relevant to the questions asked in the current study. The researchers wanted to know whether female videogame characters have similar body proportions to the average American female if the proportions of female videogame characters vary by level of realism, and if female character proportions vary depending on the video game rating. "The results show that female characters at low levels of photorealism were systematically larger than the average American woman while characters at high levels of photorealism were systematically thinner" (Martins et al., 2009, p. 824). More specifically,

characters were found, in general, to be thinner than the average American female. Female characters tended to have a large head, but their chests, waist, and hips were smaller than the average American's (Martins et al., 2009). This finding supports that general representation of female videogame characters conforms to the thin ideal.

This news may not be as concerning as it might seem at first glance due to the uncanny valley effect, which proposes that humans disregard comparison effects to those who are perceived as unrelatable. This can happen both with exposure to cartoon-like characters who are more obviously disproportionate and characters that are considerably more proportionate, but still not quite human (Mangan, 2007). Once a level of a likeness is achieved by a character, a strong revulsion is felt towards said character. It is argued that this could be a potential threat to the current climate of video games (Serviss, 2005). The uncanny valley effect is not as important in the current study since the focus is on achievable body proportions and the effects on body image dissatisfaction rather than disliking the character for potentially being too relatable. It is still important to be aware of this effect, however, when comparing body proportions of characters as with the current study.

The emerging findings of male dominance in video game content prompted further exploring. A larger content analysis was conducted by Beasley and Standley (2002). Instead of focusing on popular games, 47 games were randomly selected for coding from either Nintendo 64 or Sony PlayStation. Five-

hundred and ninety-seven characters were coded in total. Of this total, only 82 were female and a majority of these female characters had more exposed skin than the male characters. Studies following the Beasley and Standley study (2002) found similar results of dominant male playable characters (Brand, Knight, & Majewski, 2003).

Although content analyses have been conducted for games themselves, they have also been conducted inside game magazines and game reviews (Scharrer, 2004; Ivory, 2006).

Scharrer (2004) analyzed 1054 video game advertisements in 3 different video game magazines. A similar trend of female underrepresentation was found when only 1 in 3 characters were female and the rest were male in video game magazine advertisements. Females were also found to be more sexualized than the male characters. Ivory (2006) analyzed video game reviews from a popular video game website Gamespot (www.gamespot.com). Ivory selected reviews from both the sites "Top Rated" and "Most Popular" list (2006). 100 games were sampled. It was found that females were less represented and references to female characters mentioned their attractiveness and sexuality (12%) far more than that of males (<1%). This finding is echoed by Miller and Summers (2007) in a wide-spread content analysis assessing game articles in videogame magazines.

More recent research on this topic was conducted by Near (2012), who specifically studied the representation of female characters on box art in correlation with sales. A sample of 399 box art covers that received either a Teen

or a Mature label by Entertainment Software Rating Board (ESRB) were analyzed. It was found that box art which contains sexualized, non-main female characters is correlated with higher sales, and box art that depicts the central female character (sexualized or not) or female characters in the absence of male characters has a negative association with sales. This suggests that there is a financial incentive to exclude and sexualize female video game characters. This supports the gratification notion found for males and video games by Provenzo (1991), which is the cliche "save the princess" situation or the female character being portrayed in a sexually objectified way for the male audience.

Fortunately, there has been progression in the video game field of having more prominent female characters, such as Tomb Raider's Lara Croft. However, this progression has not always been as positive and as linear as it may sound. Although Lara Croft became one of the first female protagonists to become widely recognized, she still faces challenges of being hypersexualized. With large breasts and a tiny waist and short-shorts, it is easy to see that this progression may not have been as progressive after all. There is a term for this in games literature, which is called the Lara phenomenon (Jansz & Martis, 2007). The Lara phenomenon is the notion of a strong, female protagonist that appears to be independent and powerful.

Jansz and Martis (2007) coined the term "Lara phenomenon" after conducting a content analysis of 12 popular video game introductions. They found that leading characters were equally men and women characters, but supporting

characters were disproportionately men compared to women. Female characters were not found to be in a submissive position, whereas three male characters were found to be in submissive positions. However, females were more often sexualized than male characters, with 77% of female's breasts and buttox were emphasized compared to only 25% of male characters being objectified in some way. Among all games, Jansz and Martis (2007) found that males dominate female characters; their results suggest that, in more recent games, the number of females is larger than what previous studies by Dietz (1998) and Provenzo (1991) found. Jansz and Martis (2007) concluded that these results were not representative since the videogames they used for analysis was selected based on popularity and is not representative of videogames in general. Although the results may have been representative of only the most popular games, they are the most likely to have wide-spread effects since they're played the most.

More recent literature than Dietz (1998) regarding female character representation in video games shows that female characters are still representing the thin ideal when shown at high levels of photorealism. In contrast, it was found that male characters were portrayed as having more attainable physicality (Martins, Williams, Ratan, Harrison, 2009, 2011). It's difficult to speculate why this may be. Williams (2006) has suggested that perhaps it is because there are more male video game developers than women and therefore men reflect what they see in the media into video games. Regardless of why this is happening, it is

important to understand the effects that these idealized female bodies have on female players more thoroughly.

A similar situation to the Lara phenomenon was also found in the Buffy The Vampire video game. Labre and Duke (2004) conducted a critical analysis on the video game, Buffy The Vampire Slayer. The game was released in 2002. They found that the game reinforced stereotypical gender stereotypes around the protagonist character, Buffy. Buffy is a teenage girl living in a small town who is "the chosen one" to fight vampires and demons and protect civilization. She is a petite, blonde girl who does not have a toned or athletic figure, yet she is just as powerful as the demons she fights. The Buffy video game reinforces gender stereotype of anti-intellectualism and gives males more opportunity to be individualized and the females represented as being part of a group. The game also sexualizes Buffy by wearing tight, revealing clothes. Her cleavage is shown most of the time, usually emphasized by the color of her outfit. Female villains are also usually dressed in a provocative way, often wearing low-cut jeans and showing cleavage.

In addition to body-images, the dialogue is also sexually charged, with male villains telling Buffy that "I want you, but not in a good way," and male friends of Buffy's telling her that her cheerleading outfit is hot. Fights between Buffy and villains are also focused on female traits. For example, when Buffy is taken by the dominatrix-type vampire, Buffy calls her a "bloodsucking ho" and that her "outfit screams biker slut" (Labre & Duke, 2004).

Effects of Female Character Portrayals

Although females seem to be rising into positions of power more often than in the past, their sexualization remains an issue that ultimately holds them back from matching their male counterparts. Williams (2006) believes that these gender stereotypes are an important reason why fewer females play video games compared to males. Others also speculate that playing a disproportionate amount of thin, female characters could negatively influence one's health (Labre & Duke, 2004). However, Jansz and Martis (2007) speculated that the strong female protagonist, or the Lara phenomenon, may empower female players. To that point, as females have been highly sexualized in games outside of Tomb Raider, the effects have not gone unstudied. A majority of this research has been on adolescents and could benefit from studying the adult population as well for these effects. A study by Behm-Morawitz and Mastro (2009) conducted an experiment to analyze the relationship between exposure to sexualized female characters and its effect on players self-efficacy and attitudes towards women. The main theory used in the study was social cognitive theory, focusing on how exposure to sexualized female characters in video games may convey messages to players about gender and their own gender concepts.

Gender stereotypes typically depict males with more confidence and independent traits compared to female stereotypes. These images activate these stereotypes and can become internalized and lead to lower self-esteem. Behm-Morawitz and Mastro (2009) wanted to explore whether or not this phenomenon

also applied to when female players are exposed to sexualized female video game characters. It was found that both male and female players who played as the sexualized female character had more negative perceptions of females in general compared to females who played either the non-sexualized character or no game at all.

Males were found to still have more traditional attitudes towards women in either sexualized or non-sexualized category of gameplay. There were two important differences found between male and female players. Females who played as the more sexualized character experienced a decrease in self-efficacy compared to males who did not experience this. Females also rated the sexualized character to be less physically able than the non-sexualized character, while males rated both characters as equally physically capable (Behm-Morawitz & Mastro, 2009). It is possible that the participants rated sexualized female characters to be less physically able because female characters in video games appeal to men and often include potentially degrading qualities. (Hartmann & Klimmt, 2006, Matthews et al., 2016). Perhaps the finding that females view sexualized female characters as less efficacious is a potential reason for the contrary insights found by Matthews et al. (2016), when female participants experience an decrease in weight concern after playing the hyper-idealized female character opposed to the idealized character or non-idealized character.

In addition to body-image effects, research on the effects on player self-esteem is fairly limited and should be further explored. Existing literature does

demonstrate a social learning effect from playing video games. A study done by Funk and Buchman (1996) (self-concept) analyzed the gameplay habits of adolescents and found that as gameplay for adolescent girls increased, their self-esteem decreased. Unfortunately, a deeper analysis of types of game character exposure was not measured in this study so it's impossible to say how much impact, if any, sexualization of female characters had on players. Questions from the study mainly focused on gameplay time and not which games the participants were playing.

Existing literature on the relationship between body image dissatisfaction and gameplay found that female participants felt worse about their bodies after playing a game that emphasized female bodies (Extreme Beach Volleyball). However, playing this game did not significantly impact body satisfaction (Barlett & Harris, 2008). This contradicts the more recent Matthews et al. (2016) study that found exposure to hyper-idealized bodies to result in an increase in body image dissatisfaction, while exposure to less idealized bodies resulted in neutral responses. It is uncertain why this contradiction was found. Matthews et al. (2016) speculates that this could be because of participants engaging in downward social comparison or participants feeling a sense of empowerment due to the physical ability of the characters.

The current study aims to bring some resolution to the mixed results that previous literature has shown regarding the relationship between body image dissatisfaction and idealized female characters (Barlett & Harris, 2008; Matthews

et al., 2016). In order to disentangle these mixed results, the current study has added questions that attempt to further understand why participants may feel an increase in body image dissatisfaction following exposure to an idealized female character, in hopes of shedding light as to why participants may feel an increase in body image dissatisfaction rather than lowered body image dissatisfaction following exposure to idealized female bodies.

Body image effects from general media

Body image dissatisfaction has become normalized among western culture. As much as 50% of college undergraduate females are thought to suffer from body-image dissatisfaction (Bearman, Presnell & Martinez, 2006). Body image dissatisfaction has been shown to be a predictor of other mental health issues including depression, low self-esteem, and eating disorders (Grabe, Hyde & Lindberg, 2007). Body image dissatisfaction is defined as dysfunctional beliefs about one's weight and shape (Garner, 2002). Self-esteem is defined as "a person's general sense of worth or acceptance" (Wylie, 1979). There has been an established positive correlation between body image and self-esteem (Abell & Richards, 1996).

Research has shown that the thin ideal is prominent in numerous media platforms such as television, advertising, movies, and magazines. Trends indicate it has become increasingly thinner for some time. Examples of the thin ideal are the shift in content-analyzed stimuli such as Playboy magazine and a massive increase in diet-related articles (Garner, Garfinkle, Schwartz & Thompson, 1980). Much has

been studied regarding the relationship between exposure to thin ideal images, self-esteem and body image perception. Cultivation, social comparison and social learning theory have been used to assess the effects of thin ideal images (Gerbner, Gross & Morgan, 2002; J.D. Brown, 2002).

Thin ideal images can also affect body image dissatisfaction (Garner, 2002; Fouts & Burggraf, 1999). Much research has utilized an experimental methodology to study the relationship between media portrayals of the thin ideal and how they make women feel (Gabe, Hyde & Ward, 2008). A classic experimental design would include exposure to either a thin-ideal image (experimental group) or a neutral image (control group) and then assessing body-related constructs such as self-esteem or body-image dissatisfaction (Gabe et al., 2008). Many experiments have shown that females who are exposed to the experimental stimuli tend to show less body-image satisfaction overall, but others have shown contrary results (e.g., Birkeland, Thomas & Herbozo, 2005; Champion & Furnham, 1999). Since the literature is mixed in terms of findings regarding self-esteem and body image satisfaction, the following research questions are proposed:

RQ1: How will exposure to an idealized character body during video gameplay affect participants' body image dissatisfaction?

RQ2: How will exposure to an idealized character body during video gameplay affect participants' self-esteem?

While research on this topic has been mixed, many studies have been conducted to explain why some women are more susceptible to detrimental effects from exposure to thin-idealness in the media. Prior existing body dissatisfaction has had a strong tie to body-comparison among women as well as societal acceptance of body image attitudes (Heinberg & Thompson, 1995; Prosovac, Prosovac, & Prosovac, 1998).

For example, Heinberg and Thompson (1995) conducted an experiment that analyzed the effects of exposure to televised images of highly thin and attractive females. Participants (females) were randomly assigned to one of two groups. One of the groups was exposed to an advertisement emphasizing attractiveness and thinness. The other group was exposed to a non-appearance related advertisement. A pre-posttest was administered which measured attitude towards body-image, depression, anxiety, and anger. Those who scored highly on any of these measures were more likely to feel depressed after exposure to the advertisement emphasizing attractiveness but were less depressed after viewing the advertisement that did not emphasize attractiveness (Heinberg & Thompson, 1995).

Role of Social Comparison orientation on body image and self-esteem

Social comparison theory is a social psychology theory developed in the 1950's by Leon Festinger (Festinger, 1954). Social comparison claims that people have an innate desire to compare themselves to others who are perceived to be similar to ourselves. This is done to help us understand where we fit into society

by comparing ourselves to those around us. There are two ways in which people engage in this comparison behavior: upward or downward comparison. When people engage in upward social comparison they're comparing themselves to those who are perceived to be above them in some way. This can often result in lowered self-esteem, but not always. Sometimes, people can engage in upward social comparison for enhancement reasons. If one is looking to those above them in order to understand how they can improve themselves to become a higher status then this would be unlikely to result in lowered self-esteem (Festinger, 1954). However, this is not usually the case and instead creates negative feelings towards the self. Downward social comparison instead happens when engaging in comparing the self to those who are perceived to have a lower status for self-esteem maintenance purposes.

Botta (1999) studied the effects of thin ideal body image exposure on adolescent girls using social comparison theory. "Media variables accounted for 15% of the variance of drive for thinness, 17% of body satisfaction, 16% for bulimic behaviors, 33% for thin ideal endorsement" (Botta, 1999). The variables analyzed in the Botta (1999) study were general television and television dramas.

Early studies using social comparison to analyze body image in regard to the thin-ideal found that those with higher body dissatisfaction had a tendency to compare themselves to others by engaging in upward comparison (Tiggeman & McGill, 2004). Those who engaged in upward comparison tended to feel lower confidence in attractiveness, and experienced more eating disorder symptoms than

the controls who did not compare. It was concluded that the amount of negative affect experienced by exposure to thin-ideal body images was mediated by varying degrees of social comparison (Tiggeman & McGill, 2004).

Findings that are contrary to Tiggeman & McGill's (2004) are findings by Dittmar and Howard (2004), who conducted an experiment on 150 professional women in hopes to further understand the conditions under which exposure to thin-idealness had negative personal consequences. Two moderators were presented: internalization of thin-idealness and social comparison tendency. Participants were randomly assigned to one of three groups: exposure to thin-ideal, exposure to average model, and no exposure to models. It was found that internalization has more direct effects on anxiety than social comparison when exposed to the thin ideal (Dittman & Howard, 2004).

Research analyzing the effects of exposure to body idealness in the media has shown to be inconsistent, with some showing negative effects in women including body dissatisfaction and disordered eating behavior, while others show neutral effects. (Bessenoff, 2006). Past studies, as well as the current, are trying to understand why it is that some women are more vulnerable to these types of media effects than other women. Social comparison has been used as a lens to understanding this issue in media outside the realm of video games, including television shows and advertisements (Bessenoff, 2006). Pre-existing body-image dissatisfaction (negative evaluation of one's body) and thin-ideal internalization (agreement to societal standards of thinness) have been studied as factors

moderating the effects of exposure to idealized-body stimuli. Social comparison theory encompasses both of these moderators, as used in a study by Bessenoff (2006) which aimed at understanding the effects of thin-idealness exposure in media on women. Social comparison was used as a mediator for effects of idealized body exposure while self-discrepancy was used as a moderator. The individual difference variable, body self-discrepancy, was found to moderate the mediator, social comparison, after exposure to thin-ideal images (Bessenoff, 2006).

As mentioned previously, Matthews et al. (2016) was the first study to apply SCT to video games, however, it was applied slightly differently than the current study. Rather than looking at the interaction of social comparison and character body, Matthews et al. (2016) analyzed how social comparison orientation interacted with body image dissatisfaction and body attitudes. They found no significant findings between social comparison orientation and character body type. The application of SCT needs further investigating in order to better understand the effects that idealized character bodies has on players. Since there have been mixed results with social comparison orientation and media, there is both a research question and a hypothesis regarding social comparison orientation. The research question regarding SCT is as follows:

RQ3: How will exposure to an idealized character body during video gameplay affect participant's social comparison orientation?

If there is a significant interaction between exposure to an idealized character body and social comparison orientation, I propose the following hypothesis:

H: Social comparison mediates the relationship between character body version played and body image dissatisfaction, and self-esteem.

Chapter 3: Methodology

To address the aforementioned research questions and hypothesis, a between groups, lab-based experiment was conducted. Video game character body type was manipulated by game version. A pilot test was conducted to choose the characters for the main experiment. The main experiment used the two characters from the pilot test that had the most extreme differences in body proportion.

Pilot Test

In order to select the best two versions of the video game Tomb Raider, a pilot test was conducted that asked participants to compare and rate the bodies of four different Lara Croft characters from their respective Tomb Raider games: Tomb Raider: Anniversary, Tomb Raider Legend, Tomb Raider Underworld, Tomb Raider (2013). Perceived body proportion was the variable of focus for the character. This was measured by asking participants to rate how unrealistic/realistic the characters' body proportions appeared to be. The goal was to select the two most extreme rated characters in terms of most realistically proportioned and least realistically proportioned were selected as the stimuli for the main experiment. In addition, perceptions of how revealingly dressed the characters were, physical strength, and physical attractiveness were measured with the aim of ensuring the selected characters would not be significantly different on these characteristics. The full questionnaire is available in Appendix A.

The participants (N=41) were recruited from the School of Journalism and Mass Communication (SJMC) subject pool at The University of Minnesota.

Participants only consisted of females. Participants who participated in the Pilot study were not allowed to participate in the main experiment. Less than half (20%) of the participants played video games at all.

A series of repeated measures ANOVAs were conducted for each of the measured variables (game version was the within-subjects factor). The results revealed an overall significant difference between game character body version for all variables except physical attractiveness (see Table 1). Follow-up pairwise comparison tests revealed that Tomb Raider (2013) and Tomb Raider: Anniversary were the most different in terms of body proportion, with the Tomb Raider (2013) character's body ($M = 4.08$, $SD = 1.53$) being rated more realistically proportioned than the Tomb Raider: Anniversary character body ($M = 2.46$, $SD = 1.36$). Tomb Raider: Anniversary was rated only slightly less realistically proportioned than Tomb Raider: Legend ($M = 2.51$, $SD = 1.34$), so Tomb Raider: Legend and Tomb Raider: Anniversary were nearly tied in terms of having extreme difference in character body proportions compared to Tomb Raider (2013). Therefore, to make a further determination of the character selection, the results of the other perception variables were examined. Tomb Raider (2013) and Tomb Raider: Anniversary were found to be the least different in terms of the other variables, which is necessary to have the best possible control by having other nonrelated variables be as similar as possible. Therefore, Tomb Raider (2013) was selected for the version with the least idealized body and Tomb Raider: Anniversary was selected for the version with the most idealized character body.

Table 1

Character body versions manipulation check (N = 41)

	TR: Legend M(SD)	TR: 2013 M(SD)	TR: Underworld M(SD)	TR: Anniversary M(SD)	F (d.f)
Unrealistically proportioned/Realistically Proportioned	2.51 (1.34)	4.08 (1.53)	2.97 (1.51)	2.46 (1.36)	17.947*** (3, 34)
Unrevealingly Dressed/Revealingly Dressed	6.08 (.86)	5.33 (1.27)	5.67 (1.02)	5.46 (.93)	10.763*** (3, 34)
Weak/Strong	4.95 (.81)	4.13 (1.04)	5.56 (0.55)	4.95 (1.06)	25.785*** (3, 34)
Unattractive/Attractive	5.05 (1.34)	4.85 (1.44)	5.56 (1.22)	5.15 (1.42)	2.793 (3, 33)

* < .05. ** < .01. *** < .001.

Sample

Participants (N=36) were recruited from the SJMC subject pool at the University of Minnesota. To foster a strong sample of both gamers and non-gamers, which was looked at as a potential influencing factor in effects, the study was announced during a class session of JOUR 1501: Digital Games, Sims, and Apps: Storytelling, Play, and Commerce (students in this class were also members of the SJMC participant pool).

The inclusion criteria were: (1): Female only and (2) those who had not

previously participated in the pilot study. The age range of participants was

between 18-24 years old. The average gameplay habits of participants were

between 1-2 hours of gameplay per week. Of the 48 participants who completed

the pre questionnaire, only 36 completed both the pre and post questionnaire,

including signing up for the lab and coming into play one of the games, for a total

of 18 participants per condition.

Independent and Dependent Variables

The independent variable used in this study was the idealization of the

character body. This variable was operationalized by using the same video game

character appearing in different editions of the same video game series. Although

both game versions used the same character from the same game series, the body

proportions were different. Each player was randomly assigned to play one of the

two game versions.

Stimuli

This study used the video game stimuli Tomb Raider. Tomb Raider is

unique to other video games in the sense that video games with strong narrative

(Half-Life) tend to be correlated higher with identification with playable characters

than video games that focus less on story (Doom) (Schneider, Lang, Shin &

Bradley, 2004). Tomb Raider is highly story-focused, following the story of Lara

Croft, a young archaeologist who must fight to survive. Throughout each Tomb

Raider game, the player learns more about Lara's story and her past.

The second most recent Tomb Raider game has made an effort to normalize Lara and give her more realistic body proportions. The effects of this recent progression in normalizing Lara are the subject of this study. The Tomb Raider series originated in 1996. The game revolves around Lara Croft, an archaeologist who explores tombs and searches for ancient artifacts. To date, there have been 11 Tomb Raider games released and one film. Lara Croft was the beginning of normalizing the female protagonist in games. She's also an iconic sex symbol. As Lara's story and body change throughout the Tomb Raider series, it is important to understand these effects. Lara Croft appeared in a time when male protagonist characters dominated the landscape. This, combined with the series enormous success (selling 45 million units worldwide) (Square Enix Annual Report, 2015), tells us that this video game have a lot of reach and makes the effects of the series even more important.

There were two types of stimuli using different versions of the same video game in order to maximize control of the experiment. The group assigned to play with the more idealized body played Tomb Raider: Anniversary, which is a 2007 PC game. The other group assigned to the less idealized body played Tomb Raider, a 2013 PC game. Participants each played the first 15 minutes of the game from the beginning. Controlling the time spent playing helped maintain consistency in experience for each player and was beneficial for experimental control.

Procedure

The pre- and post-exposure questionnaires were created using Qualtrics. The pre questionnaire link was distributed through the SJMC SONA system

website that was accessible to the subject pool. However, participants had to sign up for a half-hour time slot at the computer lab prior to gaining access to the pre questionnaire link. The study information on the SONA website gave specific instructions on how to participate, including signing up for a time and completing the pre questionnaire at least a few days prior to coming into the computer lab for gameplay. The pre questionnaire was meant to identify existing body-image perceptions along with self-esteem and social comparison orientation. The entire experiment, from pre questionnaire through post questionnaire, lasted about 30 minutes total.

Before arriving at the computer lab to play the game, participants were asked to take a pre questionnaire that measured self-esteem, body-image perception, and social comparison orientation. Participants were split into one of two groups: one group played with a character who had an idealized female body that is less realistically proportioned, from the game Tomb Raider: Anniversary. The other group played as a character with a less idealized body that is more realistically proportioned from Tomb Raider (2013). The participants were split into groups using randomization (www.random.org). Participants played for 15 minutes since Ward & Friedman (2006) have found that exposure to stereotypical depictions of gender in media can have negative effects in beliefs about traditional stereotypes in as short as 12 minutes. Following game play, the post questionnaire asked the same self-esteem, body image perception, and social comparison measures included in the pre questionnaire as well as questions regarding

gameplay habits and questions specific to the character played, such as strength and body proportion.

Since both the Anniversary and Legend editions were close in difference for body proportions, other measurements were assessed to aid in determining which game to use. Legend was found to be more different from Tomb Raider (2013) in terms of how revealingly dressed the character was. In other measures, such as strength and attractiveness, Anniversary and Legend were marginally different from one another. Since it is ideal to keep other variables similar apart from body proportion, Anniversary was selected since that had the least extreme differences from Tomb Raider (2013) with other variables.

Measures

This study used previously established measures (see Appendix B & C for full questionnaires). The questionnaire portion of the experiment included three main dependent measures: social comparison orientation, a self-esteem measurement scale, and a body-esteem scale. These scales were the same between both pre and post questionnaires. The post questionnaire also included questions capturing potential covariates such as asking about video game play frequency of participants and how often participants compare themselves to video game characters. These two potential covariates were measured since time spent playing video games has been associated with decreased levels of self-esteem in adolescent girls (Funk & Buchman, 1996), and it has been shown that those who

engage in social comparison frequently experience more negative feelings (Buunk, Nauta, Molleman, 2005).

The social comparison scale used was developed by Allan and Gilbert (1995). The scale indicates which direction of social comparison (upward or downward) an individual tends to engage in. The average of all 11 measures indicated the participants tendency to engage in upward social comparison (lower than 5) or downward social comparison (above 5). The measurement used is a 10-point semantic differential scale, including examples such as "In relationship to other I feel"…..Inferior/Superior, Left out/Accepted (Allan & Gilbert, 1995). This index has demonstrated good reliability (Cronbach's alpha: .90-.91 with student populations). The current study Cronbach's alpha is .72.

The self-esteem scale used was developed by Rosenberg (1965). The scale indicated the general self-esteem level of the individual taking the measure. The measures are on a 4-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree". Some examples of statements are "I take a positive attitude towards myself", "I wish I could have more respect for myself" (Rosenberg, 1989). This scale is widely used by researchers to measure self-esteem and has shown to have generally high alpha reliabilities of .88-.90 (Robins, Hendin, & Trzesniewski, 2001). The alpha for this study was .90.

The body esteem scale used for the current study can be split into separate parts to be used for either female or male body image dissatisfaction (Franzoi & Shields, 1984). This was be used to measure body image dissatisfaction. Since this

study is concerned with female participants, the index is divided in a way that only uses the female category. This includes factors such as sexual attractiveness, physical condition, and weight concern for females. The scale asks the participants to rate each aspect of their body parts and functions on a 5-point scale with 1 indicating strong negative feelings and 5 indicating strong positive feelings. The reliability coefficients ranged from .79-.87 (Franzoi & Shields, 1984). The Cronbach's alpha sexual attractiveness was .90, .83 for physical condition, and .89 for weight concern (Franzoi & Shields, 1984).

In addition, measures capturing how often people compared themselves with game characters and gameplay habits were included as potential covariates. To measure how often people compared themselves with video game characters, participants were asked to indicate, on a 5 point scale, how often they compare themselves to those in video games. An answer of 1 indicates that they never compare themselves to those in games. An answer of 5 indicates that they always compare themselves to those in games. To measure the other covariate, gameplay habits, participants were asked to indicate how many hours they play games per week using a 5-point scale. An answer of 1 indicated 0-1 hours. An answer of 5 indicated over ten hours per week.

Chapter 4: Analysis & Results

Descriptive Statistics for Key Variables

The descriptive statistics for key variables are presented in Table 2. The mean score for social comparison indicated that participants had a tendency to engage in downward social comparison ($M = 6.21$, $SD = 1.4$). This means that participants had a tendency to compare themselves to those who are less fortunate. In particular, the average value was above the scale midpoint of five, indicating participants were more likely to feel superior, confident, likeable, and accepted after comparing themselves to others. Participants averaged neutral self-esteem scores ($M = 2.54$, $SD = .54$). The body image dissatisfaction scale was broken down into three subcategories: sexual attractiveness, weight concern, and physical condition. Participants generally had a slightly lessened body image dissatisfaction in the subcategory of sexual attractiveness ($M = 3.42$, $SD = .55$). Since the Body image dissatisfaction scale ranges from 1-5, with 1 being the most negative and 5 being the most positive, the average score of $M=3.42$ indicates slightly above average. Participants had a fairly neutral body image dissatisfaction score in the subcategory of weight concern and physical condition (WC: $M = 3.03$ $SD = .8$) (PC: $M = 3.07$ $SD = .68$).

Table 2

Measures & Items with Descriptive statistics for Dependent Variables (N = 36)

Scale/Items	Mean	Std. Deviation

Social Comparison Semantic Differential 1 - 10	6.21	1.40
Inferior - Superior	6.22	1.25
Incompetent - More Confident	6.47	1.25
Unlikeable - More Likeable	6.61	1.48
Left Out - Accepted	6.28	2.19
Different - Same	5.64	2.14
Untalented - More Talented	6.08	1.74
Weaker - Stronger	6.08	1.87
Unconfident - More Confident	6.47	1.83
Undesirable - More Desirable	6.39	1.8
Unattractive - More Attractive	6.28	1.91
An Outsider - An Insider	5.89	2.09
Self-Esteem Strongly Agree (1)- Strongly Disagree (5)	2.54	.43
I feel that I'm a person of worth, at least on an equal plane with others.	1.67	.058
I feel that I have a number of good qualities.	1.61	.54
All in all, I am inclined to feel that I am a failure.	3.00	.62
I am able to do things as well as most other people.	1.97	.44
I feel I do not have much to be proud of.	2.94	.70
I take a positive attitude towards myself.	1.81	.57

On a whole, I am satisfied with myself.	1.75	.49
I wish I could have more respect for myself.	2.33	.78
I certainly feel useless at times.	2.33	.78
At times I think I am no good at all.	2.75	.83
BODY IMAGE DISSATISFACTION - Sexual Attractiveness **Have strong negative feelings (1) – Have strong positive feelings (5)**	3.42	.55
Body Scent	3.69	.78
Nose	3.31	1.22
Lips	3.69	.84
Ears	3.64	.63
Chin	3.09	.94
Chest or Breast	3.06	1.15
Appearance of Eyes	3.72	.99
Cheeks/Cheekbones	3.47	.87
Sex Drive	3.42	.79
Sex Organs	3.44	.76
Sex Activities	3.36	.75
Body Hair	3.08	.98
Face	3.33	.94
BODY IMAGE DISSATISFACTION - Weight Concern **Have strong negative feelings (1) – Have strong positive feelings (5)**	3.03	.80

Appetite	3.14	1.08
Waist	3.0	1.11
Thighs	2.61	.95
Body Build	3.0	1.06
Buttocks	3.42	.95
Hips	3.14	.89
Legs	3.06	1.2
Figure or Physique	3.03	.99
Appearance of Stomach	2.92	1.09
Weight	2.75	1.04
BODY IMAGE DISSATISFACTION - Physical Condition **Have strong negative feelings (1) – Have strong positive feelings (5)**	3.07	.68
Physical Stamina	3.06	1.06
Reflexes	3.36	.79
Muscular Strength	2.74	1.02
Energy Level	2.92	1.06
Biceps	3.0	.75
Physical Coordination	3.19	.88
Agility	3.14	.89
Health	3.14	1.03
Physical Condition	3.09	.95

Manipulation Check

The manipulation check was conducted by asking participants to rate the video game character on a 1-5 likert scale in terms of how realistic her body proportion looked. The character was also rated on whether or not the character was revealingly dressed, how strong the character was, and how attractive the character was (see Table 3).

Table 3

Descriptive statistics for social comparison orientation and variables of interest between idealized and non-idealized character body versions (N = 36)

	Idealized character body version	Non-idealized character body version	F (d.f)
Weak/Strong	5.89	5.72	.01 (1, 34)
Submissive/ Aggressive	5.61	5.44	.11.019 (1, 34)
Not Sexualized/ Sexualized	6.33	5	9.96 (1, 34)
Conservatively Dressed/ Revealingly Dressed	2.78	3.78	3.76 (1, 34)

Unrealistically Proportioned/ Realistically Proportioned	5.78	4.79	3.84 (1, 34)

* < .05 ** < .01

An ANOVA was conducted with exposure to idealized character body version as the independent variable and perceived body proportion as the dependent variable. Results found that the difference in body proportion perceptions between the non-idealized character body version in Tomb Raider (2013) ($M = 3.68$) and the idealized character body version Tomb Raider: Anniversary ($M = 2.76$) did not reach statistical significance ($F [1, 34] = 3.84, p = .058$). However, the difference was in the correct direction and was very close to being significant. One could argue that this is marginally significant and was perhaps affected by the small sample size. Because it is so close to being significant, I proceeded with analyzing the findings.

One-way ANOVAs were also conducted for the remaining four dependent perception variables and their relationship with character body version. It was found that there was significant finding between the perceived sexualization variable rating and character body version. The idealized body game version was found to be rated as significantly more sexualized ($M = 6.35$) than the non-idealized body game version ($M = 5.11, F (1, 34) = 9.96, p < .01$). There were no significant results found between the strength perception variable and the idealized game character body version ($M = 5.82$) or non-idealized version ($M = 5.79, F (1, 34) = .012, p = .914$). There was also no significance found between

the perceived aggressiveness variable rating and the idealized game character body version ($M = 5.47$) and non-idealized game character body version ($M = 5.53$, $F (1, 34) = .021$).

Results by Research Questions and Hypothesis

RQ1: How will exposure to the idealized character body during gameplay affect participants' body image dissatisfaction?

One-way ANOVAs were used to assess the effect of exposure to idealized body version on the three subcategories of body image dissatisfaction: sexual attractiveness, physical ability, and weight concern. The effect of idealized character body version on body image dissatisfaction - weight concern was found to be significant ($F (1, 34) = 5.94$, $p < .05$) with body game version. The idealized character body version ($M = 3.33$, $SD = .7$) showed lesser body image dissatisfaction with weight concern than the non-idealized group ($M = 2.71$, $SD = .82$). There was not a significant relationship found between idealized character body version and the other two dimensions of body image dissatisfaction (sexual attractiveness and physical condition).[J] .

A second analysis tested the effect of the independent variable on each category of body image dissatisfaction with the inclusion of covariates. A correlation test indicated the potential covariates that were significantly related to body image dissatisfaction - weight concern were how often people compare themselves to game characters ($r = .34$), the three pre-questionnaire subcategories of body image dissatisfaction weight concern [$r = .81$], physical condition [r

=.57], and sexual attractiveness [r =.49]), pre-questionnaire social comparison orientation (r =.33), and pre-questionnaire self-esteem (r =-.39). These variables were entered as covariates in an ANCOVA (see table 4) with body image dissatisfaction – weight concern as the dependent variable. The ANCOVA showed that the effect of idealized character body version was not significant (p > .05) when covariates were taken into account.

Similarly, an ANCOVA was conducted (see table 4) with body image dissatisfaction - sexual attractiveness as the dependent variable using the covariates that showed significant correlation with body image dissatisfaction - sexual attractiveness: pre-questionnaire body image dissatisfaction -sexual attractiveness (r =.82), pre-questionnaire body image dissatisfaction - weight concern (r =.45), and pre-questionnaire self-esteem (r =-.45) (see table 4). The ANCOVA reported that the effect of idealized character body version remained insignificant (p > 5).

For body image dissatisfaction - physical condition, the ANCOVA included the covariates that showed significant correlation with body image dissatisfaction - physical condition: pre-questionnaire body image dissatisfaction - sexual attractiveness (r =.39), pre-questionnaire body image dissatisfaction - weight concern (r =.62), and pre-questionnaire body image dissatisfaction - physical condition (r =.71). The ANCOVA indicated that the effect of idealized character body version was still not significant (p > 5).

Table 4

ANCOVA For character body version and dependent variables with

covariates

	Idealized Body M (SD)	Non-idealized body M (SD)	F (d.f)
Self-esteem [a]	2.44 (.52)	2.63 (.32)	25.88 (1, 30)
SCO [b]	6.64 (1.38)	5.84 (1.35)	8.2 (1, 29)
BID-WC [c]	3.33 (.7)	2.71 (.82)	8.27 (1, 31)
BID-PC [d]	3.24 (.68)	2.91 (.66)	8.59 (1, 31)
BID-SA [e]	3.57 (.51)	3.3 (.58)	16.92 (1, 31)

$* < .05 ** < .01$

[a] Significant covariates are BID – WCpre, BID –SApre, SCOpre, and SEpre.
[b] Significant covariates are BID – SApre, BID – WCpre, BID – PCpre, SCOpre, and SEpre.
[c] Significant covariates are How often people compare themselves with video game characters, BID – SApre, BID – WCpre, BID – PCpre, SCOpre, and SEpre.
[d] Significant covariates are BID – SApre, BID - WCpre, BID –Pcpre, and SEpre.
[e] Significant covariates are BID –Sapre, BID – Wcpre, and SEpre.

RQ2: How will exposure to the idealized character body during video

gameplay affect participants' self-esteem?

A one-way ANOVA was used to assess the effect of exposure to idealized

character body version on the level of self-esteem following video gameplay. The

results found that there was not a significant relationship between character body

versions and self-esteem (F (1, 34) = 1.85, *ns*). However, a significant correlation

was found between self-esteem and some of the covariates. Therefore, an

ANCOVA was conducted (see table 4) between self-esteem and idealized

character body version using the covariates that showed significant correlation

with self-esteem: pre-questionnaire body image dissatisfaction - weight concern (*r*

=-*.33*), pre-questionnaire body image dissatisfaction - sexual attractiveness (*r* =-

.47), pre-questionnaire social comparison orientation (*r* =-.56), and pre-

questionnaire self-esteem (*r* =.90). The ANCOVA showed that the effect of

idealized character body version was not significant (p > 5).

RQ3: How will exposure to the idealized character body during video

gameplay affect participants' social comparison orientation?

A one-way ANOVA was conducted to analyze the difference in social

comparison orientation following video gameplay between the two exposure to

idealized character body version conditions. The results found no significant

difference in social comparison between idealized and non-idealized character

body versions (F (1, 34) = 3.84, *ns*). As with the other dependent variables, a

correlation test was conducted and revealed significant correlations between social

comparison orientation and some of the covariates. Therefore, an ANCOVA was

conducted (see table 4) for social comparison orientation using the covariates that

showed significant correlation with self-esteem: pre-questionnaire body image

dissatisfaction - weight concern (*r* =.39), pre-questionnaire body image

dissatisfaction - sexual attractiveness ($r =.52$), pre-questionnaire body image dissatisfaction - physical condition ($r =.37$), pre-questionnaire social comparison orientation ($r =.72$), and pre-questionnaire self-esteem ($r =-.57$). The ANCOVA reported that the effect of idealized character body version was not significant ($p > 5$).

H: Social comparison mediates the relationship between character body version played and body image dissatisfaction, self-esteem.

Since there was not a significant relationship between exposure to idealized character body version and social comparison orientation, a mediation test was not conducted. If a significant relationship had been found, a mediation test would be conducted to see if social comparison orientation mediated the relationship between game play version and BODY IMAGE DISSATISFACTION as well as self-esteem.

Chapter 5: Summary and Discussion

Summary of the Findings

This thesis explored the psychological effects of playing an idealized versus a less idealized video game character. These effects include self-esteem, body image dissatisfaction., and if the games activated the participants social comparison orientation. It also proposed that social comparison orientation mediated the relationship between video game version exposure and body image dissatisfaction. and self-esteem.

A one-way ANOVA was used and significant findings were found between video game version (Tomb Raider: Anniversary or Tomb Raider: 2013) and weight concern, a subscale of body image dissatisfaction. This suggests that it's possible that there is a relationship between idealized character body versions played and weight concern. Specifically, results show that weight concern was *less* for those who played the idealized version of Lara (Tomb Raider: Anniversary) compared to the non-idealized version of Lara (Tomb Raider 2013). There were no significant findings between game version and sexual attractiveness or physical condition. These findings are consistent with Matthews et al. (2016). This suggests the possibility that certain types of video game characters may have some effect on weight concern towards one's own body.. Since the manipulation check failed (although in the right direction), the only conclusion is to draw no conclusion and instead claim it is possible that idealized body exposure affects body image dissatisfaction.

Matthew et al. (2016) offers two reasons as to why this may be. First, it could be that the exposure to hyper-idealized bodies induces a downward social comparison orientation since hyper-idealized bodies may include sexualized features that appeal to the male gaze, and therefore make participants feel better about themselves. This is a possibility since the average social comparison orientation score for those who played the idealized body game version is 6.58, indicating a downward social comparison orientation. Note that this social comparison orientation score is slightly higher than the overall average score for participants in both groups combined, but not significantly different.

The second reason is the Lara phenomenon (Jansz & Martis, 2007; Matthews et al., 2016). Playing as an idealized game character may induce a feeling of power and independence in female players. Although the idealized character body version was rated as more sexualized and more revealingly dressed, she was also rated by participants to be stronger and more aggressive than the non-idealized version, albeit minimally. These findings support both explanations of why participants who played the idealized body game version tended to have lower body image dissatisfaction than those who played the non-idealized game version.

Since this current finding replicated that of Matthews et al. (2016), and if future replications continue to show similar results, important implications for video game and theory development are provided. Video games have been criticized for portraying female characters sexually and giving them unrealistic body proportions that only a small amount of the population can achieve

naturally. The current study faintly echoes the results of the Matthews et al. (2016) study. This study does not suggest, however, that video game developers should disregard criticism about portrayal of female characters because of these results, as it is difficult to tell *why* this outcome was observed. Body proportion was questioned in addition to other factors. Outside variables such as familiarity with the character or other body characteristics were not recorded, such as body mass index (BMI).

There were no significant findings between video game version played and social comparison orientation or self-esteem. Since there was not a significant relationship found between game version and social comparison orientation, a mediation test was not conducted. There are many possible reasons as to why this finding occurred. First, there has been research that suggests internalization of thin-ideal plays a part in social comparison. Internalization refers to the extent that individuals accept a standard such as the thin ideal (Heinberg, Thompson & Stormer, 1995). If the thin-ideal is not internalized, a negative body image effect is less likely to be present (Warren, Gleaves, Cepeda-Benito, Fernandez, & Rodriguez-Ruiz, 2005). Internalization was not measured in this study.

There could also be methodological explanations for why there was no significance found. The stimuli could potentially affect the outcome if participants were familiar with Lara Croft. She is a well-known sex-symbol in the video game world so it's not unreasonable to say that this could potentially influence social comparison orientation and self-esteem outcomes. If participants were familiar

with Lara, they may feel inclined to support her long standing reputation as an over-sexualized female character that was designed for males. Playing as Lara could induce a heuristic to engage in downward social comparison if they know her to be a sex symbol, or alter self-esteem due to the downward comparison.

Implications

This study provides perspective on the widely researched relationship between idealized body exposure and body image dissatisfaction/self-esteem by exploring the use of video game characters as the idealized body stimuli. Since the manipulation check failed, it is impossible to give practical implications.

As mentioned earlier, there may be a Lara phenomenon effect from playing as strong, female, characters, regardless of being sexualized. Since the idealized version of Lara was rated as stronger and more aggressive, it's possible that this empowered female players, regardless of her also being rated as more sexualized, less realistically proportioned, and more revealingly dressed. This suggests that negative effects from sexualization of female characters may not necessarily outweigh the positive effects from portraying these characters to be strong and physically capable. This has important real-life and SCT implications. When one engages in downward social comparison, it is because the person of comparison is perceived to be below the individual engaging in comparison. In the current study, it was found that the participants, on average, had a downward comparison tendency. However, although participants rated the idealized version of Lara to be more sexualized, she was also stronger and more aggressive than the

less idealized version of Lara. This suggests that, perhaps the downward

comparison could allow participants to focus more on the negative traits that

initiated the downward comparison to begin with (Lara's sexualization) and

therefore either ignore the potential negative effects of Lara's positive traits

(Lara's strength) or use them as empowerment to make themselves feel better

about their own weight concerns. This implies that, if Lara is already perceived to

be below participants, participants might believe that they're better than her in *all*

ways, including strength. This is particularly interesting since these traits found in

the idealized Lara could have negative effects if coming from someone who

participants were engaging themselves with in an upward spiral. Conditions of

SCT should be studied further to understand if someone is perceived to be below

you, does this mean that they are perceived to be below you in *all* ways? Because

it is unclear how SCT accounts for how a positive trait like strength affects the

participants weight concern, the study partially supports SCT. Overall, social

comparison is an appropriate theory to use when applying to video games with the

caveat of the uncanny valley effect. This study suggests no reasons why this theory

should not be used with video games.

Industry and advocacy implications

Since the manipulation check was marginally significant, suggestions

cannot be accurately made to industry advocacy and developers. However, if

patterns similar to what was found in the current study persist then this could

mean that developers do not necessarily need to alter female characters in a way

that is more realistic. Also, consumer advocates could be sending an inaccurate message regarding harmful effects of idealized female video game characters. According the results, female consumers may fare better about their weight concern attitudes if they're playing a female character that allows them to engage in downward comparison. This doesn't suggest, however, that video game makers should ignore backlash against sexualizing female characters. Although the study didn't show any negative effects from exposure to an idealized, sexualized female character, it should not be assumed that sexualizing a female character is something that females enjoy.

Limitations and future research

The current study is not without limitations. The experimental design along with the sample does not offer itself well to generalization. Specifically, since the experiment was conducted in a lab setting, it's not generalizable to the natural, real world setting that people play video games in, or has low ecological validity. The demographics of the sample limit generalizability since the study was conducted on a college-aged population, which is only partially representative of the general population of those who play video games. It is also difficult if not impossible to control for confounding variables not included in the study that could potentially affect self-esteem and body image dissatisfaction. Therefore, it is important to assess the results with caution. Factors that influence body image dissatisfaction are internalization of societal norms coupled with a perceived inconsistency between the self and societal norms (Heinberg & Thompson, 1995). This was not

assessed in the current study and should be done so in future research to get a more well-rounded understanding of body-image effects from video game play.

Another area that was difficult to control was the time between participants taking the pre questionnaire and coming into the lab for the gameplay and the post questionnaire. Although some participants signed up for the study through the SONA system, others from the SJMC were recruited through classes directly. The researcher contacted the class informing them of the study and signed up participants manually. Although participants received instruction to complete the pre questionnaire prior to attending the computer lab, it was impossible to control for the time between participants taking the pre questionnaire and participants coming into the lab. Several participants completed the pre questionnaire within three days of coming into the lab. This could be problematic since participants could more easily remember their responses for the pre questionnaire while taking the post questionnaire, therefore influencing results. This study also included a particularly small overall sample size (N=36). A larger sample size would be ideal for this study. The study is underpowered due to a small sample size. Having a larger sample size would help determine a more accurate power and understanding of participant's assessment of body proportion of character bodies. Because it is underpowered it's not possible to make solid claims regarding the patterns found.

The current study built upon the previous literature by exploring how idealized bodies affect social comparison orientation, self-esteem, and body image

dissatisfaction. Future research could continue to explore this further by asking participants to further elaborate on their perceptions of game characters either through an open-ended questionnaire or interviews and include a longitudinal design that measures potential lasting effects. Open-ended questionnaires and interviews allow for participants to disclose information that the researcher might otherwise not uncover using closed-ended questionnaires. This methodology could shed light as to why the results have been found that contrast existing literature. A longitudinal study would help bolster the current findings if they are shown to hold up over time. Although the covariates dampened the effect between character body version and weight concern, it would be useful to know how the persistence between weight concern and character body version hold up over time. Future research should also explore effects from playing characters of more varied body-types. The current study and the study by Matthews et al. (2016) only explored effects from either idealized, hyper idealized, or slightly less idealized. It would be useful to explore other, more varied body types that are outside of this idealist range to get a better understanding of effects from different types of body-type exposure.

In addition, it is imperative to understand the contrast between an animated character and a real-life version due to the uncanny valley effect. There has not been adequate research done for understanding how social comparison lends itself to animated stimuli. The effect could potentially nullify social comparison tendencies if there is indeed a revulsion felt by players experiencing the uncanny

valley effect when playing a video game character. Social comparison could be used in the future to compare participant social comparison orientation to a real person and also to a video game version of a person to verify whether or not an uncanny valley effect is triggered by a character who appears to be too realistic. An example of how this that could be explored would be comparing an older version of the animated Lara Croft to the real life, human version of Lara Croft from the movie Tomb Raider (2001) who was played by Angelina Jolie.

An interesting finding from the current study is the difference in rating of strength and aggressiveness between the idealized character body and the non-idealized character body. This poses a limitation since the two characters are not portrayed as equal as possible on the game scenarios. Future research could disentangle this by using a study design that exposes participants to the idealized and non-idealized character body version in a weaker body scenario and a more aggressive scenario to further understand how participants perceive the characters.

Finally, it would be useful to also explore how video game play that includes idealistic bodies affects other areas of mental health, such as depression. Although the main concern with thin-ideal body exposure has been with one's own body-image perception and beliefs, it would be useful to gain a more holistic understanding of the mental health effects from exposure. Part of the health effects would also include asking participants about gender/sexism attitude. These questions have been asked in previous literature but not in the current. It should be explored as to how these attitudes interact with social comparison, body image

dissatisfaction and self-esteem when exposed to idealized versus non-idealized

character bodies.

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Appendix A: Pilot Test

Perceptions of Video Game Characters

You are invited to be in a research study of video game character perception. You were selected as a possible participant because you are in the School of Journalism and Mass Communication subject pool or in the JOUR 1501 Digital Games, Sims and Apps course. We ask that you read this form and ask any questions you may have before agreeing to be in the study.
This study is being conducted by: Hannah Murphy, School of Journalism and Mass Communication If you agree to be in this study, we would ask you to do the following things:

Please fill out the questionnaire after viewing some video game characters. Other questions include your own video games habits, and some demographic information. The questionnaire should take no longer than 15 minutes.

Confidentiality:
The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records.

Voluntary Nature of the Study:
Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota and School of Journalism and Mass Communication. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:
The researcher conducting this study is: Hannah Murphy . You may ask any questions you have now. If you have questions later, you are encouraged to contact her at 330 Murphy Hall, 612-625-9824, murp0705@umn.edu. The advisor is Jennifer Ball, available to contact at 612-626-7754, jgball@umn.edu

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

You will be given a copy of this information to keep for your records.

1. Please rate the following characters on the scales provided.

The character appears to be....

Weak   Strong

○   ○   ○   ○   ○   ○

Submissive   Aggressive

○   ○   ○   ○   ○   ○   ○

Unrealistically proportioned | ○ ○ ○ ○ ○ ○ ○ | Realistically proportioned

Unattractive | ○ ○ ○ ○ ○ ○ ○ | Attractive

Not Sexualized | ○ ○ ○ ○ ○ ○ ○ | Sexualized

Conservatively Dressed | ○ ○ ○ ○ ○ ○ ○ | Revealingly Dressed

Passive | ○ ○ ○ ○ ○ ○ ○ | Violent

The character appears to be....

Weak					Strong
○	○	○	○	○	○

Submissive						Aggress ive
○	○	○	○	○	○	○

| Unrealistically proportioned | | | | | | Realis tically propo |

rtione
d

○   ○   ○   ○   ○   ○   ○

Unattractive   Attrac
tive

○   ○   ○   ○   ○   ○   ○

Not Sexualized   Sexualized

○   ○   ○   ○   ○   ○   ○

Conservatively   Revealingly

Dressed   Dressed

○   ○   ○   ○   ○   ○   ○

Passive   Violent

○   ○   ○   ○   ○   ○   ○

The character appears to be....

Weak   Strong

   O   O   O   O   O   O

Submissive   Aggressive

○   ○   ○   ○   ○   ○   ○

Unrealistically proportioned   Realistically proportioned

○   ○   ○   ○   ○   ○   ○

Unattractive   Attractive

○   ○   ○   ○   ○   ○   ○

Not Sexualized   Sexualized

○   ○   ○   ○   ○   ○   ○

Conservatively Dressed   Revealingly Dressed

○   ○   ○   ○   ○   ○   ○

Passive   Violent

○   ○   ○   ○   ○   ○   ○

The character appears to be....

Weak   Strong

○   ○   ○   ○   ○   ○

Submissive   Aggressive

○   ○   ○   ○   ○   ○   ○

Unrealistically proportioned

Realistically proportioned

○   ○   ○   ○   ○   ○   ○

Unattractive

Attractive

○   ○   ○   ○   ○   ○   ○

Not Sexualized

Sexualized

○   ○   ○   ○   ○   ○   ○

Conservatively Dressed

Revealingly Dressed

○   ○   ○   ○   ○   ○   ○

Passive

Violent

○   ○   ○   ○   ○   ○   ○

1   2

Which image does the character appear to be more sexualized?

○ Image 1   ○ Image 2

Which character appears to be more realistically proportioned?

○ Image 1   ○ Image 2

Which character appears to be more attractive?

○ Image 1   ○ Image 2

Which character appears to be more competent?

◉ Image 1   ○ Image 2

Which image does the character appear to be more sexualized?

○ Image 1 ○ Image 2

Which character appears to be more realistically proportioned?

○ Image 1 ○ Image 2

Which character appears to be more attractive?

○ Image 1 ⦿ Image 2

Which character appears to be more competent?

○ Image 1 ○ Image 2

Which image does the character appear to be more sexualized?

○ Image 1 ○ Image 2

Which character appears to be more realistically proportioned?

○ Image 1 ○ Image 2

Which character appears to be more attractive?

○ Image 1 ◉ Image 2

Which character appears to be more competent?

○ Image 1 ○ Image 2

Which image does the character appear to be more sexualized?

○ Image 1 ○ Image 2

Which character appears to be more realistically proportioned?

○ Image 1 ○ Image 2

Which character appears to be more attractive?

○ Image 1 ◉ Image 2

Which character appears to be more competent?

○ Image 1 ○ Image 2

Which image does the character appear to be more sexualized?

  ○ Image 1 ○ Image 2

Which character appears to be more realistically proportioned?

  ○ Image 1 ○ Image 2

Which character appears to be more attractive?

  ○ Image 1 ◉ Image 2

Which character appears to be more competent?

  ○ Image 1 ○ Image 2

Which image does the character appear to be more sexualized?

○ Image 1 ○ Image 2

Which character appears to be more realistically proportioned?

○ Image 1 ○ Image 2

Which character appears to be more attractive?

○ Image 1 ● Image 2

Which character appears to be more competent?

○ Image 1 ○ Image 2

What is your sex?

○ Male

○ Female

○ Other

○ Prefer not to answer

Do you play video games?

○ Yes

○ No

How familiar are you with the previous characters?

Not at all						Very familiar
○	○	○	○	○	○	○

Appendix B: Pre Questionnaire

Effects of video game playing on the PC
You are invited to be in a research study of video game character perception. You were
selected as a possible participant because you are in the School of Journalism and Mass
Communication subject pool or are enrolled in another course within the School of
Journalism and Mass Communication. We ask that you read this form and ask any questions
you may have before agreeing to be in the study. This study is being conducted by: Hannah
Murphy, School of Journalism and Mass Communication. If you agree to be in this study, we
ask you to do the following things:

Please fill out this short questionnaire at least a few days prior to coming into the computer
lab. The questionnaire will ask you questions regarding self-esteem and video game habits.
You will come into the computer lab after completing the questionnaire to participate in
playing a pre-selected computer game for 15 minutes followed by another short
questionnaire. Each questionnaire should take no longer than 15 minutes.

Confidentiality:
The records of this study will be kept private. In any sort of report we might publish, we will
not include any information that will make it possible to identify a subject. Research records
will be stored securely and only researchers will have access to the records.

Voluntary Nature of the Study:
Participation in this study is voluntary. Your decision whether or not to participate will not
affect your current or future relations with the University of Minnesota and School of
Journalism and Mass Communication. If you decide to participate, you are free to not answer
any questions or withdraw at any time without affecting those relationships.

Contacts and Questions:
The researcher conducting this study is Hannah Murphy. You may ask any questions you
have now. If you have questions later, you are encouraged to contact her at 330 Murphy Hall,
612-625-9824, or murp0705@umn.edu. The advisor is Jennifer Ball, available to contact at
612-626-7754, jgball@umn.edu.

If you have any questions or concerns regarding this study and would like to talk to someone
other than the researcher, you are encouraged to contact the Research Subjects' Advocate
Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-
1650.

You will be given a copy of this information to keep for your records

Please select the amount to which you agree with the following statements:

	Strongly Agree	Agree	Disagree	Strongly Disagree

I feel that I'm a person of worth, at least on an equal plane with others.	○	○	○	○
I feel that I have a number of good qualities.	○	○	○	○
All in all, I am inclined to feel that I am a failure.	○	○	○	○
I am able to do things as well as most other people.	○	○	○	○
I feel I do not have much to be proud of.	○	○	○	○
I take a positive attitude towards myself.	○	○	○	○
On a whole, I am satisfied with myself.	○	○	○	○
I wish I could have more respect for myself.	○	○	○	○
I certainly feel useless at times.	○	○	○	○
At times I think I am no good at all.	○	○	○	○

On this page are listed a number of body parts and functions. Please read each item and indicate how you feel about this part or function of your own body using the following scales:

1 = Have strong negative feelings

2 = Have moderate negative feelings
3 = Have no feeling one way or the other
4 = Have moderate positive feelings
5 = Have strong positive feelings

	1	2	3	4	5
Body Scent	○	○	○	○	◉
Appetite	○	○	○	○	○
Nose	○	○	○	○	○
Physical Stamina	○	○	○	○	○
Reflexes	○	○	○	○	○
Lips	○	○	○	○	○
Muscular Strength	○	○	○	○	○
Waist	○	○	○	○	○
Energy Level	○	○	○	○	○
Thighs	○	○	○	○	○
Ears	○	○	○	○	○
Biceps	○	○	○	○	○
Chin	○	○	○	○	○

Body Build	○	○	○	○	○
Physical Coordination	○	○	○	○	○
Buttocks	○	○	○	○	○
Agility	○	○	○	○	○
Chest or Breasts	○	○	○	○	○
Appearance of Eyes	○	○	○	○	○
Cheeks/Cheek bones	○	○	○	○	○
Hips	○	○	○	○	○
Legs	○	○	○	○	○
Figure or Physique	○	○	○	○	○
Sex Drive	○	○	○	○	○
Sex Organs	○	○	○	○	○
Appearance of Stomach	○	○	○	○	○
Health	○	○	○	○	○

Sex Activities	○	○	○	○	○
Body Hair	○	○	○	○	○
Physical Condition	○	○	○	○	○
Face	○	○	○	○	○
Weight	○	○	○	○	○

In relationship to others, I feel...

Inferior	○	○	○	○	○	○	○	○	○	○	Superior
Incompetent	○	○	○	○	○	○	○	○	○	○	More Competent
Unlikeable	○	○	○	○	○	○	○	○	○	○	More Likeable
Left out	○	○	○	○	○	○	○	○	○	○	Accepted

Different	○	○	○	○	○	○	○	○	○	○	Same
Untalented	○	○	○	○	○	○	○	○	○	○	More Talented
Weaker	○	○	○	○	○	○	○	○	○	○	Stronger
Unconfident	○	○	○	○	○	○	○	○	○	○	More Confident
Undesirable	○	○	○	○	○	○	○	○	○	○	More Desirable
Unattractive	○	○	○	○	○	○	○	○	○	○	More Attractive
An Outsider	○	○	○	○	○	○	○	○	○	○	An Insider

How many hours per week do you play video games?

○ 0-1 Hours

○ 1-2 Hours

○ 3-4 Hours

○ 5-10 Hours

○ 10+ Hours

Which are your favorite genres of games?

☐ Action/Adventure   ☐ First-person Shooter

☐ Sports   ☐ Other

☐ Strategy   ☐ I don't play games

☐ Role-Playing Game

What is your age range?

○ 18-21

○ 22-24

○ 25-30

○ >30

Q33

Please provide your x500, university ID, and the name of the class you wish to receive extra credit for below.

x500

ID

Class

Q20

Which game version did you play? This should say on the control sheet.

○ A

○ B

Please select the amount to which you agree with the following statements:

	Strongly Agree	Agree	Disagree	Strongly Disagree
I feel that I'm a person of worth, at least on an equal plane with others.	○	○	○	○
I feel that I have a number of good qualities.	○	○	○	○
All in all, I am inclined to feel that I am a failure.	○	○	○	○
I am able to do things as well as most other people.	○	○	○	○

I feel I do not have much to be proud of.	○	○	○	○
I take a positive attitude towards myself.	○	○	○	○
On a whole, I am satisfied with myself.	○	○	○	○
I wish I could have more respect for myself.	○	○	○	○
I certainly feel useless at times.	○	○	○	○
At times I think I am no good at all.	○	○	○	○

On this page are listed a number of body parts and functions. Please read each item and indicate how you feel about this part or function of your own body using the following scales:

1 = Have strong negative feelings
2 = Have moderate negative feelings
3 = Have no feeling one way or the other
4 = Have moderate positive feelings
5 = Have strong positive feelings

	1	2	3	4	5
Body Scent	○	○	○	○	◉
Appetite	○	○	○	○	○
Nose	○	○	○	○	○

Physical Stamina	○	○	○	○	○
Reflexes	○	○	○	○	○
Lips	○	○	○	○	○
Muscular Strength	○	○	○	○	○
Waist	○	○	○	○	○
Energy Level	○	○	○	○	○
Thighs	○	○	○	○	○
Ears	○	○	○	○	○
Biceps	○	○	○	○	○
Chin	○	○	○	○	○
Body Build	○	○	○	○	○
Physical Coordination	○	○	○	○	○
Buttocks	○	○	○	○	○
Agility	○	○	○	○	○
Chest or Breasts	○	○	○	○	○

Appearance of Eyes	○	○	○	○	○
Cheeks/Cheek bones	○	○	○	○	○
Hips	○	○	○	○	○
Legs	○	○	○	○	○
Figure or Physique	○	○	○	○	○
Sex Drive	○	○	○	○	○
Sex Organs	○	○	○	○	○
Appearance of Stomach	○	○	○	○	○
Health	○	○	○	○	○
Sex Activities	○	○	○	○	○
Body Hair	○	○	○	○	○
Physical Condition	○	○	○	○	○
Face	○	○	○	○	○
Weight	○	○	○	○	○

Please rate the character played in the video game on the following traits...

The character was..

Weak	○	○	○	○	○	○	○	Strong
Submissive	○	○	○	○	○	○	○	Aggressive
Unrealistically proportioned	○	○	○	○	○	○	○	Realistically proportioned
Unattractive	○	○	○	○	○	○	○	Attractive
Not sexualized	○	○	○	○	○	○	○	Sexualized
Conservatively Dressed	○	○	○	○	○	○	○	Revealingly Dressed
Passive	○	○	○	○	○	○	○	Violent

I compare my body to those in video games

Never	Sometimes	About half the time	Most of the time	Always
○	○	○	○	○

Appendix D: Experimental Stimuli

Tomb Raider: Anniversary gameplay screenshots

Tomb Raider (2013) gameplay screenshots