

THE ROLE OF VIDEO GAMES IN SELF-OBJECTIFICATION: DOES THAT  
AVATAR BECOME YOU, TOO?

A Dissertation

by

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## ABSTRACT

Research suggests that virtual environments present revealing and unrealistic representations of males and females; however, the effect of exposure to virtual worlds remains understudied. Objectification theory and social learning theory suggest that exposure to these images may impact one's view of their own body, and in turn, result in maladaptive beliefs and behaviors to obtain these unrealistic ideals. The current study sought to examine the effects of exposure to modest and revealing video game avatars on adolescents' reported state self-objectification, body image, negative affect, food consumption, and task performance. Further, empathy, self-objectification, and immersion were examined as potential mediators and moderators of this relationship.

A total of 213 male and female adolescents residing in a southeast town in Texas completed the current study. Results suggested that exposure to same- or opposite-gendered, exposed avatars resulted in higher levels of state self-objectification for both males and female adolescents. Further, females reported greater negative affect following exposure to these image when compared to males. However, no support was garnered for exposed images affecting body image, negative affect, food consumption, and task performance. Further, empathy, immersion, and self-objectification did not mediate or moderate this relationship. Implications for prevention and treatment for male and female adolescents exposed to revealing avatars are discussed, as this may lead to negative perceptions about the self and negative affect.

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## CHAPTER I

### INTRODUCTION

Rates of disordered eating behaviors among adolescents are alarmingly high, with findings suggesting rates between 56-57% for females and 28-31% for males (Croll, Neumark-Sztainer, Story, & Ireland, 2002). Research has shown that maladaptive weight-related problems can increase in severity into later adolescence and adulthood and may contribute to the initiation of other harmful weight-related behaviors (Neumark-Sztainer et al., 2006; Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011). Furthermore, among individuals reporting pathological dieting behaviors, 20-25% will meet either sub-clinical or full criteria for an eating disorder following the initiation of these behaviors (Mellin et al., 1991). This is concerning, as individuals diagnosed with an eating disorder are resistant to treatment and have the highest rates of morbidity among psychological disorders. Thus, determining factors contributing to the onset of these disorders can assist in lessening the financial and emotional burdens that accompany these disorders (Lock, Couturier, & Agras, 2008; Pohjolainen et al., 2010; Toulany et al., 2015).

While the onset and maintenance of eating disorders are complex, decades of research into the etiology of these behaviors have identified key individual and environmental factors that affect their development. The sociocultural model is one of the most empirically supported models explaining the relationship between body dissatisfaction and disordered eating. This model stresses the impact of social and cultural standards as primary contributors to the relationship between objectification and

body dissatisfaction and resulting disordered eating behaviors (Cusumano & Thompson, 1997; Stormer & Thompson, 1996). More specifically, this model suggested that dissatisfaction with one's body results from the ideals promulgated by Western society, the inclination to view the body as an object, and a focus on the benefits of meeting beauty standards (Morrison, Kalin, & Morrison, 2004). Mass media has been identified as the primary means by which these ideals are presented, and although research supports the effects of magazine and media exposure on body image and disordered eating behaviors, few studies have examined whether similar effects occur when idealized standards are presented through virtual avatars. Therefore, the current study seeks to address this gap in the literature by examining the effects of video game use on subsequent body image and eating behaviors among adolescents. These findings will assist in the development of more efficacious treatment and prevention programs.

Approximately 2.0% of males and 4.8% of females meet criteria for an eating disorder diagnosis, and over the past ten years these rates are reportedly increasing among adolescent females age 15-19 (Smink, van Hoeken, & Hoek, 2012). In addition to the increase in eating disorder diagnoses, disordered eating behaviors, such as laxative use, diet pills, and fasting, have also increased in childhood and adolescence with rates ranging from 56-57% among female and 28-31% among male adolescents (Croll et al., 2002). Perhaps most concerning about these high rates are findings that suggest that individuals who engage in disordered eating behaviors are more likely to continue to engage in these maladaptive eating patterns in later life and view these behaviors as effective means of weight management (Paxton et al., 1991; Rosen & Gross, 1987).



Further, persistent engagement in disordered eating behaviors can result in a number of negative physical and psychological effects for individuals. These effects include electrolyte imbalances such as hypokalemia related to heart problems, along with cardiovascular problems, gastrointestinal, endocrine, and metabolic abnormalities (Pomeroy & Mitchell, 2002). Provided the physical and mental health concerns that accompany these behaviors, it is imperative that research works to understand factors that may contribute to the onset of these eating behaviors and associated beliefs.

### **Self-Objectification: Theory and Consequences**

Self-objectification theory posits individuals the views of an outside observer on their own body after being subjected to messages which objectify the body. Because individuals' bodies exist within a social context, social and cultural standards and ideals are readily placed on the body through marketing and other media outlets, and as a result, individuals begin to view themselves as objects to be evaluated by these established ideals (Noll & Fredrickson, 1998). Within Western society these ideals emphasize thinness in females, while males are encouraged to be tall, muscular, and mesomorphic (Derenne & Beresin, 2006; Halliwell, Dittmar, & Orsborn, 2007; Smolak, 2013).

Self-objectification has been examined at both the state and trait level. Trait levels of self-objectification are defined as persistent traits, while state self-objectification is conceptualized as an induced state. Both trait and state self-objectification have been shown to have negative psychological effects on functioning. More specifically, self-objectification theory proposes that the practice of objectifying

and dehumanizing oneself, even in induced cases, leads to several psychological consequences such as body shame, appearance anxiety, reduction of flow states, and decreased awareness of emotional experience (Fredrickson & Roberts, 1997). It is believed that as individuals perpetually objectify themselves, these negative consequences may lead to a number of mental health risks, including depression and eating disorders (Tiggemann, 2011). Thus, by examining induced states of self-objectification, a better understanding of the longitudinal effects of trait self-objectification can be established.

Self-objectification was first hypothesized as a phenomenon among females as women are believed to be at greater risk of objectification when compared to men. Indeed, studies examining the prevalence of objectifying images in the media and advertisements have found that women are at greater risk of being represented in sexually exploitive images within the media (Schur, 1984). However, studies examining ethnic and sex differences in the experience of self-objectification have found that self-objectification transcends both race and gender. More specifically, these studies found that males who wore a speedo endorsed greater levels of state self-objectification compared to males who wore a sweater. Further, these studies found that Caucasian, African American, Asian American, and Hispanic males and females experienced greater negative outcomes when wearing a bathing suit compared to those who wore a sweater (Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998; Harrison & Fredrickson, 2003; Hebl, King, & Lin, 2004). Although women may be subject to greater objectification in the media, there is increasing evidence that males are beginning to be

increasingly objectified within advertisements and other media outlets (Rohlinger, 2002). Yet, in spite of the proliferation of media that objectifies men and women, little research has examined the causes and consequences of self-objectification in both sexes.

Self-objectification has been shown to interfere with performance on various tasks, and thus has been identified, in essence, to be a disruption to functioning (Quinn, Chaudoir, & Kallen, 2011). One manner in which self-objectification disrupts functioning is by affecting one's ability to focus on physical and mental tasks. Various studies examining these effects have shown the impact of both state and trait self-objectification on performance in tasks requiring focused attention, such as the Stroop task (Quinn, Kallen, Twenge, & Fredrickson, 2006), math tasks (Fredrickson et al., 1998), and tracking time (Breines, Crocker, & Garcia, 2008). In addition to flow states, self-objectification has been shown to predict affective states among males and females. A number of studies have also found greater negative affect among males and females reporting higher levels of self-objectification (Agliata & Tantleff-Dunn, 2004; Grabe & Jackson, 2009; Harper & Tiggemann, 2008; Miner-Rubino, Twenge, & Fredrickson, 2002; Muehlenkamp et al., 2009). Further, self-objectification has been shown to increase reported state and trait appearance anxiety (Noll & Fredrickson, 1998; Tiggemann & Lynch, 2001). Finally, a robust body of research has linked trait self-objectification to disordered eating behaviors (Calogero & Thompson, 2009; Hurt et al., 2007; Moradi, Dirks, & Matteson, 2005; Noll & Fredrickson, 1998; Slater & Tiggemann, 2010). Indeed, greater levels of self-objectification among males and females have been shown to increase likelihood of exercising for appearance-based

reasons, and have been associated with lower body esteem for males and females (Daniel & Bridges, 2010; Strelan & Hargreaves, 2005; Strelan, Mehaffey, & Tiggemann, 2003). Therefore, these findings indicate that both sexes are suspect to the negative consequences that have been associated with increased levels of self-objectification. Given these negative consequences, it is imperative that research works to understand which outlets and individual differences contribute to one becoming susceptible to the experience of self-objectification.

### **Sociocultural Influences in Self-Objectification: The Role of Media**

Exposure to images from sources such as commercial advertisements, music videos, print advertisements, and magazines have been shown to increase body shame, appearance anxiety, thin-ideal internalization, and self-objectification (Aubrey, 2006; Grabe, Ward, & Hyde, 2008; Vandenbosch & Eggermont, 2012). Analyses examining the ideals presented through the media have shown that messages consistently teach males to believe that the ideal body shape is a strong upper body with a small waist, being underweight is immasculine, females desire strong male partners, and muscularity signifies power, success, and athleticism. In a similar manner, females learn that beauty is vital, slenderness equates to attractiveness, image allows one to portray self-control, and seeking beauty is innate (Smolak & Murnen, 2001). Research has shown that females are more likely to adopt and invest in the thin ideal and are more likely to have their body-image evaluation influenced by the media to which they are exposed. Yet, males have also been shown to increase body-image investments, steroid use, and focus on appearance self-esteem following exposure to the societal ideals of a masculine body

(Levine, Smolak, & Hayden, 1994; Stice, Schupak-Neuberg, Shaw, & Stein, 1994; Tiggemann & Pickering, 1996). Various media forms include television, magazine, and social networking sites. All of which have been shown to negatively affect male and female self-objectification and body esteem (De Vries & Peter, 2013; Fredrickson et al., 1998; Hebl et al., 2004; Morry & S.L., 2001). Although a number of studies have investigated the role of types of media inducing state self-objectification, few have examined the potential role that video games may play on state self-objectification in male and female adolescents.

### **Video Game Use Among Adolescents**

Recent advancements in the availability and accessibility of technology have resulted in its increased use among all age groups. Children and adolescents spend a large proportion of their days immersed in mass media, with estimations of seven hours spent consuming various forms of media daily (Arnett, 1995; Singer & Singer, 2001). This trend is also present among video game use, with 63% of Americans reporting the use of video games within the past six months. Further despite popular beliefs that video game users are predominantly male, approximately 48% of gamers are female (Association & Insight, 2007). Provided the increased use of video games, researchers have begun to focus on the potential consequences that may be associated with exposure to and engagement in video games. Findings have suggested that negative mood states and externalizing behaviors are higher among those that report a greater level of video game use (Gentile, Lynch, Linder, & Walsh, 2004). More specifically, this study revealed that adolescents who were exposed to a greater amount of violent video

games were more hostile, indicated greater frequency of arguments with teachers, and performed more poorly in school. This initial evidence points to the translation of behaviors and social standards of a virtual environment to one's personal behaviors in reality. Although previous research has focused on the association of violent behaviors and video games, limited research has investigated the potential effects gaming may have on other behaviors or impacts on perceptions of self and societal standards.

### **Early Evidence for Video Game Use and Self-Objectification**

Few studies have examined the potential impact of video games on self-objectification; however, initial findings have supported this relationship for both self-objectification and related constructs (Fox, Ralston, Cooper, & Jones, 2014). A recent study presented by Fox and colleagues (2013) revealed that female undergraduate students placed in a virtual environment were more likely to have a change in their self-perception when exposed to a sexualized female avatar versus a modestly dressed, female character. This occurred through both the internalization of the avatar's appearance as well as reported levels of self-objectification. Research has also revealed that body image, a related construct to self-objectification, can be affected by exposure to video games, with both male and female undergraduate students showing decreased body-esteem following 15-minutes of exposure to a video game displaying their respective gender's bodily ideals (Barlett & Harris, 2008). These initial findings suggest video games can affect one's body image and increase self-objectification, and the current study will expand upon this existing literature by using a between-subjects

experimental design to examine the effects of video game exposure on self-objectification and subsequent behaviors and beliefs in male and female adolescents.

### **Individual Characteristics Increasing Vulnerability to Media Images**

Immersion, in reference to video game use, refers to the idea that an individual playing a video game is fully engrossed in the game's story. Immersion has been shown to increase in the past years due to the realistic images which are portrayed on newer gaming systems (McMahan, 2003). Early evidence suggests that individuals who feel a greater presence, or are more immersed, in a video game report more aggressive thoughts from playing a violent video game. Further, this study found that individuals were found to feel more immersed when the gender of the avatar matched the gender of the participant (Eastin, 2005). Research has underscored the importance of immersion in the experience of hostile thoughts and self-focused, self-centered goals following video game exposure (Tamborini, Eastin, Skalski, & Lachlan, 2004; Weinstein, Przybylski, & Ryan, 2009).

Limited research has examined individual differences in the relationship between immersion and psychological and behavioral outcomes. Early evidence suggests that trait levels of hostility, empathy, and hostile views mediate the effects of violent video games on aggression (Bartholow, Sestir, & Davis, 2005). Therefore, individual differences in the experience and ability to empathize and relate to the video game content may affect the outcomes of video game use. Thus, it appears plausible that these individual differences may also impact the severity of self-objectification, appearance

anxiety, restrained eating, and body dissatisfaction following exposure to idealized bodies in a virtual environment.

### **Current Study**

The proposed model of self-objectification points to a need to identify societal and cultural factors which contribute to these beliefs and behaviors. Early findings suggest a relationship between video game exposure and self-objectification among adolescents and emerging adults. The proposed study will further inform this research by implementing an experimental design to examine the effects of video game use on reported severity of self-objectification. Additionally, provided that findings suggest this phenomenon exists for both males and females, both sexes will be included in the current study to further understand potential gender differences in this relationship. This study is one of the first to examine the effects of video game exposure on experiences of self-objectification in adolescents, and aims to identify a subset of adolescents that may be targeted for prevention and intervention efforts. These findings will lay the foundation for future studies to further understand this relationship and develop more effective prevention and treatment strategies for adolescent eating disorders and depression.

### **Specific Aims**

Media influences represent a primary means of experiencing sociocultural messages regarding bodily ideals. While research has examined the effects of media sources such as magazines, social media, and television on levels of self-objectification, limited research has examined the potential role video games may play in influencing



self-objectification (Aubrey, 2006; Fox et al., 2013; Harrison & Fredrickson, 2003; Morry & S.L., 2001). Content analyses of video game covers have revealed that male characters are presented with muscular physiques while female characters are exaggerated in sexual presentation, termed hypersexualization (Burgess, Steven, & Stephen, 2007). These presentations of video game avatars are an exaggeration of the already unrealistic bodily expectations for males and females in Western culture. Given that recent research has indicated 87% of children aged 8-17 engage in video game use, it is important to investigate the effect exposure to these images may have on an individual's experience of self-objectification and subsequent negative consequences (Walsh, Gentile, & Bennett, 2006). The current study will address this gap in the literature by examining the effects of video game exposure on adolescents' levels of self-objectification and subsequent psychological factors and eating behaviors. The current study also aims to examine a number of factors that may influence or mediate and moderate the effects of media exposure. Specifically, the current study explored the impact of video game exposure on attention, the potential mediation of immersion and empathy, and potential sex differences in the examined outcomes.

**Specific Aim 1.** Limited research has examined the effects of video game use on self-objectification. In order to examine the effects of video game exposure on reported self-objectification and related outcomes, the current study will examine potential condition effects of the experimental and control conditions. Provided previous findings suggesting increased self-objectification following exposure to sexualized avatars, it was hypothesized that individuals in the Experimental Same Gender condition would have

the highest scores on H1: state self-objectification, H2: appearance anxiety, H3: body dissatisfaction, H4: restrained eating, and H5: negative affect. Further, it was hypothesized that individuals in the Experimental Opposite Gender condition would significantly higher scores compared to the control conditions on H6: state self-objectification, H7: appearance anxiety, H8: body dissatisfaction, H9: restrained eating, and H10: negative affect.

**Specific Aim 2.** Research has suggested that the effects of video game exposure on related outcomes are mediated by the experience of self-objectification. Therefore, the current study will examine whether self-objectification serves as a mediator in the relationship of video game condition and reported outcomes. It is hypothesized that self-objectification will mediate the relationship between exposure to sexualized avatars and H11: greater appearance anxiety, H12: greater body dissatisfaction, H13: greater restrained eating, and H14: increased negative affect.

**Specific Aim 3.** Self-objectification is believed to usurp cognitive resources as one shifts their focus from the task at hand to monitoring of their body. Past research has consistently found that individuals subjected to an induced state of self-objectification perform more poorly on a math task, and show decreased performance on the Stroop task (Noll & Fredrickson, 1998; Quinn et al., 2006). Interestingly, a study examining the combined effects of the sweater-swimsuit paradigm, the seminal manipulation testing state self-objectification, and “fat talk”, defined as comments which are body-disparaging, revealed that women reporting higher levels of self-objectification who were also exposed to fat talk performed more poorly on selected portions of the Kit of

Factor-Referenced Cognitive Tests (Gapinski, Brownell, & LaFrance, 2003). Together these results suggest that state self-objectification impairs performance on cognitive tasks, and the current study will examine the potential effects of self-objectification on a task of attention. Therefore, it is hypothesized that individuals in the experimental conditions will perform more poorly on a task of inattention as measured by H15: errors of omission, H16: commission, H17: detectability, H18: perseverations, and H19: hit rate on the CPT-III.

**Specific Aim 4.** Previous research suggests that individual differences in both immersion and empathy may impact the relationship between exposure to violent video games and related hostile behaviors. More specifically, this study found that empathy and immersion mediate this relationship (Bartholow et al., 2005). Extending these findings to the current study, it is hypothesized that greater immersion, empathy, and perspective-taking will augment reported levels self-objectification. Therefore, it is hypothesized that H20: greater immersion, H21: greater empathy, H22: greater fantasy scores, H23: greater perspective-taking, and H24: greater personal distress will moderate the relationship between video game exposure and self-objectification such that higher scores on these moderators will increase levels of reported self-objectification.

**Specific Aim 5.** It was also hypothesized that sex differences would exist between male and female adolescents. Past research findings suggesting that females are more negatively affected by sociocultural factors. Therefore, it was hypothesized that there would be an interaction between gender and experimental condition such that

females would endorse greater H25: appearance anxiety, H26: body dissatisfaction, H27: negative affect, and H28: restrained eating.

## CHAPTER II

### METHOD

#### **Participants**

Adolescents residing in Southeast Texas were recruited through the psychology subject pool, internet postings, social media sites, and flyers. A prescreening questionnaire was administered during the telephone screening or internet screening process to determine study eligibility. In order to participate in the study, adolescents met the following criteria (1) were between the ages of 13-19, (2) did not have a current or past diagnosis of a depressive or eating disorder, (3) were not currently taking ADHD medication, and (4) were fluent in English. For the current study, a total of 224 adolescents completed the study questionnaires. At the end of the study research assistants asked questions from a script that assessed what participants believed was the true purpose of the current study. After completing a questionnaire to assess participants' understanding of the purpose of the study, 11 participants were removed from the dataset due to suspiciousness. Additionally, 1 participant was removed due to failure to answer a majority of the study questions. After these participants were removed, a total of 212 participants (91 males [42.9%], 121 females [57.1%]) were randomly assigned to either the control or experimental condition. Participants identified predominantly as Caucasian (62.7%), followed by Hispanic (17.9%), Asian (8.0%), Other (5.2%), African American (4.7%), and Native American (.5%). For participants included in the analyses, there were 55 (25.9%) assigned to the Control Same Gender group, 50 (23.6%) in the Control Opposite Gendered avatar group, 52 (24.5%) in the Experimental Same

gendered avatar group, and 55 (25.9%) in the Experimental Opposite gendered avatar group. Further 116 participants (54.7%) were compensated monetarily, and 96 participants (45.3) were compensated through course credit.

### **Testing Session**

Following consent, all individuals were taken to a separate room where they tested a unisex scent and then completed a marketing questionnaire, the self-objectification questionnaire, mood questionnaire, and the objectified body consciousness scale – youth version. Following this, participants were randomly assigned to play either 15 minutes of an objectifying or a control video game with either a gender-matched or opposite gendered avatar. Immediately following video game exposure, participants were asked to complete a measure of state self-objectification, mood, appearance anxiety, video game satisfaction, and video game immersion. Following this task, participants were moved to a separate room where they completed a questionnaire examining future product purchase likelihood.

After completing this questionnaire, participants were provided a sample of 6 premeasured (grams) cookies and were instructed to “consume as many cookies as you would like, as the remaining cookies will be thrown away,” while they completed various questionnaires. These questionnaires included a demographic questionnaire, interpersonal reactivity index, mood questionnaire, and food satisfaction questionnaire. Participants were then moved to a separate room in which they completed a computer task examining attention. In the final portion of the study session, participants’ height and weight were measured with their backs turned to the scales. Finally, participants

completed a suspiciousness interview to determine if they are able to identify the primary research question, those reporting suspiciousness were withdrawn from analyses. Following this, participants were debriefed and compensated \$30 for their time, or received course credit if completing the study as part of a class requirement.

### **Consent Procedures**

Appropriate procedures were followed to obtain adult consent. Additionally, parental/legal guardian consent and adolescent assent were collected for participation of individuals under the age of 18. Participants were provided an IRB approved consent form, which documented the expectations of the study in order to allow participants to discern whether they would like to complete the study. Participants were also provided the opportunity to ask any pertinent questions before beginning their participation in the research study.

### **Materials**

**Scent Questionnaire.** As a decoy for the current study, participants were asked to smell and rate a unisex scent – CK® One. After smelling the scent, participants completed a measure developed for the study, which is a compilation of common marketing questions such as, “I like this product,” “I would be willing to pay for this scent in the future,” and “the most I would be willing to pay for this scent would be \_\_\_\_.”

**Trait Self-Objectification Questionnaire (SOQ).** The SOQ asks participants to rank order ten attributes of their body. Five of the attributes are appearance-based, while the other five are based upon physical competency, and are ranked from 0 (least

important) to 9 (most important) according to their impact on one's physical self-concept. Possible scores range from -25 to 25, with high levels of self-objectification being indicated by higher scores (Noll & Fredrickson, 1998). Previous research has reported the 10-question version of this measure is a more reliable and valid measure of self-objectification (Hill & Fischer, 2008). Due to the nature of the scale and the ranking of items, reliability scores cannot be calculated. Previous research suggests that internal consistency reliability for the SOQ can be examined by determining the correlation between the sum scores of appearance-based and competence-based items. Previous findings suggest strong negative correlations between these two categories suggesting good reliability,  $r = -.81$  to  $-.88$  (Calogero & Jost, 2011; Hill & Fischer, 2008). The current study found that the SOQ was a reliable measure of trait self-objectification,  $r = -.81$ .

**Objectified Body Consciousness Scale - Youth (OBCS-Youth).** The OBCS-Youth was developed to measure the degree to which preadolescents and adolescents adopt the viewpoint of an outside observer on their body. The measure was modeled after the adult version of the OBCS (McKinley & Hyde, 1996). Participants are asked to rate items on a 7-point scale, ranging from (1, strongly disagree to 7, strongly agree). The scale assesses three constructs related to self-objectification and its negative outcomes including (1) body surveillance, (2) body shame, and (3) appearance control beliefs. Psychometric properties were assessed using both preadolescent and adolescent samples and construct validity ranged from  $.51-.77$ , and reliability ranged from  $r = .62-.81$  (Lindberg, Hyde, & McKinley, 2006). For the current study, both the body



surveillance ( $\alpha = .83$ ) and body shame ( $\alpha = .76$ ) scales were found to have adequate consistency. However, the control beliefs scale did not have an acceptable reliability score ( $\alpha = .19$ ), which is consistent with findings during the scale's construction (Lindberg et al., 2006).

**Video Game Exposure.** Participants were randomly assigned to either the control or experimental condition. Participants assigned to the control condition played a realistic snowboarding game entitled SSX. In this condition participants were either a female snowboarder (Zoe) or a male snowboarder (Mac). Once playing commenced, participants played the game for 5 minutes to become acquainted with the controls, and then were allowed to play the game for an additional 15 minutes. Individuals in the experimental condition played games with more revealing characters. Those assigned to the condition in which they were a male avatar were assigned to play WWE 2K14, specifically as the characters The Rock vs. Chris Jericho. Those assigned to the female experimental condition played London 2012 Olympics Beach Volleyball as team USA. All games were played on the Xbox 360 with the television muted. Similar games have been used in previous studies using video game exposure to assess body dissatisfaction (Barlett & Harris, 2008).

**Game Rating and Experience.** As a partial decoy questionnaire to the current study, participants were asked to complete a measure assessing their enjoyment of the game they have been asked to play, experience with the video game they played during the session, as well as marketing questions to provide credence to the cover story.

**Twenty Statements Test (TST).** In order to assess state self-objectification, participants completed the TST (Fredrickson & Noll, 1998). This measure asks participants to fill-in a small blank following the words “I am.” Two raters blind to the subject condition coded the data into five separate categories (1) body shape and size, (2) other physical appearance, (3) physical competence, (4) traits or abilities, and (5) states or emotions. For the current study, coders had a 73.84% agreement, and all discrepancies were reconciled by a third coder. This measure has shown good reliability and validity with adolescent samples (see (Fredrickson & Harrison, 2005). For the current study the instructions have been modified to reflect the video game task versus the clothing manipulation used in the original study. Instructions read as follows for the current study:

“Viewing various forms of media can often have an impact on people's views of themselves. Please take a moment to think about how playing this particular video game makes you feel about yourself and your identity. In the twenty blanks below please make twenty different statements about yourself and your identity that complete the sentence "I am " Complete the statements as if you were describing yourself to yourself, not to somebody else.”

Statements that were coded as 1's (body shape and size) and 2's (other physical appearance) were summed to determine a state self-objectification score.

**The Physical Appearance State and Trait Anxiety Scale (PASTAS).** The PASTAS state scale assesses state appearance anxiety and includes a Weight (W) and a Non-Weight (NW) scale. This measure has a high alpha coefficient which ranges from

.82-.92 among college females and a test-retest reliability of .87 (Reed, Thompson, Brannick, & Sacco, 1991). For the current study this scale had an acceptable level of internal consistency ( $\alpha = .90$ ).

**Video Game Immersion Questionnaire.** The video game Immersion Questionnaire was developed to assess the relationship of video game immersion and both affective states and video game use behavior. This initial study found that greater immersion was related to more objective measures of immersion including greater connection to the game and a greater number of saccades focused on the video game (Jennett et al., 2008). The scale has a total score which reflects self-reported immersion, for the current study this measure had an internal consistency score of  $\alpha = .38$ . Because of this unacceptable reliability, a one-item immersion scale was used instead. This question asked participants, "How immersed did you feel? (10 = very immersed; 0 = not at all immersed) Definition of Immerse: 'Involve oneself deeply in a particular activity.'"

**Food Presentation.** Following the video game presentation and questionnaires, participants will be invited to a third room in which they were provided a plate of 6 Chips Ahoy® cookies. This food presentation reflects similar methods used in previous research (Fredrickson et al., 1998). To standardize time allowed to eat the cookies, participants were left with the cookies for 5 minutes while the questionnaires were being completed. At the five-minute mark, the food was removed and weighed to discern how much food was consumed.

**Food Enjoyment.** During food consumption, participants were asked to complete questionnaires designed specifically for this study to assess the food that had been presented. These questions were to assist in both bolstering the cover story of the research study and assessing for differences in food preference that may affect food consumption.

**Interpersonal Reactivity Index (IRI).** The IRI is a measure of empathy that assessed the multidimensional components of empathy. The instrument consists of four subscales that are composed of seven questions each. These subscales include Perspective Taking (PT), which assess one's ability to take another's point of view. The Empathic Concern (EC) scale examines how one experiences feelings of sympathy and compassion for others that are less fortunate. The Personal Distress (PD) scale examines how one experiences distress for others that are in a distressing situation. Finally, the Fantasy Scale (FS) assesses one's tendency to transpose themselves into fictional situations (Davis, 1980; Davis, 1983). However, it is important to note that this measure yielded a Cronbach's alpha of  $\alpha = 0.552$ .

**Demographic Questionnaire.** The Demographic Questionnaire was designed for the current study and collected basic demographic information, including gender, age, ethnicity, race, and current grade level.

**Conners Continuous Performance Task (CPT-III).** The CPT-III was developed to assess attention in individuals aged eight and older (Conners & Sitarenios, 2011). The participant is asked to press the left mouse button for every letter presented except when the letter "X" appears on the computer screen. Errors of commission are

responses made to the non-target stimulus, while errors of omission are non-responses to the target stimuli. The new scoring software provides four different aspects of attention: inattention, impulsivity, sustained attention, and vigilance. Split-half reliabilities for the various outputs of the CPT range from .80-.98, while validity has been confirmed following significant differences in scores between adolescents with ADHD versus those without (Conners & Sitarenios, 2011).

### **Procedure**

Following prescreening and consent, adolescents were invited to the study rooms at TAMU HBRG. For adolescents under the age of 18, parents were consented in a separate room to fully disclose the intentions of the research study. Adolescents under the age of 18 were informed that they were taking part in a study examining the effects of various consumer products on emotions, thoughts, and decision-making. The first 91 participants were informed that they have been asked to take part in a consumer marketing study involving products and mood, and that they will be asked to review various products they may purchase in the future. However, following an additional review by the IRB, these instructions were changed to inform participants they were being asked to take part in a study examining the effect of various products on thoughts, emotions, and decision-making. A one-way ANOVA analysis examining: state self-objectification ( $p=.584$ ), trait self-objectification, sex ( $p=.254$ ), race ( $p=.373$ ), condition ( $p=.848$ ), BMI ( $p=.756$ ), state physical appearance anxiety ( $p=.817$ ), state body image ( $p=.972$ ), immersion ( $p=.786$ ), empathy ( $p=.275$ ), CPT Detection ( $p=.158$ ), CPT commissions ( $p=.395$ ), CPT perseverance ( $p=.514$ ), CPT hit rate ( $p=.662$ ), cookies

remaining ( $p=.249$ ), or cookie difference ( $p=.116$ ) did not reveal significant differences between groups based upon instructions. However, differences were found in age ( $F(1,126)=10.335, p = .002$ ) and CPT Omissions ( $F(1,126) = 5.455, p = .021$ ). This difference in age was anticipated due to the ability to recruit younger participants as a result of the new instructions and these analyses revealed significant age differences such that participants who completed the study prior to the instruction change had a mean age of 18.50 years, and those after the instruction change had a mean age of 17.50 years. Further, improved performance with age is a common finding among older teens (Conners, Epstein, Angold, & Klaric, 2003). Indeed, in the current study the group prior to the instruction ( $M = 56.83$ ) change performed significantly better than those after the instruction change ( $M=55.60$ ). Therefore, it was determined no significant group differences existed which would impact study findings as a result of this change in instructions.

## CHAPTER III

### RESULTS

#### **Preliminary Data Analysis**

SPSS 20.0 was used to conduct all analyses. The proportion of missing data across assessments ranged from 0 to 9%. The few missing item values were handled by using the expectation-maximization technique in SPSS, which imputes the missing value by determining the most likely value based upon the distribution of the data. Data were screened for normality of distribution, and no outliers were detected using Mahalanobis distance. Further, analyses examining the skewness and kurtosis values for all study variables were in the acceptable range (skewness range = -1.24 to 2.56, kurtosis range = -1.01 to 8.35) recommended by Kline (2010). Further, homoscedasticity of variance between groups was acceptable. As a result of these analyses, no variables were transformed. A correlation matrix of all variables is provided in Table 1.

#### **Determination of Covariates**

In order to determine group differences and covariates for all analyses, an ANOVA was used to examine potential group differences on trait self-objectification, age, sex, BMI, and ethnicity. There were no group differences found for age ( $F(3,211)=1.055, p=.369$ ), BMI ( $F(3,190)=.878, p=.545$ ), or trait self-objectification ( $F(3,190)=.687, p=.561$ ). Further, chi-square analyses revealed that neither ethnicity  $X^2(18, N = 212) = 28.181, p = .059$ , nor sex  $X^2(3, N = 212) = .601, p = .896$  were significantly different. However, provided the pre-post nature of the current analyses, trait self-objectification was included as a covariate following suggestions by Calgero

Table 1. Correlation matrix of all study variables.

	Restraint	CPT D	CPT O	CPT C	CPT P	CPT H	Immersion	TST	BISS	Sex	Neg. Affect	Fantasy	Empathy	Perspective Taking	Personal Distress
CPT D	.032														
CPT O	-.038	.778**													
CPT C	.035	.850**	.422**												
CPT P	.002	.626**	.535**	.490**											
CPT H	-.005	-.391**	-.080	-.596**	-.268**										
Immersion	.120	-.116	-.210**	-.058	.012	-.028									
TST	-.040	.049	.082	.036	.107	-.084	.000								
BISS	-.076	.027	.058	.060	-.087	-.072	-.044	-.010							
Sex	-.135	.140*	.102	.172*	.009	-.049	-.200**	-.057	.139						
Neg. Affect	.004	.044	.054	.012	.056	.031	.005	.018	-.055	-.082					
Fantasy	.045	.000	-.130	.110	.040	-.099	.216**	-.079	.011	.293**	.091				
Empathy	-.006	-.128	-.135	-.060	-.072	.034	-.038	-.046	.019	.178*	.056	.390**			
Perspective Taking	-.083	-.060	-.045	-.059	-.011	.065	-.007	.101	-.013	.041	-.110	.056	.362**		
Personal Distress	.015	.084	.007	.116	.045	-.148*	.042	-.056	.137	.294**	.056	.415**	.320**	-.020	
Appearance Anxiety	-.183*	.117	.091	.173*	-.043	-.054	-.095	.012	.459**	.334*	.006	.163*	.165*	-.027	.206**

Note. \* indicates  $p < .05$  and \*\* indicates  $p < .001$ . CPT D = Detection, CPT O = Omissions, CPT C = Commissions, Commission P = Perseverations, CPT H = Hit Rate, PASTAS = Physical State and Trait Appearance Scale, TST = State Self-objectification, BISS = Body Image State Scale.



(2004). Group means and standard deviations or  $n$  and percentages for examined covariates are presented in Table 2. Additionally, differences in examined outcomes based on compensation type were tested; however, Wilk's lambda was not significant ( $p = .073$ ), thus this was not included as a covariate.

### **Specific Aim 1: Effects of Condition on Self-Objectification and Related Outcomes**

The first aim of the current study sought to examine potential group differences between the experimental and control conditions on the outcomes of interest. This aim was accomplished using an ANCOVA to examine conditional effects of condition on the following outcome variables: (1) state self-objectification, (2) appearance anxiety, (3) state body image, (4) restrained eating, and (5) affect. It was hypothesized that individuals in the experimental conditions would have higher score on the state self-objectification scale, greater appearance anxiety, more body dissatisfaction, greater restraint in cookie consumption, and greater negative affect.

The initial ANOVA examined the effect of condition on state self-objectification after controlling for trait self-objectification. A linear relationship was confirmed between pre- and post-assessments of self-objectification through visual inspection of a scatterplot. Further, there was homogeneity of regression slopes as the interaction term was not statistically significant,  $F(3,179) = .627, p = .599$ . When comparing the combined experimental conditions to the combined control conditions, the experimental conditions reported significantly higher levels of state self-objectification,  $F(1,184) = .760, p = .006$ . Analyses further examining separate group differences between condition and reported state self-objectification supported the hypothesis revealing that, after

Table 2. Chi-square and ANOVA tests for covariates

<b>Ethnicity</b>	Control Same Gender		Control Opposite Gender		Experimental Same Gender		Experimental Opposite Gender	
	n	frequency	n	frequency	n	frequency	n	frequency
Black	1	1.82%	1	2.00%	3	5.77%	5	9.09%
White	44	80.00%	26	52.00%	34	65.38%	29	52.73%
Asian	3	5.45%	3	6.00%	6	11.54%	5	9.09%
Hispanic	5	9.09%	15	30.00%	5	9.62%	13	23.64%
Native American	1	1.82%	0	0.00%	0	0.00%	0	0.00%
Other	1	1.82%	5	10.00%	4	7.69%	3	5.45%
<b>Total</b>	<b>55</b>		<b>50</b>		<b>52</b>		<b>55</b>	
<b>Sex</b>								
	Control Same Gender		Control Opposite Gender		Experimental Same Gender		Experimental Opposite Gender	
	n	frequency	n	frequency	n	frequency	n	frequency
Male	24	43.64%	22	44.00%	20	38.46%	25	45.45%
Female	31	56.36%	28	56.00%	32	61.54%	30	54.55%
<b>Total</b>	<b>55</b>		<b>50</b>		<b>52</b>		<b>55</b>	
<b>Age</b>								
	Control Same Gender		Control Opposite Gender		Experimental Same Gender		Experimental Opposite Gender	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
	18.24	1.32	17.68	1.87	17.83	1.84	17.94	1.63
<b>BMI</b>								
	Control Same Gender		Control Opposite Gender		Experimental Same Gender		Experimental Opposite Gender	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
	23.91	3.93	23.75	4.07	24.99	8.18	23.28	4.20
<b>Trait Self Objectification</b>								
	Control Same Gender		Control Opposite Gender		Experimental Same Gender		Experimental Opposite Gender	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
	-4.6226	11.95219	-5.5581	12.61575	-6.2449	12.20575	-2.9184	11.71153

controlling for trait self-objectification, group differences were significantly different on reported state self-objectification,  $F(3,182) = 3.115, p = .028$ . Further, trait self-objectification,  $F(1,182) = .372, p = .627$ , was not a significant predictor of state self-objectification in the current model. Mean state self-objectification scores are presented for both combined and separate conditions in Table 3. Pairwise comparisons revealed that significant group differences existed between Control Same Gender condition and Experimental Same Gender ( $p = .013$ ) and Experimental Opposite Gender ( $p = .024$ ) conditions. Interestingly, no significant differences emerged between the Control Opposite Gender condition and the two experimental conditions. However, differences were nearing significance between the Experimental Same Gender ( $p = .053$ ) condition and Experimental Opposite Gender condition ( $p = .089$ ). No differences existed between the two experimental groups or two control conditions on state self-objectification scores. For all pairwise comparisons of mean state self-objectification scores refer to Table 4.

It is important to note that for the current study, state self-objectification scores were strongly, positively skewed. Therefore, a logarithmic transformation of scores was completed in order to meet the assumption of linearity. An ANCOVA, controlling for negative affect at time 1, failed to find an effect of condition on negative affect following video game exposure,  $F(3,207) = .737, p = .531$ . A MANOVA was also used to examine appearance anxiety, body dissatisfaction, and restrained eating behaviors. Study condition failed to have a significant effect on state appearance anxiety,

Table 3. Average square-root state self-objectification scores for conditions combined and separate conditions

Condition	Mean	Standard Deviation
Conditions Combined		
Control	0.3278	0.55175
Experimental	0.5983	0.77845
Conditions		
Control Same Gender	0.3185	0.5065
Control Opposite Gender	0.3391	0.60828
Experimental Same Gender	0.5796	0.82414
Experimental Opposite Gender	0.6154	0.7422

Table 4. Pairwise comparison of trait self-objectification scores for all conditions

Comparison Condition	Condition	Mean Difference	Std. Error
<b>Control Same Gender</b>	Control Opposite Gender	-0.119	0.261
	Experimental Same Gender	-0.643*	0.256
	Experimental Opposite Gender	-0.571*	0.251
<b>Control Opposite Gender</b>	Experimental Same Gender	-0.524	0.269
	Experimental Opposite Gender	-0.452	0.264
<b>Experimental Same Gender</b>	Experimental Opposite Gender	0.072	0.259

Note. \* indicates  $p < .05$ .

$F(3, 191) = .190, p = .903$ , state body dissatisfaction  $F(3, 191) = .922, p = .431$ , and difference pre- to post- cookie weight  $F(3,191) = .137, p = .938$ .

### **Specific Aim 2: Mediation of State Self-Objectification**

It was also hypothesized that state self-objectification would have a mediational role on the outcome variables of interest. In order to examine this relationship, PROCESS for SPSS 20.0 was used to allow for the investigation of the bootstrapped mediation. Video game condition was the independent variable, state self-objectification was the mediator, and appearance anxiety, state body image, food consumed, and affect were the examined outcomes (Hayes, 2013, 5,000 samples). However, state self-objectification failed to significantly mediate the effects of condition on appearance anxiety ( $p = .60$ ), state body dissatisfaction ( $p = .94$ ), food consumed ( $p = .99$ ) and negative affect ( $p = .58$ ).

### **Specific Aim 3: Effects on Task Performance**

Previous research suggests that cognitive resources are reduced due to body monitoring as assessed by state self-objectification. Therefore, it was hypothesized that individuals in the experimental condition would perform more poorly, have higher T-scores, on outcome measures of the CPT. In order to examine the potential effects of self-objectification on cognitive function, an ANOVA was employed to assess the potential effect of condition on performance on the Conners Continuous Performance Test for errors of omission, commission, detectability, and hit rate. Results failed to support our hypothesis as no effect of condition was found on T-scores for detectability

( $p = .550$ ), omissions ( $p = .621$ ), commissions ( $p = .596$ ), perseverations ( $p = .419$ ), or hit rate ( $p = .617$ ).

#### **Specific Aim 4: Moderation of IRI Subscales and Immersion**

In order to further examine the potential role of immersion and empathy in relation to the observed outcomes, a moderation analysis was completed using condition as the IV, state self-objectification, body dissatisfaction, physical appearance anxiety, food restriction, and affect as the DVs (Hayes, 2013, 5,000 samples). Immersion failed to moderate the relationship between video game condition and state self-objectification ( $F(3,183) = 2.326, p = .076, R^2 = .037$ ), body dissatisfaction ( $F(3,170) = .272, p = .846, R^2 = .005$ ), physical appearance anxiety ( $F(3,176) = 1.094, p = .353, R^2 = .018$ ), food restriction ( $F(3,177) = 1.306, p = .274, R^2 = .022$ ), and affect ( $F(3,189) = .425, p = .735, R^2 = .007$ ).

Further, Empathic Concern scores failed to moderate this relationship between video game condition and state self-objectification ( $F(3,185) = 1.914, p = .129, R^2 = .030$ ), body dissatisfaction ( $F(3,171) = .046, p = .987, R^2 = .001$ ), physical appearance anxiety ( $F(3,175) = 2.079, p = .105, R^2 = .034$ ), food restriction ( $F(3,178) = .071, p = .975, R^2 = .001$ ), and affect ( $F(3,189) = .668, p = .572, R^2 = .011$ ). Thus, no support was garnered for these hypotheses.

The Fantasy scale was also examined as a potential moderator of the outcomes examined. However, the Fantasy scale failed to moderate the relationship between condition and state appearance anxiety ( $F(3,176) = 2.043, p = .110, R^2 = .034$ ), state body dissatisfaction ( $F(3,172) = .517, p = .671, R^2 = .009$ ), cookie consumption ( $F(3,179) =$

.998,  $p = .395$ ,  $R^2 = .017$ ), and negative affect ( $F(3,190) = .785$ ,  $p = .504$ ,  $R^2 = .012$ ). The model for state self-objectification was significant ( $F(3,186) = 2.902$ ,  $p = .036$ ,  $R^2 = .045$ ); however, the interaction was not significant,  $p = .136$ .

The Perspective Taking scale was also examined as a potential moderator of the outcomes examined. However, the Fantasy Scale failed to moderate the relationship between condition and state self-objectification ( $F(3,186) = 2.595$ ,  $p = .054$ ,  $R^2 = .040$ ), state appearance anxiety ( $F(3,176) = .189$ ,  $p = .903$ ,  $R^2 = .003$ ), state body dissatisfaction ( $F(3,172) = .132$ ,  $p = .941$ ,  $R^2 = .002$ ), cookie consumption ( $F(3,179) = 1.367$ ,  $p = .254$ ,  $R^2 = .022$ ), and negative affect ( $F(3,190) = 1.16$ ,  $p = .327$ ,  $R^2 = .018$ ).

Finally, the the Personal Distress scale was also examined as a potential moderator of the outcomes examined. However, the Personal Distress scale failed to moderate the relationship between condition and state self-objectification ( $F(3,186) = 1.97$ ,  $p = .120$ ,  $R^2 = .031$ ), state appearance anxiety ( $F(3,176) = .189$ ,  $p = .903$ ,  $R^2 = .003$ ), state body dissatisfaction ( $F(3,172) = .117$ ,  $p = .323$ ,  $R^2 = .020$ ), cookie consumption ( $F(3,179) = .472$ ,  $p = .702$ ,  $R^2 = .008$ ), and negative affect ( $F(3,190) = .519$ ,  $p = .670$ ,  $R^2 = .008$ ). Although, the model for personal distress significant for state appearance anxiety ( $F(3,176) = 3.935$ ,  $p = .010$ ,  $R^2 = .063$ ), the r-square increase due to the interaction was not significant,  $p = .094$ .

### **Specific Aim 5: Gender Differences in Outcomes**

It was hypothesized that gender differences would exist in the examined outcome of condition on appearance anxiety, body dissatisfaction, negative affect, and restrained eating. More specifically, it was hypothesized that females would be more negatively



affected by playing the experimental video game condition. In order to examine this hypothesis, an ANCOVA was employed to examine potential experimental group by gender interactions on the examined outcomes. However, after examining these relationships these analyses failed to reveal gender differences on reported state self-objectification ( $p=.785$ ), body dissatisfaction ( $p=.525$ ), appearance anxiety ( $p=.271$ ), or restrained eating ( $p=.263$ ). However, there was a significant interaction of condition and sex on reported negative affect,  $F(1,183)= 3.370, p=.020$ . Consistent with our hypothesis, pairwise comparisons revealed that females ( $M_{sad}= 1.950$ ) in the Experimental Same Gender condition had a significantly greater negative affect compared to males ( $M_{sad}=.781, p = .024$ ). Additionally, this relationship showed a trend toward significance in the Experimental Opposite Gender with females reporting greater negative affect ( $M_{sad}=1.969$ ) than males ( $M_{sad}=1.120, p=.090$ ).

## CHAPTER IV

### CONCLUSIONS

The current study sought to examine the potential role of video games on subsequent state self-objectification and related outcomes. Previous findings have shown a relationship between video game exposure and greater body dissatisfaction among adolescents; however, the current study sought to expand upon these findings by examining the effects of same and opposite gendered sexualized or modest avatars in male and female adolescents. Given that previous research has emphasized the impact of sociocultural factors primarily in females, the current study was also interested in examining potential gender differences in this relationship. More specifically, the current study examined the effect of sexualized and covered avatars on state self-objectification, appearance anxiety, body dissatisfaction, restrained eating, and negative affect. As well as the potential mediation of state self-objectification in the outcomes of interest and moderation of video game immersion.

#### **Group Differences in Body Image and Eating Behavior**

Participants in the Control Same Gender conditions reported significantly lower state self-objectification scores than those in both experimental conditions, while lower scores in the Control Opposite Gender were nearing significance. These findings suggest that both male and female adolescents exposed to revealing avatars, regardless of the gender of the avatar, are more likely to take an observer's perspective on their own bodies. This is concerning, as self-objectification has been linked to a number of negative outcomes in teens and young adults. More specifically, trait self-objectification

has been shown to be linked to dissociation, depression, self-harm, body shame, steroid use, and disordered eating behaviors in males and females (Erchull, Liss, & Lichiello, 2013; Lam, Mahone, Mason, & Scharf, 2011; Slater & Tiggemann, 2010; Tiggemann & Slater, 2015). Additionally, recent findings suggest that adolescents are more likely to relate their avatar to their own identity (Blinka, 2008). In light of the current findings, this is concerning as adolescence may be a particularly susceptible developmental stage in which individuals are more likely self-objectify as a result of exposure to idealized avatars. Future research should continue to examine this relationship in adolescence, as this period of development may be an important focus for prevention efforts.

Although self-objectification has been linked to a number of mental health and eating behavior outcomes, the current study found no significant differences between groups for appearance anxiety, state body dissatisfaction, or cookie consumption. However, given the cross-sectional nature of the current study, future research should examine these effects longitudinally in order to determine how long-term exposure to sexualized avatars may affect trait self-objectification and related outcomes.

Additionally, these null findings may be explained by the fact that the video games used in the current study were not as revealing as many of the more sexualized games available. Indeed, highly photorealistic games have been shown to have greater disparity from the average female body type, and other content analyses have also shown hypermasculine characterizations of males (Martins, Williams, Harrison, & Ratan, 2009; Matthews, Lynch, & Martins, 2016). Therefore, in spite of these limited findings, these initial findings suggesting an increase in state self-objectification for male and female

adolescents and thus video game use and exposure may be an important focus for intervention and prevention.

### **Mediational Role of Self-Objectification**

Previous research findings suggest that state self-objectification mediates the relationships between exposure and body shame, body dissatisfaction, and restrained eating. However, in the current study, state self-objectification failed to significantly mediate the effects of condition on appearance anxiety, state body dissatisfaction, food consumed, and negative affect. Provided the non-significant findings in regards to experimental condition on these outcomes, it is not surprising that state self-objectification failed to mediate this relationship. As noted previously, the current study used exposed avatars, but not hypersexualized. Therefore, this may have limited power and contributed to the nonsignificant findings.

### **Video Game Immersion and Empathy**

Previous findings have suggested that video game immersion and interpersonal empathy may affect one's experience within a virtual world. Therefore, it was hypothesized that greater immersion and greater empathy may potentially moderate the relationship between video game condition and the outcomes of interest: state self-objectification, body dissatisfaction, physical appearance anxiety, and affect. However, video game immersion and empathy, as measured by all the scales of the IRI, failed to moderate the relationship between these factors. Again, given the non-significant relationship between condition and a majority of the examined outcomes, it is not surprising that immersion and empathy failed to moderate these relationships. However,

past findings suggest a relationship between video game immersion and decision making (Weinstein et al., 2009). Further, previous research suggests that video game immersion may be trifurcated into emotional, physical, and narrative presence (Przybylski, Rigby, & Ryan, 2010). Therefore, future research may benefit from examining these three components of video game immersion to discern if these components may differentially moderate the potential relationship between immersion and the examined outcomes in the current study.

### **Gender Differences in Video Game Exposure**

Previous findings have suggested that males and females may be impacted differently by the presentation of objectified images. However, in the current study, no gender differences in the effects of video game exposure on reported self-objectification, body dissatisfaction, appearance anxiety, or restrained eating. These results are consistent with the findings of Hebl et al. (2004), in which there were no gender differences in the reported experience of self-objectification following mirror exposure in a bathing suit. Given the significant findings on the effects of video game exposure on self-objectification, these findings suggest that both males and females are susceptible to the effects of exposure to revealing video game avatars. This finding further points to a need to understand the longitudinal effects of video games on trait self-objectification to further discern whether these effects may persist beyond the acute effects examined in the current study.

There was a significant difference between male and females negative affect following video game exposure, with females in the experimental condition having

significantly higher negative mood scores compared to males. This is consistent with previous research findings that suggest women express more negative affect compared to males when exposed to identical stimuli (Fujita, Diener, & Sandvik, 1991). Further, previous findings suggest that greater negative affect acts as a moderator for adolescents exposed to sociocultural influences. Most specifically, these findings suggest that adolescents reporting a greater negative affect endorse greater body dissatisfaction (Ricciardelli & McCabe, 2001). Provided these findings, further research would benefit from examining how negative affect may impact the longitudinal and acute effects of video game exposure among male and female adolescents.

### **Implications for Prevention**

Although a number of the proposed hypotheses for the current study failed to obtain support, implications do exist for significant findings from the current study. The current study did support that video game exposure to more revealing avatars does increase reported state self-objectification in adolescent males and females. Although meta-analyses examining the impact of media and sociocultural factors have found a small to moderate effect body image and self-objectification, few studies have examined how virtual worlds may impact ones perspective on their own appearance (Barlett, Vowels, & Saucier, 2008; Grabe et al., 2008). The findings of the current study suggest that virtual worlds may impact one's perception of and satisfaction with their own body and highlights an important area of prevention to address the self-objectification among male and female adolescents. Provided this information, prevention programs should aim to inform parents and adolescents of the concerns of how males and females are

represented on within video games. Specifically, demonstrating the exaggeration of muscular and feminine ideals as demonstrated by many video games may assist in creating cognitive dissonance among adolescent video game players to reduce their own susceptibility to increased self-objectification. Further, as demonstrated by the current study's findings, these messages and discussion should occur among both males and females, as these concerns were present for both sexes.

Additionally, the current study suggests the importance of understanding negative affect in female adolescents and the potential impact affect may have on females are presented with images of unrealistic body types. Studies examining emotional expression among depressed patients suggest that the teaching of coping skills to tolerate criticism may prevent negative outcomes from occurring within this population (Hooley & Gotlib, 2000). Expanding upon this model, prevention efforts may work to help females to become more critical viewers of their environment and develop strategies to cope with stressors and perceived criticisms in their environment.

### **Limitations and Future Research**

Although the current study adds to the literature by examining new sociocultural risk factors for self-objectification and related eating disorder risk behaviors, there are a number of limitations that need to be considered. The first is that the current study is cross-sectional in nature. Future research would benefit from examining the longitudinal effects of video game use and the examined outcomes. This examination would allow for a greater understanding of how specific genres of games may impact these outcomes

differently and may affect trait level characteristics and their development during adolescence.

Second, the sample from the current study was primarily Caucasian. Therefore, although no differences were found as an affect of ethnicity, future research would benefit from examining these outcomes in a more diverse sample. Additionally, this sample was drawn from a sample of adolescents in southeast Texas. Therefore, the generalizability of the current study findings of the are limited given the homogeneity of the sample.

Although the use of standardized measures can be considered a strength of the current study, it is not without its limitations. Specifically, self-report measures have been shown to result in socially desirable responses. Although the current study did remove participants who accurately suspected the purpose of the current study, this should still be considered as a potential bias within the current sample. Further, social desirability has been shown to impact self-reports of physical activity and may have impacted food intake as an effect of social desirability in the current study (Klesges et al., 2004). However, in spite of this limitation, past research has suggested that adolescents are valid self-reporters (Crockett, Schulenberg, & Petersen, 1987).

Finally, research assistants conducting the video game exposure were aware of the condition each participant was placed in order to ensure the correct game was played. As a result, the research assistants were selecting the games for participants and could not be blind to the assigned condition for each participant. Each research assistant was trained and provided written instructions for the study protocol and instructed on the



importance of remaining neutral when completing the video game exposure and cookie presentation. However, it is possible differences could exist and affect responses to the video game and cookie exposures. If this occurred, it could have influenced participants' responses and their decision to consume the provided cookies.

### **Conclusion**

In spite of the aforementioned limitations, the current study is one of the first to reveal the negative effects of revealing video game avatars on male and female adolescent's state self-objectification and negative affect in females. Given the increased use of video games and the improvement of video game graphics, these findings point to the importance of examining the longitudinal effects of video game use on adolescents' perceptions of their own bodies and subsequent body image, affect, eating behaviors, and task performance. Finally, the current study findings support a need for additional research to develop a better understanding of these relationships in order to determine specific aspect to be targeted to address these concerns through both prevention and intervention efforts.

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