Summer 2017

Body Image and Bodybuilding: The Impact Commitment to Bodybuilding Has on Body Image Disturbance among Competitive Bodybuilders

Jordan Henslee
Missouri State University, Henslee1@live.missouristate.edu

BODY IMAGE AND BODYBUILDING: THE IMPACT COMMITMENT TO BODYBUILDING HAS ON BODY IMAGE DISTURBANCE AMONG COMPETITIVE BODYBUILDERS

A Masters Thesis

Presented to

The Graduate College of

Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Clinical Psychology

By

Jordan Nicole Henslee

July 2017

BODY IMAGE AND BODYBUILDING: THE IMPACT COMMITMENT TO BODYBUILDING HAS ON BODY IMAGE DISTURBANCE AMONG COMPETITIVE BODYBUILDERS

Psychology

Missouri State University, July 2017

Master of Science

Jordan Nicole Henslee

ABSTRACT

The purpose of this study was to examine the effect commitment to bodybuilding had on body image disturbance in men. It was hypothesized that competitive bodybuilders would exhibit higher levels of body dissatisfaction, body checking, body consciousness, and symptoms of muscle dysmorphia than regular weight lifters. It was also hypothesized that commitment to bodybuilding, as defined by the number of competitions, would predict the severity of body image disturbance as measured by body dissatisfaction, body checking, body consciousness, and symptoms of muscle dysmorphia. Participants included males who were a minimum age of 18 years old. Participants were recruited via Mechanical Turk, Amazon.com's paid participant database. Participants who met the criteria completed a battery of questionnaires measuring body image disturbance, exercise dependence, and commitment to bodybuilding. Multiple regressions, analyses of variance, and correlations were conducted in order to test the hypotheses. Results suggest that both competitive bodybuilders and competitive fitness lifters show higher levels of muscle dysmorphia symptoms than regular fitness lifters. Competitive fitness lifters also expressed higher levels of body checking and body dissatisfaction than regular fitness lifters.

KEYWORDS: body image disturbance, bodybuilders, competitive, fitness lifters, body dissatisfaction, body checking, body image, body consciousness, muscle dysmorphia

This abstract is approved as to form and content

_____

Dr. Danae L. Hudson
Chairperson, Advisory Committee
Missouri State University

BODY IMAGE AND BODYBUILDING: THE IMPACT COMMITMENT TO BODYBUILDING HAS ON BODY IMAGE DISTURBANCE AMONG COMPETITIVE BODYBUILDERS

By

Jordan Nicole Henslee

A Masters Thesis
Submitted to the Graduate College
Of Missouri State University
In Partial Fulfillment of the Requirements
For the Degree of Master of Science, Clinical Psychology

July 2017

Approved:

_____
Dr. Danae L. Hudson

_____
Dr. Erin M. Buchanan

_____
Dr. Brooke L. Whisenhunt

_____
Dr. Julie Masterson: Dean, Graduate College

ACKNOWLEDGEMENTS

First, I would like to recognize and thank my chairperson, Dr. Danae Hudson, for being a staunch supporter throughout the entirety of this process. In working with her over the past two years, it became very clear that she genuinely wanted nothing but the best for me. Thank you for setting high expectations and guiding me through this process. Thank you for never letting me settle, even if it meant months of draft after draft just to make my introduction perfect. I will never forget the feeling of having a huge weight lifted off of my shoulders after every meeting with you; your patience was virtue.

Second, I would like to give thanks to those who helped make this dream a reality. Thank you to Dr. Erin Buchanan who was ever so patient with me while I muddled my way through the statistics. Thank you to Dr. Brooke Whisenhunt and the rest of the Eating Disorders and Body Image Lab for providing me with open and honest feedback and quality work (Heather, Dallas, Jeff, and Summer) that helped land me where I am today.

Finally, I especially want to thank those individuals in my life that had to put up with me throughout this process; through the grueling sleepless nights, the countless hours of reading and re-reading articles, and the annoyance of listening to me pound away at my keyboard, which was primarily just the backspace key. Thank you to Rachel Swadley, my dear friend and cohort member, for providing continuous words of encouragement, listening to me vent for hours on end, and for never letting me lose sight of my goal. Most importantly, thank you to my parents and Coleton Cloud who have always given me nothing, but love and support for as long as I can remember. Thank you for holding me accountable and never letting me settle for anything less.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Over the last several decades, body image has become an increasingly popular focus of many researchers (Cash, 2000). Although the operational definition of body image has varied (Bane & McAuley, 1998), it is typically defined as the internal representation of one's outer appearance (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Furthermore, the existence of disturbances of body image is prevalent in North America (Cash & Henry, 1995; Garner, 1997).

Men and women differ in terms of their ideal body image preference. For example, women seem to idealize a thinner, toned appearance, (Olivardia, 2002), whereas, Pope, Olivardia, Gruber, and Borowiecki (1999) indicated that over the past 50 years, the ideal male physique has become more muscular. Current expectations of health and fitness are also emphasizing that an ideal male is both lean and muscular (Pope, Phillips, Olivardia, Frazier, & Handelsman, 2000). These expectations of the ideal male body can be threatening to men's overall body image, which may lead to the development of unhealthy attitudes and behaviors aimed at achieving the ideal body (Gonzalez, McLachlan, & Keaney, 2001; Milligan & Pritchard, 2006).

Despite research with men in the area of body dysmorphic disorder, a disproportionate amount of body image research has focused on women (Pickett, Lewis, & Cash, 2005). Since clinical samples are often difficult to obtain, researchers attempt to examine body image disturbances in higher risk groups of people, such as dancers, gymnastics, athletes and regular gym users (Stapleton, McIntyre, & Bannatyne, 2016). Due to the task and social pressures to attain an ideal physique, some researchers have

suggested that athletes can be more at-risk for body image disturbances (Davis & Cowles, 1989; Prakasa Rao & Overman, 1986). In addition to athletes such as bodybuilders, recreational gym users have been identified in research to report higher rates of body dissatisfaction as well (Esco, Olson, & Williford, 2005). Additionally, body image disturbance was found to be significantly more frequent in bodybuilders, even when compared with gymnasium users (Ravaldi et al., 2003). Tod and Edwards (2015) indicated that bodybuilding dependence and muscle satisfaction predict body image quality of life directly and indirectly via body image coping. While body image research that is focused on male athletes may utilize specialized populations, such as bodybuilders, the majority of this work tends to focus on eating disorder symptoms, muscle dysmorphia, or steroid use (Pickett, et al., 2005). There has been less research on the underlying constructs that are known to lead to clinical eating/body image disorders such as, general body dissatisfaction, body checking, body avoidance, body consciousness, and exercise dependence, especially in these specialized populations (Shafran, Fairburn, Robinson, & Lask, 2004). Therefore, this study aims to examine body dissatisfaction, body checking, body avoidance, body consciousness, and exercise dependence in athletes and non-athletes.

Bodybuilding is a sport that is likely to have a number of men who fall into this specific group of athletes. One possible explanation is the idea that these men may seek out bodybuilding as a way to achieve their ideal body. While another possible explanation is the idea that they become overly focused on their body as a result of engaging in the bodybuilding culture. A bodybuilder is defined as an individual who trains with weights on a regular and frequent basis in order to achieve high levels of

muscularity and leanness for the primary purpose of competing (Parish, Turner, & Baghurst, 2010). A bodybuilder is one who strives to develop a physique with body fat reduced to as little as 3%, compares his/her physique to that of fellow bodybuilders, and is evaluated and scored on his/her physique based on predetermined criteria and preferences of the judging panel (International Federation of Bodybuilders, 2009).

Competitive bodybuilding is strongly associated with clinical syndromes such as muscle dysmorphia (Mosley, 2009), a body-image related psychological disorder. Muscle dysmorphia can be defined as a form of body dysmorphic disorder and consists of preoccupation with the idea that one's body is too small or insufficiently lean or muscular (American Psychiatric Association, 2013). Components of muscle dysmorphia include: body image distortion/dissatisfaction, dietary constraints, pharmacological aids, dietary supplements, exercise dependence, physique concealment, and low self-esteem (Rhea, Lantz & Cornelius, 2004). Exercise dependence, in particular, can be defined as a craving for leisure time physical activity that results in uncontrollable excessive exercise behavior and that manifests in physiological symptoms and/or psychological symptoms (Hausenblas & Symons Downs, 2002). Individuals focused on muscular symmetry, such as bodybuilders, are typically used for research due to the fact that muscle dysmorphia is more prevalent in this population (Esco, Olson, & Williford, 2005). Various studies have indicated that participation in competitive bodybuilding is associated with the development of irrational thought patterns, perceptual distortions, and negative affect that undermines a positive body self-image. Furthermore, male bodybuilders closely resemble men with eating disorders in measures of body image in that they show

obsessional preoccupations with body image similarly to those with eating disorders (Mangweth et al., 2001).

Body dissatisfaction, a component of body image disturbance, can be defined as a negative subjective evaluation of the weight and shape of one's own body. Mills and D'Alfonso (2007) indicate that body dissatisfaction appears to be increasingly prevalent among young males. Although gym users and non-gym users endorse some level of dissatisfaction with their weight and shape (Stapleton et al., 2016), body dissatisfaction and eating pathology have been found to be significantly increased in male gym users (Stapleton et al., 2016). Furthermore, it has been suggested that male bodybuilders are at risk for greater body dissatisfaction and lower levels of self-esteem when compared to runners and martial artists (Blouin & Goldfield, 1995). In more recent years, research has found that young males who decide to engage in bodybuilding show a high degree of body image disturbance, even if none of them fulfilled the diagnostic criteria for muscle dysmorphia (Ravaldi et al., 2003).

Although recreational gym users have reported higher rates of body dissatisfaction (Esco et al., 2005), researchers found that competitive bodybuilders reported greater body dissatisfaction compared to their recreational weight-training counterparts (Goldfield, 2009). Interestingly, despite the likelihood of having more muscle mass, it has been found that bodybuilders have lower muscle size satisfaction, which can lead to significantly more harmful muscle gain practices compared to recreational gym users (Jankauskiene, Kardelis, & Pajaujiene, 2007).

Body checking has been defined as a behavioral manifestation of body dissatisfaction and overconcern with shape and weight that is associated with negative

cognitive, behavioral, and emotional constructs (Shafran et al., 2004). Body checking is comprised of any behavior aimed at gaining information about one's shape, weight, or size (Walker, Murray, Lavender, & Anderson, 2012), such as repeated weighing, checking one's reflection in the mirror, examining the visibility of certain bones, pinching fat, feeling muscles for size, comparing oneself to others, and seeking reassurance from others about one's size, shape, or weight (Reas, Whisenhunt, Netemeyer, & Williamson, 2002). Furthermore, cognitive behavioral conceptualizations of body checking suggest that excessive shape and weight monitoring can function to increase body dissatisfaction (Shafran et al., 2004; Williamson, 1996; Wilson, 2005). Due to the pressure that men face to be lean and muscular, men may also engage in body checking behaviors in an effort to meet such societal standards. Individuals with high levels of body image disturbance are more likely to obsessively check their physique in mirrors, pinch areas of their body, and worrying or feeling anxious about different aspects of his/her body, along with several other components (Reas, Whisenhunt, Netemeyer, & Williamson, 2002). Greater body dissatisfaction and concern with weight and shape may also be associated with an increased frequency of body checking among men, along with a greater probability of engaging in related unhealthy behaviors like drug use, excessive exercise, obsessive diets, unnecessary cosmetic surgery, and regular tanning (Walker, Anderson, & Hildebrandt, 2009).

Although research suggests that body image dissatisfaction is increasingly common among young men (Leit, Gray, & Pope, 2002), only a few studies have addressed body checking in a male population. The current literature on body checking in men suggests that overweight men endorse body checking and that the behaviors were

associated with body dissatisfaction, lower self-esteem, along with several other constructs (Grilo, Masheb, Brody, Burke-Martindale, & Rothschild, 2005; Latner, 2008; Reas, Grilo, Masheb, & Wilson, 2005). Even more recent research regarding body checking has been conducted; however, this research was conducted using an undergraduate male psychology student population (Walker et al., 2009; Walker et al., 2012). Research focusing on manifestations of body image dissatisfaction in a high-risk population, such as bodybuilders, has the potential to provide important information to the body image literature.

While body image can be seen as how an individual perceives him/herself, another component of body image is how an individual views him/herself from an outsider's perspective. Objectified body consciousness can be classified as an important component of body image disturbance. Objectified body consciousness can be defined as an individual's body-self relationship primarily in the appearance of one's body as an outside observer rather than in how one's body feels or what one's body can do. Furthermore, body surveillance and body shame are features of body consciousness that tend to predict body image dissatisfaction (Jackson, Zheng, Chen, 2016). In addition to studies of women, high levels of body surveillance, body shame, and/or related constructs have been found to predict body dissatisfaction, disordered eating, depression, steroid use, and excessive exercise within samples of men (Aubrey, 2006; Hallsworth, Wade, & Tiggemann, 2005; Knauss, Paxton, & Alsaker, 2008; Tiggemann & Kuring, 2004; Wiseman & Moradi, 2010). Although there is a clear connection between objectified body consciousness disordered eating, negative self-beliefs, and reasons for exercise, one study conducted by Faries and Espie (2016) found little to no relationship between

objectified body consciousness and level of physical activity in a group of females. The current study aims to determine the relationship between, if any, between objectified body consciousness and level of competitions/commitment in a male bodybuilding population.

Exercise dependence is another common expression of body image dissatisfaction. Exercise dependence, or excessive exercise, can be defined as a craving for exercise that results in uncontrollable excessive physical activity that manifests in physiological symptoms, psychological symptoms, or both (Hausenblas & Symons Downs, 2002). Brudzynski and Ebben (2010) found that body image concerns can be significant motivators for exercise, in that, body image has been linked with increased exercise participation. Furthermore, those participants reported that body image affected the degree to which they exercised. Tiggemann and Williamson (2000) suggested that those with poorer body image reported greater amounts of exercise. Fountoulakis and Grogan (2014) found that body image does, in fact, predict exercise participation, but their results contradicted other similar research. Fountoulakis and Grogan (2014) suggested that people who are more satisfied with the look of their bodies engage in greater amounts of exercise, and that appearance evaluation was the single best predictor of exercise participation.

Researchers have found that bodybuilders tend to indicate higher exercise dependence than fitness lifters (Hale, Roth, DeLong, & Briggs, 2010). More specifically, experienced competitive bodybuilders display more exercise dependence than inexperienced bodybuilders on both the Training Dependence Scale and the Mastery Scale (Hurst, Hale, Smith, & Collins, 2000). These results suggest that experienced

bodybuilders are more likely to become dependent on the actual activity of lifting weights rather than just the social aspect of the activity and they may also have more of a need to have control over their training schedules. Hale, Diehl, Weaver, and Briggs (2013) suggest that female bodybuilders seem to be more at risk for exercise dependence than female recreational weight lifters. However, no study has examined the extent of exercise dependence in male bodybuilders compared to male recreational weight lifters.

Performing a sport whose atmosphere is highly competitive, such as bodybuilding, may put individuals who engage in those sports under unbearable pressure. Competition is thought to facilitate the onset of body image disturbance at an elite level, where appearance, a lean body shape, and low body weight are emphasized (Smolak, Murnen, & Ruble, 2000). Furthermore, athletes at a higher level of competition have been found to be at a greater risk for disordered eating behavior than were athletes at a lower competition level (Picard, 1999). To attain the level of muscularity displayed in the modern-day competitive arena, competitive bodybuilders show a high level of dedication and commitment through training intensely for many years. Research has shown that males feel worse about their general appearance and physical ability following failure (Mills & D'Alfonso, 2007). Furthermore, Hale et al., (2010) suggests that bodybuilders may tend to become overcommitted in their weight lifting routines in comparison to fitness lifters. This suggests that the level of commitment to bodybuilding may play a rather large role in body image specifically in the population of competitive bodybuilders. In addition, Mills and D'Alfonso (2007) suggest that men may therefore use their bodies to increase their sense of self-worth, achievement, and/or accomplishment through competitive performance feedback. Milligan and Pritchard

(2006) stated that for an athlete to make it to the elite-level, the athlete must have a competitive edge. After all, bodybuilders regard bodybuilding as a sport and embody a "do what it takes to win" philosophy (Suffolk, 2014).

Purpose

The purpose of this study is to determine if male bodybuilders exhibit more attitudes and behaviors consistent with body image disturbance compared to men who engage in non-competitive weight training. In addition, this study will determine if commitment to bodybuilding predicts the severity of body image disturbance among men.

Hypotheses

It is hypothesized that:

1.) Competitive male bodybuilders will exhibit higher levels of body dissatisfaction, body checking, body consciousness, symptoms of muscle dysmorphia, and overall body image concerns than regular weight lifters.

2.) Among those who compete, commitment to bodybuilding, as defined by the number of competitions, exercise dependence, and sport commitment, will each uniquely predict the severity of body image disturbance as measured by body dissatisfaction, body checking, body consciousness, symptoms of muscle dysmorphia, and overall body image concerns.

METHOD

Participants

A convenience sample of 67 men volunteered to participate in the study. Participants were recruited via Mechanical Turk; Amazon.com's paid participant database. Amazon's Mechanical Turk website is an online marketplace where individuals choose to complete tasks in exchange for monetary compensation. The entire process to provide informed consent and complete the measures took approximately 45 minutes to one hour and MTurk participants were compensated $2.00 for their participation in the study, which was directly deposited to their Amazon account upon completion of the task.

Only males were recruited for the current study since the majority of the literature concentrates on females. Research conducted with male bodybuilders focuses on eating disorder symptoms, muscle dysmorphia, or steroid use (Pickett, Lewis, & Cash, 2004), not the general construct of body image. Additionally, there has been a sociocultural emphasis that has been placed on muscularity, which in return has led many men to pursue weightlifting and/or bodybuilding as the means to the end (Pickett, Lewis, & Cash, 2005). However, many researchers have suggested that previous measures of body image, many of which were initially developed for women, may not effectively look at body image concerns among men (Cafri & Thompson, 2004; Ridgeway & Tylka, 2005). It is possible that underlying body image disturbance is the precipitating factor in the development of a clinical eating disorder symptoms/muscle dysmorphia or steroid use

suggesting the need for more research with a particular focus on body image in bodybuilders, particularly in males.

Measures

Demographics Questionnaire. All participants completed a demographic questionnaire that was developed by the researchers to examine basic demographic information including age, marital status, gender, race, highest level of education, height, weight, workout history, and bodybuilding competition history. BMI was calculated based on self-reported height and current weight using the following formula: BMI = (weight in pounds/[height in inches]^2) x 703. (Appendix A).

Male Body Dissatisfaction Scale. (MBDS; Ochner, Gray, & Brickner, 2009). The MBDS is a 25-item questionnaire, which measures body dissatisfaction in the male population. Each item is based on a 5-point Likert scale ranging from 1 = *always* to 5 = *never* or from 1 = *strongly agree* to 5 = *strongly disagree* depending upon the item. Participants additionally rate each item on "how important the item is to you" on a scale of 1 = *most important* to 10 = *least important*. An individual's total score on the MBDS can range from 2.5 to 125, with higher scores indicating more body dissatisfaction. Internal consistency was calculated in the initial validation study using Cronbach's alpha and suggests excellent reliability with an overall alpha coefficient of .93. (Appendix B)

Multidimensional Body-Self Relations Questionnaire. (MBSRQ; Cash, 1988). The MBSRQ-A is a 69-item questionnaire, which assesses body image via 10 subscales: Appearance Evaluation, Appearance Orientation, Fitness Evaluation, Fitness Orientation, Health Evaluation, Health Orientation, Illness Orientation, Body Areas Satisfaction,

Overweight Preoccupation, and Self-Classified Weight . Each item is based on a 5-point Likert- type scale ranging from 1 = *definitely disagree/very dissatisfied* to 5 = *definitely agree/very satisfied*. Higher scores on the appearance evaluation subscale indicate more positive and satisfied feelings of their appearance. Higher scores on the appearance orientation subscale indicate placing more importance on how one looks, paying attention to their appearance, and engaging in extensive grooming behaviors. Higher scores on the fitness evaluation subscale indicate more feelings of regarding themselves as physically fit, "in shape", or athletically active and competent. Higher scores on the fitness orientation subscale indicate individuals place more value on fitness and are more actively involved in activities to enhance or maintain their fitness. Higher scores on the health evaluation subscale indicate feelings of one's body being in good health. Higher scores on the health orientation subscale indicate being more "health conscious" and try to lead a healthy lifestyle. Higher scores on the illness orientation subscale indicate being more alert to personal symptoms of physical illness and are apt to seek medical attention. Internal consistency was calculated in the initial validation study using Cronbach's alpha and suggests acceptable reliability with alpha coefficients greater than .70 for all subscales. (Appendix C)

Muscle Appearance Satisfaction Scale. (MASS; Mayville, Williamson, White, Netemeyer, & Drab, 2002). The MASS is a 19-item questionnaire, which measures symptoms of Muscle Dysmorphia. Each item is based on a 5-point Likert-type scale ranging from 1 = *never* to 5 = *always*. Higher scores indicate greater levels of muscle dysmorphia. Internal consistency was calculated in the initial validation study using

Cronbach's alpha and suggests acceptable reliability with alpha coefficients greater than .70. (Appendix D)

Objectified Body Consciousness Scale. (OBCS; McKinley & Hyde, 1996). The OBC is a 24-item questionnaire, which measures body surveillance, internalization of cultural body standards, and beliefs about body control. Surveillance suggests individuals are trying to ensure they match up to perceived body-related standards, with higher scores for those who watch their body frequently and are more worried about how they look than how they feel. Control beliefs suggest a level of control on how their body looks, with a higher score representing the perceptions one can control weight and appearance if one works hard enough. Lower scores represent lower perceived control over body, but also suggest placing control to outside factors like heredity. Body shame is felt when one does not match up to his/her internalized standards, with a higher score suggesting more shame or feeling like a "bad person" for not matching up to such standards. Each item is based on a 6-point Likert-type scale ranging from 1 = *strongly disagree* to 6 = *strongly agree*. Internal consistency was calculated in the initial validation study using Cronbach's alpha and suggests acceptable reliability with alpha coefficients greater than .72. (Appendix E)

Male Body Checking Questionnaire. (MBCQ; Hildebrandt, Walker, Alfano, Delinsky, & Bannon, 2010). The MBCQ is a 19-item questionnaire, which measures the global construct of body checking behaviors. The MBCQ assesses checking related to overall appearance, checking of specific body parts, and checking rituals, specifically in males. Each item is based on a 5-point Likert- type scale ranging from 1 = *never* to 5 = *always*. Higher scores indicate more intense body dissatisfaction, fear of fatness, body

image avoidant behaviors, and general eating disturbances. Internal consistency was calculated in the initial validation study using Cronbach's alpha and suggests excellent reliability with an alpha coefficient of .94. (Appendix F)

Shape and Weight Inventory for Males. (SWIM; Whisenhunt, Allen, Drab-Hudson, Levesque, & Keller). The SWIM is a 39-item questionnaire, which measures concerns about being overweight, worry about being too thin and not muscular enough, behavioral strategies to improve one's shape/weight, and avoidance of social situations, relationships, and being distracted by concern about one's shape/weight. Each item is based on a 6-point Likert-type scale ranging from 1 = *never* to 6 = *always*. Higher scores indicate greater levels of shape and weight concern. Internal consistency was calculated in the initial validation study using Cronbach's alpha and suggests high reliability with alpha coefficients of each subscale greater than .85. (Appendix G)

Exercise Dependence Questionnaire. (EDQ; Ogden, Veale, & Summers, 1997). The EDQ is a 29-item questionnaire, which measures motivation to continue exercising, positive reward after exercise, desire to control weight and body shape, need for social contact, drive for physical health, as well as recognition of problem behaviors. Each item is based on a 7-point Likert-type scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. Higher scores indicate greater exercise dependence. Internal consistency was calculated in the initial validation study using Cronbach's alpha and suggests good reliability with a total alpha coefficient of .84 for all subscales. (Appendix H)

Obligatory Exercise Questionnaire. (OEQ; Thompson & Pasman, 1991). The OEQ is a 20-item questionnaire, which measures excessive exercise activity. Each item is based on a 4-point Likert- type scale ranging from 1 = *never* to 4 = *always*. Higher

scores indicate more excessive exercise. Internal consistency was calculated in the initial validation study using Cronbach's alpha and suggests acceptable reliability with alpha coefficients greater than .69 for all three factors. (Appendix I)

Sport Commitment Questionnaire-2. (SCQ-2; Scanlan, Chow, Sousa, Scanlan, & Knifsend, 2016). The SCQ-2 is a 58-item questionnaire, which measures the sources and types of commitment to sports based on a number of constructs. Each item is based on a 5-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree.* Higher scores indicate higher levels of commitment to sport. Internal consistency was calculated in the initial validation study using Cronbach's alpha and suggests acceptable reliability with alpha coefficients greater than .70 for all subscales except Valuable Opportunities (.65) and Social Constraints (.66). (Appendix J)

Figures Preferences in Men. (Lynch & Zellner, 1999). The Figures Preferences in Men is a set of male figure drawings which illustrate differing degrees of muscle mass rather than body fat. Men participants select their current figure and their ideal figure, which measures body dissatisfaction among men. Higher score discrepancies indicate higher body dissatisfaction. Internal consistency was calculated in the initial validation study using Cronbach's alpha and suggests a reliability of the "current" figure to have an alpha coefficient of .88, while the "ideal" figure has an alpha coefficient of .71. (Appendix K)

Procedure

Before recruiting participants, this study received approval from the Missouri State Institutional Review Board **(Study #: IRB-FY2016-293; 1/8/2017**; Appendix L).

Participants were recruited through online bodybuilding survey websites, online bodybuilding forums, social media, flyers posted at local fitness centers, and through word of mouth. Participants were originally directed to Mechanical Turk, Amazon.com's paid participant database. Once enough participants directed to Mechanical Turk who fell into the "fitness lifter" category were obtained with compensation, participants were then screened out and excluded from taking the survey if they indicated they were a fitness lifter.

All volunteers who agreed to participate in the study read and provided online informed consent, which explained the purpose of the study, acknowledgment of any risks or discomforts the participants might experience, any benefits the participants might gain from the study, the right to stop participating at any time, the right to withdrawal their data from the study, as well as contact information of the researchers.

After providing consent, participants were asked to indicate their gender as well as classify themselves as a "competitive bodybuilder," "fitness lifter," or "none of the above" based on the criteria provided, as two screener questions. If participants indicated they were "female" or "none of the above" on either of the screener questions, they were automatically directed to the end of the survey. If participants indicated they were "male" and "competitive bodybuilders" or "fitness lifters," (i.e., the desired population), they were directed to a set of questionnaires on their screen and asked to begin the study.

The researchers expected to collect data amongst two groups, competitive bodybuilders and regular fitness lifters. As the data collection progressed, it became clear that there was an additional group of individuals who indicated that they compete, yet also indicated they do not view themselves as bodybuilders. There were enough

participants identifying themselves in this way that another group, referred to as "Competitive Fitness Lifters" was created.

All participants completed a series of questionnaires including a demographics questionnaire, Muscle Appearance Satisfaction Scale (MASS; Mayville, Williamson, White, Netemeyer, & Drab, 2002), Objectified Body Consciousness Scale (OBCS; McKinley & Hyde, 1996), Exercise Dependence Questionnaire (EDQ; Ogden, Veale, & Summers, 1997), Shape and Weight Inventory for Males (SWIM; Whisenhunt, Allen, Drab-Hudson, Levesque, & Keller), Male Body Checking Questionnaire (MBCQ; Hildebrandt, Walker, Alfano, Delinsky, & Bannon, 2010), Multidimensional Body-Self Relations Questionnaire (MBSRQ; Cash, 1988), Obligatory Exercise Questionnaire (OEQ; Thompson and Pasman, 1991), Male Body Dissatisfaction Scale (MBDS; Ochner, Gray, & Brickner, 2009), Sport Commitment Questionnaire-2 (SCQ-2; Scanlan, Chow, Sousa, Scanlan, & Knifsend, 2016), and Figures Preferences in Men (Lynch and Zellner, 1999). Questionnaires were administered in random order for participants in order to minimize possible order effects. All of the participants completed the questionnaires online.

After completing the study, all information was submitted to the researchers through an online database. Once participants finished the survey, individuals were assigned a random code number to ensure anonymity, which was given to the researcher in order to grant compensation for their participation.

Upon completion of the study, the participants were awarded $2 in their Mechanical Turk account through Amazon for their participation in the study. In order to receive the $2 reward, participants must have responded to 100% of the questionnaires.

Due to difficulties obtaining enough competitive bodybuilding via Mechanical Turk, the remaining participants were recruited through the local competitive bodybuilding population. To encourage participation, these individuals were informed that they would receive a $10 gift card to Supplement Superstore for their participation in the study.

RESULTS

The data were screened for accuracy issues, missing data, and assumptions. Each scale was screened separately, and participants missing less than 5% of their data on each scale had their data imputed using the *Mice* package in *R.* After screening for missing data, the data was checked for assumptions including additivity, homogeneity, normality, and homoscedasticity.

Demographics

Education Level. A chi-square was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on reported level of education (High School Diploma, Vocational/Technical School, Some College, College Degree, and Master's Degree). There was a significant effect between type of lifter and level of education, X^2 (8, N = 62) = 28, $p < .001$, indicating that the competitive bodybuilders had significantly more post-secondary education than both the competitive fitness lifters and the regular fitness lifters. Mean and standard deviation values are provided in Table 1.

Table 1
Means and Standard Deviations for Demographics Based on Type of Lifter

		Competitive Bodybuilders		Competitive Fitness Lifters		Fitness Lifters	
Variable		N	%	N	%	N	%
Marital Status							
	Single	2	40	16	84	26	68
	Married	3	60	3	16	12	32
Race							
	American Indian	-	-	1	5	-	-
	Asian American	-	-	-	-	1	3
	Black	-	-	1	5	1	3
	White	5	100	16	65	36	-
	Multiracial	-	-	1	5	-	94
Education Level							
	High School Degree	-	-	-	-	7	18
	Vocational/Technical School	-	-	2	11	4	10
	Some College	1	20	5	26	9	24
	College Degree	-	-	9	47	17	45
	Master's Degree	4	80	3	16	1	3
Intensity of Workouts							
	Light	-	-	-	-	3	8
	Moderate	1	20	8	42	23	62
	Heavy	4	80	11	58	11	30
Competitive Person							
	Yes	4	80	15	79	29	76
	No	1	20	4	21	9	24

Note. Values are number of participants (N) and percentage (%).

Marital Status. A chi-square was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on reported marital status (Single and Married). There was no significant effect between type of lifter and marital status, X^2 (2, N = 62) = 4.06, p = .13, indicating that marital

status did not differ significantly between competitive bodybuilders, competitive fitness lifters, and regular fitness lifters. Mean and standard deviation values are provided in Table 1.

Race. A chi-square was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) and reported race (Asian American, Black or African American, and White). There was no significant effect between type of lifter and race, X^2 (8, N = 62) = 5.80, p = .67, indicating that race did not differ significantly between competitive bodybuilders, competitive fitness lifters, and regular fitness lifters. Mean and standard deviation values are provided in Table 1.

Workout Intensity. A chi-square was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on reported intensity level of workouts (Heavy, Moderate, and Light). There was no significant effect between type of lifter and level of workout intensity, X^2 (4, N = 61) = 8.12, p = .09, indicating that level of workout intensity did not differ significantly between competitive bodybuilders, competitive fitness lifters, and regular fitness lifters. Mean and standard deviation values are provided in Table 1.

Competitiveness. A chi-square was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on whether or not the participant considered himself as a competitive person (Yes and No). There was no significant effect between type of lifter and competitiveness, X^2 (2, N = 62) = .07, p = .97, indicating whether the participants considered themselves to be completive or not also did not differ significantly between competitive bodybuilders,

competitive fitness lifters, and regular fitness lifters. Mean and standard deviation values are provided in Table 1.

Table 1 presents descriptive demographic data for all three groups. The three groups did not differ significantly with respect to marital status, race, workout intensity, as well as whether or not they identified themselves as a competitive person. As shown in Table 1, the groups did differ significantly with respect to education level, with the competitive bodybuilders having significantly more postsecondary education than competitive fitness lifters and regular fitness lifters.

Number of Workout Days. A one-way between-subjects ANOVA was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) and the reported number of workout days per week. There was a significant difference between type of lifter and number of workout days, $F(1, 60) = 9.47$, $p = .003$, $R^2 = .14$. Post hoc analyses using the Tukey's post hoc criterion for significance indicated that competitive fitness lifters workout significantly more days of the week than both the competitive bodybuilders and regular fitness lifters Mean and standard deviation values are provided in Table 2.

Table 2

Means and Standard Deviations for Demographics Based on Type of Lifter

	Competitive Bodybuilders			Competitive Fitness Lifters			Fitness Lifters		
Variable	N	Range	Mean ± SD	N	Range	Mean ± SD	N	Range	Mean ± SD
Age	5	25-53	37.00 ± 10.79	19	20-36	27.37 ± 3.65	37	23-70	33.11 ± 8.57
Height	5	65-77	68.80 ± 4.97	19	66-77	71.32 ± 2.87	38	64-77	70.89 ± 2.85
Current Weight	5	156-220	190.40 ± 23.99	19	128-280	192.79 ± 38.69	38	115-300	188.53 ± 39.88
Ideal Weight	5	160-225	189.00 ± 28.15	19	100-270	192.69 ± 45.76	37	120-245	181.95 ± 27.35
Workout Days	5	4-6	6.40 ± .89	19	3-7	6.68 ± 1.25	38	2-7	5.37 ± 1.42

Note. Values are number of participants (N), range of answers given (Range) and Mean ± Standard Deviation.

Age. A one-way between-subjects ANOVA was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on reported number of workout days per week. There was no significant effect between type of lifter and age, $F(1, 59) = .46$, $p = .502$, $R^2 = .01$. Mean and standard deviation values are provided in Table 2.

Height. A one-way between-subjects ANOVA was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on reported number of workout days per week. There were no significant differences in height between the three categories of weight lifters, $F(1, 60) = .58$, $p = .449$, $R^2 = .01$. Mean and standard deviation values are provided in Table 2.

Current Weight. A one-way between-subjects ANOVA was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on reported number of workout days per week. . There were no significant differences in weight between the three categories of weight lifters, $F(1, 60) = .09$, $p = .767$, $R^2 = .01$. Mean and standard deviation values are provided in Table 2.

Ideal Weight. A one-way between-subjects ANOVA was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on reported number of workout days per week. There were no significant differences in ideal weight between the three categories of weight lifters, $F(1, 59) = .89$, $p = .350$, $R^2 = .01$. Mean and standard deviation values are provided in Table 2.

Table 2 presents descriptive demographic data for all three groups. The three groups did not differ significantly with respect to age, height, current weight, and ideal weight. As shown in Table 2, the groups did differ significantly with respect to number of days in which they reported working out, with the competitive fitness lifters reporting working out on significantly more days than regular fitness lifters.

Body Image Disturbance Results

It was hypothesized that competitive male bodybuilders would exhibit higher levels of body dissatisfaction, body checking, body consciousness, symptoms of muscle dysmorphia, and overall body image concerns than regular weight lifters. In order to determine if these groups would differ between each variable, separate analyses of variance were conducted. The researchers also hypothesized that among those who have

competed, commitment to bodybuilding, as defined by the number of competitions, exercise dependence, and sport commitment, would each uniquely predict the severity of body image disturbance as measured by body dissatisfaction, body checking, body consciousness, symptoms of muscle dysmorphia, and overall body image concerns. In order to determine if each variable predicted severity of body image disturbance, separate multiple regressions were conducted for each of the body image dependent variables. Mean and standard deviation values are provided in Table 3.

Table 3
Means and Standard Deviations for Total Scores Between Type of Lifter

	Competitive Bodybuilders		Competitive Fitness Lifters		Fitness Lifters	
Variable	Range	Mean ± SD	Range	Mean ± SD	Range	Mean ± SD
MBCQ	31-74	48.88 ± 16.79	25-95	57.74 ± 17.02	19-84	41.23 ± 15.11
MASS	37-61	48.80 ± 10.73	48-85	60.74 ± 9.17	23-69	40.42 ± 12.45
SWIM	66-177	100.75 ± 40.89	59-174	126.89 ± 32.12	39-149	94.56 ± 32.69
OBCS	64-108	80.13 ± 13.91	67-127	94.89 ± 15.48	69-158	88.67 ± 15.22
MBSRQ	230-280	254.25 ± 18.81	199-301	240.84 ± 31.82	206-308	250.89 ± 28.97

Note. Values are range of answers given (Range) and Mean ± Standard Deviation.

Body Checking. A one-way between-subjects ANOVA was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) and their total score on the Male Body Checking Questionnaire. There was a significant effect between type of lifter and MBCQ total score, $F(1, 60) = 17$, $p < .001$, $R^2 = .22$. There was a significant difference between levels of body checking among the competitive fitness lifters and regular fitness lifters, suggesting that

competitive fitness lifters engage in significantly more body checking behaviors than regular fitness lifters. Competitive bodybuilders did not have significantly different levels of body checking compared to the competitive or regular fitness lifters, suggesting that competitive bodybuilders do not engage in as many body checking behaviors as competitive fitness lifters. These results do not support our hypothesis that competitive bodybuilders would engage in more body checking behaviors.

Symptoms of Muscle Dysmorphia. A one-way between-subjects ANOVA was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on total Muscle Appearance Satisfaction Scale score. There was a significant effect between type of lifter and MASS total score, $F(1, 64) = 6.29$, $p = .01$, $R^2 = .089$. There was a significant difference between the competitive fitness lifters and regular fitness lifters on levels of muscle dysmorphia, suggesting that competitive fitness lifters report significantly more symptoms of muscle dysmorphia than regular fitness lifters. Competitive bodybuilders did not have significantly different levels of muscle dysmorphia symptoms compared to the competitive or the regular fitness lifters, suggesting that competitive bodybuilders do not report as many symptoms of muscle dysmorphia as competitive fitness lifters. This data does not support our hypothesis that predicted that competitive bodybuilders would indicate higher levels of muscle dysmorphia symptoms.

Body Dissatisfaction. A one-way between-subjects ANOVA was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on total Shape and Weight Inventory for Males score. There was no significant effect between type of lifter and SWIM total score, $F(1, 64) =$

3.21, $p < .078$, $R^2 = .05$. This data does not support our hypothesis that competitive bodybuilders will have higher levels of body dissatisfaction.

Body Consciousness. A one-way between-subjects ANOVA was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on total Objectified Body Consciousness Scale score. There was no significant effect between type of lifter and OBCS total score, $F(1, 64) = .25$, $p = .617$, $R^2 = .01$. This data does not support our hypothesis that competitive bodybuilders would have higher levels of body consciousness.

Overall Body Image. A one-way between-subjects ANOVA was conducted to test for differences between type of lifter (Competitive Bodybuilder, Competitive Fitness Lifter, Regular Fitness Lifter) on total Multidimensional Body-Self Relations Questionnaire score. There was no significant effect between type of lifter and MBSRQ total score, $F(1, 63) = .09$, $p = .768$, $R^2 = .01$. This data does not support our hypothesis that competitive bodybuilders would have higher levels of body image concern.

Table 3 presents body image disturbance data for all three groups. The three groups did not differ significantly with respect to overall scores on the SWIM, OBCS, and MBSRQ. As shown in Table 3, the groups did differ significantly with respect to overall scores on the MBCQ and the MASS, with the competitive fitness lifters engaging in significantly more body checking behaviors than regular fitness lifters. However, competitive fitness lifters did not score significantly higher than competitive bodybuilders.

In an effort to understand the relationship between commitment to bodybuilding and body image disturbance, multiple regressions were performed to determine whether

or not each of the three independent variables: 1.) number of competitions indicated in the survey, 2.) exercise dependence, as measured by the EDQ and OEQ, and 3.) commitment to sport, as measured by the SCQ-2, predicted any of the dependent variables, each of which express a dimension of body image disturbance, 1.) body dissatisfaction, as measured by the SWIM, 2.) body checking, as measured by the MBCQ, 3.) body consciousness, as measured by the OBCS, and 4.) symptoms of muscle dysmorphia, as measured by the MASS, and overall body image, as measured by the MBSRQ.

Body Dissatisfaction. We hypothesized that competitive male bodybuilders would exhibit higher levels of body dissatisfaction, body checking, body consciousness, symptoms of muscle dysmorphia, and overall body image concerns. To determine if commitment to sport, exercise dependence, and sport commitment were significant factors in body image disturbance, a multiple regression was performed with commitment to sport (number of competitions), exercise dependence (EDQ and OEQ), and sport commitment (SCQ-2) as the independent variables and body dissatisfaction (SWIM) as the dependent variable. The overall regression model for total scores (Number of Competitions;EDQ/OEQ;SCQ) predicting SWIM was significant, $F(4, 55) = 10.09$, $p < .001$, Adjusted $R^2 = .38$. Table 4 shows that the number of competitions is significant at the .05 alpha level, while the EDQ and OEQ are significant at the .01 alpha level, and the SCQ is significant at the .001 alpha level. These results suggest that number of competitions, exercise dependence, and sport commitment each exclusively predicted body dissatisfaction as measured by the SWIM.

Table 4
Summary of Multiple Regression Analysis for Variables Predicting Body Dissatisfaction

Variable	b	Standard Error b	*t* value	*p* value	Partial R^2
Number of Competitions	-4.315	1.784	-2.419	.019*	.119
EDQ	.785	.270	2.911	.005**	.134
OEQ	1.952	.670	2.916	.005**	.134
SCQ	-.768	.188	-4.083	.001***	.435

Note. ***$p < .001$. **$p < .01$. *$p < .05$. EDQ = Exercise Dependence Questionnaire; OEQ = Obligatory Exercise Questionnaire; SCQ = Sport Commitment Questionnaire.

Body Checking. The researchers predicted that competitive male bodybuilders would exhibit higher levels of body checking than fitness lifters. To determine if commitment to sport, exercise dependence, and sport commitment were significant factors in body image disturbance, a multiple regression was performed with commitment to sport (number of competitions), exercise dependence (EDQ and OEQ), and sport commitment (SCQ-2) as the independent variables and body checking (MBCQ) as the dependent variable. The overall regression model for total scores (Number of Competitions;EDQ/OEQ;SCQ) predicting MBCQ was significant, $F(4, 55) = 10.83$, $p < .001$, Adjusted $R^2 = .40$. Table 5 shows that the number of competitions itself was not significant, but both the EDQ and OEQ were significant at the .01 alpha level, while the SCQ is significant at the .05 alpha level. These results suggest that body checking symptoms are more influenced by both exercise dependence and sport commitment, rather than the individual's history of competitions.

Table 5
Summary of Multiple Regression Analysis for Variables Predicting Body Checking

Variable	b	Standard Error b	*t* value	*p* value	Partial R^2
Number of Competitions	-1.703	.866	-1.965	.054	.076
EDQ	.421	.131	3.214	.002**	.158
OEQ	.906	.325	2.785	.007**	.124
SCQ	-.190	.091	-2.083	.042*	.086

Note. ***$p < .001$. **$p < .01$. *$p < .05$. EDQ = Exercise Dependence Questionnaire; OEQ = Obligatory Exercise Questionnaire; SCQ = Sport Commitment Questionnaire.

Body Consciousness. The researchers predicted that competitive male bodybuilders would exhibit higher levels of body consciousness than fitness lifters. To determine if commitment to sport, exercise dependence, and sport commitment were significant factors in body image disturbance, a multiple regression was performed with commitment to sport (number of competitions), exercise dependence (EDQ and OEQ), and sport commitment (SCQ-2) as the independent variables and body consciousness (OBCS) as the dependent variable. The overall regression model for total scores (Number of Competitions;EDQ/OEQ;SCQ) predicting OBCS was significant, $F(4, 55) = 3.75$, $p < .009$, Adjusted $R^2 = .16$. Table 6 shows that the number of competitions, EDQ, and OEQ were not significant, but the SCQ was significant at the .001 alpha level. These results suggest that body consciousness is more influenced by sport commitment rather than exercise dependence and the individual's history of competitions.

Table 6
Summary of Multiple Regression Analysis for Variables Predicting Body Consciousness

Variable	b	Standard Error b	*t* value	*p* value	Partial R^2
Number of Competitions	-.864	.915	-.944	.349	.016
EDQ	.230	.138	1.659	.103	.048
OEQ	.541	.344	1.574	.121	.043
SCQ	-.342	.096	-3.543	.001***	.296

Note. ***$p < .001$. **$p < .01$. *$p < .05$. EDQ = Exercise Dependence Questionnaire; OEQ = Obligatory Exercise Questionnaire; SCQ = Sport Commitment Questionnaire.

Symptoms of Muscle Dysmorphia. The researchers predicted that competitive male bodybuilders would exhibit higher levels of symptoms of muscle dysmorphia than fitness lifters. To determine if commitment to sport, exercise dependence, and sport commitment were significant factors in body image disturbance, a multiple regression was performed with commitment to sport (number of competitions), exercise dependence (EDQ and OEQ), and sport commitment (SCQ-2) as the independent variables and symptoms of muscle dysmorphia (MASS) as the dependent variable. The overall regression model for total scores (Number of Competitions;EDQ/OEQ;SCQ) predicting MASS was significant, $F(4, 54) = 16.61$, $p < .001$, Adjusted $R^2 = .52$. Table 7 shows that the sport commitment itself was not significant, but number of competitions was significant at the .01 alpha level, while the EDQ is significant at the .001 alpha level, and the OEQ is significant at the .05 alpha level. These results suggest that symptoms of muscle dysmorphia are more influenced by exercise dependence and the individual's history of competitions, compared to their overall level of sport commitment.

Table 7
Summary of Multiple Regression Analysis for Variables Predicting Symptoms of Muscle Dysmorphia

Variable	b	Standard Error b	*t* value	*p* value	Partial R^2
Number of Competitions	-2.149	.664	-3.237	.002**	.241
EDQ	.356	.101	3.544	.001***	.159
OEQ	.591	.249	2.369	.021*	.094
SCQ	.070	.070	-.501	.618	.005

Note. ***$p < .001$. **$p < .01$. *$p < .05$. EDQ = Exercise Dependence Questionnaire; OEQ = Obligatory Exercise Questionnaire; SCQ = Sport Commitment Questionnaire.

Overall Body Image. The researchers predicted that competitive male bodybuilders would exhibit higher levels of overall body image concerns than fitness lifters. To determine if commitment to sport, exercise dependence, and sport commitment were significant factors in body image disturbance, a multiple regression was performed with commitment to sport (number of competitions), exercise dependence (EDQ and OEQ), and sport commitment (SCQ-2) as the independent variables and overall body image (MBSRQ) as the dependent variable. The overall regression model for total scores (Number of Competitions;EDQ/OEQ;SCQ) predicting MBSRQ was significant, $F(4, 54) = 12.83$, $p < .001$, Adjusted $R^2 = .45$. Table 8 shows that the EDQ and OEQ were not significant, but the number of competitions was significant at the .01 alpha level and the SCQ is significant at the .001 alpha level. These results suggest that overall body image is more influenced by both sport commitment and the individual's history of competitions, rather than exercise dependence.

Table 8

Summary of Multiple Regression Analysis for Variables Predicting Overall Body Image

Variable	b	Standard Error b	*t* value	*p* value	Partial R^2
Number of Competitions	3.923	1.409	2.785	.007**	.126
EDQ	-.211	.216	-.980	.332	.018
OEQ	.611	.546	1.120	.268	.023
SCQ	.801	.149	5.362	.001***	.347

Note. ***$p < .001$. **$p < .01$. *$p < .05$. EDQ = Exercise Dependence Questionnaire; OEQ = Obligatory Exercise Questionnaire; SCQ = Sport Commitment Questionnaire.

DISCUSSION

The purpose of this study was to determine if male bodybuilders exhibit more attitudes and behaviors consistent with body image disturbance compared to men who engage in non-competitive weight training. In addition, this study sought to determine if commitment to bodybuilding predicted the severity of body image disturbance among this group of men.

Overall, the first hypothesis which predicted that competitive male bodybuilders would exhibit higher levels of body dissatisfaction, body checking, body consciousness, symptoms of muscle dysmorphia, and overall body image concerns was not supported. Contrary to hypothesis 1, competitive fitness lifters reported higher levels of symptoms of muscle dysmorphia and more body checking than competitive bodybuilders and fitness lifters. We expected that competitive bodybuilders would also report higher levels of body consciousness, body dissatisfaction and overall body image concern than fitness lifters. However, data indicated that there were no significant differences in these variables between the three types of lifters.

In addition, the second hypothesis which predicted that among competitive male bodybuilders, commitment to bodybuilding, as defined by the number of competitions, exercise dependence, and sport commitment, would each uniquely predict the severity of body image disturbance as measured by body dissatisfaction, body checking, body consciousness, symptoms of muscle dysmorphia, and overall body image concerns was partially supported. There appeared to be overall support of hypothesis 2, with the data indicating that number of competitions, exercise dependence, and sport commitment all

predicted severity of body dissatisfaction among competitive bodybuilders. Not all independent variables predicted every dimension of body image. Exercise dependence and sport commitment predicted severity of body checking behaviors, while only sport commitment predicted severity of body consciousness. In addition, the number of competitions and exercise dependence predicted symptoms of muscle dysmorphia and number of competitions and sport commitment predicted severity in overall body image concern among competitive bodybuilders.

Consistent with previous research, which has revealed that body image concerns in males have almost tripled over the past several decades, the results of the current study indicated that the majority of the male weight lifting sample endorsed some level of dissatisfaction with their body appearance (Stapleton et al., 2016), and that commitment to weight lifting, as defined by number of competitions and exercise dependence, appears to be a predictor of body dissatisfaction, as measured by body checking, body consciousness, symptoms of muscle dysmorphia, as well as overall body image and body dissatisfaction.

Interestingly, the current study found that competitive fitness lifters indicated working out significantly more days than the competitive bodybuilders and regular fitness lifters. Furthermore, this competitive fitness lifters group also exhibited higher levels of muscle dysmorphia and reported engaging in more body checking behaviors than both competitive bodybuilders and regular fitness lifters.

One possible explanation for this result may be that these particular participants who classified themselves as “fitness lifters”, yet indicated competing in bodybuilding competitions are potentially involved in other forms of competition such as Crossfit

competitions and/or strength training competitions. It is likely that these participants are a competitive group of individuals, who spend a large portion of the week working out, even more than competitive bodybuilders and regular fitness lifters. The extent of their exercise regimen could imply that these "competitive fitness lifters" are preparing for a future competition or attempting to obtain a personal weight lifting record. As a result, this group would view themselves as competitive, but not in the realm of "bodybuilders."

In contrast, bodybuilders who have competed in a number of competitions might feel as if they are already close to their goals in terms of physique. It may be that these individuals have already obtained the "near perfect" body and do not believe that they need to gain more muscle or engage in checking behaviors as often because they are confident in their appearance. However, those individuals who have not competed in a bodybuilding competition, but are training intensely throughout the week might recognize that their physique is not developed to the point where they can compete. Therefore, it is possible that these individuals are more concerned with gaining muscle mass and engage in more checking behaviors because they are actively working to change, rather than maintain, their body. Research conducted by Jankauskiene et al (2007), found that bodybuilders of low mastery (beginners) demonstrated higher preoccupation with body shape and obsessive attitude towards exercising, which is consistent with the findings of this study.

The number of competitions predicted three of the five variables of body image disturbance including body dissatisfaction, symptoms of muscle dysmorphia, and overall body image concerns. However, it is important to note that number of competitions was

not a significant predictor of other body image disturbance variables such as body consciousness and body checking.

Similarly, exercise dependence predicted three of the five variables of body image disturbance including body dissatisfaction, symptoms of muscle dysmorphia, and body checking. However, it is important to note that exercise dependence was not a significant predictor of other body image disturbance variables such as body consciousness and overall body image concerns.

Sport commitment predicted the most body image disturbance variables of the three criterion variables. Sport commitment predicted four of the five variables of body image disturbance including body dissatisfaction, body checking, body consciousness, and overall body image concerns, yet was not a significant predictor of symptoms of muscle dysmorphia.

One possible explanation as to why sport commitment predicted the most body image disturbance variables may be that commitment to the sport could be the first step that occurs, mentally, before any physical or behavioral actions take place like exercise dependence or competing in competitions. In order to be successful in the sport, one must first make a commitment to the sport. Scanlan et al., (2016) suggests that athletes invest substantial amounts of personal resources into their sport, otherwise known as committing. With that, it is likely that an essential first component to success within a sport is committing to the sport, followed by actions that support the idea of commitment, which may include exercise dependence and competing in competitions.

Limitations

It is important to note that there are limitations to consider when interpreting these results. One of the most significant limitations of the current study was the small sample size. Unfortunately, the local bodybuilding population is not extensive. When online data collection via bodybuilding forums was unsuccessful, the researchers switched to a recruitment strategy of obtaining data from local bodybuilders via word of mouth and gift card incentives. Still, obtaining the competitive bodybuilding population was extremely difficult due to the lack of competitive bodybuilders in this area. There were too few participants, which impacted the statistics analyses, including effect sizes, power analyses, as well as *p* values, in a negative manner. As a result, all conclusions obtained from this study must be interpreted with caution.

Potentially another limitation to keep in mind is that despite creating another group of participants, the researchers do not know exactly who this separate group of participants, classified as "competitive fitness lifters," really is or even whom they represent. Therefore, the results involving this group of participants should be interpreted with caution.

Another limitation of the study was the lack of a direct measure of muscularity. Although the participants were asked their current height and weight, which was used to calculate BMI, there was no direct measure of body fat percentage or muscle mass. Since this study was focused on bodybuilders, obtaining a direct measure of muscularity may have allowed for more accurate and applicable information in regards to body composition. Furthermore, obtaining a direct measure of muscularity could have potentially served as a manipulation check to confirm the self-reported fitness category

(i.e., competitive bodybuilder, fitness lifter, etc.). The ability for researchers to confirm these categorizations based on the direct measure of muscle mass and body fat, would have increased the confidence in the results.

Furthermore, the participants of this study also self-labeled their lifting type. While the researchers provided clear criteria for each category of lifting type, participants may not have fallen neatly into one category or another and therefore may have identified, for example, as a "none of the above" when they may actually be categorized as a "competitive bodybuilder." Placement into each category needs to be more closely controlled.

The number of questions asked to participants could also be considered a limitation to this study. The survey consisted of over 300 questions; therefore, it is possible participants experienced some fatigue or boredom, resulting in rushing through the questions. One finding that supports this hypothesis involves the number of participants who started the survey, but did not finish it. In an effort to avoid this outcome, the researchers conducted a pilot study where colleagues were asked to complete the battery of questionnaires. The results of this study indicated that the entire packet only took approximately 20-30 minutes to complete. However, our results revealed otherwise indicating that participants took, on average, 45-60 minutes to complete the battery of questionnaires. One possible explanation for this discrepancy might be the setting and format in which the colleagues completed the survey compared to the setting and format in which the participants completed the survey. The colleagues took a paper version of the survey in a room with little to no distractions. The paper format provided a visual stimulus, which might have prompted an easier read for these

individuals, whom are also familiar with research and used to doing this particular type of work.

Another limitation of the current study is the self-reported nature of the research. Given that this entire study is based on self-reported information, it is important to consider that participants may not have been 100% honest or accurate in their information. The participants may have not wanted to disclosure or have difficulty disclosing certain information about a particular topic. Individuals may not have felt comfortable reporting their true feelings, behaviors, and attitudes on questions in which they may consider sensitive topics, for example, reporting one's own weight. The self-reported nature of this study is what created the difficulty of classifying participants appropriately, since they self-labeled their lifting type. While the researchers provided clear criteria for each category of lifting type, participants may not have fallen neatly into one category or another and therefore may have identified, for example, as a "none of the above" when they may actually be categorized as a "competitive bodybuilder." Placement into each category needs to be more closely controlled.

Perhaps another limitation of the current study is the use of the Male Body Dissatisfaction Scale. The MBDS consists of two components. The first component of the measure indicates that participants should rate each item based on a 5-point Likert scale. The second component suggests that participants should rate each item on a scale from 1-10 based on importance. Total scores on the MBDS are calculated by multiplying the two components of the scale. Unfortunately, digital online presentation of this measure did not work as expected, as a majority of participants only answered one of the two components, therefore, total scores could not be calculated.

A final limitation of the study involved a restriction of range in the number of competitions among the body builders and competitive fitness lifters. Therefore, it was difficult to confidently determine how the number of competitions related to the severity of body image disturbance due to this lack of variability and overall small sample size.

Clinical Implications

The findings from the current study appear to suggest that exercise dependence and sport commitment both predict several factors related to body image disturbance, including body checking, body consciousness, overall body image, symptoms of muscle dysmorphia, and body dissatisfaction. Trainers and coaches of these individuals in particular should be cognizant of this information when working with these individuals. Trainers and coaches are at the frontline and may be the first individuals to notice these particular changes. Gym users as well as key stakeholders associated with health and fitness centers, such as bodybuilding coaches and fitness trainers, are likely to benefit from greater education focusing on healthy and unhealthy body image as well as exercise-related behaviors. As such, bodybuilding coaches and fitness trainers may be the most important group to encourage the adoption of primary prevention (Stapleton et al., 2016).

Research has indicated that it is common for many men to experience some degree of concern about their appearance, or more specifically, their muscularity (Mosley, 2009). In addition, many men enjoy lifting weights in the gym as part of a healthy lifestyle. It is important to recognize that if this type of physical exercise behavior is motivated solely by physical appearance, more men may rely on the gym in order to

increase their musculature which may put them at a higher risk of developing muscle dysmorphia. (Mosley, 2009).

Clinicians, as well as bodybuilding coaches, should be made aware of the findings of this study which indicate similar results to the Mangweth et al., (2001) study, which suggests that bodybuilding may represent an alternative response to disordered body image which shares many features with that seen in eating disorders.

As clinicians and coaches working with the bodybuilding population, some practical implications ought to be considered. Helping men realize that overemphasizing appearance can degrade quality of life may assist them in reassessing their desires for an ideal muscular physique. Muscular dissatisfaction prevention programs may benefit from educating males about adaptive coping strategies for dealing with their concerns, such as those associated with rational acceptance (Tod & Edwards, 2015).

Future Research

The results of this research suggest that body image disturbance in the bodybuilding population is an important topic of scientific inquiry. Future research may consider trying to better understand the psychological processes of how body image is constructed and how it is influenced by exercise and sports that are solely focused on appearance (such as bodybuilding).

Future researchers might consider keeping track of the number of individuals of who started the study, but did not finish the study potentially citing lack of time, lack of interest in the topic, and/or length of the survey as reasons for not completing the full

study. Future research may also attempt to find a better method of data collection for "difficult to find" populations such as competitive bodybuilders.

In conclusion, this investigation did not confirm greater body image disturbances among male competitive bodybuilders compared to regular fitness lifters. However, the findings suggest that exercise dependence and sport commitment both predict several factors related to bodybuilding and fitness lifting including body checking, body consciousness, overall body image, body dissatisfaction, and symptoms of muscle dysmorphia. Additional findings indicate that both competitive bodybuilders and competitive fitness lifters report higher levels of symptoms of muscle dysmorphia compared to regular fitness lifters. Furthermore, data indicate that competitive fitness lifters also report higher levels of body checking and body dissatisfaction than regular fitness lifters. The findings suggest that male bodybuilders and competitive fitness lifters may be at high risk for potentially addictive behavioral disorders, particularly muscle dysmorphia. Health pursuits for men should emphasize function and enhancing overall well-being rather than appearance if they are to avoid deleterious consequences.

REFERENCES

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders: DSM-5. Washington, D.C: American Psychiatric Association

Aubrey, J. S. (2006). Effects of sexually objectifying media on self-objectification and body surveillance in undergraduates: Results of a 2-year panel study. *Journal of Communication, 56*(2), 366-386.

Bane, S., & McAuley, E. (1998). Body image and exercise. Advances in sport and exercise psychology measurement, 311-322.

Blouin, A. G., & Goldfield, G. S. (1995). Body image and steroid use in male bodybuilders. *International Journal of Eating Disorders, 18*(2), 159-165.

Brown, T. A., Cash, T. F., & Mikulka, P. J. (1990). Attitudinal body image assessment: Factor analysis of the Body Self-Relations Questionnaire. *Journal of Personality Assessment*, 55, 135–144.

Brudzynski, L., & Ebben, W. P. (2010). Body image as a motivator and barrier to exercise participation. *International Journal of Exercise Science*, *3*(1), 14-24.

Cash, T. F. (2000). Manual for the Multidimensional Body Self-Relations Questionnaire. Unpublished manuscript, Old Dominion University, Norfolk, VA.

Cash, T. F., & Henry, P. E. (1995). Women's body images: The results of a national survey in the USA. *Sex roles, 33*(1-2), 19-28.

Davis, C., & Cowles, M. (1989). A comparison of weight and diet concerns and personality factors among female athletes and non-athletes. *Journal of Psychosomatic Research, 33*(5), 527-536.

Esco, M., Olson, M., & Williford, H. (2005). Muscle dysmorphia: An emerging body image concern in men. *Strength & Conditioning Journal (Allen Press), 27*(6), 76-79.

Faries, M. D., & Espie, E. (2016). Objectified body consciousness, physical activity, and dietary intake in women. *Journal of Applied Biobehavioral Research, 21*(1), 25-45. doi:10.1111/jabr.12041

Fountoulakis, C., & Grogan, S. (2014). An investigation of the links between body image and exercise participation. *Sport & Exercise Psychology Review, 10*(3), 19-30.

Garner, D. M. (1997). The 1997 body image survey results. *Psychology Today*, *30*(1), 30-44.

Goldfield, G. (2009). Body image, disordered eating and anabolic steroid use in female bodybuilders. *Eating Disorders, 17*(3), 200-210. doi:10.1080/10640260902848485

Gonzalez, A., McLachlan, S., & Keaney, F. (2001). Anabolic steroid misuse: How much should we know? *International Journal of Psychiatry in Clinical Practice, 5*(3), 159-167. doi:10.1080/136515001317021617

Grilo, C. M., Masheb, R. M., Brody, M., Burke-Martindale, C. H., & Rothschild, B. S. (2005). Binge eating and self-esteem predict body image dissatisfaction among obese men and women seeking bariatric surgery. *International Journal of Eating Disorders, 37*(4), 347-351. doi:10.1002/eat.20130

Hale, B., Diehl, D., Weaver, K., & Briggs, M. (2013). Exercise dependence and muscle dysmorphia in novice and experienced female bodybuilders. *Journal of Behavioral Addictions, 2*(4), 244-248. doi:10.1556/JBA.2.2013.4.8

Hale, B., Roth, A., DeLong, R., & Briggs, M. (2010). Exercise dependence and the drive for muscularity in male bodybuilders, power lifters, and fitness lifters. *Body Image, 7*, 234-239. doi:10.1016/j.bodyim.2010.02.001

Hallsworth, L., Wade, T., & Tiggemann, M. (2005). Individual differences in male body-image: An examination of self-objectification in recreational body builders. *British Journal of Health Psychology, 10*(3), 453-465.

Hausenblas, H., & Symons Downs, D. (2002). Exercise dependence: A systematic review. *Psychology of Sport & Exercise, 3*(2), 89-123.

Hildebrandt, T., Walker, D., Alfano, L., Delinsky, S., & Bannon, K. (2010). Development and validation of a male specific body checking questionnaire. *International Journal of Eating Disorders, 43*(1), 77-87. doi:10.1002/eat.20669

Hurst, R., Hale, B., Smith, D., & Collins, D. (2000). Exercise dependence, social physique anxiety, and social support in experienced and inexperienced bodybuilders and weightlifters. *British Journal of Sports Medicine, 34*(6), 431-435.

International Federation of Bodybuilding and Fitness. (n.d.). Retrieved November 15, 2016, from http://www.ifbb.com/

Jackson, T., Zheng, P., & Chen, H. (2016). Features of objectified body consciousness and sociocultural perspectives as predictors of eating and body image disturbances among young women and men in China. *Journal of Gender Studies, 25*(5), 599-612. doi:10.1080/09589236.2015.1073144

Jankauskiene, R., Kardelis, K., & Pajaujiene, S. (2007). Muscle size satisfaction and predisposition for a health harmful practice in bodybuilders and recreational gymnasium users. *Medicina*, 43(4), 338-346.

Knauss, C., Paxton, S. J., & Alsaker, F. D. (2008). Body dissatisfaction in adolescent boys and girls: Objectified body consciousness, internalization of the media body ideal and perceived pressure from media. *Sex Roles*, *59*(9/10), 633-643.

Latner, J. (2008). Body checking and avoidance weight-loss participants. *Body Image, 5*, 91-98. doi:10.1016/j.bodyim.2007.08.001

Leit, R. A., Gray, J. J., & Pope Jr., 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.

Lynch, S. M., & Zellner, D. A. (1999). Figure preferences in two generations of men: The use of figure drawings illustrating differences in muscle mass. *Sex Roles, 40*(9-10), 833-843.

Mangweth, B., Pope, H. J., Kemmler, G., Ebenbichler, C., Hausmann, A., De Col, C.,… & Biebl, W. (2001). Body image and psychopathology in male bodybuilders. *Psychotherapy and Psychosomatics, 70*(1), 38-43.

Mayville, S. B., Williamson, D. A., White, M. A., Netemeyer, R. G., & Drab, D. L. (2002). Development of the Muscle Appearance Satisfaction Scale: A self-report measure for the assessment of muscle dysmorphia symptoms. *Assessment, 9*(4), 351-360.

McKinley, N. M., & Hyde, J. S. (1996). The Objectified Body Consciousness Scale: Development and validation. *Psychology of Women Quarterly, 20*, 181-215.

Milligan, B., & Pritchard, M. (2006). The relationship between gender, type of sport, body dissatisfaction, self esteem and disordered eating behaviors in division I athletes. *Athletic Insight: The Online Journal of Sport Psychology, 8*(1), 1-15.

Mills, J. S., & D'Alfonso, S. R. (2007). Competition and male body image: Increased drive for muscularity following failure to a female. *Journal of Social & Clinical Psychology, 26*(4), 505-518.

Mosley, P. E. (2009). Bigorexia: Bodybuilding and muscle dysmorphia. *European Eating Disorders Review, 17*(3), 191-198. doi:10.1002/erv.897

Ochner, C. N., Gray, J. A., & Brickner, K. (2009). The development and initial validation of a new measure of male body dissatisfaction. *Eating Behaviors, 10*(4), 197-201. doi:10.1016/j.eatbeh.2009.06.002

Ogden, J., Veale, D., & Summers, Z. (1997). The development and validation of the Exercise Dependence Questionnaire. *Addiction Research, 5*(4), 343.

Olivardia, R. (2002). Body image obsession in men. *Healthy Weight Journal, 16*(4), 59.

Parish, T., Turner, R., & Baghurst, T. (2010). Becoming competitive amateur bodybuilders: Identification of contributors. *Psychology of Men & Masculinity, 11*(2), 152-159. doi:10.1037/a0018091

Pasman, L., & Thompson, J. K. (1988). Body image and eating disturbance in obligatory runners, obligatory weightlifters, and sedentary individuals. *International Journal of Eating Disorders, 7*(6), 759-769.

Picard, C.L. (1999). The level of competition as a factor for the development of eating disorders in female collegiate athletes. *Journal of Youth and Adolescence, 28*, 583. doi:10.1023/A:1021606710398

Pickett, T. C., Lewis, R. J., & Cash, T. F. (2005). Men, muscles, and body image: Comparisons of competitive bodybuilders, weight trainers, and athletically active controls. *British Journal of Sports Medicine, 39*(4), 217-222.

Pope, H. G., Olivardia, R., Gruber, A., & Borowiecki, J. (1999). Evolving ideals of male body image as seen through action toys. *International Journal of Eating Disorders, 26*(1), 65-72.

Pope, H. J., Phillips, K. A., Olivardia, R., Frazier, J., & Handelsman, D. (2000). *The Adonis complex: the secret crisis of male body obsession*.

Prakasa Rao, V., & Overman, S. (1986). Psychological well-being and body image: a comparison of black women athletes and nonathletes. *Journal of Sport Behavior, 9*(2), 79-91.

Ravaldi, C., Vannacci, A., Zucchi, T., Mannucci, E., Cabras, P. L., Boldrini,… & Ricca, V. (2003). Eating disorders and body image disturbances among ballet dancers, gymnasium users and body builders. *Psychopathology, 36*(5), 247-254. doi:10.1159/000073450

Reas, D. L., Grilo, C. M., Masheb, R. M., & Wilson, G. T. (2005). Body checking and avoidance in overweight patients with binge eating disorder. *International Journal of Eating Disorders*, *37*(4), 342-346. doi:10.1002/eat.20092

Reas, D. L., Whisenhunt, B. L., Netemeyer, R., & Williamson, D. A. (2002). Development of the Body Checking Questionnaire: A self-report measure of body checking behaviors. *International Journal of Eating Disorders, 31*(3), 324-333.

Rhea, D., Lantz, C., & Cornelius, A. (2004). Development of the Muscle Dysmorphia Inventory (MDI). *Journal of Sports Medicine & Physical Fitness, 44*(4), 428-435.

Scanlan, T. K., Chow, G. M., Sousa, C., Scanlan, L. A., & Knifsend, C. A. (2016). The development of the Sport Commitment Questionnaire-2 (English version). *Psychology of Sport & Exercise, 22*, 233-246. doi:10.1016/j.psychsport.2015.08.002

Shafran, R., Fairburn, C. G., Paul, R., & Bryan Lask, A. (2004). Body checking and its avoidance in eating disorders. *International Journal of Eating Disorders, 35*(1), 93-101. doi:10.1002/eat.10228

Smolak, L., Murnen, S. K., & Ruble, A. E. (2000). Female athletes and eating problems: A meta-analysis. *International Journal of Eating Disorders, 27*(4), 371-380.

Stapleton, P., McIntyre, T., & Bannatyne, A. (2016). Body image avoidance, body dissatisfaction, and eating pathology: Is there a difference between male gym users and non-gym users? *American Journal of Men's Health, 10*(2), 100-109. doi:10.1177/1557988314556673

Steffen, J. J., & Brehm, B. J. (1999). The dimensions of obligatory exercise. *Eating Disorders. 7*(3), 219.

Suffolk, M. T. (2014). Competitive bodybuilding: Positive deviance, body image pathology, or modern day competitive sport? *Journal of Clinical Sport Psychology, 8*(4), 339-356.

Thompson, J. K., & Pasman, L. (1991). The obligatory exercise questionnaire. *The Behavior Therapist, 14*, 137.

Thompson, K., Heinberg, L., Altabe, M., & Tantleff-Dunn, S. (1999). Exacting beauty: Theory, assessment, and treatment of body image disturbance. Washington, DC, US: American Psychological Association, pp. 396. doi:10.1037/10312-000

Tiggemann, M., & Kuring, J. K. (2004). The role of body objectification in disordered eating and depressed mood. *British Journal of Clinical Psychology*, *43*(3), 299-311.

Tiggemann, M., & Williamson, S. (2000). The effect of exercise on body satisfaction and self-esteem as a function of gender and age. *Sex Roles*, *43*(2), 119-127.

Tod, D., & Edwards, C. (2015). Relationships among muscle dysmorphia characteristics, body image quality of life, and coping in males. *Journal of Science & Medicine in Sport, 18*(5), 585-589.

Walker, D., Anderson, D. A., & Hildebrandt, T. (2009). Body checking behaviors in men. *Body Image, 6*(3), 164-170. doi:10.1016/j.bodyim.2009.05.001

Walker, D., Murray, A., Lavender, J., & Anderson, D. (2012). The direct effects of manipulating body checking in men. *Body Image, 9*(4), 462-468.

Whisenhunt, B. L., Allen, B. J., Drab-Hudson, D. L., Levesque, C., & Keller, E. A. Development and validation of the Shape and Weight Inventory for Males. Unpublished manuscript, Missouri State University and St. Louis University.

Williamson, D. (1996). Dietary intake and physical activity as "predictors" of weight gain in observational, prospective studies of adults. *Nutrition Reviews, 54* (4(4,pt.2), s101-109.

Wiseman, M. & Moradi, B. (2010). Body image and eating disorder symptoms in sexual minority men: A test and extension of objectification theory. *Journal of Counseling Psychology, 57*(2), 154-166. doi:10.1037/a0018937

APPENDICES

Appendix A. Demographics Questionnaire

Age: _____

Height: _____Current Weight: _____

Highest Adult Weight: _____Lowest Adult Weight: _____

Ideal Adult Weight: _____

Please Circle your answer for the following questions –

Marital Status:

1. Single
2. Married
3. Divorced
4. Separated
5. Widowed

Gender:

1. Male
2. Female
3. Transgender

Race:

1. American Indian or Alaska Native
2. Asian
3. Black or African American
4. Native Hawaiian or Other Pacific Islander
5. White
6. Hispanic or Latino
7. Other: _____

Highest education level completed:

1. Elementary School
2. High School or equivalent
3. Vocational/Technical School (2 years)
4. Some College
5. College Graduate

6. Master's Degree (MS, MA)
7. Doctoral Degree (PhD)
8. Professional Degree (MD, JD, etc.)
9. Other: _____

1.) Based on the criteria we have provided below, how would you classify yourself? (Circle "a", "b", or "c")

a.) Competitive bodybuilder

Criteria: (must meet all 3)

i.) Have competed in a bodybuilding competition within the last year
ii.) Plan to compete in another bodybuilding competition within the next year
iii.) Train with weights 3 times a week for the past 6 months

b.) Fitness lifter

Criteria: (must meet all 3)

i.) Have never competed in a bodybuilding competition
ii.) Have no plan to compete in a bodybuilding competition
iii.) Train with weights at least 1 time a week for the past 6 months

c.) None of the above

i.) Explain:

_____
_____
_____
_____

2.) How many total times have you competed in a bodybuilding competition?

a.) 0
b.) 1-2
c.) 3-4
d.) 5-6
e.) 7-8
f.) 9 or more

3.) What is the highest level you have ever placed in a bodybuilding competition?

a.) 1st place
b.) 2nd place
c.) 3rd place
d.) 4th place
e.) 5th place
f.) 6th place or lower

4.) How many times have you competed and placed in the top five?

a.) 0

b.) 1-2
c.) 3-4
d.) 5-6
e.) 7-8
f.) 9 or more

5.) How many times have you competed in a bodybuilding competition and won (1st place)?
    a.) 0
    b.) 1-2
    c.) 3-4
    d.) 5-6
    e.) 7-8
    f.) 9 or more

6.) What is the maximum level you have competed at in bodybuilding?
    a.) Regional/Local
    b.) National
    c.) International
    d.) N/A

7.) How many days a week do you typically workout? (0-7) _____

8.) How long does each workout usually last? _____

9.) How long have you been a member at local gym or fitness center?
    _____

10.)How many years have you been lifting? _____

11.)How would you describe the intensity of the majority of yourworkouts?
    a.) Light
    b.) Moderate
    c.) Heavy

12.)What is the main reason you lift weights? Rank order from 1 to 9 (1being the most prominent reason and 9 being the least prominentreason)

_____ a.) Weight loss

_____ b.) Reduce body fat

_____ c.) Improve strength

_____ d.) Build muscle

_____ e.) Improve sports performance

_____ f.) Relieve stress

_____ g.) Making/being with friends

_____ h.) Rehabilitate an injury

_____ i.) Competitions

13.) Generally, would you classify yourself as a competitive person?

a.) Yes

b.) No

Appendix B. Male Body Dissatisfaction Scale

MBDS

Height: _____ft._____in. Weight: _____lbs.
Body type (check one): skinny_____ overweight_____ average_____ muscular_____
PLEASE READ: Circle one answer below each item according to how *you* currently feel about your body. *In addition, rate how important each item is to you*–place a number from 1 to 10 (1 = no importance to you; 10 = great importance) on the line before each item. Read all questions carefully and answer honestly; all responses are kept *confidential.*

Importance: Item:

1. _____ I am happy with how much muscle I have compared to how much fat I have.
   Strongly agree Agree Neutral Disagree Strongly disagree
2. _____ Otherpeople think I have a good body.
   Strongly agree Agree Neutral Disagree Strongly disagree
3. _____ I am a good weight for my height.
   Strongly agree Agree Neutral Disagree Strongly disagree
4. _____ I wish I had more muscular arms.
   Strongly Agree Agree Neutral Disagree Strongly Disagree
5. _____ I am hesitant to take my shirt offin public because people will look at my body.
   Strongly agree Agree Neutral Disagree Strongly disagree
6. _____ I fantasize about having more muscle.
   Always Often Sometimes Rarely Never
7. _____ I have thoughts of dissatisfaction towards my body.
   Always Often Sometimes Rarely Never
8. _____ I think I have a generally attractive body.
   Strongly agree Agree Neutral Disagree Strongly disagree
9. _____ I wish I had more of a V-shaped torso (upper body).
   Strongly agree Agree Neutral Disagree Strongly disagree
10. _____ I wish I could become more toned in order to accentuate the muscle I do have.
    Strongly Agree Agree Neutral Disagree Strongly Disagree
11. _____ I am more muscular than the average male my age.
    Strongly agree Agree Neutral Disagree Strongly disagree
12. _____ I worry about being more muscular.
    Always Often Sometimes Rarely Never
13. _____ I wish I had bigger biceps.
    Strongly agree Agree Neutral Disagree Strongly disagree
14. _____ I think my pectoral (chest) muscles are well developed.
    Strongly agree Agree Neutral Disagree Strongly disagree
15. _____ I have a "six-pack" or "washboard" stomach.
    Strongly agree Agree Neutral Disagree Strongly disagree
16. _____ Otherswould find me more attractive if I had more muscle.
    Strongly agree Agree Neutral Disagree Strongly disagree
17. _____ I wish I could lose more fat.
    Strongly agree Agree Neutral Disagree Strongly disagree
18. _____ Mybody looks healthy.
    Strongly agree Agree Neutral Disagree Strongly disagree
19. _____ I like to show off my body.
    Always Often Sometimes Rarely Never
20. _____ Theshape of my body is one of my assets.
    Strongly agree Agree Neutral Disagree Strongly disagree
21. _____ I look like I could lift more weight than the average male my age.
    Strongly agree Agree Neutral Disagree Strongly disagree
22. _____ I wish I had better muscle definition.
    Strongly agree Agree Neutral Disagree Strongly disagree
23. _____ Mybody is sexually appealing to others.
    Strongly agree Agree Neutral Disagree Strongly disagree
24. _____ I think about how different my body looks from what my ideal body would look like.
    Always Often Sometimes Rarely Never
25. _____ I wish I could build a better body for myself.
    Strongly agree Agree Neutral Disagree Strongly disagree

Appendix C. MBSRQ

1	2	3	4	5
Definitely Disagree	Mostly Disagree	Neither Agree Nor Disagree	Mostly Agree	Definitely Agree

_____ 1. Before going out in public, I always notice how I look.
_____ 2. I am careful to buy clothes that will make me look my best.
_____ 3. I would pass most physical-fitness tests.
_____ 4. It is important that I have superior physical strength.
_____ 5. My body is sexually appealing.
_____ 6. I am not involved in a regular exercise program.
_____ 7. I am in control of my health.
_____ 8. I know a lot about things that affect my physical health.
_____ 9. I have deliberately developed a healthy lifestyle.
_____ 10. I constantly worry about being or becoming fat.
_____ 11. I like my looks just the way they are.
_____ 12. I check my appearance in a mirror whenever I can.
_____ 13. Before going out, I usually spend a lot of time getting ready.
_____ 14. My physical endurance is good.
_____ 15. Participating in sports is unimportant to me.
_____ 16. I do not actively do things to keep physically fit.
_____ 17. My health is a matter of unexpected ups and downs.
_____ 18. Good health is one of the most important things in my life.
_____ 19. I don't do anything that I know might threaten my health.

_____ 20. I am very conscious of even small changes in my weight.
_____ 21. Most people would consider me good-looking.
_____ 22. It is important that I always look good.
_____ 23. I use very few grooming products.
_____ 24. I easily learn physical skills.
_____ 25. Being physically fit is not a strong priority in my life.
_____ 26. I do things to increase my physical strength.
_____ 27. I am seldom physically ill.
_____ 28. I take my health for granted.
_____ 29. I often read books and magazines that pertain to health.
_____ 30. I like the way I look without my clothes on.
_____ 31. I am self-conscious if my grooming isn't right.
_____ 32. I usually wear whatever is handy without caring how it looks.
_____ 33. I do poorly in physical sports or games.
_____ 34. I seldom think about my athletic skills.
_____ 35. I work to improve my physical stamina.
_____ 36. From day to day, I never know how my body will feel.
_____ 37. If I am sick, I don't pay much attention to my symptoms.
_____ 38. I make no special effort to eat a balanced and nutritious diet.

_____ 39. I like the way my clothes fit me.

_____ 40. I don't care what people think about my appearance.

_____ 41. I take special care with my hair grooming.

_____ 42. I dislike my physique.

_____ 43. I don't care to improve my abilities in physical activities.

_____ 44. I try to be physically active.

_____ 45. I often feel vulnerable to sickness.

_____ 46. I pay close attention to my body for any signs of illness.

_____ 47. If I'm coming down with a cold or flu, I just ignore it and go on as usual.

_____ 48. I am physically unattractive.

_____ 49. I never think about my appearance.

_____ 50. I am always trying to improve my physical appearance.

_____ 51. I am very well coordinated.

_____ 52. I know a lot about physical fitness.

_____ 53. I play a sport regularly throughout the year.

_____ 54. I am a physically healthy person.

_____ 55. I am very aware of small changes in my physical health.

_____ 56. At the first sign of illness, I seek medical advice.

_____ 57. I am on a weight-loss diet.

For the remainder of the items use the response scale given with the item, and enter your answer in the space beside the item.

_____ 58. I have tried to lose weight by fasting or going on crash diets.

1. Never
2. Rarely
3. Sometimes
4. Often
5. Very Often

_____ 59. I think I am:

1. Very Underweight
2. Somewhat Underweight
3. Normal Weight
4. Somewhat Overweight
5. Very Overweight

_____ 60. From looking at me, most other people would think I am:

1. Very Underweight
2. Somewhat Underweight
3. Normal Weight
4. Somewhat Overweight
5. Very Overweight

61-69. Use this 1 to 5 scale to indicate how dissatisfied or satisfied you are with each of the following areas or aspects of your body:

1	2	3	4	5
Very Dissatisfied	**Mostly Dissatisfied**	**Neither Satisfied Nor Dissatisfied**	**Mostly Satisfied**	**Very Satisfied**

_____ 61. Face (facial features, complexion)

_____ 62. Hair (color, thickness, texture)

_____ 63. Lower torso (buttocks, hips, thighs, legs)

_____ 64. Mid torso (waist, stomach)

_____ 65. Upper torso (chest or breasts, shoulders, arms)

_____ 66. Muscle tone

_____ 67. Weight

_____ 68. Height

_____ 69. Overall appearance

Appendix D. Muscle Appearance Satisfaction Scale

Muscle Appearance Satisfaction Scale Items

1. When I look at my muscles in the mirror, I often feel satisfied with my current muscle size.
2. If my schedule forces me to miss a day of working out with weights, I feel very upset.
3. I often ask friends and/or relatives if I look big.
4. I am satisfied with the size of my muscles.
5. I often spend money on muscle-building supplements.
6. It is OK to use steroids to add muscle mass.
7. I often feel like I am addicted to working out with weights.
8. If I have a bad workout, it is likely to have a negative effect on the rest of my day.
9. I would try anything to get my muscles to grow.
10. I often keep working out even when my muscles or joints are sore from previous workouts.
11. I often spend a lot of time looking at my muscles in the mirror.
12. I spend more time in the gym working out than most others who work out.
13. To get big, one must be able to ignore a lot of pain.
14. I am satisfied with my muscle tone/definition.
15. My self-worth is very focused on how my muscles look.
16. I often ignore a lot of physical pain while I am lifting to get bigger.
17. I must get bigger muscles by any means necessary.
18. I often seek reassurance from others that my muscles are big enough.
19. I often find it difficult to resist checking the size of my muscles.

Appendix E. Objectified Body Consciousness Scale

Strongly Disagree	***Disagree***	***Somewhat Disagree***	***Neither Agree nor Disagree***	***Somewhat Agree***	***Agree***	***Strongly Agree***
1	***2***	***3***	***4***	***5***	***6***	***7***

1.) I rarely think about how I look
1234567

2.) I think it is more important that my clothes are comfortable than whether they look good on me
1234567

3.) I think more about how my body feels than how my body looks
1234567

4.) I rarely compare how I look with how other people look
1234567

5.) During the day, I think about how I look many times
1234567

6.) I often worry about whether the clothes I am wearing make me look good
1234567

7.) I rarely worry about how I look to other people
1234567

8.) I am more concerned with what my body can do than how it looks
1234567

9.) When I can't control my weight, I feel like something must be wrong with me
1234567

10.)I feel ashamed of myself when I haven't made the effort to look mybest
1234567

11.)I feel like I must be a bad person when I don't look as good as I could
1234567

Strongly Disagree	***Disagree***	***Somewhat Disagree***	***Neither Agree nor Disagree***	***Somewhat Agree***	***Agree***	***Strongly Agree***
1	***2***	***3***	***4***	***5***	***6***	***7***

12.)I would be ashamed for people to know what I really weigh
1234567

13.)I never worry that something is wrong with me when I am notexercising as much as I should
1234567

14.)When I'm not exercising enough, I question whether I am a good enoughperson
1234567

15.)Even when I can't control my weight, I think I'm an okay person
1234567

16.)When I'm not the size I think I should be, I feel ashamed
1234567

17.)I think a person is pretty much stuck with looks they are born with
1234567

18.)A large part of being in shape is having that kind of body in the firstplace
1234567

19.)I think a person can look pretty much how they want to if they are willingto work at it
1234567

20.)I really don't think I have much control over how my body looks
1234567

21.)I think a person's weight is mostly determined by the genes they areborn with
1234567

22.)It doesn't matter how hard I try to change my weight, it's probablyalwaysgoing to be about the same
1234567

Strongly Disagree	***Disagree***	***Somewhat Disagree***	***Neither Agree nor Disagree***	***Somewhat Agree***	***Agree***	***Strongly Agree***
1	***2***	***3***	***4***	***5***	***6***	***7***

23.)I can weigh what I'm supposed to when I try hard enough
1234567

24.)The shape you are in depends mostly on your genes
1234567

Appendix F. Male Body Checking Questionnaire

Please rate to what extent the following items apply to you. Circle one number per item: (1 = never; 5 = always)

1. I check the hardness of my biceps to ensure I have not lost any muscle mass.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

2. I look at my abdominal muscle (6-pack) in the mirror.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

3. I flex my biceps when looking in the mirror to ensure symmetry of my muscles.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

4. I compare the size of my muscles to others.

Version 1 – 03/20/15

pplemental Information
isorders

ing Behaviors

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

5. I compare my overall leanness and muscle definition to others.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

6. I compare my overall muscle mass to athletes or celebrities.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

7. I compare my overall leanness mass to athletes or celebrities.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

8. I ask others to feel my muscles to ensure their size or density.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

9. I ask others to comment on my muscle definition or size.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

10. I pinch the fat around my abdomen and back (e.g., love handles) to determine my leanness.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

11. I compare the leanness or definition of my chest muscle with others.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

12. I compare the size of my chest muscles with others.

›plemental Information
sorders

ng Behaviors

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

13. I compare the broadness of my shoulder with others.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

14. I flex my chest muscles in the mirror to find lines or striation in the muscle.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

15. I flex my muscles when looking in the mirror to find lines or striation in the muscle.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

16. I take measurements of my muscle with a tape measure.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

17. I push the fat around or pull my skin back to accentuate the muscles underneath.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

18. I will check the size and shape of my muscles in most reflective surfaces (e.g., car windows, shopping store windows, mirrors, etc.).

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

19. I pinch or grab my muscles to check their size and density.

1	2	3	4	5
Never	Sometimes	Often	Very Often	Always

Appendix G. Shape and Weight Inventory for Males

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*	*Always*
1	*2*	*3*	*4*	*5*	*6*

1.) Have you been worried that you are too skinny or will become too skinny?
123456

2.) Have you worried about having love handles?
123456

3.) Has thinking about your shape made you feel insecure?
123456

4.) Have you worried that others would comment negatively on your body shape?
123456

5.) Do you feel self-conscious about your body shape when around women?
123456

6.) Have you felt excessively small and skinny?
123456

7.) Have you avoided situations where people could see your body (e.g., communal changing rooms or swimming pools)?
123456

8.) Have you worked out or lifted weights before social events or activities that would make your shape visible?
123456

9.) Do you worry about not having enough muscle tone?
123456

10.)Have you avoided certain activities because of concerns about yourbody size/shape?
123456

11.)Have you worried excessively about what women might think aboutyour shape?
123456

12.)Have you been concerned that your arms are too skinny?
123456

Never	***Rarely***	***Sometimes***	***Often***	***Very Often***	***Always***
1	***2***	***3***	***4***	***5***	***6***

13.)When around physically fit men, do you feel self-conscious about yourshape?
123456

14.)Have you been afraid that you might become fat (or fatter)?
123456

15.)Have you been so worried about your shape that you have been feelingthat you ought to take nutritional supplements (e.g., proteinshakes)?
123456

16.)Do you avoid short sleeves or tank tops because you worry that yourarms are too skinny?
123456

17.)Have you avoided initiating relationships because of your concernsaboutyour body shape?
123456

18.)Have you taken over-the-counter supplements in order to feel betterabout your shape or to help change your shape?

123456

19.)Have you avoided swimwear because you are afraid of how your shapemight appear?

123456

20.)Have you thought that your legs, chest, or arms are too small or notmuscular enough?

123456

21.)Do you ever take anything like caffeine or ephedra to enhance yourworkout?

123456

22.)Has a being naked, such as when taking a shower, made you feelunhappy about your shape?

123456

23.)Have you not gone out to social occasions (e.g., parties) because youhave felt bad about your shape?

123456

Never	***Rarely***	***Sometimes***	***Often***	***Very Often***	***Always***
1	***2***	***3***	***4***	***5***	***6***

24.)Have you noticed the shape of other men and felt that your own shapecompared unfavorably?

123456

25.)Have you avoided wearing shorts because you are afraid that yourlegsare too skinny?

123456

26.)Has thinking about your shape interfered with your ability toconcentrate (e.g., while watching TV, reading, listening toconversations)?

123456

27.)Has being around larger men made you feel small and skinny?

123456

28.)Have you felt sad or depressed when you are unhappy with your bodyshape?

123456

29.)Have you ever exercised or lifted weights excessively in an attempt tofeel better about your body or change your body?
123456

30.)Have you ever used protein powder to improve your body shape orweight?
123456

31.)Have you worried about other people seeing rolls of flesh around yourwaist or stomach?
123456

32.)Have you felt ashamed of your body?
123456

33.)Have you thought that your stomach or waist is too large for the restof you?
123456

34.)Has worry about your shape made you exercise or lift weights?
123456

Never	*Rarely*	*Sometimes*	*Often*	*Very Often*	*Always*
1	*2*	*3*	*4*	*5*	*6*

35.)Do you worry excessively about the need to put on weight?
123456

36.)Has seeing your reflection (e.g., in a mirror or shop window) madeyoufeel bad about your shape?
123456

37.)Have you been particularly self-conscious about your shape when inthe company of other people?
123456

38.)Do you ever wear two or more shirts to make your chest or torso lookbigger?
123456

39.)Have you avoided romantic relationships or sex because of concernsabout your shape?

123456

Appendix H. Exercise Dependence Questionnaire

Below are a series of statements that people have used to describe their attitudes to exercise. Please rate each of the statements by circling the appropriate number for how much it describes your attitude to your own exercise over the past month. Please use the following scale:

	Strongly Disagree						Strongly Agree
	1	2	3	4	5	6	7
1/ My level of exercising makes me tired at work	1	2	3	4	5	6	7
2/ After an exercise session I feel happier about life	1	2	3	4	5	6	7
3/ If I cannot exercise I feel irritable	1	2	3	4	5	6	7
4/ The rest of my life has to fit in around my exercise	1	2	3	4	5	6	7
5/ After an exercise session I feel less anxious	1	2	3	4	5	6	7
6/ I exercise to look attractive	1	2	3	4	5	6	7
7/ I sometimes miss time at work to exercise	1	2	3	4	5	6	7
8/ After an exercise session I feel that I am a better person	1	2	3	4	5	6	7
9/ If I cannot exercise I feel agitated	1	2	3	4	5	6	7
10/ I exercise to meet other people	1	2	3	4	5	6	7
11/ I hate not being able to exercise	1	2	3	4	5	6	7
12/ I exercise to keep me occupied	1	2	3	4	5	6	7
13/ If I cannot exercise I feel I cannot cope with life	1	2	3	4	5	6	7
14/ I exercise to control my weight	1	2	3	4	5	6	7
15/ I have little energy for my partner, family and friends	1	2	3	4	5	6	7
16/ Being thin is the most important thing in my life	1	2	3	4	5	6	7
17/ I feel guilty about the amount I exercise	1	2	3	4	5	6	7
18/ I exercise to be healthy	1	2	3	4	5	6	7
19/ After an exercise session I feel thinner	1	2	3	4	5	6	7
20/ My level of exercise has become a problem	1	2	3	4	5	6	7
21/ I make a decision to exercise less but cannot stick to it	1	2	3	4	5	6	7
22/ I exercise for the same amount of time each week	1	2	3	4	5	6	7
23/ After an exercise session I feel more positive about myself	1	2	3	4	5	6	7
24/ My weekly pattern of exercise is repetitive	1	2	3	4	5	6	7
25/ My pattern of exercise interferes with my social life	1	2	3	4	5	6	7
26/ I exercise to feel fit	1	2	3	4	5	6	7
27/ My exercising is ruining my life	1	2	3	4	5	6	7
28/ I exercise to prevent heart disease and other illnesses	1	2	3	4	5	6	7
29/ If I cannot exercise I miss the social life	1	2	3	4	5	6	7

Appendix I. Obligatory Exercise Questionnaire

1 – NEVER 2 – SOMETIMES 3 – USUALLY 4 – ALWAYS

1. I engage in physical exercise on a daily basis. 1 2 3 4
2. I engage in one/more of the following forms of exercise: walking, jogging/running or weightlifting. 1 2 3 4
3. I exercise more than three days per week. 1 2 3 4
4. When I don't exercise I feel guilty. 1 2 3 4
5. I sometimes feel like I don't want to exercise, but I go ahead and push myself anyway. 1 2 3 4
6. My best friend likes to exercise. 1 2 3 4
7. When I miss an exercise session, I feel concerned about my body possibly getting out of shape. 1 2 3 4
8. If I have planned to exercise at a particular time and something unexpected comes up (like an old friend comes to visit or I have some work to do that needs immediate attention) I will usually skip my exercise for that day. 1 2 3 4

9. If I miss a planned workout, I attempt to make up for it the next day. 1 2 3 4

10. I may miss a day of exercise for no good reason. 1 2 3 4

11. Sometimes, I feel a need to exercise twice in one day, even though I may feel a little tired. 1 2 3 4

12. If I feel I have overeaten, I will try to make up for it by increasing the amount I exercise. 1 2 3 4

13. When I miss a scheduled exercise session I may feel tense, irritable or depressed. 1 2 3 4

14. Sometimes, I find that my mind wanders to thoughts about exercising. 1 2 3 4

15. I have had daydreams about exercising. 1 2 3 4

16. I keep a record of my exercise performance, such as how long I work out, how far or fast I run. 1 2 3 4

17. I have experienced a feeling of euphoria or a "high" during or after an exercise session. 1 2 3 4

18. I frequently "push myself to the limits." 1 2 3 4

19. I have exercised when advised against such activity (i.e. by a doctor, friend, etc.) 1 2 3 4

20. I will engage in other forms of exercise if I am unable to engage in my usual form of exercise. 1 2 3 4

Appendix J. Sport Commitment Questionnaire-2

Items	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Somewhat agree
1. Playing this sport is fun.	1	2	3	4	5
2. I have spent a lot of time in this sport.	1	2	3	4	5
3. Other things in my life make it difficult to play this sport.	1	2	3	4	5
4. I try to dominate in this sport.	1	2	3	4	5
5. In this sport, I am constantly trying to improve my skills.	1	2	3	4	5
6. The mental effort I have put into this sport makes it difficult to stop playing.	1	2	3	4	5
7. Staying in this sport is more of a necessity than a desire.	1	2	3	4	5
8. There are future events in this sport that I would really miss experiencing if I no longer played.	1	2	3	4	5
9. I am being pulled away from this sport by other things in my life.	1	2	3	4	5
10. The physical effort I have put into this sport makes it difficult to stop playing.	1	2	3	4	5
11. I like playing this sport.	1	2	3	4	5
12. I am dedicated to keep playing this sport.	1	2	3	4	5
13. Once I attain a goal in this sport, I challenge myself to continue improving.	1	2	3	4	5
14. I would really miss the travel experiences I have if I no longer played this sport.	1	2	3	4	5
15. People would be upset if I didn't keep playing this sport because they have invested so much.	1	2	3	4	5
16. In this sport, I strive for the perfect performance.	1	2	3	4	5
17. In this sport, I have put in a lot of training.	1	2	3	4	5
18. People would be disappointed if I didn't keep playing this sport.	1	2	3	4	5
19. I have a mentor who provides guidance in this sport.	1	2	3	4	5
20. People who are important to me attend the majority of my competitions in this sport.	1	2	3	4	5
21. I feel trapped in this sport.	1	2	3	4	5
22. People who are important to me are there for me after I perform poorly in this sport.	1	2	3	4	5
23. The time I have spent in this sport makes it difficult to stop playing.	1	2	3	4	5
24. I constantly try to learn from my mistakes in this sport.	1	2	3	4	5
25. When things get tough in this sport, people who are important to me provide comfort.	1	2	3	4	5
26. It is almost impossible to play this sport because of other things in my life.	1	2	3	4	5
27. People who are important to me teach me the strategies of this sport.	1	2	3	4	5
28. I love to play this sport.	1	2	3	4	5
29 In this sport, I strive to be better than my opponents.	1	2	3	4	5
30. I would really miss the things I learn in this sport if I didn't play.	1	2	3	4	5
31. I am willing to overcome any obstacle to keep playing this sport.	1	2	3	4	5
32. Although I think about quitting this sport, I feel I must keep playing.	1	2	3	4	5
33. I push myself to win every time I compete in this sport.	1	2	3	4	5
34. I have put a great deal of mental effort into this sport.	1	2	3	4	5
35. People who are important to me teach me about the mental side of this sport.	1	2	3	4	5
36. There are other things in my life that limit my participation in this sport.	1	2	3	4	5
37. Because people who are important to me also play this sport, it is assumed that I will keep playing.	1	2	3	4	5
38. In this sport, I strive to improve every aspect of my performance.	1	2	3	4	5
39. I feel I am forced to keep playing this sport.	1	2	3	4	5
40. Other things in my life compete with playing this sport.	1	2	3	4	5
41. I push myself to reach my full potential in this sport.	1	2	3	4	5
42. It is difficult to stop playing because of the personal discipline I have maintained in this sport.	1	2	3	4	5
43. I feel I have to keep playing this sport, even though I don't want to.	1	2	3	4	5

44. To improve in this sport, I push myself to achieve the goals that I have set.	1	2	3	4	5
45. Playing this sport is very pleasurable.	1	2	3	4	5
46. I am determined to keep playing this sport.	1	2	3	4	5
47. In this sport, I challenge myself to be better than everyone else.	1	2	3	4	5
48. I have put a great deal of physical effort into this sport.	1	2	3	4	5
49. I am very attached to this sport.	1	2	3	4	5
50. I would really miss the competition in this sport if I no longer played.	1	2	3	4	5
51. When I compete in this sport, people who are important to me cheer me on.	1	2	3	4	5
52. People who are important to me expect me to keep playing this sport.	1	2	3	4	5
53. I will continue to play this sport for as long as I can.	1	2	3	4	5
54. People give me trustworthy advice about this sport.	1	2	3	4	5
55. Playing this sport makes me happy.	1	2	3	4	5
56. It is difficult to stop playing because of the training I have put into this sport. In this sport,	1	2	3	4	5
57. In this sport, people provide useful instruction to improve my performance.	1	2	3	4	5
58. I am willing to do almost anything to keep playing this sport.	1	2	3	4	5

Appendix K. Figures Preferences in Men

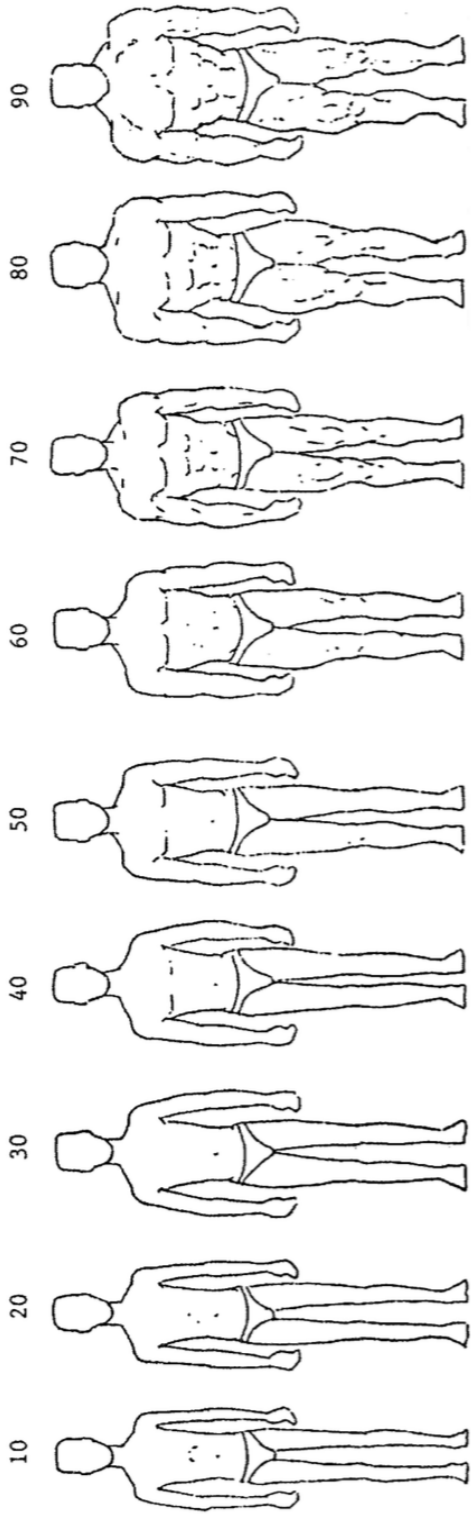

Fig. 1. Male figure drawings used in the experiment which vary in muscle mass. Figures were originally used in Winitch (1993) and drawn by Barbara Alexander.

Appendix L. Human Subjects IRB Approval

To:
Danae Hudson
Psychology
Brooke Whisenhunt

RE: Notice of IRB Approval
Submission Type: Initial
Study #: IRB-FY2016-293
Study Title: Body Image Disturbance Among Competitive Bodybuilders, Recreational Bodybuilders, and Athletic Controls
Decision: Approved

Approval Date: Jan 8, 2017
Expiration Date: Jan 7, 2018

This submission has been approved by the Missouri State University Institutional Review Board (IRB) for the period indicated.