Virtual ideals: The effect of video game play on male body image

Zeely Sylvia *, Teresa K. King, Brendan J. Morse

Bridgewater State University, Department of Psychology, Bridgewater, MA, United States

ARTICLE INFO

ABSTRACT

The perpetuation of unrealistic body ideals by popular media has been linked to negative body image and self-esteem; however, the influence of video games has remained largely unexamined despite their growing popularity as a media form, particularly among men. The purpose of this study was to investigate whether playing video games that emphasize an unrealistic male body ideal has a negative impact on body satisfaction. Participants played a highly realistic video game for 45 min and then completed questionnaires measuring muscularity concerns and body image. Men randomized to the experimental group played the game with a character of exaggerated muscularity, whereas those randomized to the control group played with a character of average build. Men in the muscular condition reported significantly lower body satisfaction than men in the control condition. Considering the wide-spread use of video games, as well as the increasing muscularity of the ideal male body in popular culture, this finding could have important implications for the psychological well-being of men who regularly play video games. Further research should assess whether this lowered body satisfaction is maintained and to determine if negative behavioral consequences emerge.

© 2014 Elsevier Ltd. All rights reserved.

1. Introduction

Popular media has an enormous influence on how Americans perceive their bodies, and the negative consequences of this influence are well-documented. The current study investigates whether video game play, one of the most popular forms of media today, may increase body dissatisfaction among young men by way of the increasingly muscular, and unrealistic, virtual bodies that are used in modern video games.

Body image dissatisfaction (BID), defined by Crowther and Williams (2011) as negative and dysfunctional thoughts and attitudes about the shape and weight of one's own body, is a common affliction throughout the US. Evidence suggests that BID has consistently remained at high levels among women over the past few decades (Rozin, Trachtenberg, & Cohen, 2001), and potentially increased among men (Adams, Turner, & Bucks, 2005; Neighbors, Sobal, Liff, & Amiraian, 2008). BID has been found to be negatively correlated with self-esteem and social functioning (Furnham & Calnan, 1998), and has also been regarded as a key risk factor for the development of eating disorders (Brannan & Petrie, 2011; Polivy & Herman, 2002).

Traditionally, body image dissatisfaction has been viewed by researchers and the public as a primarily female affliction, greatly influenced by body ideals, such as thinness, perpetuated in popular media. Although women continue to report less body satisfaction than men (Bearman, Presnell, Martinez, & Stice, 2006; Fallon & Rozin, 1985; Feingold & Mazzella, 1998; Gillen & Lefkowitz, 2012), recent studies have found significant increases in body dissatisfaction in males following media exposure, suggesting that BID is an issue for both genders (Arbour & Martin Ginis, 2006; Farquhar & Wasylkiw, 2007; Leit, Gray, & Pope, 2002). The growing attention to idealized male bodies in the popular media has likely heightened males' awareness of body image ideals (Blond, 2008), and altered their attitudes towards them. The tripartite influence model (Thompson, Coovert, & Stormer, 1999) posits that an individual's body image is formed by three different direct influences: parental, peer, and media influence. The effect of the media on body image has been shown to be quite strong among females (Tiggeman, Verri, & Scaravaggi, 2005; Mazur, 1986), and influential on men as well (Hobza, Walker, Yakushko, & Peugh, 2007). Thus, for men regularly exposed to images of unrealistic male body ideals, the unrealistic body could eventually become the benchmark for a normative body. This benchmark could be responsible for the increase in body dissatisfaction among men being observed today (Murnen, 2011).

In contrast to the modern female body ideal that emphasizes a small waistline and a disproportionately large bust, attitudes

* Corresponding author. Address: The Weight Control and Diabetes Research Center, Warren Alpert Medical School of Brown University, 196 Richmond St., Providence, RI 02903, United States. Tel.: +1 401 793 9712.
E-mail address: Zsylvia@lifespan.org (Z. Sylvia).

towards the male body emphasize extreme proportions of a different nature. Muscularity concerns dominate male body image. Men are more likely to have a desire to increase their muscularity and either gain or lose weight to attain a mesomorphic physique, i.e. broad shoulders and chest, small waist, and minimal body fat (Pingitore, Spring, & Garfield, 1997). There is evidence that attitudes towards muscularity often equate having large muscles with masculinity and traditional masculine norms such as risk-taking and emotional control (Helgeson, 1994; Steinfeldt, Gilchrist, Halterman, Gomory, & Steinfeldt, 2011). Studies have observed a steady increase in the muscularity of cultural icons such as male models (Leit, Pope, & Gray, 2000) and action figures (Pope, Olivardia, Gruber, & Borwiecki, 1999) over time. This suggests that as the male body ideal becomes ever more muscular, male attitudes towards muscularity will become more salient; that is, the importance of having a muscular physique will increase. Consequently, male body dissatisfaction may increase as most men find themselves farther from the hypermuscular media ideal.

In a meta-analysis, Blond (2008) reviewed 15 studies examining the effect of media images of idealized bodies on male body dissatisfaction. The results showed that 30 out of 35 effect sizes were significant, indicating an increase in overall dissatisfaction. Agliata and Tantleff-Dunn (2004) exposed college-aged males to commercials either featuring male actors who embodied the male ideal (muscular, lean and young, wearing athletic attire or appearing shirtless), or commercials featuring average looking men (older, fully clothed, advertising neutral products). The men who viewed the commercials featuring ideal male bodies reported significantly higher rates of muscle dissatisfaction and depression than the neutral group. Similarly, Baird and Grieve (2006) found that men who were asked to view advertisements featuring ideal male bodies reported significantly lower rates of body satisfaction than men who were asked to view neutral advertisements featuring only products.

Although the evidence of the media's influence on male body image is mounting, there has been little research on the effects of video games on male body dissatisfaction, despite the fact that most households own at least one video game console, and that the majority of video game consumers are male (Entertainment Software Association., 2012). Considering that video games are one of the most popular forms of media today, and more psychologically immersive than some other forms of media, it is important to understand how these games affect body image.

Despite the need for research into the relationship between video games and male body image, the complexity of this task must be acknowledged. There is a great deal of variability in the portrayal of video game avatars, making it difficult to draw conclusions about any kind of general effect. An avatar is a digital, visual representation that reflects the behaviors executed by the human player in real time (Bailenson & Blascovich, 2004). Martins, Williams, Ratan, and Harrison (2011) compared avatars to the real measurements of an average American male as well as the dimensions of the media ideal. They concluded that, overall, video game avatars tended to be larger than the average US male, but slightly blockier than the media ideal, suggesting that game characters, unlike magazine ads or commercials featuring actual human beings, may not embody the physical ideal in the same ways as other forms of media.

The advanced technology of modern video games is also an important factor when considering how games may affect body image. There is evidence that as video games become more realistic, they also become more psychologically salient. Presence is the degree to which a person feels that they are actually experiencing a virtual world (Lombard & Ditton, 1997), and the amount of presence in video games has increased in parallel with the advancement of video game technology (Ivory & Kalyanaraman, 2007). Presence has been linked with increased arousal, involvement and aggressive affect, which can increase identification with video game charac-

ters: for example, gamers who identified more with their characters while playing an aggressive game displayed more aggressive behaviors afterwards (Fischer, Greitemeyer, Kastenmuller, Vogrincic, & Sauer, 2011; Ivory & Kalyanaraman, 2007).

Similarly, a concept known as the Proteus Effect, in which a video game user may make inferences about his expected behavior based on the appearance of his avatar, has received some attention in the literature. Yee, Bailenson, and Ducheneaut (2009) found that people who participated in a negotiation task using a tall avatar, as opposed to a shorter avatar, negotiated more aggressively both in the virtual environment and in a face-to-face task immediately afterward. This provides tentative evidence that video games may influence behavior outside of the virtual environment as well. If vivid, technologically advanced video games that depict male body ideals do impact male body dissatisfaction, there may be an increased chance of this dissatisfaction manifesting behaviorally outside the virtual environment. Harmful behaviors linked with body dissatisfaction include steroid use and excessive exercise (Hatoum & Belle, 2004).

To date, there has been only one published study that specifically examines the relationship between video game play and male body satisfaction (Bartlett & Harris, 2008). Male participants were recruited to play the video game WWF Wrestlemania 2000, chosen because of its emphasis on muscular male bodies. The researchers attempted to create a more immersive experience for the player by instructing them to make their own character as similar to them as possible. The players played the video game for 15 min, either with a muscular opponent, or an obese opponent that acted as a control. As predicted, men with the muscular opponent reported decreased body satisfaction, as well as decreased positive attitudes towards muscularity. It is important to note that the muscularity manipulation focused on the player's computer-controlled opponent rather than the avatar controlled by the player, thus likely, limiting presence and Proteus Effect.

Considering the evidence that video games have a psychological effect on players, the aim of the current study was to investigate the effect of playing a vivid, technologically advanced video game with visibly muscular avatars on male body image. This study extends the work of Bartlett and Harris (2008) by manipulating the player's avatar to more directly target the immersive effects of video game play on one's self-image. Thus, we hypothesized that men who play a highly realistic game with a hypermuscular (mesomorphic) avatar will report decreased body satisfaction and decreased positive attitudes towards muscularity, compared to those who play with an avatar of average build.

2. Method

2.1. Participants

Participants were 51 undergraduate students from a large public university in the Northeast United States. One participant was excluded because he did not complete the study, leaving a final sample of 50 participants. The participants ranged in age from 18 to 24 ($M = 19.76$, $SD = 1.49$). The participants' self-reported ethnicity was primarily Caucasian (86.3%), with four minority participants (one each reporting Hispanic, African American, Lebanese, and mixed ethnicity) and three participants who chose not to respond.

3. Materials and procedures

3.1. The rosenberg self-esteem scale

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is a 10-item scale measuring feelings of global self-esteem. Items are

rated on a four point Likert-type scale with anchors ranging from *strongly agree* to *strongly disagree.* After reverse coding, higher scores indicate higher levels of global self-esteem. In our sample, the RSES exhibited strong internal consistency with Cronbach's alpha = .896. This measure was used to examine whether the two groups were equivalent before the manipulation. Self-esteem is highly correlated with body satisfaction but the items of the RSES would not be suggestive that the research concerned body image.

3.2. The swansea muscularity attitudes questionnaire

The Swansea Muscularity Attitudes Questionnaire (SMAQ; Edwards & Launder, 2000) is designed to evaluate men's perceptions of muscularity as well as behaviors related to their feelings about muscularity. The SMAQ contain two subscales: positive attributes of muscularity and drive for muscularity. For this study, we were primarily interested in the positive attributes of muscularity (PAM) subscale (10 items) and, thus, only this subscale was included in the analyses. Items are rated on a seven point Likert-type scale with anchors ranging from *definitely* to *definitely not.* Higher scores indicate greater importance placed on muscular appearances. In our sample, the positive attributes of muscularity subscale of the SMAQ exhibited strong internal consistency with Cronbach's alpha = .916.

3.3. The body esteem scale

The Body Esteem Scale (BES; Franzoi & Herzog, 1986) was used to measure body satisfaction. The BES asks participants to rate 35 body parts according to how positively or negatively they feel about each body part. The BES items are rated on a five point scale with anchors ranging from strong negative feelings to strong positive feelings. Higher scores indicate greater body satisfaction. In our sample, the BES exhibited strong internal consistency with Cronbach's alpha = .955.

3.4. Procedure

The experiment was conducted in a small laboratory room with no more than two participants and a lab assistant in the room during a session. Participants were randomly assigned to a condition (muscular, $n = 27$; control, $n = 23$) prior to their arrival at the lab. The purpose of the study was kept intentionally vague to control for demand effects; therefore, participants were told that they were involved in an experiment that would "examine how playing video games affects the thinking patterns of college students." Participants were then administered a pre-test questionnaire that included demographics questions, self-reported height and weight, the Rosenberg Self-Esteem Scale, and questions about the participants video game habits. The Rosenberg Self-Esteem Scale was included in the pre-test as a proxy for body image to ensure pre-manipulation group equivalency.

Following the pre-test, the participants received a brief written explanation of the video game they would be playing, as well as written instructions on how to control their character. The game that was selected for the experiment was the role-playing game *The Elder Scrolls V: Skyrim* (Bethesda Softworks, 2011). The game had been critically acclaimed for its detailed, realistic world (Schreier, 2011) and was selected to enhance the amount of presence that the player would experience. Most importantly, the characters in *Skyrim* were highly detailed and realistic, and the game allowed for precise character customization.

The researchers customized the muscularity of the participants' avatar to reflect the experimental manipulation. In the control condition, the game was played with an avatar of average size and shape. The average avatar's muscularity was set near the center of the avatar customization scale, so that the character did not appear significantly bulky, or skinny. In the experimental condition, the avatar's muscularity was manipulated to the highest point on the scale, allowing the avatar to appear significantly more muscular than the average male. All other features of the avatar (facial features, skin color, hair, clothing, etc.) remained the same as the control group. Participants played the game, uninterrupted, for 45 min. The game is an "open world" game, which allows the participants to roam the virtual world and engage in any tasks they choose. They were then asked to exit the game and complete the post-test measures, which consisted of the SMAQ and BES questionnaires. Participants were then debriefed and credited for their participation.

4. Results

The self-reported height and weight of participants' was used to calculate their Body Mass Index (BMI), a common measure of weight status (i.e. overweight, obese) which estimates the body fat of an individual based on height and weight. Results showed that BMIs in this sample ranged from 19.58 to 39.05 ($M = 26.56$, $SD = 4.62$) – BMIs above 25 are considered overweight. The distribution for BMI in our sample was positively skewed (skew = .676) suggesting that the majority of the participants were in the normal weight range for their body type with a small number of participants in the overweight/obese range.

The participants also responded to questions regarding their habits of video game play. The men reported playing an average of 1.73 h ($SD = 1.26$) of video games a day, and 9.9 h ($SD = 8.75$) a week. Both the hours per day and hours per week of video game play were positively skewed (skew = .797 and 2.21 respectively) suggesting that some participants were heavy video game players. The most frequently cited reasons for playing video games were boredom (31.4%) and relaxation (23.5%). Participants were asked to specify which categories of video games they played most often; the most popular categories were sports (35.3%), action games (25.5%), and massive multiplayer (21.6%).

Due to the relatively small sample size, we sought to verify that the groups were equivalent on a variety of demographic variables as well as self-esteem – the body satisfaction proxy. A multivariate analysis of variance (MANOVA) indicated that there was no omnibus multivariate effect between the control (average build) and experimental (hypermuscular) conditions, Wilks' lambda = .904, $F(7, 39) = .592$, $p = .758$, for the demographic variables of age, education, BMI, hours per day playing video games, hours per week playing video games, first video game play age, and self-esteem. The results also indicated that there were not significant differences between the groups for ethnicity, $\chi^2(4) = 4.133$, $p = .388$ nor most frequent reason for playing video games, $\chi^2(4) = 5.252$, $p = .262$.

To test the primary hypothesis, independent samples t-tests were used to explore differences between the control (average build) and experimental (hypermuscular) conditions on body satisfaction (BES) and perceptions of muscularity (SMAQ–PAM). These dependent variables were tested separately because they likely reflect distinct constructs of male body image, thus they were not combined into a multivariate composite. Further, BMI was not used as a covariate in these analyses because it was not significantly correlated with either dependent variable (Miller & Chapman, 2001). There was a significant difference between the average and muscular conditions in body satisfaction, $t(47) = -2.468$, $p = .017$, Cohen's $d = .71$, 95% CI -26.09 to -2.66. Participants in the hypermuscular condition reported significantly lower body satisfaction ($M = 101.54$, $SD = 18.25$) than participants in the average build condition ($M = 115.91$, $SD = 22.50$) after

playing the game. However, there were no significant differences between the average and muscular conditions in perceptions of muscularity, $t(47) = -.150$, $p = .881$, Cohen's $d = .04$, 95% CI -4.84 to 4.17. Participants in the hypermuscular condition reported similar perceptions of muscularity ($M = 9.48$, $SD = 6.66$) as participants in the average build condition ($M = 9.82$, $SD = 9.00$) after playing the game.

5. Discussion

It was expected that participants who played a highly realistic, immersive video game with a muscular avatar would display lower body satisfaction and less positive attitudes towards muscularity than participants who played the game with a avatar of average body size and shape. The results of the current study demonstrated a strong, significant effect supporting the body satisfaction hypothesis. Participants in the muscular condition reported lower body satisfaction than the control group participants. However, there were no significant differences between groups in attitudes towards muscularity. These results suggest that playing video games with a muscular character is likely to affect immediate feelings about body satisfaction, but not an individual's perception of muscularity as positive or negative, an attitude which may be more temporally stable.

One other psychological study (Bartlett & Harris, 2008), has investigated the relationship between video games and male body image. Both this previous study and the current investigation observed a significant decrease in male body satisfaction after exposure to muscular body ideals in video games, despite significant differences in experimental design. In the Bartlett and Harris study, the independent variable was the muscularity of the player's virtual opponent, while the current study used the muscularity of the actual avatar that the player controlled. Interestingly, Bartlett and Harris, using the SMAQ, observed a decrease in positive attitudes towards muscularity in the experimental group, while there was no observable difference in our analyses between muscular and control groups. It is possible that perceiving muscularity in terms of an opponent could have led players to see this construct in a more negative light. A muscular avatar, essentially a virtual extension of oneself, would therefore not have the same effect. The control condition also differed between studies, with Bartlett and Harris using an obese opponent as a control, while the current study instead manipulated the avatar to be of average build. Bartlett and Harris reasoned that using an obese opponent with no defined muscularity would more effectively define muscular and non-muscular groups. The fact that we were able to obtain an effect for body satisfaction with groups defined by muscular versus average, as opposed to muscular versus obese, further demonstrates the strength of this effect.

The results of the current study indicate a need for further research into the relationship between male body image and video games. If playing video games does have a negative effect on the body image of men, as the results of this study indicate, it is quite likely that high rates of participation in this form of media may lead to higher rates of body dissatisfaction within the male population. The male body in the media has become a great deal more visible and muscular over the past few decades, which some argue is leading to a culture of muscularity in men that parallels the culture of thinness that has led to low self-esteem and disordered eating for so many women (Agliata & Tantleff-Dunn, 2004). Many studies have observed a clear cut relationship – with increased exposure to idealized male images, men's body image drops and muscularity concerns rise (Bartlett, Harris, Smith, & Bonds-Raacke, 2005; Cafri, Strauss, & Thompson, 2002). These two consequences can lead to body and muscle dissatisfaction,

which is associated with serious conditions including low self-esteem, depression, and even body dysmorphia (Baghurst & Kissinger, 2009; Olivardia, Pope, Borowiecki, & Cohane, 2004).

It is possible that, in different contexts, the physical appearance of avatars in video games may have a positive influence on players' body satisfaction, rather than the negative influence found in this study. The growing body of research concerning the priming effects of avatars on feelings about physical appearance lends preliminary support for this idea. As previously discussed, the Proteus Effect asserts that within the context of a video game, users will make inferences about their expected behaviors and attitudes based on the physical appearance of their avatar, rather than the appearance of their physical self. For example, Yee and Bailenson (2007) found that video game players assigned to conduct a virtual negotiation task with a taller avatar negotiated more aggressively than players assigned to a shorter avatar, as well as in a later face-to-face negotiation task. Additionally, Jin (2010) found that when people were instructed to create and play a game with an avatar that physically reflected their ideal-self rather than their actual-self, they felt a more personal connection to their ideal-self avatar. This departs from the current study, in which players were given an avatar of pre-determined appearance and muscularity to play with, potentially diminishing the personal connection that players feel upon creating their own avatar. Perhaps, if players feel a heightened personal connection to their avatar through customization, and create them in the image of a realistic ideal physical self, rather than an unattainable and unrealistic ideal, they may be more likely to feel an increase in body satisfaction as they are engaged in gameplay.

The customization of avatars may be important on other dimensions. For example, in *Skyrim* a player has the option to customize his or her avatar and the beginning of the game, which, as mentioned, had been done before the experiment by the researchers to control the muscularity of the avatars. Observing video game users preferences and tendencies in customizing their own avatars, in relation to variables such as self-esteem, BMI, and body satisfaction, may serve to add dimension to the relationship between video games and male body image. Lomanowska and Guitton (2012) found that female gamers in the virtual environment of *Second Life* were more likely to have avatars that disclosed high amounts of bare skin, even in a socially unsupported setting. The researchers concluded that these findings are indicative of the female preference for amount of skin disclosure in environments both virtual and real- the virtual environment was simply unhindered by environmental and physical factors that may keep women from disclosing more skin in reality. In the same way that the virtual environment reveals latent preferences for skin disclosure in women, allowing men to customize the muscularity of their avatars may reveal their own concepts of what their ideal body would look like, and allow for comparisons with the muscular media ideal.

Several important limitations must be noted. First, the sample size was small, with only 51 participants. This limits the generalizability of the results, especially since the sample was quite homogenous, consisting almost entirely of young Caucasian college students. This study should be replicated with a larger and more diverse pool of participants. Additionally, because of the small sample size it was beyond the scope of the current study to test for moderation effects of variables that may have an impact on body dissatisfaction, such as BMI and video game habits. It may be that men with higher BMIs, who are classified as overweight or obese, inherently have lower rates of body satisfaction because their body type is farther from the hypermuscular ideal than men with healthier body weight. Video game playing habits may also be important for exposure reasons. Amount of time spent playing video games, as well as the types of games preferred, will affect

the amount of exposure to muscular male bodies that an individual experiences. For example, a man who plays action/adventure games is more likely to see high amounts of muscularity, compared to a gamer that prefers racing games where full bodies are rarely depicted. However, whether long-term exposure to muscularity in video games serves to enhance or dull the effect observed in the current study can only be determined by further research, such as longitudinal studies.

Second, the open-world features of the game selected for this study, while advantageous in some respects, may have also served to limit the reliability of the study. Because the players were not guided by the video game towards one particular goal or set of actions, and their gameplay was not monitored by the researcher, the actual experience of the game could have been different from one participant to the next. Because of this, other influences, such as the degree of success or failure that the participant experienced while playing the game, may have affected self-esteem, and in turn influenced the results of the experiment.

It is also important to consider the differences between how the game was experienced by participants in this study, and how video games are played in an uncontrolled environment. For example, the brief encounter with this game that the participants had is not typical of a gamer's interaction with a video game; in reality, a gamer would play more than once, for longer periods of time, until the game was completed. This repeated exposure to the muscularity of the avatars would logically affect body satisfaction, and the nature of this effect may be determined by future research.

Suggestions for further research include longitudinal studies, which could determine the long-term behavioral effects of video game play on male body image, as well as studies that include specific measures of presence, realism, and game play success as potential covariates. The results of this preliminary investigation are intriguing, and will hopefully serve to inspire greater scientific investigation of the relationship between video games and male body image.

Author Note

References

Adams, G., Turner, H., & Bucks, R. (2005). The experience of body dissatisfaction in men. Body Image, 2, 271–283. http://dx.doi.org/10.1016/j.bodyim.2005.05.004.

Agliata, D., & Tantleff-Dunn, S. (2004). The impact of media exposure on male's body image. Journal of Social and Clinical Psychology, 23(1), 7–22. http://dx.doi.org/10.1521/jscp.23.1.7.26988.

Arbour, K. P., & Martin Ginis, K. A. (2006). Effects of exposure to muscular and hypermuscular media images on young men's muscularity dissatisfaction and body dissatisfaction. Body Image, 3, 153–161. http://dx.doi.org/10.1016/j.bodyim.2006.03.004.

Baghurst, T., & Kissinger, D. B. (2009). Perspectives on muscle dysmorphia. International Journal of Men's Health, 8(1), 82–89. http://dx.doi.org/10.3149/jmh.0801.82.

Bailenson, J., & Blascovich, J. (2004). Avatars. In W. S. Bainbridge (Ed.), Encyclopedia of Human–Computer Interaction (pp. 62–64). Great Barrington, MA: Berkshire.

Baird, A. L., & Grieve, F. G. (2006). Exposure to male models in advertisements leads to a decrease in men's body satisfaction. North American Journal of Psychology, 8(1), 115–122.

Bartlett, C. P., & Harris, R. (2008). The impact of body emphasizing video games on body image concerns in men and women. Sex Roles, 59, 586–601. http://dx.doi.org/10.1007/s11199-008-9457-8.

Bartlett, C. P., Harris, R., Smith, S., & Bonds-Raacke, J. (2005). Action figures and men. Sex Roles, 53(11), 877–886. http://dx.doi.org/10.1007/s11199-005-8304-4.

Bearman, S. K., Presnell, K., Martinez, E., & Stice, E. (2006). The skinny on body dissatisfaction: A longitudinal study of adolescent girls and boys. Journal of Youth and Adolescence, 35(2), 229–241. http://dx.doi.org/10.1007/s10964-005-9010-9.

Blond, A. (2008). Impacts of exposure to images of ideal bodies on male body dissatisfaction: A review. Body Image, 5, 244–250. http://dx.doi.org/10.1016/j.bodyim.2008.02.003.

Brannan, M. E., & Petrie, T. A. (2011). Psychological well-being and the body dissatisfaction–bulimic symptomatology relationship: An examination of moderators. Eating Behaviors, 12, 233–241. http://dx.doi.org/10.1016/j.eatbeh.2011.06.002.

Cafri, G., Strauss, J., & Thompson, J. K. (2002). Male body image: Satisfaction and its relationship to well-being using the Somatomorphic Matrix. International Journal of Men's Health, 1(2), 215–231. http://dx.doi.org/10.3149/jmh.0102.215.

Crowther, J. H., & Williams, N. M. (2011). Body image and bulimia nervosa. In T. F. Cash & L. Smolak (Eds.), Body Image: A Handbook of Science, Practice, & Prevention (2nd ed., pp. 154–169). New York, NY: Guilford Press.

Edwards, S., & Launder, C. (2000). Investigating muscularity concerns in male body image: Development of the Swansea Muscularity Attitudes Questionnaire. International Journal of Eating Disorders, 28(1), 120–124. doi: 10.1002/(SICI)1098 108X(200007)28:1<120::AID-EAT15>3.0.CO;2-H.

Entertainment Software Association. (2012). Industry Facts. Retrieved from <http://www.theesa.com/facts/index.asp>.

Fallon, A. E., & Rozin, P. (1985). Sex differences in perceptions of desirable body shape. Journal of Abnormal Psychology, 94(1), 102–105. http://dx.doi.org/10.1037/0021-843X.94.1.102.

Farquhar, J. C., & Wasylkiw, L. (2007). Media images of men: Trends and consequences of body conceptualization. Psychology of Men and Masculinity, 8(3), 145–160. http://dx.doi.org/10.1037/1524-9220.8.3.145.

Feingold, A., & Mazzella, R. (1998). Gender differences in body image are increasing. Psychological Science, 9(3), 190–195. http://dx.doi.org/10.1111/1467-9280.00036.

Fischer, P., Greitemeyer, T., Kastenmuller, A., Vogrincic, C., & Sauer, A. (2011). The effects of risk-glorifying media exposure on risk-positive cognitions, emotions, and behaviors: A meta-analytic review. Psychological Bulletin, 137(3), 367–390. http://dx.doi.org/10.1037/a0022267.

Franzoi, S. L., & Herzog, M. E. (1986). The body esteem scale: A convergent and discriminant validity study. Journal of Personality Assessment, 50(1), 24–31. http://dx.doi.org/10.1207/s15327752jpa5001_4.

Furnham, A., & Calnan, A. (1998). Eating disturbance, self-esteem, reasons for exercising and body weight dissatisfaction in adolescent males. European Eating Disorders Review, 6, 58–72. http://dx.doi.org/10.1002/(SICI)1099-0968(199803)6:1<58::AID-ERV184>3.0.CO;2-V.

Gillen, M. M., & Lefkowitz, E. F. (2012). Gender and racial/ethnic differences in body image development among college students. Body Image, 9(1), 126–130. http://dx.doi.org/10.1016/j.bodyim.2011.09.004.

Hatoum, I. J., & Belle, D. (2004). Mags and abs: Media consumption and bodily concerns in men. Sex Roles, 51(7/8), 397–407. http://dx.doi.org/10.1023/B:SERS.0000049229.93256.48.

Helgeson, V. S. (1994). Prototypes and dimensions of masculinity and femininity. Sex Roles, 31(11), 653–682. http://dx.doi.org/10.1007/BF01544286.

Hobza, C. L., Walker, K. E., Yakushko, O., & Peugh, J. L. (2007). What about men? Social comparison and the effects of media images on body and self-esteem. Psychology of Men and Masculinity, 8(3), 161–172. http://dx.doi.org/10.1037/1524-9220.8.3.161.

Ivory, J. D., & Kalyanaraman, S. (2007). The effects of technological advancement and violent content in video games on players' feelings of presence, involvement, physiological arousal, and aggression. Journal of Communication, 57, 532–555. http://dx.doi.org/10.1111/j.1460-2466.2007.00356.x.

Jin, S. A. (2010). I feel more connected to the physically ideal mini me than the mirror-image mini me: Theoretical implications of the "malleable self" for speculations on the effects of avatar creation on avatar. Cyberpsychology, Behavior & Social Networking, 13(5), 567–570. http://dx.doi.org/10.1089/cyber.2009.0243.

Leit, R. A., Gray, J. J., & Pope, H. G. (2002). The media's representation of the ideal male body: A cause for muscle dysmorphia? International Journal of Eating Disorders, 31(3), 334–338.

Leit, R. A., Pope, H. G., & Gray, J. J. (2000). Cultural expectations of muscularity in men: The evolution of playgirl centerfolds. International Journal of Eating Disorders, 29, 90–93. http://dx.doi.org/10.1002/1098-108X(200101)29:1<90::AID-EAT15>3.0.CO;2-F.

Lomanowska, A. M., & Guitton, M. J. (2012). Virtually naked: Virtual environment reveals sex-dependent nature of skin disclosure. PLoS ONE, 7(12). http://dx.doi.org/10.1371/journal.pone.0051921.

Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence [Electronic version]. Journal of Computer-Mediated Communication, 3(2), 1–8. http://dx.doi.org/10.1111/j.1083-6101.1997.tb00072.x.

Martins, N., Williams, D. C., Ratan, R. A., & Harrison, K. (2011). Virtual muscularity: A content analysis of male video game characters. Body Image, 8, 43–51. http://dx.doi.org/10.1016/j.bodyim.2010.10.002.

Mazur, A. (1986). U.S trends in feminine beauty and overadaptation. The Journal of Sex Research, 22(3), 281–303. http://dx.doi.org/10.1080/00224498609551309.

Miller, G. A., & Chapman, J. P. (2001). Misunderstanding analysis of covariance. Journal of Abnormal Psychology, 110(1), 40–48. http://dx.doi.org/10.1037/0021-843X.110.1.40.

Murnen, S. K. (2011). Gender and body images. In T. Cash & L. Smolak (Eds.), Body Image: A Handbook of Science, Practice, and Prevention (pp. 173–179). New York: The Guilford Press.

Neighbors, L. A., Sobal, J., Liff, C., & Amiraian, D. (2008). Weighing weight: Trends in body weight evaluation among young adults, 1990 and 2005. *Sex Roles, 59*, 68–80. http://dx.doi.org/10.1007/s11199-008-9407-5.

Olivardia, R., Pope, H. G., Borowiecki, J. J., & Cohane, G. H. (2004). Biceps and body image: The relationship between muscularity and self-esteem, depression, and eating disorder symptoms. *Psychology of Men & Masculinity, 5*(2), 112–120. http://dx.doi.org/10.1037/1524-9220.5.2.112.

Pingitore, R., Spring, B., & Garfield, D. (1997). Gender differences in body satisfaction. *Obesity Research, 5*, 402–409.

Polivy, J., & Herman, P. (2002). Causes of eating disorders. *The Annual Review of Psychology, 53*, 187–213. http://dx.doi.org/10.1146/annurev.psych.53.100901.135103.

Pope, H. G., Olivardia, R., Gruber, A., & Borwiecki, J. (1999). Evolving ideals of male body image as seen through action toys. *International Journal of Eating Disorders, 26*, 65–72. http://dx.doi.org/10.1002/(SICI)1098-108X(199907)26:1<65::AID-EAT8>3.0.CO;2-D.

Rosenberg, M. (1965). *Society and the Adolescent Self-image.* Princeton, NJ: Princeton University Press.

Rozin, P., Trachtenberg, S., & Cohen, A. B. (2001). Stability of body image and body image dissatisfaction in American college students over about the last 15 years. *Appetite, 37*, 245–248. http://dx.doi.org/10.1006/appe.2001.0426.

Schreier, J. (2011). Review: Boundless Skyrim will Become Your Life. Wired. Retrieved from <http://www.wired.com/gamelife/2011/11/skyrim-review/>.

Bethesda Softworks (2011). *The Elder Scrolls V: Skyrim [computer software].* Rockville, MD: Bethesda Softworks.

Steinfeldt, J. A., Gilchrist, G. A., Halterman, A. W., Gomory, A., & Steinfeldt, M. C. (2011). Drive for muscularity and conformity to masculine norms among college football players. *Psychology of Men and Masculinity, 12*(4), 324–338. http://dx.doi.org/10.1037/a0024839.

Thompson, J. K., Coovert, M. D., & Stormer, S. M. (1999). Body image, social comparison, and eating disturbance: A covariance structure modeling investigation. *International Journal of Eating Disorders, 26*(1), 43–51. http://dx.doi.org/10.1002/(SICI)1098-108X(199907)26:1<43::AID-EAT6>3.0.CO;2-R.

Tiggeman, M., Verri, A., & Scaravaggi, S. (2005). Body dissatisfaction, disordered eating, fashion magazines, and clothes: A cross-cultural comparison between Australian and Italian young women. *International Journal of Psychology, 40*(5), 293–302. http://dx.doi.org/10.1080/00207590444000311.

Yee, N., & Bailenson, J. (2007). The proteus effect: The effect of transformed self-representation on behavior. *Human Communication Research, 33*, 271–290. http://dx.doi.org/10.1111/j.1468-2958.2007.00299.x.

Yee, N., Bailenson, J. N., & Ducheneaut, N. (2009). The proteus effect: Implications of transformed digital self-representation on online and offline behavior. *Communication Research, 36*(2), 285–312. http://dx.doi.org/10.1177/0093650208330254.