Predictive Factors of Muscle Dysmorphia, Intent to Use Steroids, and Non-Intuitive Eating in

Male Recreational Weightlifters

by

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Abstract

Muscle Dysmorphia (MD) is a pathological disorder that arises from men's extreme desire for the socially valued, "perfect" male physique and most often appears in male bodybuilders and weightlifters. Predictive factors for this disorder include body dissatisfaction, physical perfectionism, steroid use, and restrictive eating behaviors. Gender-role norms and media images contribute to the development of MD symptoms, with some researchers theorizing that women's social and economic achievements produce "gender-role strain" on some men, who then feel the need to engage in hypermasculine behaviors (such as extreme muscle building) to counteract such strain. Thus, sexist attitudes also may predict MD symptoms. 182 male recreational weightlifters were recruited from Powerhouse Gyms in the Detroit Metro area to fill out a survey assessing: 1) four components of MD, 2) body dissatisfaction, 3) physical perfectionism, 4) intent to use steroids, 5) restrictive eating behaviors, 6) hours spent working out in the gym, and 7) sexist attitudes. A series of multiple linear regression analyses demonstrated that steroid-use intent significantly predicted three components of MD symptoms. As expected, body dissatisfaction, physical perfectionism, and hours spent working out were also significant predictors of MD components. However, restrictive eating was not a significant predictor. These findings suggest that MD is more similar to obsessive-compulsive disorder than to eating disorders. In addition, sexist attitudes significantly predicted the MD component of Bodybuilding Dependence, thus lending support to the "gender-role strain theory" of MD.

Chapter 1

Introduction

Muscle dysmorphia (MD) is a disorder that currently appears in the Diagnostic and Statistical Manual version 5 (DSM-5) as a sub-type of Body Dysmorphic Disorder (BDD) under the Obsessive Compulsive umbrella. MD primarily affects male bodybuilders, with prevalence rates within the bodybuilding community as high as 10% (Pope, Phillips, & Olivardia, 2000). It has been suggested that this disorder arises from an extreme desire for the socially valued, "perfect" male physique (Pope, Gruber, Choi, Olivardia, & Phillips, 1997). Men with MD are overall displeased with their body (Choi, Pope, & Olivardia, 2002), believing that they are smaller and less muscular than they are in reality; thus, there are large differences between their actual body muscularity and their ideal muscularity.

Despite being the most at-risk group, MD is not a disorder exclusive to male bodybuilders. MD is a prevalent disorder for which predictive factors are found throughout the male population. When comparing male weightlifters to male college students, research has found that MD traits such as body dissatisfaction, disordered eating, and drive to become more muscular were found in both sample populations (Davey & Bishop, 2006). In exploratory studies, MD symptoms have also been found in other samples of male college students (Walker et al., 2009). MD does not have a list of specific diagnostic requirements for one to exhibit for a diagnosis to be assigned. It is currently grouped with BDD, whose primary features involve people believing and reporting "seeing" specific physical features more remarkably different

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how they are in reality. Significant clinical distress and/or impairment in the individual's life also accompanies their beliefs. However, men with MD experience much more negative psychopathology than men with BDD including more suicidal ideation and substance abuse (Pope, C., Pope, H., Menard, Fay, Olivardia, & Phillips, 2005).

Pope, Gruber, Choi, Olivardia, and Phillips (1997) suggested that the diagnostic criteria for MD should include the following: (1) the preoccupation individuals have with their body believing they are not lean or muscular enough; (2) clinical significant distress that leads to impairment in social, occupational, or overall functioning; and (3) behavior focused on the held idea that one is inadequately small, accompanied by a fear of being fat. This diagnostic proposal offered a set of symptoms one needs to have in order to meet diagnosis.

Other attempts to conceptualize MD as a disorder have been proposed by Lantz, Rhea, and Cornelius (2002) and Grieve (2007). Lantz et al. (2002) categorized six characteristics of the disorder, which fell into two distinct groups. These groups were 1) nutrition concerns (e.g., drug use, supplement use, dieting behaviors) and 2) physique concerns (e.g., physique protection, exercise dependence, body symmetry concerns). Lantz et al.'s theory (2002) focused on the characteristics related to the disorder as identified by previous research. Grieve's (2007) model of MD also drew on previous research to help understand this disorder. He suggested that social-environmental, emotional, psychological, and physical variables explain MD. First, social-environmental factors in his model are media influences and participation in a sport where significant muscle size and strength are emphasized (e.g., football). Emotional factors include various forms of negative affect, such as guilt, contempt, and anger. Psychological factors include body dissatisfaction, ideal-body internalization, perfectionism, self-esteem, and body perception distortion. Finally, the physical factor identified by Grieve (2007) is individuals' body

 mass. Grieve (2007) also noted that of these factors, body dissatisfaction, body distortion, and internalization were the three most important variables, in that the interaction of these three variables is what produces susceptibility to MD. Grieve's model suggests that the combination of these categories (social-environmental, emotional, psychological, and physical) of symptoms put men at risk for developing MD.

Although currently within the BDD diagnostic category, researchers investigating MD have tried to decipher just where in the DSM-5 this disorder belongs. Maida and Armstrong (2005) assessed how the symptoms of MD correlate with other clinical disorders. Their research showed that MD symptomology presents less like a Somatoform Disorder, but rather mirrors an Obsessive-Compulsive Disorder and Body Dysmorphic Disorder (Maida & Armstrong, 2005). This combined categorization is due to individuals' preoccupation with their own body, along with behaviors that may look like compulsive behaviors (e.g., excessive weight lifting and mirror checking). Twin studies also indicate that genetic influences and environment factors could both possibly play a role in muscle dissatisfaction, which is a key component of MD (Raevuori, Keski-Rahkonen, Bulik, Rose, Rissanen & Kaprio, 2006). Predictive factors of MD are what may make establishing diagnostic criteria so difficult. Men with MD hold a strong belief that they are too small and much less muscular than they are in reality. This body distortion highly resembles BDD. It has even been found that the greater the difference between perceived and actual size, the more MD symptoms men report (Moyers, 2005). The belief that one is too small is also involved in the construct labeled Drive for Muscularity, which can be defined as the desire to increase muscle size while holding the belief one is not muscular enough (Olivardia et al., 2004; Smolak & Stein, 2006). While this closely resembles BDD in terms of body distortion aspects, men with MD have been shown to have more significant psychopathology. Men with

MD, in comparison to men with BDD, are more likely to have previous suicide attempts, have a poorer quality of life, and engage in more illicit substance use (Pope et al., 2005).

Other characteristics further confuse the phenomenology of MD and the importance of these clinical features cannot be overlooked. While research has shown that MD appears to be a sub-type of BDD, other symptoms mimic those of OCD. Maida and Armstrong (2005) assert that MD belongs on the OCD spectrum, with BDD and body-dissatisfaction serving as mediating variables. MD characteristics, such as obsessive thoughts about muscularity, compulsive body-checking, need for peer affirmation, and excessive exercise, support the relationship between MD and OCD (Maida & Armstrong, 2005). These symptoms, however, do not encompass the whole clinical presentation of MD. It cannot be overlooked that MD shares similar features with eating disorders, such as clinical perfectionism, mood intolerance, and low self-esteem (Murray et al., 2013). The pathological eating and exercise behaviors found in MD also mirror symptoms of eating disorder symptomology (Murray et al., 2012).

Theoretical Background

As is evident, Muscle Dysmorphia is an illusive disorder that has researchers and clinicians seeking answers as to how to conceptualize it. Experts have not yet agreed upon an official disorder spectrum in which MD should reside. This may be due to different theoretical orientations attempting to conceptualize MD differently. It is apparent that MD is a disorder that goes beyond simple diagnostic symptoms and is deeply entrenched in social, cultural, and psychological theory. Therefore, a review of the theoretical literature is necessary in order to provide possible explanations for the etiology and maintenance of MD.

Sociocultural theory. Sociocultural theory (Vygotsky, 1993, see Newman, 1993) suggests that media images (as well as numerous other social and cultural factors)

influence the societal expectations people adhere to. Cultural expectations for how people should look, act, and behave establish norms that members of a society operate under. Within these norms are where social learning and psychological development take place (Wertsch, 2009; Vygotsky, 1993). For example, beauty standards for Westernized cultures have taught members of these cultures that to be happy, they should be thin (if female) or muscular (if male), and if they do not have these physiques, they should strive to have them (Tiggemann, 2011; Silverstein, Perdue, Peterson, & Kelly, 1986). When these ideals are internalized by an individual, body dissatisfaction can result (Pritchard, & Cramblitt, 2014). Societal expectations and beauty standards in media have been identified as part of eating disorder etiology in women (Keel & Klump, 2003). Anderson and DiDomenico (1992) have noted that women are exposed to up to ten times more media messages involving thinness ideals than are men. These differences in exposure rates may explain the gender difference in the prevalence of eating disorder diagnoses (Jones & Morgan, 2010).

While media influences have been identified as a risk factor for disordered eating in females (due to a focus on excessive thinness), males are not immune to such sociocultural influences (Culbert, Racine, & Klump, 2015).   The media pressure men to adhere to muscular body-image ideals, which are sometimes related to body-image concerns/disorders and abnormal eating (Hausenblas, Campbell, Menzel, Doughty, Levine, & Thompson, 2013). Research on eating disorders in different societies over past centuries has posed the idea that eating disorders, such as anorexia nervosa and bulimia nervosa, may be culture-bound syndromes, in that prevalence rates for these disorders have increased in cultures or societies that hold beauty and physical appearance in high regard. These cultures tend to be those civilizations with heritage, social norms, and values with European origin or association.

"Westernized cultures," therefore, refer to nations marked by European influence such as the United States, Canada, Australia, and Europe itself.

Anorexia nervosa and bulimia nervosa both require body-shape concerns and weight concerns as part of their diagnostic criteria (American Psychiatric Association, 2013). As Westernized norms for beauty have become established, people in these societies have compared their physical features to these norms more and more. Therefore, body-shape and weight concerns for cosmetic reasons may have developed in response to media pressures of beauty. Sociocultural influences have been shown to predict body dissatisfaction and concerns about physique improvement in adolescents of both genders (Ricciardelli & McCabe, 2004)

Recently, research regarding media influences has paid increased attention to messages about muscularity and their relation to male gender norms. The muscular male body idealized in Western media and societies is a "cross-over image," for it appeals to heterosexual males, heterosexual females, and homosexual males alike (Pope et al., 2000). The male body has received increased attention in television, movies, and advertisements (Pope et al., 2000). These media messages suggest that men should be muscular, yet lean, powerful, and strong (Leit, Gray, & Pope, 2002; White & Gillett, 1994). A review of thousands of magazine advertisements from 1950 to 2000 featuring men and women revealed that men are as objectified as women (Mager & Helgeson, 2010). Groth (2012) even points to the fetishism of the male body, specifically the arms ("guns"), chest ("pecs") and abdomen ("six pack").

Regardless of gender, it is difficult for individuals in Western societies to ignore media images. Men and women both report an onslaught of media messages that invade their everyday lives (Shields, 2013). Media messages serve as a strong form of gender-role socialization. "Gender media monitoring" has been defined as "the practice of analyzing how gender is

represented and enacted throughout various media content" such as news, advertisements, and

fictional portrayals (Amason, 2012, p.146). As children mature, their gender identity is created

through observations of sociocultural elements and other individuals, and through categorizing

behaviors as either male or female (Amason, 2012). Children then generally behave in

accordance with the cultural expectations congruent with their biological sex (Amason, 2012).

Media messages, therefore, provide social teaching and have perpetuated stereotypes for both

genders (Pohl, 2012). Women are usually either displayed as sexual objects for judgment or

placed in the home raising children and seen as passive, nurturing, and repressed; both

demeaning roles (Silverman, 2012). Men, on the other hand, are most often displayed as

aggressive, dominant, and insensitive (Silverman, 2012). These media messages are then

replayed constantly and consistently with culturally based gender stereotypes, thus providing a

paradigm for gender-roles that now is interpreted as natural and real (Amason, 2012; Goffman,

1976).

   With current media messages most often featuring a fully muscular, lean male body, a

new male gender norm may be developing. When it comes to media portrayals of the male body,

White and Gillett (1994) have identified two media effects that may have a detrimental impact

on men. One, these media images normalize the desirability of a muscular physique. The media

asserts that striving and desiring to look like the man on the poster is normal. The second effect

is that these media influences perpetuate the myth that an overly muscular male

physique is natural and biologically obtainable (White & Gillett, 1994). Previous research on

these media influences has found them to be predictive of MD symptoms and eating disorders

(Dryer, Farr, Hiramatsu, & Quinton, 2016). American society places great importance on

physicality and appearance. Sociocultural theory helps us to understand MD as a possible

culture-bound disorder that has increased in prevalence due to the increase in muscularity-focused male images. This theory suggests that as media messages change, people will seek affirmation and conform to them.

Social comparison theory. Social comparison theory (Festinger, 1954) suggests that people tend to compare themselves to others, whether in-person or via the media. This comparison leads to internalization of ideals, investment in one's appearance, and dissatisfaction when unrealistic goals are not met (Tiggemann, 2011). Specific characteristics that are important to the individual, such as physical attractiveness, may receive more social comparison (Festinger, 1954). Because beauty and status are becoming more emphasized in the media, more comparison may take place. Repeated and frequent exposure to these media messages about beauty creates reference points for people to compare themselves to (Tiggemann, 2011). However, it is when men and women repeatedly compare their bodies to media images that more distress tends to occur (Grabe, Ward, & Hyde, 2008; Olivardia, 2001). For example, men might evaluate themselves as not measuring up to the extremely muscular model on a poster or the action movie hero; therefore, what may come next are attempts at minimizing this gap they perceive between their own body and the body they idolize. This, then, may lead to the development of MD in some men.

Gender-role strain theory. Theories involving gender-roles may help explain why men sometimes develop MD. Traditional constructs of masculinity and femininity are not the same across cultures (Murray & Touyz, 2012). In Westernized cultures the media perpetuate body-image profiles related to these gender-role constructs. The muscular male physique frequently portrayed in Western media emphasizes traditional masculinity through muscle size and strength, a profile many men do not match up to, leaving them insecure (Pope et al., 2000; Swami &

Voracek, 2013). White and Gillett (1994) argue that the insecurities men perceive are what drive them to conform more to these gender norms and ideas of being muscular. According to White and Gillett (1994), these insecurities are what motivate may men to go to the gym in the first place (White & Gillett, 1994).

Gender-role Strain Theory is a theory by Pleck (1981) that states that negative consequences follow those who violate traditional gender-role norms. In order to understand gender-role strain, it is essential to understand what traditional male gender-roles are. Levant (1992) has identified seven traditional male-role norms that define the masculine male in Westernized cultures. These seven norms are: (1) avoidance of femininity, (2) restrictive emotionality, (3) achievement and status seeking, (4) self-reliance, (5) aggression, (6) homophobia, and (7) non-relational attitudes towards sexuality (Levant, 1992). It is these seven aspects of masculinity that men must adhere to lest they experience gender-role strain (Pleck,1981).

The Gender-role Strain Paradigm acknowledges the biological sex differences between males and females, but suggests that gender is a social construct that is fluid in nature (Pleck, 1981). Concepts of masculinity and femininity have no biological underpinning and therefore are heavily influenced by psychological, social, and cultural factors (Pleck, 1981; Levant, 2011). Interestingly, Pleck (1981) pointed out that the number who violate traditional gender norms is greater than the number that adhere to them. Pleck (1981) postulated that psychological stress and condemnation follow those who violate norms; therefore, gender-roles may serve as a dysfunction in society. When violation of norms occurs, people may engage in over-conformity (Pleck, 1981). For example, according to this theory, a man may act out aggressively in order to compensate for the psychological strain he experiences when he actually violates or believes he

is violating traditional gender norms. In this theory, stereotypes and norms are perpetuated by the very individuals who endorse them. Men therefore perpetuate the norm that, in turn, causes them harm. When the societal expectations creates the norm that men should be muscular, those men who do not initially adhere may overcompensate. It has been found in research that the more men endorse traditional masculine gender-roles, the more body-image concerns and body dissatisfaction they have (Murray, Rieger, Karlov, & Touyz, 2013; Murray & Touyz, 2012). So for these men, the perpetuation of unrealistic norms may help, explain how men develop MD.

It has been suggested that the increases in women's achievements in the past half-century are imposing a threat to traditional gender-roles (Pope et al., 2000). According to Pope et al. (2000), as women continue to minimize the power gap between men and women, some men are becoming more challenged to adhere to their socially prescribed norms. Thus, these men find it harder and harder to distinguish themselves as powerful, strong, and self-reliant individuals with commendable achievements. Interestingly, however, Pope et al. (2000) have pointed out that significant feminist milestones have co-occurred with significant changes in the media images representing male bodies. One example is the court ruling of Roe v. Wade upholding women's abortion rights debuted the same year as Playgirl magazine in 1978. Another is that, Harvard University became coeducational in 1977, And the following year the Chippendales male performers debuted. A final example is that in 1982 the all-female band the Go-Go's hit #1 on the billboard charts the same year that movie blockbuster hits Rambo and Conan the Barbarian premiered (staring Sylvester Stallone and Arnold Schwarzenegger, respectively). According to Pope et al.'s (2000) theory, media images are emphasizing the male physique in response to women becoming more accomplished. Similarly, Gagnon (1974) claimed that the desired male physique is a symbolic construct, which serves as a response to advances made by women.

Therefore, it is co-occurrence of increased media attention on the muscular male body and gains in women's societal achievements may be more than a coincidence.

Synthesis of theoretical perspectives. Synthesizing all the previously discussed theories may help explain why MD is such a puzzling disorder. With women's achievements threatening the male gender-role as the dominant one, men may seek out ways to uphold their dominance. According to the previously discussed gender-role theories, men are strongly socialized to strive to meet expected, traditional gender norms. However, with women's achievements (as well as gender fluidity) now threatening these norms, gender-role strain can occur, resulting in overcompensation by some men, who compensate for this perceived threat through overt expressions of masculinity. The embodiment of a developed muscular body is the canvas on which this overcompensation reaction can be observed (Pope et al., 2000). According to these gender-role theories, muscularity and strength are now the remaining aspects in which women cannot compete with men; therefore, men threatened by changing gender-roles work on gaining muscle and strength in attempts to reclaim their dominant role.

Gender-role strain theory and sociocultural theory explain how traditional gender-roles perpetuate the sociocultural norm that muscle size is a symbol traditional dominant masculinity (White & Gillett, 1994). Media images in Western societies, which generally depict large, muscular, male bodies, give men a yardstick to compare themselves to. Media do not just show a muscular body, however; they show a muscular male physique that represents traditional male gender norms of power and dominance (White & Gillett, 1994). These images perpetuate the masculine gender norms that most men violate, because typical men do not look like the men in the media. The resulting violation (perceived or actual) may lead to insecurities, psychological distress, and overcompensation.

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For some men the pursuit of the muscular male physique may initially be disguised as a normal, healthy activity. However, when psychological distress causes a male to adapt unhealthy preoccupations, problems occur. All of this research and theoretical speculation motivated Pope, Phillips, and Olivardia (2000) to create the theory they call *The Adonis Complex*. They suggested that aspects of media internalization, threat of gender-roles, and genetic predisposition all point to the clinical characteristics of MD. They asserted that MD is not a disorder that exclusively affects bodybuilders; rather, all men are susceptible. The activity of weightlifting for health reasons is not what creates the problem, they assert. However, when simple healthy behaviors lead to psychological distress, family and friends should take notice. Going to the gym and eating healthily may turn into restrictive eating, anabolic-androgenic steroid use, and significant impairment to social functioning.

Summary

The aforementioned theories help illustrate how MD is developed and maintained. Sociocultural theory explains the importance of media messages and how MD may be a disorder arising from changes in cultural norms. Social comparison theory suggests that men compare their bodies to these norms and desire to emulate this muscular ideal of traditional masculinity (Alperstein, 2012). As discussed previously, this physique may be seen as unobtainable, leading to them becoming dissatisfied and depressed in regard to their own bodies (Alperstein, 2012). It is this dissatisfaction and depression that may develop into MD in some men.

Gender-roles are one component of cultural norms and these roles, according to gender-role strain theory (Pleck, 1981), may contribute to MD. According to this theory (Pleck, 1981), the increase in women's achievements over the past half century have challenged traditional

gender-roles, thereby invalidating traditional male hegemony (White & Gillett, 1994) and fueling men's drive for hypermasculinity.

Many theories discussed here offer some explanations as to why men in Westernized cultures MD has proven to be a difficult disorder to clinically conceptualize due to its unique symptomology and elusive etiology.

Muscle Dysmorphia: Predictive Factors and Research Findings

Several predictive factors have been identified as related to MD symptoms. Gender-role attitudes, body image, self-esteem, steroid use, restrictive eating, and perfectionism help us to understand the different components of this form of BDD.

Gender-role attitudes and MD. When men with traditional gender-role attitudes perceive their gender role as being threatened, psychological distress may occur (Pleck, 1981). In reaction to this threat, these men may focus on traditional masculinity as expressed through muscularity, power, and status (Pleck, 1981; White & Gillett, 1995). Previous research on MD symptomology has given insight into the relationship between MD and gender-role attitudes. Men who experience MD symptoms often follow more masculine gender norms (Murray, Riger, Karlov, & Touyz, 2013). Additionally, the more men endorse these masculine norms, the more dissatisfied there are with their bodies and the more they may work to achieve the societal standard of a muscular physique (Frederick, Buchanan, Sadehgi-Azar, Peplau, Haselton, Berezovskaya, & Lipinski, 2007; Kimmel & Mahalik, 2004; Steinfeldt, Gilchrist, Halterman, Gomory, & Steinfeldt, 2011). Drive for muscularity, a key symptom of MD, has also been shown to positively correlate with conformity to traditional gender norms (Gattario, Frisen, Fuller-Tyszkiewicz, Ricciardelli, Diedrichs, & Yager, 2015).

Negative issues, however, may occur when an individual adheres too closely to these gender norms, such as anti-feminist attitudes, sexual harassment, and the objectification of women. Research has shown that men who endorse more traditional gender-role norms are more likely to harbor negative attitudes towards women's equality and positive attitudes towards sexual harassment of women (Wade & Brittan-Powell, 2001). The objectification of women (i.e., viewing women as objects for aesthetic judgment) has also been identified as a strong predictor of men's drive for muscularity (Swami & Voracek, 2013). Men who seek to build muscle look down on women and see them as aesthetic objects for evaluation and judgment. This may be a result of the degree of objectification they view within themselves, for more self-objectification has been related to MD symptoms and gender-role conflict in men (Grieve & Helmick, 2008).

Body image, self-esteem, and MD. Pressures men feel to achieve a certain look may lead to significant declines in self-esteem and body-image satisfaction. Body image has been defined as one's beliefs, attitudes, behaviors, and perceptions related to one's own body (Cash & Pruzinsky, 1990; Grogan, 2008; Thompson & Hienburg, 1999). A person can perceive body-image pressures from many sources, both external (e.g., media, peers) and internal (e.g., negative self-concept).

When individuals have a negative body image, they engage in critical evaluation of themselves, such as paying more attention to their perceived flaws. These evaluations involve appraisals and beliefs that may lead to dissatisfaction with their body shape (Cash & Pruzinksy, 2002; Muth & Cash, 1997). When dissatisfaction occurs, people may develop investment in their appearance and behave in ways that maintain or improve how they look. Such measures for improvement or maintenance may include exercising or modifying one's diet (Ozimok, Lamarche, & Gammage, 2015).

It is when these behaviors and investment become an obsession that psychopathology may develop. This is the key diagnostic feature of Body Dysmorphic Disorder: People perceive a specific aspect of their body to be flawed, become distressed, and fixate on that one feature (American Psychiatric Association, 2013). This fixation becomes an obsession that may lead to depression or erroneous measures to "fix" their flaws. In men with MD, their muscle size becomes the thing they are insecure about and become invested in changing. The more muscle these men gain, the more invested in exercise they may become. A cycle then occurs: being dissatisfied, seeing improvements, becoming more invested, and then being dissatisfied all over again. Men with MD never become satisfied, because the more improvements they see, the more invested they become (Choi, Pope, & Olivardia, 2002; Grieve, 2007). With the media portrayal of the "muscular ideal" developing over the years to become more and more muscular, men's body image dissatisfaction is worsening (Pope et al., 2000). Feelings of never achieving their goal may be what motivate men to push their limits and do more risky things, like extreme dieting and using illicit steroids (Tod & Lavallee, 2010). In men, greater investment in body image has been identified as a significant predictor of restrictive eating, as well (Ozimok, Lamarche, & Gammage, 2015). Bodybuilders also report significantly greater body dissatisfaction when compared to competitive sport athletes and college students (Loosemore & Moriarty, 1990). Therefore, greater body dissatisfaction can be found in men who participate in sports where physical appearance is related to success, rather than physical abilities.

Body dissatisfaction and self-esteem seem to go hand-in-hand. Associations between low self-esteem and body dissatisfaction have been researched across ages, genders, ethnicities, and socioeconomic statuses. The association between body dissatisfaction and low self-esteem seems to be strong and persistent over time across many demographics (van den Berg, Mond,

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Eisenberg, Ackard, & Neumark-Sztainer, 2010). Both low self-esteem and body dissatisfaction have been proposed as influencing individuals to start weight-lifting to improve their physique (Lantz, Rhea, & Mayhew, 2001, see Muller et al., 2004; Smith, Hale, Rhea, Olrich, & Collier, 2009). Perceived muscle size has been found to be a predictive factor of self-esteem in men with MD (Olivardia et al., 2004). Other scholars suggest that for some of these men, their self-esteem may be reliant upon how big they are (Olivardia, 2001).

Steroids and MD. Muscle Dysmorphia is highly correlated with androgenic-anabolic steroid (AAS) use. AASs are illicit drugs that are often administered orally or through needle injection. While several different forms exist, they are often used to promote muscle growth and increase muscular endurance. Doses are often administered in "cycles" ranging anywhere from 4 to 12 weeks. An AAS-using bodybuilder would have to consistently take AASs for a period of time and then "cycle off" to combat harmful side effects (Evans, 1997). Many users "stack" several different strains of AASs at one time to obtain optimal effectiveness (Wright, Grogan, & Hunter, 2000). While some AASs have been used to increase athletic ability, a large number of men use AASs to enhance their physical appearance (Wright, Grogan, & Hunter, 2000). It is because of this that AASs have been labeled a "body image drug" (Kanayama, Pope, & Hudson, 2001). Body image drugs are drugs used to incrementally improve a person's appearance rather than get any immediate gratification or "high" (Kanayama, Hudson, & Pope, 2009). Because AASs are a body image drug, they therefore do not follow conventional theories of drug abuse (Rohman, 2009). With AASs, there is no immediate reaction by the limbic system so there is no pleasurable physiological reaction to reinforce use. Repeated AAS use may be encouraged by the stress of negative body image or when visible increases in muscle mass appear (Rohman, 2009; Hildebrant, Langenbucher, San Juan & Park, 2006).

For purposes of muscle growth, AASs are often used in conjunction with high-volume training and a high-protein diet (Evans, 1997). Global estimates of lifetime prevalence rates for male AAS users are at 6.4% (Sagoe, Molde, Andreassen, Torsheim, & Pallesen, 2014). The Centers for Disease Control (2009) found that 3.4% of male, high school 12th-graders in the United States reported using AASs in the past year. Previous research regarding international demographics of frequent AAS users report the majority (88.5%) of users are of Caucasian/White ethnicity (Cohen, Collins, Darkes, & Gwartney, 2007).   Why an individual, may begin to use AAS is important to understand. For example, in in-depth interviews, many bodybuilders report being frustrated with their lack of noticeable improvements in the gym (for both strength and size) and with being surpassed by individuals who already use AASs (Olrich & Ewing, 1999). These factors may motivate individuals to initially experiment with AASs.

While it is well known that AASs are dangerous, it seems as though many people are unaware of or unaffected by these risks. For instance, bodybuilders have been shown to hold beliefs that AASs are not harmful in moderation and that those who criticize AAS use are "ignorant" (Wright, Grogan, & Hunter, 2000). Favorable symptoms, such as muscle growth and strength, are usually endorsed and may be what motivate an individual to repeatedly use AASs (Olrich & Ewing, 1999). For example, many bodybuilders report increases in muscle mass, more positive peer recognition, and increases in strength and sexual performance after using AASs (Olrich & Ewing, 1999), and those who have used AASs long-term have reported favorable experiences and minimal side effects (Olrich & Ewing, 1999). Because harmful side effects are under-reported, people are more inclined to believe these drugs are safe and therefore may develop more liberal attitudes about AAS. These liberal attitudes have been identified as a risk factor for AAS use (Hildebrandt, Harty, & Langenbucher, 2012). Bodybuilders, when compared

to runners and martial artists, have been shown to have more liberal attitudes toward and a greater reported use of AASs (Blouin & Goldfield, 1995). Bodybuilders who use fat-burning and muscle-building supplements also tend to have more positive beliefs about AAS use and safety (Hildebrandt et al., 2012).

There are many harmful side effects of continued AAS use. Adverse effects may include acne, hypertension, and testicular atrophy (Hildebrandt et al., 2006). Repeated AAS use may lead to more AAS dependency. More dependency has been related to higher doses, more "cycles," and more body dissatisfaction (Brower et al., 1991). Bodybuilders may become dependent on AASs for several reasons. It has been proposed that the desired body shape these men strive for is not feasible without the use of AAS (Pope et al., 2000). The look that men perceive as natural and realistic, with bulging muscles and minimal body fat, may not be achievable with exercise and diet alone. As men go through cycle after cycle and become "heavy users," the more they are at risk for these harmful symptoms and health risks (Hildebrandt et al., 2006; Kanayama, Barry, Hudson, & Pope, 2006).

Many comparative studies between AAS-using bodybuilders and individuals with anorexia nervosa have been conducted. It has been proposed that bodybuilders' fixation on AAS resembles the fixation on diuretic use that individuals with anorexia have (Joubert & Melluish, 2016). Other similarities between the groups have also been identified. Preoccupation with food and restrictive eating are the most significant (Pope, Katz, & Hudson, 1993). Excessive exercise, body dissatisfaction, and low self-esteem are also similar traits (Blouin & Goldfield, 1995; Joubert & Melluish, 2016; Kanayama et al., 2006). Other risk factors identified for AAS use include endorsement of traditional male gender-roles, other illicit drug use, and perfectionism (Hildebrandt et al., 2012; Kanayama et al., 2006).

Restrictive eating and MD. MD was originally coined "reverse anorexia" in its early

days of identification, as it shares many factors found in other eating disorder diagnoses (Stice,

Telch, & Rizivi, 2000). The Transdiagnostic Model for eating disorders suggests that all eating

disorders share similar core factors (Fairburn, Cooper, Shafran, 2003). This model is used as a

theory to explain why individuals with eating disorder pathology seem to shift from one

diagnostic category to another and appear to transition between diagnoses (Fairburn, Cooper, &

Shafran, 2003). These shared factors between eating disorders include 1) a fixation on food and

eating, 2) efforts at weight and shape control, and 3) body dissatisfaction. Research has identified

several other predictive factors in research that serve to maintain and mediate the course of an

eating disorder's diagnosis. Clinical factors identified have been perfectionism (as a personality

trait), low baseline self-esteem, mood intolerance, and interpersonal difficulties (Bardone-Cone,

Wonderlich, Frost, Bulik, Mitchell, Uppala, & Simonich, 2007; Fairburn et al., 2003; Fairburn,

2008).

Despite the fact that the majority of eating disorder research has been conducted on

women, in recent decades men with eating disorders have been receiving more attention. In

terms of prevalence, it has been suggested that the female-to-male ratio may be up to 3:1

diagnoses for eating disorders (Eisenberg, Nicklett, Roeder, & Kirz, 2011). Lifetime prevalence

rates for men with anorexia nervosa and bulimia nervosa are at .3% and .5% accounting for 25%

individuals diagnosed with both disorders (Hudson, Hiripi, Pope, & Kessler, 2007). Eating

disorder development in men has been found to occur as early as young teens (13-15 years) or

early adulthood (18-20 years) (Andersen, Bartlett, Morgan, & Brownell,1995; Olivardia, Pope,

Mangweth, & Hudson, 1995). Predictive factors for eating disorders in men are both similar and

different to factors identified in women. Research on both genders has identified low self-esteem

 and body image importance as related to restrictive eating patterns (Brechan & Kvalem, 2015). So, regardless of gender, individuals with a low self-esteem who place value on their physical appearance may be susceptible to developing an eating disorder. In men, however, a higher BMI has shown to be a significant predictor of restrictive eating in men (Ozimok, Kamarche, & Cammage, 2015). Similar to findings on satisfaction, the internalization of traditional male gender-roles is also related to restrictive eating patterns in men (Giffiths, Murray, Touyz, 2013). This actually is in contrast to previous findings, which suggested that endorsement of traditional male gender-roles may serve as a protective factor against eating disorder development (Lakkis, Ricciardelli, & Williams, 1999). In male college students restrictive eating was also found to be related to substance use, exercise dependency, and muscle-related body image concerns (Chittester & Hausenblas, 2009).

Although there is significant morbidity between characteristics of individuals who demonstrate MD and individuals with eating disorders, harmful systematic dieting behaviors differ between these two clinical populations (Cafri, Thmpson, Ricciardelli, MacCabe, Smolak, & Yesalis, 2005). Research previously has focused on women and how their dieting practices for thinness present. It is important to recognize that there are likely alternative behaviors observed in men who do not seek thinness, but instead wish to put on muscle (Cafri et al., 2005; Mangweth, Pope, Kimmler, Ebenbichler, Hausmann, De Col, Kreutner, Kinzl, & Biebl, 2001). Bodybuilders often use a combination of strategies for losing weight and gaining weight (Ricciardelli & McCabe, 2004). Many bodybuilders go through alternating phases of diet control called the "cutting" and "bulking" phases (Petrocelli, Oberweis, & Petrocelli, 2008). In the "cutting" phase, dietary restrictions for fat loss include meticulous diet monitoring, excessive cardiovascular exercise (running or biking as opposed to weight-lifting), and supplement use

(Probert & Leberman, 2009). Other extreme dieting behaviors include fasting, dehydration, and diuretic use (Andersen et al., 1995). Oftentimes, the goal of weight loss is to reduce one's body fat percentage as much as possible while still retaining muscle gains (Helms, Aragon, & Fitschen, 2014). This results in the defined muscular look that is often portrayed in media, which is the look these men are striving to achieve. It is a look that is big, yet still lean.

However, bodybuilders in the "bulking" phase may have diets that look very different. When in the "bulking" phase, men will increase their caloric intake and change their supplement use for the purpose of gaining muscle (Petrocelli, Oberweis, & Petrocelli, 2008). The caloric surplus is coupled with intense weight training and minimal cardiovascular exercise so that the excess calories will go to building muscle. Body fat percentage does increase during this phase. The food intake in this stage will also look very different, where more unhealthy or "unclean" foods will be used to increase calories. Bodybuilders utilize these phases to attempt to put on as much muscle as possible, so they then have more muscle mass to "cut" down to when the cycles end. The goal is for each cycle to put on significant size through each "bulking" phase, then reap the positive benefits of being lean and muscular when they are done "cutting." This never-ending cycle can lead to years of dissatisfaction, psychological strain, and fixation on their food intake (Mangweth et al., 2001).

Bodybuilders, overall, have been shown to have greater fixations on dieting and their weight in comparison to athletic and nonathletic males (Franco, Tamburrino, Carroll, & Bernal, 1988). This excessive fixation on dieting is related to anxiety problems that reach clinical significance among bodybuilders (Gruber & Pope, 1998). Competitive bodybuilders engage in even stricter methods of weight control that look like a pathological eating disorder, suggesting that these individuals may be at a heightened risk for developing an eating disorder (Goldfield,

Harper, Blouin, 2007). Food intake concerns may also impede a bodybuilder's social functioning. Bodybuilders may not attend social or occupational functions for fear of not being able to precisely monitor food intake. They may feel required to stick to their diet plan and not attend any functions in which their food regimen is challenged (Probert & Leberman, 2009).

Perfectionism and MD. Clinical perfectionism is a personality trait in which individuals hold unrealistic, pathologically high standards for themselves (Shafran, Cooper, & Fairburn, 2002). General perfectionism is the disposition where high personal standards of performance affect various life domains (Frost, Marten, Lahart, & Rosenblate, 1990). Many different components make up what we traditionally understand as "perfectionism" and it has therefore been conceptualized as a multidimensional characteristic rather than a single unitary construct (Frost et al., 1990; Hewitt & Flett, 1991).

Three broad components of perfectionism. When examining the intrapersonal components of this trait, Hewitt and Flett (1991) have identified three dimensions of perfectionism. The three dimensions they proposed are self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism. Differences between these domains reflect the target of perfectionism behavior (self or other) and to whom the perfectionism is attributed (socially-prescribed). Differences in behavior patterns do not separate these domains, but Hewitt and Flett (1991) believed that each dimension plays an important role in general perfectionism behavior.

The first domain is self-oriented perfectionism, which can be understood as the self-directed behaviors and high standards one requires for oneself (Hewitt & Flett, 1991). This dimension also involves the harsh critical evaluation of one's own behavior, the motivation to attain perfection, and failure avoidance (Hewitt & Flett, 1991). Self-oriented perfectionism is

reflected in Slade and Owens's (1998) dual-model of perfectionism. In their model, perfectionism is separated into behaviors that are either approach-oriented or avoidant-oriented in nature (Slade & Owens, 1998). These behaviors are related to self-oriented perfectionism for they involve the pursuit of perfection (approach-oriented) or avoidance of failure (avoidant-oriented) (Hewitt & Flett, 1991; Slade & Owens, 1998).

The second domain of perfectionism identified by Hewitt and Flett (1991) is other-oriented perfectionism. Other-oriented perfectionism is reflected through interpersonal behavior, where one has high, unrealistic standards for other people. Someone with other-oriented perfectionism traits is more likely to expect perfection from other people and evaluate their performance (Hewitt & Flett, 1991). Whereas self-oriented perfectionism involves self-criticism and evaluation, other-oriented perfectionism involves more blame, distrust, and hostility towards others (Hewitt & Flett, 1991).

The final domain of perfectionism Hewitt and Flett (1991) identified was socially-prescribed perfectionism. This dimension of perfectionism involves perceived levels of perfectionism that one may feel from external sources. Socially-prescribed perfectionism involves concerns to meet standards set by outside sources (such as significant others) and stringent evaluation when expectations are not met (Hewitt & Flett, 1991). These imposed standards are perceived as excessive and uncontrollable and therefore contribute to negative emotions (such as depression or anxiety) (Hewitt & Flett, 1991). All three dimensions contribute to psychopathology uniquely. In research, self and socially-prescribed perfectionism have been shown to predict eating disorder symptoms and MD symptoms (Sherry, Hewitt, Besser, McGee, & Flett, 2004; Murray et al., 2012). In both of these disorders, there is a major focus on physical appearance.

Physical perfectionism. Physical perfectionism is a subdomain of self-oriented perfectionism (Hewitt & Flett, 1991) in which a person has unrealistic standards for their physical appearance and strives to achieve the perfect body. Yang and Stoeber (2012) have created a model to further understand personal differences related to physical perfectionism. In their model, physical perfectionism involves Hope for Perfectionism and Worry about Perfectionism components (Yang & Stoeber, 2012). Hope for Perfectionism involves the positive strivings for perfection and positive self-perceptions, whereas Worry about Perfectionism involves body-image concerns and the avoidance of failure (Yang & Stoeber, 2012). These two components may be understood in the context of the aforementioned approach and avoidant-oriented perfectionism model by Slade and Owens (1998). Hope for Perfection is reflective of approach-oriented perfectionism, involving personal pursuit of excellence, satisfaction of self, and success (Slade & Owens, 1998; Yang & Stoeber, 2012). Worry about Perfection, however, mimics avoidance-oriented perfectionism, which involves dissatisfaction, concern over failures, and disapproval of self (Slade & Owens, 1998; Yang & Stoeber, 2012).

Perfectionism has mostly been studied in women, but theories as to how perfectionism applies to men suggest that traditional gender-roles may contribute. Messages of masculinity identified by Harris (1995) convey the concept of being "the best you can" in order to receive respect from peers (Gurney, 1987). This concept of status and achievement seeking is also identified in Levant's (1992) idea of traditional male gender-role norms. A relationship between the upholding of traditional male gender-role norms and perfectionism has been identified in boys as young as age 15 (Adams & Goovender, 2008). Greater levels of perfectionism have also been identified in groups identified at risk of developing MD.

Competitive bodybuilders display higher levels of perfectionism when compared to runners and martial artists (Blouin & Goldfield, 1994). The perfectionism that bodybuilders exhibit may be due to the fact that in comparison to non-aesthetic sports, physical appearance as a means of measuring achievement is critically scrutinized.

The Present Study

The purpose of this study was to examine the previously discussed predictive factors of MD symptoms in a non-clinical, community sample of male recreational weightlifters. In addition, we investigated the predictors of intent to use steroids and non-intuitive eating behaviors. We investigated the following hypotheses:

Hypothesis 1: Based on the previously discussed theory and research, we hypothesized that lower self-esteem, more non-intuitive eating, more dieting behaviors, higher physical perfectionism, greater body fat and muscularity dissatisfaction, more sexist attitudes, and greater steroid-use intent will all be predictive of MD symptoms.

Hypothesis 2: Also based on the aforementioned theory and research, we predicted that lower self-esteem, higher physical perfectionism, greater body fat and muscularity dissatisfaction, higher MD symptomatology, White ethnicity, higher BMI, and more sexist attitudes would predict Intent to Use Steroids.

In addition to these two hypotheses, a study aim was to do an exploratory analysis of factors that may predict non-intuitive eating patterns. Intuitive Eating is a relatively new concept that is currently gaining research traction in the eating disorder research community. We hoped to see how this concept relates to MD. Due to the diagnostic criteria debate of MD, we hoped to investigate the argument of MD being classified as a possible eating disorder. Predictive factors related to MD and MD symptoms were used in this exploratory

analysis. We hoped to understand how demographic variables, hours per week spent lifting

weights, BMI, self-esteem, dieting behaviors, physical perfectionism, MD symptoms, body fat

and muscularity dissatisfaction, steroid-use intent, and sexist attitudes may predict non-intuitive

eating.

Chapter II

Method

Participants

A sample of 182 adult male recreational weightlifters was recruited to participate in this study. All participants were current gym membership holders and at least 18 years old. Participants' ages ranged from 18 to 56 years ($M = 27.18$, $SD = 9.05$). Their Body Mass Index (BMI) ranged from 19.93 to 47.84 ($M = 29.17$, $SD = 4.92$). Of the sample population, 53.5% identified as Caucasian, 14.1% as African American, 14.1% as Hispanic or Latino, 11.4% as Arab American, 3.8% as Multiethnic, 1.6% as Asian American, and 1.6% as Native American. In terms of political affiliation, 38.6% had no political affiliation, 28.3% reported Democrat Party affiliation, 19.0% identified as having Republican Party affiliation, 7.1% reported Independent Party affiliation, 3.3% had a Libertarian Party affiliation, 2.2% reported Other affiliation, 1.1% reported Constitution Party affiliation, and .5% reported Green Party affiliation. Religious affiliation varied, with 39.1% Catholic, 29.7% Other, 8.2% Protestant Christian, 7.6% Evangelical Christian, 6.5% Muslim, 2.7% Jewish, and 1.1% not providing religious affiliation. Religious affiliation was not collected for 10 participants due to researcher error. Degree of religiosity ranged from 0 to 7 with an average of 3.07 ($SD = 1.81$).

Over forty-two (42.4%) percent of the sample reported having received some college education while not currently holding a degree, 25.0% received a high school diploma or GED, 12.5 % had an Associate's Degree, 10.3% had a Bachelor's Degree, 4.9% held graduate level or

Professional Degree, 3.8% completed part of a high school education, and 1.1% did not indicate

their level of education

Measures

      Muscle dysmorphia. To assess Muscle Dysmorphia symptomology in the participants,

the Muscle Appearance Satisfaction Scale (Mayville, Williamson, White, Netemeyer, & Drab,

2002) was used. This scale contains 19 items and participants responded using a 4-point Likert

scale ranging from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*). The scale consists of five

subscales: Bodybuilding Dependence (5 items), Injury (3 items), Substance Use (4 items), Body

Checking (4 items), and Body Satisfaction (2 items). The Bodybuilding Dependence subscale

reflects excessive dedication and a behavioral compulsion to exercise with weights. Items from

this subscale include "If my schedule forces me to miss a day of working out with weights, I feel

very upset" and "To get big, one must ignore a lot of pain." The second subscale, labeled Injury,

measures symptoms of over-training and unsafe exercising habits. Items from this subscale

include statements such as "I often ignore a lot of physical pain when I am lifting to get bigger."

The third subscale, which measures Substance Use, measures a potential desire to use anabolic

steroids or other muscle-building supplements. An example item from this subscale is "It is OK

to use steroids to add muscle mass." The fourth subscale, Body Checking, measures reassurance-

seeking behaviors in relation to one's musculature. An example statement from this subscale is

"I often spend a lot of time looking at my muscles in the mirror." Finally, the fifth subscale,

Satisfaction, which measures self-satisfaction with one's body and muscle size, includes

statements such as "I am satisfied with my muscle tone/definition." One item on this subscale

was removed, specifically "I am satisfied with the size of my muscles," due to repeated

questions on other scales mimicking similar wording. Higher scores on each subscale indicate a greater degree of MD behavior.

Mayville et al. (2002) reported internal consistencies (Cronbach's alpha coefficients) above .70 for the overall scale as well as for each individual subscale. Within the current study, adequate to strong internal consistency was found for Bodybuilding Dependence (α = .62), Body Checking coefficients (α = .74), Satisfaction coefficients (α = .70), and Satisfaction (α = .72).

Sexist attitudes. To measure sexist attitudes, we used the modified version of the Sex-Role Attitude Measure (Mason, Denison, & Schacht, 1974), titled the Gender-Role Attitudinal Inventory (Renzetti, 1987). The original scale, developed by Mason et al. (1974), assessed attitudes about sex roles in various institutional areas such as the political system and the labor force. For her modified measure, The Gender-Role Attitudinal Inventory, Renzetti (1987) pulled only items that assessed gender discrimination or support of the women's movement.

Participants responded on this measure using a 4-point Likert-type scale, ranging from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*). The measure contains 24 items, with 9 reverse-coded items and 4 subscales. These subscales are: Traditional Attitudes Towards Gender-roles (8 items), Feminist Attitudes Toward Gender-roles (5 items), Awareness Of Gender Inequality (4 items), and Attitudes Toward the Women's Movement (7 items). Sample statements include "For a woman to be truly happy, she needs to have a man in her life" and "I consider myself to be a feminist." Low scores on this measure indicate conservative and non-feminist attitudes towards gender-roles. Internal consistency for the current study was calculated for Traditional Attitude Towards Gender-roles (α = .75), Feminist Attitudes Toward Gender-roles (α = .39), Awareness Of Gender Inequality (α = .20), and Attitudes Toward the Women's Movement (α = .43). Due to

 the generally poor internal consistencies, we performed a factor analysis on this measure (see

Results section).

Intent to use steroids. To assess participants' knowledge about steroid use and their

intent to use steroids, we used the 5-item Intention to Use Anabolic-Androgenic Steroids

measure (Parent & Moradi, 2011). This scale was developed to evaluate a men's propensity to

use anabolic-androgenic steroids. For each statement, participants responded on an 8-point scale

that ranged from 0 (*Very Untrue*) to 7 (*Very True*), with higher scores indicating greater intent to

use anabolic steroids. Sample statements from this scale include "I have looked up information

on how to obtain steroids" and "I have talked with people who use steroids about getting or using

steroids." Test developers, Parent and Moradi (2011) found high internal consistency for this

measure and, for the current sample, Cronbach's alpha coefficient was .94.

Perfectionism. To assess concerns participants have about their physical appearance, as

well as their perfectionistic cognitive patterns, we used the Physical Appearance Perfectionism

Scale (Yang & Stoeber, 2012), which contains 12 items and has two subscales: a 7-item Worry

About Imperfection subscale and a 5-item Hope For Perfection subscale. To indicate their level

of agreement with each statement, participants use a 5-point Likert scale ranging from 1

(*Strongly Disagree*) to 5 (*Strongly Agree*). Higher scores on the Worry About Imperfection

subscale and lower scores on the Hope For Perfection subscale both indicate a negative

perception of oneself and more perfectionism traits. An example item from the Worry About

Imperfection subscale is "I worry that my appearance is not good enough" and an example item

from the Hope For Perfection subscale is "I hope my body shape is perfect." Test developers

found high internal reliability as demonstrated by appropriate alpha coefficients and high test-

retest reliability (Yang & Stoeber, 2012). For the current sample, the Worry About Imperfection and the Hope For Perfection both had strong internal consistency ($\alpha = .85$, $\alpha = .79$, respectively).

Self-esteem. To measure self-esteem, we used the Rosenberg Self-Esteem Scale (Rosenberg, 1965), which contains 10 items. Participants responded using a 4-point Likert-type scale, ranging from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*).   Five items were reverse coded, so that higher scores on the overall scale indicate higher self-esteem. According to Rosenberg (1965), one-week test-retest was strong and the scale showed high internal consistency ($\alpha = .88$). Statements include "at times, I think I am no good at all" and "I take a positive attitude toward myself." For the current sample, the Cronbach's alpha coefficient was .54.

Body attitudes. Participants' dissatisfaction with their body fat and muscularity was assessed through the Male Body Attitudes Scale (Tylka, Bergeron, & Schwartz, 2005). The measure contains 24 items with three subscales. The two subscales used in the current study were Body Fat Dissatisfaction (11 items) and Body Muscularity Dissatisfaction (11 items). "I think my body should be leaner" and "I think my chest should be broader" are examples of items on each subscale, respectively. The third subscale (Height Dissatisfaction) was not used in the current study because of the items pertaining to height. Although previous research has shown that height satisfaction is related to males' overall body concerns, its relationships to males' self-perceptions of body shape and muscularity are not robust (Tylka et al., 2005); therefore, the subscale about height was not relevant for the current study. After dropping this subscale, 22 items remained, with three items reverse-coded. Responses to each statement were given on a 6-point scale ranging from 1 (*Never*) to 6 (*Always*). Higher scores on both scales indicate more dissatisfaction. Reliability tests conducted by the test developers showed high internal consistency for the overall scale as well as each subscale (Tylka, Bergeron, & Schwartz, 2005).

Test-retest reliability was also high for the overall scale and subscales within a two-week period. For the current sample, the Cronbach's alpha coefficient for Body Fat Dissatisfaction and Body Muscularity Dissatisfaction were .92 and .88, respectively.

Eating behaviors. To measure participants' eating behaviors, we used two measures. The first was the Dieting Behaviors Scale (Blodgett, Gondoli, Corning, McEnery, & Grundy, 2007), which contains 7 items and measures how much participants alter their dietary intake. Dieting behaviors are described as socially acceptable means of regulating caloric intake and restrictive behaviors participants may engage in. Responses to each statement were given on a 6-point scale, ranging from 0 (*Never*) to 5 (*Always*). Sample items include questions such as "have you skipped meals?" and "have you exercised more to lose weight?" Higher scores indicate more engagement in dieting behaviors. Research on reliability showed high one-year test-retest reliability and an overall high internal consistency. The internal consistency of the measure for the current sample was adequate ($\alpha = .78$).

The second scale we used to measure eating behaviors was the Intuitive Eating Scale-2 (Tylka & Kroon Van Diest, 2013). This measure assesses individuals' ability to tap into their physical hunger and satiety cues and beliefs about food consumption. The Intuitive Eating Scale-2 is a 23-item scale with 6 reverse-coded items and consists of four subscales: Unconditional Permission to Eat (6 items), Eating For Physical Rather Than Emotional Reasons (8 items), Reliance on Hunger and Satiety Cues (6 items), and Body-Food Choice Congruence (3 items). To indicate level of agreement with each statement, participants used a 5-point Likert scale, ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Higher scores indicate more restrictive eating and less engagement in intuitive eating behaviors.

Items in the subscale titled Unconditional Permission to Eat ask participants about their eating behaviors and emotions related to how much they allow or restrict certain foods. An example item from this subscale is "if I am craving a certain food, I allow myself to have it." The items in the subscale Eating For Physical Rather Than Emotional Reasons ask about participants' behavior of relying on physical cues versus using food for emotional coping. An example item is "I use food to help me soothe my negative emotions." The subscale items in Reliance on Hunger and Satiety Cues ask participants to consider whether or not they rely on and trust their body regarding how much and when to eat. Reliance on these cues would be indicative of using internal cues such as hunger and fullness rather than external cues such as time. An example item from this scale is "I trust my body to tell me when to eat." Items in the last subscale, named Body-Food Choice Congruence, ask participants about their consumption behaviors concerning the nutritional quality and energy efficiency of food. A sample item from this subscale would be "most of the time, I desire to eat nutritious foods." Adequate to strong internal consistency was found for Unconditional Permission to Eat ($\alpha = .75$), Eating For Physical Rather Than Emotional Reasons ($\alpha = .82$), Reliance on Hunger and Satiety Cues ($\alpha = .83$), and Body-Food Choice Congruence ($\alpha = .82$).

Demographics

Participant demographics were also assessed. Questions used a combination of open-ended and forced-choice format. To indicate their age (in years), participants filled in a blank. To learn about their ethnicity, participants were asked: "Which of the following best describes your race/ethnicity? (Please circle one response.)" The list for this included African American, Arab American, Asian American, Caucasian, Hispanic/Latino, Multiethnic, Native American, and Pacific Islander. Participants also had the option of open-ended response where they could

identify as "Other" with a blank to respond what ethnicity they identified with. Participants who circled more than one response were recoded as Multiethnic.

Participants were also requested to report their political affiliation and were asked: "Which of the following best describes your political affiliation? (Please circle one answer.)" The list for this included Constitution Party, Democrat, Green Party, Independent, Libertarian, Republican, and No affiliation. Participants also had the option of open-ended response where they could identify as "Other" with a blank to respond what political affiliation they identified with.

A forced-choice response was used to access participants' current level of education. Participants were asked: "Which of the following best describes your level of education? (Please circle one answer.)" They chose from list of six options including "Some high school (no degree)," "High school diploma or GED," "Some college (but no degree)," "Associate's degree," "Bachelor's degree," and "Graduate or professional degree. "

Religious affiliation was also requested of the participants. Participants were asked, "What is your religious affiliation?" The list of response options included Buddhist, Catholic, Evangelical, Christian, Hindu, Jewish, Muslim, and Protestant Christian. Participants also had the option of open-ended response where they could identify as "Other" with a blank to respond what their religious affiliation was.

Participants were asked to indicate their level of religiosity on a 7-point scale, ranging from 1 (*Not Religious At All*) to 7 (*Highly Religious*). Specifically, they responded to the following statement: "On the following scale, please circle the number best corresponding to how religious you are." Participants were also asked to report the following demographics by open-ended response: current height in feet and inches, current weight in pounds, average

number of times per week they lifted weights, and average number of hours per week they lifted

weights. Self-reported height and weight was later used to determine each participant's Body

Mass Index (BMI) for data analysis.

Procedure

Gym locations were contacted via a mailed letter of interest (on university letterhead)

prior to data collection express interest of facility and resource use. This letter included an

introduction of the PI, an explanation of the topic and goals of the research, and information that

the PI would be visiting the facility for a face-to-face meeting. Two weeks after mailing the

letters, the PI visited or called each gym personally to follow up with each possible data

collection site and meet with facility managers. Of the seven gyms to which a letter was mailed,

two received a follow-up telephone call rather than an in-person meeting (due to their distant

location). The PI traveled to the other five locations and requested to speak with a facility

manager. Of seven contacted gym locations, personnel from two gyms agreed to allow on-site

data collection. Both managers and the single owner of two Powerhouse Gym franchise locations

agreed to participate with data collection. The gym managers provided written, signed agreement

regarding the use of their facilities for data collection purposes.

All data collection sessions were conducted by the same Caucasian, female, graduate

researcher (the PI). The PI greeted potential participants near the gym entrance upon their

leaving and entering the gym. Potential participants were approached and asked if they were

interested in participating in the study. At both gyms, the PI was stationed at the front check-in

desk away from gym equipment and the members using equipment. The PI pre-screened

potential participants by asking their age to ensure appropriate consent could be granted.

Participants 18 years of age or older who were willing to participate were given an informed

consent document that was approved by the university's Institutional Review Board (IRB). Participants were instructed to read the IRB-approved informed consent document. Due to the sensitive nature of the study, a waiver of signed consent was utilized in this study to avoid identifying participants.

All participants filled out the demographics measure first, followed by the Rosenberg Self-Esteem Scale (Rosenberg, 1965). In addition, for all participants the final scale in the questionnaire packets was the Gender-Role Attitudinal Inventory (Renzetti, 1987). Demographic questions and the Rosenberg Self-Esteem Scale were chosen to be first in the questionnaire packet because both measures include easy questions and would likely not create defensiveness in the participants. Demographics were also assessed at the beginning of the survey so that participants would be less likely to skip them (as they may have if these questions were asked at the end of the relatively lengthy survey). While research has shown that introducing demographics at the start of a survey may introduce stereotype threat, introducing demographics first has also shown to increase the response rate for such items (Spencer, Logel, & Davies, 2016). The Rosenberg Self-Esteem Scale was presented to all participants after the demographic items because it is a brief, unambiguous scale. It also introduced the Likert scale format used in most of the subsequent measures, thereby creating familiarity with that response format. The scales that remained were the Dieting Behaviors Scale, Intuitive Eating Scale, Intent To Use Anabolic Steroids Scale, Male Body Attitudes Scale, Physical Perfection Scale, and the Muscle Appearance Satisfaction Scale. These six scales, due to their related nature of exercising, muscularity, and dieting behaviors, were grouped in the middle of the questionnaire packet and their order was determined by a random number generator. A random order was used to eliminate the chance of order effects. The Gender-Role Attitudinal Inventory was selected to be

last in the questionnaire packet due to its sensitive, controversial nature. By presenting it last, we were able to control for possible carry-over effects.

After reading the consent form, participants provided the PI with oral consent to signify their understanding of their rights. Participants were then led to a private location within the gym to complete the questionnaire anonymously. Participants either sat at a provided table and chair setup or stood a 20-foot-long counter-top workspace. This counter-top was at the front of the gym check-in counter, away from the public and any outside interference. Anywhere from one to five participants filled out questionnaires at a time. The number of participants per day ranged from 3 to 15, and questionnaires took an average of 20 minutes to complete. No more than three people completed a questionnaire at one time in order to provide ample space for privacy. Participants were placed apart from one another and were asked not to interact with each another while filling out the questionnaire. Once they were finished, participants returned the filled-out questionnaire to the PI, who placed it in a box with the PI's data collection materials located behind the gym counter. They were then thanked and given a $10 MasterCard gift card as compensation for their time.

Chapter III

Results

Preliminary Analyses

Preliminary Analyses of the data were conducted prior to main data analyses. This Preliminary Analyses included cleaning of the data, identifying outliers, and marking where data was absent. Due to missing data on some participants, exactly 32 participants were dropped from the data analyses. Additionally, statistical outliers were identified through a stem-and-leaf plot. These outliers were removed from the analyses and then re-included once it was established that they had not significant effect on the results.

Descriptive analyses. Descriptive statistics (means and standard deviations) that were calculated for all variables included in this study are presented in Table 1 and Table 2. As can be seen in this table, the mean age for participants was 27.17 ($SD = 9.06$), indicating a relatively young sample. Interestingly, the mean number of hours spent per week lifting weights for participants was almost 9 hours per week. The mean score for Dieting Behaviors was below the midpoint (i.e., 3.5 of a maximum 7.0), whereas the mean score on the Intuitive Eating Scale was above the midpoint (i.e., 2.5 of a maximum 5). Table 1 also demonstrates that a whole point difference separates mean scores on Worry About Perfectionism and Hope for Perfectionism subscales.

Intercorrelations between variables. In order to discover the interrelationships between all variables used in the study, we next conducted bivariate correlation analyses. Table 3 shows that age was significantly negatively correlated with hours spent in the gym,

Body-Checking Behaviors, and Muscle Dissatisfaction. Dieting Behaviors were negatively correlated with Unconditional Permissions to Eat, Eating for Physical Reasons, and Reliance on Hunger Cues. Additionally, Dieting Behaviors were positively correlated to Body Fat Dissatisfaction, Muscularity Dissatisfaction, Worry About Perfectionism, and Hope for Perfection. Additionally, more Bodybuilding Dependence was significantly and positively correlated with Body-Checking Behaviors, Substance Use, and Intent To Use Steroids. Body Fat Dissatisfaction was positively correlated with age, hours per week spent in the gym, Dieting Behaviors, and Bodybuilding Dependence. Table 2 also shows that Worry About Perfectionism and Hope for Perfection were both positively correlated to Body Fat Dissatisfaction. Sexism was negatively correlated to BMI and Eating for Physical Reasons.

Factor analysis. Due to the low internal consistencies for the Gender-Role Attitudinal Inventory, further analyses were conducted in order to identify usable factors for analyses. To explore the factor structure of the Gender-Role Attitudinal Inventory (Renzetti, 1987) in our sample of bodybuilders and weightlifters from the Detroit metro area, we conducted a principal axis factor analysis, which is an appropriate method for discovering superordinate domains. Because of the expectation of correlated factors, we used a Promax rotation with Kaiser normalization (Gorsuch, 1997). The significant Bartlett's test of sphericity ($X^2 = 923.38$, df = 276, p = .0001) and the size of the Kaiser-Meyer-Olkin measure of sampling adequacy (.73) indicated that the correlation matrix was factorable and the sample size was sufficient (Tabachnick & Fidell, 2001). We determined the number of factors to extract from the rotated pattern matrix by using eigenvalues greater than 1.0 and consulting the scree plot (Cattell, 1966). To be part of a factor, items had to have a loading of at least .40 and not load equally or higher on other factors.

Using the aforementioned criteria, we extracted seven factors (11 iterations required) that explained 56.69% of the variance (see Table 3). Factor 1 (l = 4.40, accounting for 18.31% of the variance) included 7 items. This factor, labeled Sexism, included items 6, 12, 21, 2, 5, 17, and 20 and was not consistent with any of Renzetti's (1987) subscales on the Gender-Role Attitudinal Inventory. Each of the remaining six factors contained only one or two items, which indicates that they are weak and unstable factors (Costello & Osborne, 2005). Therefore, we could not use these factors in our analyses. The second (l = 2.22) and third factors (l = 1.71), which each contained two items, accounted for 9.23% and 7.11% of the variance, respectively. Additionally, the third factor (l = 1.61, accounting for 6.70% of the variance) contained only two items. The remaining factors, the fifth (l = 1.35), sixth (l = 1.27), and seventh (l = 1.06), contained only one item each. These three factors accounted for 5.61%, 5.30%, and 4.43% of the variance, respectively. In addition, several items did not load sufficiently on any of the factors. These were items 1, 3, 4, 9, 14, 16, 20, and 24. In sum, for our statistical analyses we could only use one factor extracted from the exploratory factor analysis.

Predictors of Muscle Dysmorphia

Four linear regression analyses were conducted to investigate factors predicting participants' muscle dysmorphia symptoms (i.e., their responses on the Muscle Appearance Satisfaction Scale). Each subscale of the Muscle Appearance Satisfaction Scale was used as an outcome variable. Therefore, the outcome variables for our regression analyses were Bodybuilding Dependence, Body Checking, Body Satisfaction, and Substance Use. The exact same predictor variables were used in each of the four regression analyses. Predictor variables were the following: age, hours per week lifting weights, BMI, self-esteem, Intent to Use

Steroids, Dieting Behaviors, Worry about Perfectionism, Hope for Perfectionism, Unconditional

Eating, Eating for Physical Reasons, Reliance on Hunger Cues, Body-Food Choice Congruence,

Body Fat Dissatisfaction, Muscularity Dissatisfaction, and Sexism. For Bodybuilding

Dependence behavior, the overall model was significant and explained 26% of the

variance, $F(15, 164) = 5.23$, $p = .0001$. As Table 4 demonstrates, the more hours per week the

participants spent time lifting weights, the more of a dependence on bodybuilding behaviors they

had, $t(179) = 3.54$, $p = .001$. In addition, higher dependence on bodybuilding behaviors was

significantly related to an increase in the Intent to Use Steroids, $t(179) = 4.87$, $p = .0001$. More

sexist beliefs were also significantly related to a greater dependence of bodybuilding

behaviors, $t(179) = 2.39$, $p = .018$.

In terms of Body-Checking Behaviors, the overall model was significant and explained

17% of the variance, $F(15, 165) = 3.47$, $p = .0001$. As can be seen in Table 5, the younger the

participants were, the more they engaged in Body Checking, $t(180) = -2.96$, $p = .004$. In addition,

more Body Checking was significantly related to an increase in hours spent lifting weights

$[t(180) = 2.25$, $p = .026]$ and greater Intent To Use Steroids, $t(180) = 1.98$, $p = .049$. Increased

Hoping For Perfection was also significantly related to more Body Checking, $t(180) = 1.97$, $p =$

.050.

For Substance Use, Table 6 shows that overall model was significant and explained 38%

of the variance, $F(15, 164) = 8.21$, $p = .0001$. An increase in the Intent to Use Steroids was

significantly related Substance Use, $t(179) = 8.21$, $p = .0001$. No other significant predictors

were identified.

In terms of Body Satisfaction, the overall model was significant, $F(15, 163) = 8.69$, $p =$

.0001, explaining 39% of the variance (see Table 7). Participants' BMI was significantly related

to how satisfied they were with their bodies, such that a higher BMI predicted less Body

Satisfaction, $t(178) = -2.34$, $p = .020$. Additionally, participants who were more worried about

their imperfections [$t(178) = -3.62$, $p = .0001$] and those who hoped for perfection [$t(178) =$

3.87, $p = .0001$] were less satisfied with their bodies. Finally, participants who were less satisfied

with their body fat [$t(178) = -2.17$, $p = .032$] and less satisfied with their overall muscularity

[$t(178) = -3.97$, $p = .0001$] were more dissatisfied with their overall body shape.

Predictors of Intent to Use Steroids

Because MD is highly related to steroid use, linear regression analyses were also

conducted using Intent to Use Steroids as the outcome variable. Predictor variables used for this

analysis were age, hours per week lifting weights, BMI, self-esteem, Dieting Behaviors, Worry

about Imperfection, Hope for Perfection, Bodybuilding Dependence, Body Checking, Substance

Use, Body Satisfaction, Body Fat Dissatisfaction, ethnicity (Caucasian versus non-Caucasian),

and Sexism. As Table 8 shows, the overall model was significant and explained 48% of the

variance, $F(16, 160) = 11.85$, $p = .0001$. Participants lower in BMI [$t(176) = 4.60$, $p = .0001$] and

those who endorsed more dieting behaviors [$t(176) = 2.52$, $p = .013$] were more likely to have an

Intent To Use Steroids. Participants with higher Bodybuilding Dependence [$t(176) = 2.94$, $p =$

$.004$] and who reported less Body Checking [$t(176) = -2.74$, $p = .007$] were more likely to have

an Intent to Use Steroids. The more substance and muscle-building supplement use the

participants endorsed, [$t(176) = 6.53$, $p = .0001$], the more likely they were to have an Intent To

Use Steroids. Participants who had less overall satisfaction about their body fat [$t(16, 176) = -$

3.16, $p = .002$] and more satisfaction about their muscularity [$t(176) = 2.10$, $p = .038$] had more

Intent to Use Steroids. Finally, participants who identified themselves as Caucasian were more

likely to have an Intent To Use Steroids, $t(176) = -2.96$, $p = .004$.

Predictors of Intuitive Eating

To investigate how MD components and related factors predict disordered eating behaviors, linear regression analyses were also conducted using the Intuitive Eating Scale subscales as outcome variables. A total of four analyses were conducted, each using the individual subscales that comprise the overall measure. These subscales are Unconditional Permissions to Eat, Eating for Physical Rather than Emotional Reasons, Reliance On Physical Hunger Cues, and Body Food Choice Congruence. For each analysis, the exact same predictor variables were used: age, hours per week lifting weights, BMI, self-esteem, Dieting Behaviors, Worry about Imperfection, Hope for Perfection, Bodybuilding Dependence, Body Checking, Substance Use, Body Satisfaction, Body Fat Dissatisfaction, Muscularity Dissatisfaction, Intent to Use Steroids, and Sexism.

For Unconditional Permissions to Eat, the overall model was significant and explained 23% of the variance, $F(16, 160) = 4.51$, $p = .0001$. As Table 9 shows, the more Dieting Behaviors the participants endorsed, the less they held Unconditional Permissions to Eat, $t(176) = -2.87$, $p = .005$. In addition, an increase in Body Fat Dissatisfaction was significantly related to less Unconditional Permissions to Eat , $t(176) = -2.26$, $p = .025$.

In the case of Eating for Physical Rather than Emotional Reasons, the overall model was significant, $F(16, 160) = 4.06$, $p = .0001$, explaining 20% of the variance. Table 10 shows that participants' BMI was significantly related to Eating for Physical Rather than Emotional Reasons [$t(176) = -2.67$, $p = .008$] such that, the greater the participants' BMI, the less participants ate for physical reasons. Additionally, participants with more sexist views were less likely to eat food for physical reasons, $t(176) = -4.21$, $p = .0001$.

For the Reliance on Physical Hunger Cues subscale, the overall model was significant, $F(16, 160) = 1.99$, $p = .019$, accounting for 8% of the variance. However, as Table 11 shows, there were no significant predictors.

For Body Food Choice Congruence, the overall model was marginally significant with 6% of the variance explained, $F(16, 160) = 1.70$, $p = .056$. Table 12 indicates that the more hours per week participants exercised with weights, the slightly more they engaged in Body-Food Choice Congruence, $t(176) = 1.98$, $p = .050$. Additionally, the higher participants' self-esteem, the slightly more they made food choices that were consistent with their body's needs, $t(176) = 2.91$, $p = .004$.

Chapter IV

Discussion

Predictors of Muscle Dysmorphia

Our first hypothesis was that self-esteem, non-intuitive eating, dieting behaviors, self-esteem, non-intuitive eating, dieting behaviors, physical perfectionism, Body Fat and Muscularity Dissatisfaction, sexist beliefs, and Intent to Use Steroids would all be predictive of muscle dysmorphia (MD) symptoms. This first hypothesis was partially supported; however, we also found that different predictive factors contributed to the different components of MD symptomology. These results suggest that MD is a multidimensional disorder with different factors related to its development and maintenance, as has been discussed by other scholars (Grieve, 2007; Rhea, Lantz, & Cornelius, 2004; Nieuwoudt, Zhou, Coutts, & Booker, 2012; Olivardia, 2001; Pope et al., 2006).

Steroid-use intention and MD symptoms. Intent to Use Steroids was the most consistent predictor of MD components, predicting the behaviors of Bodybuilding Dependence, Body Checking, and Substance Use. These findings support previous research regarding steroid use as a possible diagnostic feature of MD (Rohman, 2009). The findings also tentatively suggest that muscle supplement use (measured by the subscale Substance Use) may serve as a gateway for illicit steroid use (Hildebrandt et al., 2012).

Individuals with a greater intent to use steroids may be highly invested in the weight-lifting and fitness lifestyle to the point of considering extreme measures to bolster the

physique. Bodybuilding Dependence reflects this personal investment in the culture where muscle growth and exercising with weights are a top priority, These men may also be hyper-vigilant about any increases in muscle size, and therefore repeatedly check their physique in the mirror. Those with a greater Intent To Use Steroids may be excessively invested in this culture and check their muscles constantly. This would be especially true if individuals were possible steroid users, seeking affirmation about the effectiveness of steroids.

As expected, we also found that an increase in the intention to use steroids was related to increased Substance Use. The MD subscale of Substance Use includes items pertaining to the use of steroids and muscle-building supplements. However, we did not uncover any other factors predictive of Substance Use, such as Body Fat Dissatisfaction, Muscularity Dissatisfaction, Dieting Behaviors, or either of the perfectionism subscales. The Substance Use subscale includes questions pertaining to both legal nutritional supplements (such as protein powder) and illicit steroids. Although, we did discover that other factors were related to Intent to Use Steroids, we did not find that these same factors were predictive of Substance Use. This may be because Substance Use involves other aspects of a person's supplementation regime social desirability bias may have influenced participants' responses on the Substance Use subscale. The participants may have been reluctant to reveal (especially to the female researcher) not only their steroid use, but also their use of supplements. They may have preferred others to believe that their physique was by their own doing, without any help.

Although Intent to Use Steroids predicted three of the MD subscales, it was not, however, related to Body Satisfaction. This may be due to the fact that the Body Satisfaction subscale asks about global body satisfaction, whereas steroid-use intent is specific to certain physical features of body satisfaction (e.g., body fat, muscularity). Our findings concerning the predictors of Intent

to Use Steroids support the idea that body dissatisfaction includes important subdomains that need to be assessed separately. These findings will be discussed later, in the subsection titled Predictors of Intent to Use Steroids.

Hours spent in the gym and sexist attitudes: Predictive factors of MD. Along with Intent to Use Steroids, greater time spent in the gym lifting weights was predictive of Body Checking and Bodybuilding Dependence. The finding concerning hours spent in the gym and Body Checking may be explained by the wall-to-wall mirror coating that weightlifting gyms commonly utilize. That is, men who spend an excessive amount of time in the gym are exposed both to mirrors and to peers, allowing them to engage in self-monitoring behaviors and, perhaps, peer affirmation seeking. Our findings can be explained by Social Comparison Theory, in that individuals will seek affirmation and conformity within their peer groups by comparing themselves to others. More mirror-checking of one's body will inevitably occur if one spends a lot of time in the gym exercising. Excessive time spent in the gym is also a key factor in exercise dependence (Hausenblas & Downs, 2002).

We also found that greater number of hours per week men spent lifting weight was significantly related to Bodybuilding Dependence. The number of hours spent in the gym may be reflective of MD symptoms as a form of exercise dependency. Hausenblaus and Downs (2002, p. 90) define Exercise Dependence as "craving for leisure-time physical activity, resulting in uncontrollable excessive exercise behavior that manifests in physiological (e.g. tolerance/withdrawal) and/or psychological (e.g. anxiety, depression) symptoms." The Bodybuilding Dependence subscale measures a specific form of exercise dependence, an addiction to weightlifting and feelings of sadness and frustration when one's

schedule does not allow a "good" workout. Exercise Dependence has been shown to be present in men with a high drive for muscularity (Hale, Roth, Delong, & Briggs, 2010). Drive for muscularity is comparable to Bodybuilding Dependence in that both constructs involve a strong motivation to increase muscle size and a greater fixation on working out with weights (Mayville et al., 2002; Olivardia et al., 2004). It is perhaps the gender-role strain men perceive that motivates them to spend many hours working out with weights, to the point of obsession and dependence on their bodybuilding lifestyle.

Bodybuilding dependence is a key feature of MD that not only requires time and money, but also a personal investment in one's lifestyle and the bodybuilding culture. This dependence again may stem from the gender-role strain men perceive. Consistent with White and Gillett's (1994) idea and with Pleck's (1981) Gender-role Strain Theory, we found that sexist attitudes towards women were a predictor of Bodybuilding Dependence. That is, men who held more traditional gender-role beliefs and negative views about feminism were more likely than other men to have a lifestyle that is reliant on weightlifting and bodybuilding activities. This finding is in accordance with Swami and Voracek's (2012) results, which showed that a greater endorsement of sexist attitudes was related to more internalization of the "muscular ideal." These findings are also consistent with Murray et al.'s (2013) findings, in that men with this MD facet were more likely than other men to adhere to traditional masculine gender norms. It is perhaps this close adherence to traditional masculine gender norms that cause some men to develop MD symptoms.

According to Levant et al.'s (1992) theory of gender-role norms, men fulfill their identity as aggressive and strong while avoiding femininity. Not giving their 100% in the gym or showing a lack of significant musculature lessens the gap between men's standing in society and

women's standing. According to this theory, by not achieving commendable muscle size through grueling workouts day in and day out, men are at risk for being compared to women and being no longer "manly." This idea that slender and less muscular men are viewed as feminine is well established in male body-image research (Bottamini & Ste-Marie, 2006; Grogan & Richards, 2002). When this gender-role is strained, according to Pleck (1981), negative attitudes towards women can result. This strain may put some men in the gym to the point where they become obsessed with the gym, develop feelings of being addicted to weight lifting, and spend many hours exercising. Being immersed in the bodybuilding lifestyle, however, may provide some men a means of separating themselves from those perceived as less masculine. As White and Gillett (1994) suggest, it is a lifestyle that combats gender-role strain pressures.

It is important to note that sexist attitudes were not predictive of any other facet of MD explored in this study. This may speak to the less specific nature of the Bodybuilding Dependence subscale compared to the other components of MD. That is, the measure of Bodybuilding Dependence in the current study consists of items related to the experiences and affect related to the bodybuilding culture. A sample item reflecting this would be "If my schedule forces me to miss a day of working out with weights, I feel very upset." The Bodybuilding Dependence subscale items are very reflective of the nature of MD, encompassing motivation to put on muscle size and psychological consequences from "withdrawal" (having a bad workout or being forced to skip a day of exercising). Both intense commitment to bodybuilding and negative feelings when satisfactory exercise is compromised may be due to the gender-role strain some men perceive. Gender-role strain theory (Pleck, 1981) predicts that such men will become compelled to perform well in the gym to compensate for this gender-role strain and when something happens and they are not able to exercise adequately, negative emotions

toward women may follow. Sexist beliefs, therefore, may be related to the global concept of Bodybuilding Dependence rather than specific, quantifiable factors such as amount of supplements used or how often men engage in body-checking behaviors.

BMI, perfectionism, and body dissatisfaction as predictors of MD. Results of the present study showed that men who had a larger BMI, who exhibited more physical perfectionism concerns, and who were more dissatisfied with their body fat and muscularity were overall less satisfied with their bodies (as measured by the Body Satisfaction subscale of the Muscle Appearance Satisfaction Scale). According to Social Comparison theory (Festinger, 1954), people evaluate their physical features and measure themselves up against an accepted norm. The male gender-role norm in American society is the "muscular ideal" and is praised and revered as a sign of discipline, power, strength, and dominance. When a physical marker, such as height and weight (transformed into BMI), of a person does not meet societal norms, more body dissatisfaction can occur.

In the present study, a greater degree of physical perfectionism was also significantly related to Body Satisfaction, in that Hope for Perfection was positively related to satisfaction with one's body and Worry About Imperfection was negatively related to it. Perfectionism, while multifaceted, can be understood as a personality trait that is fairly stable in nature (Rice & Aldea, 2006). Participants who worried more about their physical imperfection and hoped less for perfection reported being less satisfied with their bodies. These relationships between Body Satisfaction and both Hope for Perfection and Worry About Imperfection may seem a bit perplexing. However, these findings may be due to the difference between approach and avoidant perfectionism. Hoping for perfection is an approach-oriented perfectionism trait, whereas worrying about imperfections is avoidant-oriented. This idea of approach versus

avoidant classifications represents Slade and Owens's (1998) dual model of perfectionism. Approach-oriented perfectionism is related to positive factors such as satisfaction, excellence, and goal pursuit, whereas avoidant-oriented perfectionism is related to dissatisfaction, failure, and disapproval. In the current research, the less participants hoped for perfectionism, the more dissatisfied they were with their bodies. Increased dissatisfaction coincides with worrying about imperfection, which is the avoidant-oriented aspect of perfectionism. Therefore, the findings concerning Body Satisfaction's relation to Worry About Imperfection and Hope for Perfection are in accordance with Slade and Owen's (1998) model. Sociocultural Theory also helps explain how physical perfectionism and Body Satisfaction relate. What society dictates as "perfect" is the widely circulated male physique seen in mass media. Those with perfectionism traits may internalize this image as the "perfect physique" and strive to match it.

In our study, we also found that Body Fat Dissatisfaction and Muscularity Dissatisfaction were positively related to Body Dissatisfaction. That is, men that experienced specific dissatisfaction regarding their body fat or level of muscularity are overall dissatisfied with their body physique. This is expected due to the consistent theme of our measures. Body Fat and Muscularity Dissatisfaction were not predictive of other components of MD. This lack of findings is inconsistent with social comparison theory, for one would assume that dissatisfaction would occur when individuals compare themselves to others and media messages. According to this theory, men who are dissatisfied with their body fat and muscle size would be striving to meet these cultural norms set by media messages. This dissatisfaction would be theorized to be related to dependence on bodybuilding behaviors, body-checking, and substance use and why our research did not support this idea is perplexing.

In terms of Physical Perfectionism, BMI, and Body Fat and Muscularity Dissatisfaction predicting other components of MD, our findings do not support previous research regarding men with MD. These three factors were not significantly related to our other components of MD, specifically, Bodybuilding Dependence, Body Checking, or Substance Use. We would anticipate Physical Perfectionism to be predictive of MD components, for perfectionism traits have been identified in bodybuilders (Blouin & Goldfield, 1995). Additionally, perfectionism traits would be assumed to be related to more body checking, in order for individuals to constantly evaluate their current physique. We would also assume that perfectionism traits would be related to Substance Use, for individuals would want to utilize any methods in order to meet physique goals. This lack of findings we acknowledge as unexpected.

BMI was also not predictive of any other MD component. This may be due to the fact that any person of any size can experience symptoms related to MD components. A significantly large or small BMI may not necessarily have to be predictive of MD symptoms, for any person of any size could be dependent on the bodybuilding culture, have body-checking behaviors, and use muscle-building supplements. It is expected that BMI would be related to Body Dissatisfaction, as we found in our study and discussed above. However, the lack of significant findings relating BMI to the other MD components is not striking. Our lack of findings overall related to MD are perplexing, however help us to understand this disorder in more detail

Dieting and non-intuitive eating as predictors of MD. Other aspects of our study also help us in expanding our knowledge of this subtype of BDD, which is the reason for our exploratory analyses. In terms of our exploratory analyses, non-intuitive eating patterns and dieting behaviors were not predictive of MD characteristics. This is in contrast to previous research that suggests that MD mimics an eating disorder with similar symptoms of anorexia

nervosa (Pope et al., 1993). Previous research relating eating disturbances to bodybuilding has primarily been found in competitive bodybuilders (Picket, Lewis, & Cash, 2005) so this group has been identified as an at-risk group for developing psychopathology. Our sample was not composed entirely of competitive bodybuilders; therefore, eating pathology may not be present in the MD population we sampled. In addition, our research findings support the idea that MD is more reflective of an obsessive-compulsive disorder (Maida & Armstrong, 2005) than of an eating disorder, in that we found excessive exercise and perfectionism constructs significantly predicted some symptoms of MD, whereas abnormal eating did not.

Predictors of Intent to Use Steroids

After investigating our first hypothesis, concerning factors predicting MD, our second hypothesis was about men's intention to use steroids. The goal of our research was not only to understand the possible similar predictive factors of MD and the Intent To Use Steroids, but also to see if MD facets were predictive of Intent To Use Steroids even when controlling for other variables. We hypothesized that components of MD, self-esteem, physical perfectionism, Body Fat Dissatisfaction, Muscularity Dissatisfaction, ethnicity, BMI, and sexist attitudes would predict Intent to Use Steroids. Our results partially supported our hypothesis in that three components of MD were significant predictors of men's intention to use steroids.

More specifically, the less men engaged in Body Checking, the more they endorsed the use of steroids. Men who have a greater intent to use may be already satisfied with their bodies and do not feel compelled to repeatedly check or monitor their physical appearance. In our study, neither overall body satisfaction (measured by the Body Satisfaction subscale of the Muscle Appearance Satisfaction Scale) was related to a greater Intent to Use Steroids.

In addition to the finding concerning Body Checking, we found that the more dependent men were on bodybuilding culture, the more likely they were to have an Intent To Use Steroids. The Bodybuilding Dependence subscale contains items pertaining to the maintenance of a muscular physique via much effort, time, and dedication. For some men who view their workouts and gym time as important, dedication and dependence may involve a greater intention to use steroids, because that allows them to gain the muscular physique that is important to them. Despite the direction of causality being unclear in regard to these factors, what remains is a distinct relationship between a disorder and possible drug abuse.

Components of body dissatisfaction and their relation to steroid use intent. We discovered that the less dissatisfied with their body fat and the more dissatisfied with their muscularity, the more participants had the Intent to Use Steroids. Participants in previous research on long-time steroid users are often men of commendable physiques and impressive muscle size who have been working out with weights for many years (Olrich & Ewing, 1999; Pope et al., 2000). In our study, it could be that the men who had a greater Intent to Use Steroids are actually already steroid users. These possible steroid-using men, therefore, have taken their motivation for obtaining a good physique to an "unhealthy extreme," as Kerr and Cogeni (2007) describe it. This extreme may be taken by men who already have commendable muscle size after seasons of devotion to their physique. After using steroids for the purpose of increasing muscle size, it is likely that their muscularity level is satisfactory. However, the results from steroid use (increased muscle size) may leave these men wanting more and more muscle size. Commendable muscle size with minimal body fat is the norm of the ideal male physique portrayed in mass media (Pope et al., 2000). These men may be less dissatisfied with their body fat percentage and already be appropriately lean; however, a key feature of MD is the belief of being small and

having inferior muscle size, when the opposite is true. In this case, the men may never be satisfied with their level of muscularity. Additionally, their body fat would no longer dissatisfy them, just their muscle size. This, then, may explain our findings that men with greater Intent to Use Steroids were more dissatisfied with their current muscle development and less dissatisfied with their body fat.

Previous research regarding steroid use has indicated that body dissatisfaction is significantly related to an increase in the use of steroids (Blouin & Goldfield, 1995; Pope et al., 2012,). Although we did not find that overall Body Satisfaction (a subscale of our MD measure) predicted the intention to use steroids, our study did, however, find that body dissatisfaction about specific areas of the body, namely body fat and body muscularity, predicted Intent to Use Steroids. This is consistent with previous research on women with eating disorders and men with MD, which showed that women tend to have dissatisfaction with their overall body shape and men tend to focus their dissatisfaction on certain body parts and features (Choi, Pope, & Olivardia, 2002), such as chest, arms, or mid-torso. By including separate measures of body fat and body muscularity dissatisfaction rather than relying solely on a measure of overall body dissatisfaction, we were able to see differences in the psychological processes associated with different forms of body dissatisfaction. In this way, we were also able to discover that body fat dissatisfaction and muscularity dissatisfaction are apparently negatively related for bodybuilders and weightlifters.

Abnormal eating as a predictor of intent to use steroids. To examine the relationship between non-intuitive eating and the intention of steroid use, we first looked to see if Dieting Behaviors were predictive of the Intent To Use Steroids. Presently, there are no studies outside the population of competitive weightlifters or bodybuilders that directly relate disordered eating

to the use, or possible use, of steroids. We found that the more participants engaged in dieting behaviors (e.g., cutting calories, watching what they ate, limiting unhealthy foods), the more likely they intended to use steroids. Both dieting behaviors and steroid use are central features of MD. Therefore, although Dieting Behaviors did not directly predict any of the MD components in the current study, it may be that such dieting is indirectly related to MD through its association with steroid use intent. This relationship may exist because individuals who start weightlifting may start from a health-conscious state, but, as a greater involvement in bodybuilding activities develops, the more invested in their physique they become and thus some may turn to illicit substances. This possible pathway suggests the importance of their physique goals and even a possible obsession with such goals.

Demographics of possible steroid users. Several demographic variables were related to a greater Intent to Use Steroids. We found that younger age, Caucasian ethnicity, and larger BMI predicted the intention to use steroids.

In comparison to older men, younger men may be more affected by media influences in regards to the bodybuilding and exercise culture. This may explain why we found a relationship between age and the Intent To Use Steroids. Recent research has noted current trends in which young adults perceive social media pressures about their health and exercise practices (Vaterlaus, Patten, Roche, & Young, 2015). These media pressures may be why so many young men are image-focused and may not fully understand the serious long-term health risks associated with steroid use (see Steroids, 2009). In addition to more media influences, in the present decade young men tend to have liberal ideas about steroids and are open to discussing steroid use with others who belong to the bodybuilding culture (Walker & Eli-Joubert, 2011).

Previous research on demographics of steroid users has repeatedly identified the typical user as an educated male with above average income whose age ranges from 20 to 30 years old (Cohen et al., 2007; Westerman, Charchenko, Ziegelmann, Bailey, Nippoldt, & Trost, 2016). Several other researchers have found that repeated steroid users usually begin using after 18 years of age (Cohen et al., 2007; Westerman et al., 2016). Other studies of lifetime prevalence of steroid users estimate 22% of steroid users starting before the age of 20 (Pope, Kanayama, Athey, Ryan, Hudson, & Baggish, 2014). Westerman and colleagues (2016) recently found the age range with the most steroid users was 25 to 34. Our study did not ask about explicit steroid use. However, Intent To Use Steroids as a measure captures individuals who may be already using, as well as non-users who may be contemplating use. Our measure allows us to capture individuals on a spectrum in relation to their intention to use steroids, which may explain our findings.

Participants with higher BMI were more likely to intend to use steroids. This may be explained by a few reasons. One reason may be that our sample included statistically "obese" individuals, who actually may be power-lifters (i.e., individuals whose weightlifting goals are to lift as much as humanly possible). Power-lifters, while oftentimes may not be concerned with their muscular development, may take steroids in order to develop more muscle to become as strong as possible (Hale & Smith, 2002). To test this idea, we ran analyses to determine what the regression would look like without these participants with high BMIs who were identified as outliers (based on a stem-and-leaf plot diagram). Even after these participants were excluded from the regression, larger BMI was still a significant predictor of Intent To Use Steroids; therefore, our idea that power-lifters may be skewing the results was not supported.

Another explanation as to why larger BMI predicted a greater Intent to Use Steroids is that BMI, as a measure based on height and weight, may be a misrepresentation of a person's physical build. Rothman (2006) asserted that BMI is a non-linear representation of body fat, such that individuals with similar BMI levels may have varying levels of body fat. Rothman (2006) stated that people who are very lean with considerable muscle mass, such as many of our participants, may have high BMI scores representing false body fat estimations. BMI does not take into consideration differences between fat and non-fat mass (i.e., muscle tissue, bones). This measure of body composition, therefore, may not be valid for many participants.

Caucasian ethnicity was also a predictive of a greater Intent to Use Steroids. This is consistent with international demographics obtained by Cohen et al. (2007) although it is not in accordance with research showing no differences in prevalence rates among different ethnicities (Pope et al., 2014). Our findings related to Caucasian ethnicity may be due to mass media representations of masculinity. White males are featured more than non-White males in most media sources that display them as powerful, dominant, and entitled (Tarrant, 2012). As previously discussed, mass media portrays a male physique as strong, muscular, lean, and powerful. Sociocultural theory helps us to explain then why those of Caucasian ethnicity are more likely to have a greater Intent To Use Steroids. It is young, White males, many of whom grew up idolizing Arnold Schwarzenegger and other White muscular males in media (e.g., World Wrestling Federation wrestlers), that may be more likely than other ethnic groups try to emulate these idols later in life. Sociocultural theory would suggest that media messages provide White males, more than non-White males, salient examples of extreme muscularity and hypermasculinity (Tarrant, 2012).

Perfectionism as a predictor of steroid use intent. Contrary to previous research relating perfectionism traits to steroid use, we found that neither Worry About Imperfections nor Hope for Perfection were related to the Intent to Use Steroids. These findings are not consistent with previous research (Blouin & Goldfield, 1995; Hildebrandt et al., 2012; Pope et al., 2012) that has found perfectionism in steroid-using bodybuilders. This discrepancy could be explained by differences in sample populations. Previous research, which has identified these factors as related, has used samples of explicit steroid users. In our sample, we are unable to say for certain who among the participants were steroid users or not.

Predictors of Abnormal Eating

In terms of our exploratory analyses, we looked at different facets of non-intuitive eating patterns and how MD characteristics may predict such patterns. We sought to understand how MD characteristics, Dieting Behaviors, physical perfectionism, Body Fat and Muscularity Dissatisfaction, Intent to Use Steroids, and sexist attitudes may relate to different forms of non-intuitive eating. We found that no characteristics of MD predicted any of the non-intuitive eating subscales, but that several of the other variables predicted different aspects of non-intuitive eating, suggesting that intuitive eating is a multifaceted concept.

MD as a non-predictor of intuitive eating. Our findings regarding MD symptoms not being predictive of non-intuitive eating lend support to Lakkis, Ricciardelli, and Williams's (1999) theory that masculinity serves as a protective factor against eating disorder development. That is, men who adhere more to traditional gender norms of strength and masculinity may be less inclined to monitor their food intake, as dieting may be seen as a "girly" or feminine thing to do.

Our lack of significant findings concerning the relationship between MD and abnormal eating behaviors could also be due to our use of the Intuitive Eating Scale rather than a measure that focuses specifically on eating behaviors of those seeking to gain muscle rather than lose weight. Cafri et al. (2005) stressed a further need for research by emphasizing the importance of understanding dietary practices of men who are seeking gains in muscle. Previous research has focused on eating behaviors of those trying to lose weight. In comparison, the eating behaviors of those trying to gain weight and muscle may differ in clinical appearance.

This illustrates the importance of not relying on a single unitary scale to measure eating behaviors. These differences also provide a clearer understanding of the relationship between dieting behaviors (such as avoiding foods or counting calories) and intuitive eating. Specifically, when we measure Dieting Behaviors, we are able to measure overt behaviors related to food intake monitoring, such as choosing "diet" options of food (e.g., diet soda drinks). Intuitive Eating, however, measures patterns of behavior related to food intake based on external cues or mood. An example of this would be eating when feeling lonely in order to cope with emotions. As stated above, non-intuitive eating was not a significant predictor of MD and vice versa. However, certain aspects of non-intuitive eating were shown to have a relationship with constructs previously identified as related to MD.

Body dissatisfaction, BMI, and weightlifting hours: Relations to abnormal eating. Although components of MD did not predict abnormal eating, various factors that are highly related to MD (i.e., body dissatisfaction, BMI, and hours spent lifting weights) did significantly relate to various disordered eating behaviors. According to our findings, the more dissatisfied participants were with their body fat, the more dietary restrictions they placed on themselves. People restrict food intake by placing conditions on what they are permitted to eat or

not eat. By establishing rules about foods that are "safe" or require permission to eat, the individual engages in less intuitive eating. Research (Stice & Shaw, 2002) has shown that body dissatisfaction is often a catalyst for adopting restrictive diet methods in order to achieve a certain look or health goal, and it is a factor prevalent in eating disorders. In our study, however, we only found that Body Fat Dissatisfaction, not Muscularity Dissatisfaction, was predictive of restrictive eating. This may be due to muscularity dissatisfaction being related to attempts at maintaining or growing muscle, which would require appropriate caloric intake. Individuals who are dissatisfied with their muscle size may not think to restrict their food intake as those dissatisfied with their body fat would. Those more concerned with their muscularity may not restrict their intake, but rather engage in other behaviors in order to address this dissatisfaction.

Our results also showed that the higher the BMI, the less participants eat for physical reasons rather than emotional reasons. Previous research has also shown this finding that larger BMI individuals are more likely than those with lower BMI to engage in eating a method of coping with negative emotions (Boggiano, Turan, Tatum, Morgan, & Sylvester, 2015). Both bodybuilders and weightlifters with larger BMIs may be dieting and limiting their intake for weight-loss purposes. Dieting and food-intake monitoring are stressful endeavors in themselves. Therefore, these additional pressures they put on themselves may create more distress, which may paradoxically lead them to turn to food to palliate their negative experiences about food. This behavior is an example of non-intuitive eating. Further research is required in order to understand the mechanisms underlying the relationship between BMI and eating patterns in bodybuilders and weightlifters.

In our study, we also found that weightlifting hours significantly predicted restrictive eating behaviors. We found that the more hours participants spent in the gym lifting weights, the

more food choices they made that were congruent with their body performance needs. This finding may speak to the health consciousness of our sample, such that they are more likely to view it as important to exercise often and eat only nutritious foods. It is not clear why MD components did not relate to this specific aspect of intuitive eating whereas excessive hours spent lifting weights did, seeing that excessive exercise is a component of MD.

Body fat and muscularity dissatisfaction: Their relation to abnormal eating. Restrictive eating is a concept that has other facets that our Intuitive Eating Scale may not have tapped into. As to why only Body Fat Dissatisfaction was predictive of restrictive eating and not Muscularity Dissatisfaction, we must consider other ways in which bodybuilders may be engaging in restrictive eating. Limiting food intake as a form of restrictive eating is a common strategy used by many to lose weight. Body fat dissatisfaction is often a catalyst for disordered eating that involves limiting intake. However, diet monitoring and macronutrient intake are common methods of control used by bodybuilders and weightlifters. These are dieting behaviors that are commonly utilized to alter body composition to combat any body dissatisfaction. Such meticulous counting is used to enhance their body's performance and to prevent muscle tissue loss while reducing body fat. Men with MD characteristics are socialized to experience food as fuel supply for energy to supply their bodies. Sometimes, in dangerous cases, individuals with eating disorders view food as evil and fear that any calorie will make them fat. This is especially common in women with anorexia (Gorwood, Kipman, & Foulon, 2003), however, such rigid approaches to food may be found in bodybuilders. Deliberate diet monitoring may lead to more food restriction in unhealthy ways. Bodybuilders may be like other people wishing to lose weight where both groups experience similar body fat dissatisfaction. However, it is the difference in dieting techniques that make bodybuilders unique. These behaviors are a form of restrictive

eating that our Intuitive Eating Scale fails to capture. This may explain why we did not see Muscularity Dissatisfaction as predictive of restrictive eating.

It is of interest to note that Muscularity Dissatisfaction was not related to any of the other types of non-intuitive eating. Our lack of findings may be due to the fact that we did not use a sample of individuals with restrictive eating patterns similar to those previously diagnosed with an eating disorder. In a sample of people with notable restrictive eating patterns of behavior, body fat and muscularity dissatisfaction may have been related to these other facets of intuitive eating.

Sexist beliefs and self-esteem: Their relation to abnormal eating. Our study also found a relation between sexist beliefs and abnormal eating. Men who held more sexist beliefs were more likely to eat for emotional reasons rather than for physical reasons. This relationship suggests that men who hold more sexist beliefs and adhere to more traditional gender-roles may eat in reaction to negative emotional states. The reason this relationship exists could be because emotion-related food intake is a result of gender-role strain experienced by some men. The violation of expected gender-roles may create negative psychological consequences, as suggested by Pleck's (1981) theory on gender-role strain. Therefore, some men may ease these negative consequences with food. Griffiths, Murray, and Touyz (2015) found that disordered eating behaviors in men are related to internalization of traditional male gender-roles.

We also found that low self-esteem was related to making fewer food choices congruent with one's health (i.e., Body-Food Choice Congruence). Previous research has found that low self-esteem is related to several psychiatric disorders, including eating disorders (Fairburn, 2008). Due to higher self-esteem being related to a pro-mental health construct (Li, Chan, Hung, & Chui, 2010), such positive self-regard may be a protective factor against eating disorder

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development, as identified in previous research (Braun, Park, & Gorin, 2016). It is unclear as to

why self-esteem was only predictive of this particular aspect of non-intuitive eating; however, it

could be because this component of Intuitive Eating Scale may involve an aspect of a person's

diet choices that require confidence and self-efficacy. Making food choices that align with

specific physiological requirements necessitates much knowledge about the science of food and

how the human body works. With this exceptional knowledge, a certain level of self-esteem and

confidence may be required in order to make appropriate food choices for oneself. However,

making food choices based of this reasoning is still considered a form of restrictive, non-intuitive

eating.

Limitations and Future Research

Despite its strengths, this study also had several limitations. First, incomplete data were

collected from 30 participants and thus were unable to be used in regression analyses. This error

was due to a combination of variables. One reason for the missing data is researcher error and the

random order process of collating the questionnaires. Due to the nature of random order of

assembling questionnaire packets, several incomplete questionnaires were assembled. Another

reason for the missing data is due to participants not responding to every item on the

questionnaire.

Another limitation in this study was the measure used to investigate sexist attitudes. Data

analyses revealed that the internal reliabilities of the subscales were poor; therefore, participants'

subscale and overall scores could not be used in analyses. Factor analysis on the measure

revealed one factor containing five items, which was subsequently used to create the "Sexism"

measure. However, in retrospect, a different measure could have been used such as the

Ambivalent Sexism Inventory (Glick & Fiske, 1996) for this scale taps into attitudes regarding

prejudice towards women and stereotypical gender-roles. When broaching the sensitive topic of sexism, researcher gender may play a role in participants' responses or willingness to respond, as well. Another limitation of our measures is that, due to sensitive nature of illicit drug use, we had to limit our research to investigating participants' intentions to use steroids rather than actual steroid use. Due to the fact that we did not explicit ask about steroid use, we are unable to make any claims about factors that relate to actual steroid use. This may limit the potential of our study to expand on knowledge of steroid users. However, we also acknowledge that asking gym-goers if they were using any steroids may have instigated resistance or failure to report. In addition, our research did not include a measure of self-objectification or internalization of media images. Therefore, we cannot directly assess whether sexism beliefs were a result of such societal pressures. A further limitation of this study was that one item on the Muscle Appearance Satisfaction Scale (Mayville et al., 2002) was not included in the initial questionnaire distributed to participants. This item, while included in previous validation research by test developers, mirrored other items in the questionnaire to a T, and was therefore we chose to exclude it due to redundancy.

In terms of our community sample, it included several individuals who may have been outliers and therefore skewed our data. Of these, a small number of large "obese" individuals (as measured by their BMI) were possibly power-lifters rather than casual weightlifters or those concerned about their appearance. Stricter inclusion/exclusion criteria could have prevented these individuals from participating. These power-lifters may have qualitatively different concerns than bodybuilders/weightlifters about their physical appearance or diet. A traditional goal of power-lifters is to lift as much weight as possible. Power-lifters therefore are not interested in muscle growth for physical appearance purposes or aesthetics. Ergo, power-lifters

 would not reflect the sample we were attempting to study. Another limitation of the sample was that one participant, as per PI recall, may have actually identified as transgender (in the process of becoming male and identifying as such).

While our population was a community sample, our data collection was limited to Powerhouse Gyms in southeast Michigan. Although the Powerhouse Gym name is largely associated with the bodybuilding community and is primarily a weightlifting-focused gym, other more exclusive gyms in different parts of the country may have provided different results. Sampling from gyms in more ethnically diverse communities or in parts of the country where economic instability is not present may provide different findings that are more consistent with previous research.

 Future research should also investigate the patterns of relationships in associations between MD and Intent To Use Steroids. This research goal may ultimately be achieved through a diagnostic conceptualization of MD, and research involving those diagnosed and using anabolic steroids. More research would also be required to link steroids use with the endorsement of conventional male norms.

References

Adams, L. A., & Govender, K. (2008). 'Making a perfect man': Traditional masculine ideology and perfectionism among adolescent boys. *South African Journal of Psychology, 38*(3), 551-562.

Alperstein, N. (2012). Social comparison theory. In M. Kosut (Ed.), *The Encyclopedia of gender in media* (pp. 346-347). Thousand Oaks, CA: Sage.

Amason, P. (2012). Social construction of gender. In M. Kosut (Ed.), *The Encyclopedia of gender in media* (pp. 348-350). Thousand Oaks, CA: Sage.

American Psychiatric Association. DSM-5 Task Force, & American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5 (5th ed.).* Arlington, VA: American Psychiatric Association.

Andersen, A. E., & DiDomenico, L. (1992). Diet vs. shape content of popular male and female magazines: A dose-response relationship to the incidence of eating disorders? *International Journal of Eating Disorders, 11*(3), 283-287. doi:10.1002/1098-108X(199204)11:3<283::AID-EAT2260110313>3.0.CO;2-O

Andersen, R. E., Barlett, S. J., Morgan, G. D., & Brownell, K. D. (1995). Weight loss, psychological, and nutritional patterns in competitive male body builders. *International Journal of Eating Disorders, 18*(1), 49-57. doi:10.1002/1098-108X(199507)18:1<49::AID-EAT2260180106>3.0.CO;2-C

Bardone-Cone, A. M., Wonderlich, S. A., Frost, R. O., Bulik, C. M., Mitchell, J. E., Uppala, S., & Simonich, H. (2007). Perfectionism and eating disorders: Current status and future directions. *Clinical Psychology Review, 27*(3), 384-405. doi:10.1016/j.cpr.2006.12.005

Blodgett-Salafia, E. H., Gondoli, D. M., Corning, A. F., McEnery, A. M., & Grundy, A. M. (2007). Psychological distress as a mediator of the relation between perceived maternal parenting and normative maladaptive eating among adolescent girls. *Journal of Counseling Psychology, 54*, 434-446. doi:10.1037/0022-0167.54.4.434

Blouin, A. G. & Goldfield, G. S. (1995). Body image and steroid use in male bodybuilders. *International Journal of Eating Disorders, 18*, 159–165. doi:10.1002/1098-108X(199509)18:2<159::AID-EAT2260180208>3.0.CO;2-3

Boggiano, M. M., Wenger, L. E., Turan, B., Tatum, M. M., Morgan, P. R., & Sylvester, M. D. (2015). Eating tasty food to cope. Longitudinal association with BMI. *Appetite, 87*, 365-370. doi:10.1016/j.appet.2015.01.008

Bottamini, G., & Ste-Marie, D. (2006). Male voices on body image. *International Journal of Men's Health, 5*, 109–132. doi:10.3149/jmh.0502.109

Braun, T. D., Park, C. L., & Gorin, A. (2016). Self-compassion, body image, and disordered eating: A review of the literature. *Body Image, 17*, 117-131. doi:10.1016/j.bodyim.2016.03.003

Brecham, I., & Kvalem, I. (2015). Relationship between body dissatisfaction and disordered eating: Mediating role of self-esteem and depression. *Eating Behaviors, 17,* 49-58, doi: 10.1016/j.eatbeh.2014.12.008

Brower, K. J., Eliopulos, G. A., Blow, F. C., Catlin, D. H., & Beresford, T. P. (1990). Evidence for physical and psychological dependence on anabolic androgenic steroids in eight weight lifters. *American Journal of Psychiatry, 147*(4), 510-512. doi:10.1176/ajp.147.4.510

Cafri, G., Thompson, J. K., Ricciardelli, L., McCabe, M., Smolak, L., & Yesalis, C. (2005). Pursuit of the muscular ideal: Physical and psychological consequences and putative risk factors. *Clinical Psychology Review, 25*, 215–239. doi:10.1016/j.cpr.2004.09.003

Cash, T. F., & Pruzinsky, T. (2002). *Body image: A handbook of theory, research, and clinical practice.* New York: Guilford Press.

Cash, T. F. (1990). The psychology of physical appearance: Aesthetics, attributes, and images. In T. F. Cash & T. Pruzinsky (Eds.), *Body images: Development, deviance, and change* (pp. 51-79). NY: Guilford.

Cattell, R. B. (1965). A biometrics invited paper. Factor analysis: An introduction to essentials I. The purpose and underlying models. *Biometrics, 21*(1), 190-215.

Chittester, N. I., & Hausenblas, H. A. (2009). Correlates of drive for muscularity: The role of anthropometric measures and psychological factors. *Journal of Health Psychology, 14*(7), 872-877. doi:10.1177/1359105309340986

Choi, P. Y. L., Pope Jr., H. G., & Olivardia, R. (2002). Muscle dysmorphia: A new syndrome in weightlifters. *British Journal of Sports Medicine, 36*(5), 375-376. doi:10.1136/bjsm.36.5.375

Culbert, K. M., Racine, S. E., & Klump, K. L. (2015). Research review: What we have learned about the causes of eating disorders – a synthesis of sociocultural, psychological, and biological research. *Journal of Child Psychology and Psychiatry, 56*(11), 1141-1164. doi:10.1111/jcpp.12441

Cohen, J., Collins, R., Darkes, J., & Gwartney, D. (2007). A league of their own: Demographics, motivations and patterns of use of 1,955 male adult non-medical anabolic steroid users in

the United States. *Journal of the International Society of Sports Nutrition, 4*(12), doi:10.1186/1550-2783-4-

Davey, C. M., & Bishop, J. B. (2006). Muscle dysmorphia among college men: An emerging gender-related counseling concern. *Journal of College Counseling, 9*(2), 171-180. doi:10.1002/j.2161-1882.2006.tb00104.x

Dryer, R., Farr, M., Hiramatsu, I., & Quinton, S. (2016). The role of sociocultural influences on symptoms of muscle dysmorphia and eating disorders in men, and the mediating effects of perfectionism. *Behavioral Medicine, 42*(3), 174-182. doi:10.1080/08964289.2015.1122570

Eisenberg, D., Nicklett, E. J., Roeder, K., & Kirz, N. E. (2011). Eating disorder symptoms among college students: Prevalence, persistence, correlates, and treatment-seeking. *Journal of American College Health, 59*(8), 700-707. doi:10.1080/07448481.2010.546461

Evans, N. A. (1997). Gym and tonic: A profile of 100 male steroid users. *British Journal of Sports Medicine, 31*(1), 54-58. doi:10.1136/bjsm.31.1.54

Fairburn, C. G. (2008). *Cognitive behavior therapy and eating disorders*. New York, NY: Guilford Press.

Fairburn, Z., Cooper, R., & Shafran, R. (2003) Cognitive behaviour therapy for eating disorders: A "transdiagnostic" theory and treatment. *Behaviour Research and Therapy, 41*, 509–552. doi:10.1016/S0005-7967(02)00088-8

Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*(2), 117-140. doi:10.1177/001872675400700202

Franco, K. S. N., Tamburrino, M. B., Carroll, B. T., & Bernal, G. A. A. (1988). Eating attitudes in college males. *International Journal of Eating Disorders, 7*, 285-288. doi:10.1002/1098-108X(198803)7:2<285::AID-EAT2260070214>3.0.CO;2-Z

Frederick, D. A., Buchanan, G. M., Sadehgi-Azar, L., Peplau, L. A., Haselton, M. G., Berezovskaya, A., & Lipinski, R. E. (2007). Desiring the muscular ideal: Men's body satisfaction in the United States, Ukraine, and Ghana. *Psychology of Men & Masculinity, 8*(2), 103-117. doi:10.1037/1524-9220.8.2.103

Frost, R., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*(5), 449-468. doi:10.1007/BF01172967

Gagnon, J. (1974). Physical strength, once of significance. In J. Pleck & J. Sawyer (Eds.), *Men and masculinity* (pp. 139-149). Englewood Cliffs, NJ: Prentice Hall.

Gattario, K., Frisen, A., Fuller-Tyszkiewicz, M., Ricciardelli, L., Diedrichs, P., & Yager, Z. (2015). How is men's conformity to masculine norms related to their body image? Masculinity and muscularity across Western countries. *Psychology of Men & Masculinity, 16*(3), 337-347. doi:10.1037/a0038494

Glick, P. & Fiske, S. (1996). The ambivalent sexism inventory: Differentiating hostile and benevolent sexism. *Journal of Personality and Social Psychology, 70*(3), 491-512. doi:10.1037/0022-3514.70.3.491

Goffman, E. (1976). Gender advertisements. *Studies in the Anthropology of Visual Communication, 3*, 65–68.

Goldfield, G. S., Harper, D. W., & Blouin, A. G. (1998). Are bodybuilders at risk for an eating disorder? *Eating Disorders, 6*, 133–157. doi:10.1080/10640269808251249

Gorsuch, R. L. (1997). Exploratory factor analysis: Its role in item analysis. Journal of *Personality Assessment, 68*(3), 532-560. doi:10.1207/s15327752jpa6803_5

Gorwood, P., Kipman, A., & Foulon, C. (2003). The human genetics of anorexia nervosa. *European Journal of Pharmacology, 480*(1), 163-170. doi:10.1016/j.ejphar.2003.08.103

Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin, 134*(3), 460-476. doi:10.1037/0033-2909.134.3.460

Grieve, F. G. (2008). Review of the muscular ideal: Psychological, social and medical perspectives. *International Journal of Men's Health, 7*(1), 103-105. doi: 10.1080/10640260802570155

Grieve, R., & Helmick, A. (2008). The influence of men's self-objectification on the drive for muscularity: Self-esteem, body satisfaction and muscle dysmorphia. *International Journal of Men's Health, 7*(3), 288-298. doi:10.3149/jmh.0703.288

Griffiths, S., Murray, S. B., & Touyz, S. (2013). Disordered eating and the muscular ideal. *Journal of Eating Disorders, 1*(1), 15-15. doi:10.1186/2050-2974-1-15

Grogan, S. (2008). *Body image: Understanding body dissatisfaction in men, women and children* (2nd ed.). New York, NY: Routledge/Taylor & Francis Group.

Grogan, S., & Richards, H. (2002). Body image: Focus groups with boys and men. *Men and Masculinities, 4*(3), 219-232. doi:10.1177/1097184X02004003001

Groth, M. (2012). Men's magazines: Lifestyle and health. In M. Kosut (Ed.) *Encyclopedia of gender in media* (pp. 228-229). Thousand Oaks, CA: Sage

Gruber, A. J., & Pope, H. J. (1998). Ephedrine abuse among 36 female weightlifters. *The American Journal on Addictions, 7*(4), 256-261. doi:10.3109/10550499808995637

Gurney, R. (1997*). Messages men hear: Constructing masculinities.* Bristol, PA: Taylor & Francis.

Hale, B. & Smith, D. (2012) Bodybuilding. In T. Cash (Ed.) *Encyclopedia of Body Image and Human Appearance, 1*, 66-73, doi:10.1016/B978-0-12-384925-0.00046-8

Hale, B. D., Roth, A. D., DeLong, R. E., & Briggs, M. S. (2010). Exercise dependence and the drive for muscularity in male bodybuilders, power lifters, and fitness lifters. *Body Image, 7*(3), 234-239. doi:10.1016/j.bodyim.2010.02.001

Hausenblas, H. A., & Symons Downs, D. (2002). Exercise dependence: A systematic review. *Psychology of Sport & Exercise, 3*(2), 89-123. doi:10.1016/S1469-0292(00)00015-7

Hausenblas, H. A., Campbell, A., Menzel, J. E., Doughty, J., Levine, M., & Thompson, J. K. (2013). Media effects of experimental presentation of the ideal physique on eating disorder symptoms: A meta-analysis of laboratory studies. *Clinical Psychology Review, 33*(1), 168-181. doi:10.1016/j.cpr.2012.10.011

Helms, E., Aragon, A., & Fitschen, P. (2014). Evidence-based recommendations for natural bodybuilding contest preparation: Nutrition and supplementation. *Journal of the International Society of Sports Nutrition, 11*(1), 20. doi:10.1186/1550-2783-11-20

Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology, 60*, 456-470. doi:10.1037/0022-3514.60.3.456

Hildebrandt, T., Harty, S., & Langenbucher, J. W. (2012). Fitness supplements as a gateway substance for anabolic-androgenic steroid use. *Psychology of Addictive Behaviors, 26*(4), 955-962. doi:10.1037/a0027877

Hildebrandt, T., Langenbucher, J., Carr, S., Sanjuan, P., & Park, S. (2006). Predicting intentions for long-term anabolic-androgenic steroid use among men: A covariance structure model. *Psychology of Addictive Behaviors, 20*(3), 234-240. doi:10.1037/0893-164X.20.3.234

Hudson, J. I., Hiripi, E., Pope, H. G., & Kessler, R. C. (2007). The prevalence and correlates of eating disorders in the national comorbidity survey replication. *Biological Psychiatry, 61*(3), 348-358. doi:10.1016/j.biopsych.2006.03.040

Jones, W. R. & Morgan, J. F. (2010). Reproductive and sexual health needs of women with eating disorders. *Advances in Psychiatric Treatment, 16*(6), 476. doi:10.1192/apt.16.6.476

Joubert, H., & Melluish, S. (2016) Considering anabolic androgenic steroid use in relation to non-substance related diagnostic categories with special emphasis on eating disorders: A systematic review. *Journal of Substance Use, 21*(2), 210-216, doi: 10.3109/14659891.2014.977974

Kanayama, G., Barry, S., Hudson, J. I., & Pope, H. J. (2006). Body image and attitudes toward male roles in anabolic-androgenic steroid users. *The American Journal of Psychiatry, 163*(4), 697-703. doi:10.1176/appi.ajp.163.4.697

Kanayama, G., Hudson, J. I., & Pope, H. G. (2009). Features of men with anabolic-androgenic steroid dependence: A comparison with nondependent AAS users and with AAS nonusers. *Drug and Alcohol Dependence, 102*(1), 130-137. doi:10.1016/j.drugalcdep.2009.02.008

Keel, P. K., & Klump, K. L. (2003). Are eating disorders culture-bound syndromes? Implications for conceptualizing their etiology. *Psychological Bulletin, 129*(5), 747-769. doi:10.1037/0033-2909.129.5.747

Kerr, J. & Cogeni, J. (2007). Anabolic-androgenic steroids use and abuse in pediatric patients. *Pediatric Clinics of North America, 54, 771-785*. doi:10.1016/j.pcl.2007.04.010

Kimmel, S. B., & Mahalik, J. R. (2004). Measuring masculine body ideal distress: Development of a measure. *International Journal of Men's Health, 3*(1), 1-10. doi:10.3149/jmh.0301.1

Lakkis, J., Ricciardelli, L. A., & Williams, R. J. (1999). Role of sexual orientation and gender-related traits in disordered eating. *Sex Roles, 41*(1), 1-16. doi:10.1023/A:1018829506907

Lantz, C., Rhea, D., & Cornelius, A. (2002). Muscle dysmorphia in elite-level power lifters and bodybuilders: A test of differences within a conceptual model. *Journal of Strength and Conditioning Research, 16*(4), 649-655.

Leit, R. A., Gray, J. J., & Pope, H. J. (2002). The media's representation of the ideal male body: A cause for muscle dysmorphia? *International Journal of Eating Disorders, 31*(3), 334-338. doi:10.1002/eat.10019

Levant, R. (2011). Research in the psychology of men and masculinity using the gender role strain paradigm as a framework. *American Psychologist, 66*(8), 765-776. doi:10.1037/a0024624

Levant, R. F. (1992). The society for the psychological study of men and masculinity. *Journal of Men's Studies, 1*(1), 75-76.

Li, H. C. W., Chan, S. L. P., Chung, O. K. J., & Chui, M. L. M. (2010). Relationships among mental health, self-esteem and physical health in Chinese adolescents: An exploratory study. *Journal of Health Psychology, 15*(1), 96-106. doi:10.1177/1359105309342601

Loosemore, D. J., & Moriarty, D. (1990). Body image dissatisfaction and body image distortion in selected groups of males. *Canadian Association for Health, Physical Education, and Recreation, 12*, 11-15

Mager, J., & Helgeson, J. G. (2011). Fifty years of advertising images: Some changing perspectives on role portrayals along with enduring consistencies. *Sex Roles, 64*(3), 238-252. doi:10.1007/s11199-010-9782-6

Maida, D. M., & Lee Armstrong, S. (2005). The classification of muscle dysmorphia. *International Journal of Men's Health, 4*(1), 73-91. doi:10.3149/jmh.0401.73

Mangweth, B., Pope Jr., H., G., Kemmler, G., Ebenbichler, C., Hausmann, A., De Col, C., Kreutner, B., Kinzl, J., & Biebl, W. (2001) Body image and psychopathology in male bodybuilders. *Psychotherapy and Psychosomatics, 70*, 38-43. doi:10.1159/000056223

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. . doi:10.1177/1073191102238156

Moyers, S. R. (2005). *Actual and ideal self-discrepancy and body satisfaction.* (Masters thesis). Retrieved from http://digitalcommons.wku.edu/theses/465/

Muller, S. M., Dennis, D. L., Schneider, S. R., & Joyner, R. L. (2004). Muscle dysmorphia among selected male college athletes: An examination of the Lantz, Rhea, and Mayhew Model. *International Sports Journal, 8*(2), 119.

Murray, S. B., & Touyz, S. W. (2012). Masculinity, femininity and male body image: A recipe for future research. *International Journal of Men's Health, 11*(3), 227. doi:10.3149/jmh.1103.227

Murray, S. B., Rieger, E., Karlov, L., & Touyz, S. W. (2013). An investigation of the transdiagnostic model of eating disorders in the context of muscle dysmorphia. *European Eating Disorders Review, 21*, 160–164. doi:10.1002/erv.2194

Murray, S. B., Rieger, E., Karlov, L., & Touyz, S. W. (2013). Masculinity and femininity in the divergence of male body image concerns. *Journal of Eating Disorders, 1*, 1-8. doi:10.3149/jmh.1103.227

Murray, S. B, Rieger, E., Hildebrandt, T., Karlov, L., Russell, J., Boon, E., Dawson, R., & Touyz, S. (2012) A comparison of eating, exercise, shape, and weight related symptomatology in males with muscle dysmorphia and anorexia nervosa. *Body Image, 9*(2), 193-200. doi:10.1016/j.bodyim.2012.01.008

Muth, J., & Cash, T. (1997). Body-image attitudes: What difference does gender make? *Journal of Applied Social Psychology, 27*(16), 1438-1452. doi:10.1111/j.1559-

1816.1997.tb01607. Newman, F., & Holzman, L. (1993). *Lev Vygotsky: Revolutionary scientist*. New York: Routledge.

Nieuwoudt, J. E., Zhou, S., Coutts, R. A., & Booker, R. (2012). Muscle dysmorphia: Current research and potential classification as a disorder. *Psychology of Sport and Exercise, 13*(5), 569-577. doi:10.1016/j.psychsport.2012.03.006

Olivardia, R. (2001). Mirror, mirror on the wall, who's the largest of them all? The features and phenomenology of muscle dysmorphia. *Harvard Review of Psychiatry, 9*(5), 254-259. doi:10.1080/10673220127900

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

Olivardia, R., Pope, H. G., Mangweth, B., & Hudson, J. I. (1995). Eating disorders in college men. *The American Journal of Psychiatry, 152*(9), 1279-1285.

Olrich, T. W., & Ewing, M. E. (1999). Life on steroids: Bodybuilders describe their perceptions of the anabolic-androgenic steroid use period. *Sport Psychologist, 13*(3), 299-312.

Ozimok, B, Kamarche, L., & Cammage, K. (2015). The relative contributions of body image evaluation and investment in the prediction of dietary restraint in men. *Journal of Health Psychology, 20*(5), 592-601. doi:10.1177/1359105315573434

Parent, M. C., & Moradi, B. (2011). His biceps become him: A test of objectification theory's application to drive for muscularity and propensity for steroid use in college men. *Journal of Counseling Psychology, 58*(2), 246-256. doi:10.1037/a0021398

Parent, M. C., & Moradi, B. (2011). *Intention to Use Anabolic-Androgenic Steroids Measure* [Database record]. Retrieved from PsychTESTS Database. doi:10.1037/t31209-000

Petrocelli, M., Oberweis, T., & Petrocelli, J. (2008). Getting huge, getting ripped: A qualitative exploration of recreational steroid use. *Journal of Drug Issues, 38*(4), 1187-1205. doi:10.1177/002204260803800412

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. doi:10.1136/bjsm.2004.012013

Pleck, J. H. (1981). *The myth of masculinity*. Cambridge, Mass: MIT Press.

Pohl, G. (2012). Social learning theory. In M. Kosut (Eds.) *The Encyclopedia of gender in media* (pp. 354-356). Thousand Oaks, CA: Sage.

Pope, C. G., Pope, H. G., Menard, W., Fay, C., Olivardia, R., & Phillips, K. A. (2005). Clinical features of muscle dysmorphia among males with body dysmorphic disorder. *Body Image, 2*(4), 395–400. doi:10.1016/j.bodyim.2005.09.001

Pope, H. G., Katz, D. L., & Hudson, J. I. (1993). Anorexia nervosa and reverse anorexia among 108 male bodybuilders. *Comprehensive Psychiatry, 34*, 406–409. doi:10.1016/0010-440X(93)90066-D

Pope, H. J., Gruber, A. J., Choi, P., Olivardia, R., & Phillips, K. A. (1997). Muscle dysmorphia: An underrecognized form of body dysmorphic disorder. *Psychosomatics, 38*(6), 548-557. doi:10.1016/S0033-3182(97)71400-2

Pope, H., Kanayama, G., Athey, A., Ryan, E., Hudson, J., & Baggish, A. (2014). The lifetime prevalence of anabolic-androgenic steroid use and dependence in Americans: Current best estimates. *American Journal on Addictions, 23*(4), 371-377. doi:10.1111/j.1521-0391.2014.12118.x

Pope, H., Phillips, K., & Olivardia, R. (2000). *The Adonis Complex: The secret crisis of male body obsession.* New York: Free Press.

Pritchard, M., & Cramblitt, B. (2014). Media influence on drive for thinness and drive for muscularity. *Sex Roles, 71*(5-8), 208-218. doi:10.1007/s11199-014-0397-1

Probert, A., & Leberman, S. (2009). The value of the dark side: An insight into the risks and benefits of engaging in health-compromising practices from the perspective of competitive bodybuilders. *European Sport Management Quarterly, 9*(4), 353-373. doi:10.1080/16184740903331838

Raevuori, A., Keski-Rahkonen, A., Bulik, C. M., Rose, R. J., Rissanen, A., & Kaprio, J. (2006). Muscle dissatisfaction in young adult men. *Clinical Practice and Epidemiology in Mental Health, 2*(1), 6-6. doi:10.1186/1745-0179-2-6

Renzetti, C. M. (1987). New wave or second stage? Attitudes of college women toward feminism. *Sex Roles, 16*(5-6), 265-277. doi:10.1007/BF00289954

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

Ricciardelli, L. A., & McCabe, M. P. (2004). A biopsychosocial model of disordered eating and the pursuit of muscularity in adolescent boys. *Psychological Bulletin, 130*(2), 179-205. doi:10.1037/0033-2909.130.2.179

Rice, K. G., & Aldea, M. A. (2006). State dependence and trait stability of perfectionism: A short-term longitudinal study. *Journal of Counseling Psychology, 53*(2), 205-212. doi:10.1037/0022-0167.53.2.205

Rohman, L. (2009). The relationship between anabolic androgenic steroids and muscle dysmorphia: A review. *Eating Disorders: The Journal of Treatment & Prevention, 17*(3), 187-199. doi:10.1080/10640260902848477

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

Rothman, K. J. (2008). BMI-related errors in the measurement of obesity. *International Journal of Obesity, 32*(S3), S56-S59. doi:10.1038/ijo.2008.87

Sagoe, D., Molde, H., Andreassen, C., Torsheim, T., & Pallesen, S. (2014). The global epidemiology of anabolic-androgenic steroid use: A meta-analysis and meta-regression analysis. *Annals of Epidemiology, 24*(5), 383-398. doi:10.1016/j.annepidem.2014.01.009

Salafia, E. H. B., Gondoli, D. M., Corning, A. F., McEnery, A. M., & Grundy, A. M. (2007). Psychological distress as a mediator of the relation between perceived maternal parenting and normative maladaptive eating among adolescent girls. *Journal of Counseling Psychology, 54*(4), 434-446. doi:10.1037/0022-0167.54.4.434

Shafran, R., Cooper, Z., & Fairburn, C. G. (2002). Clinical perfectionism: A cognitive–behavioural analysis. *Behaviour Research and Therapy, 40*(7), 773-791. doi:10.1016/S0005-7967(01)00059-6

Sherry, S. B., Hewitt, P. L., Besser, A., McGee, B. J., & Flett, G. L. (2004). Self-oriented and socially prescribed perfectionism in the eating disorder inventory perfectionism subscale. *International Journal of Eating Disorders, 35*(1), 69-79. doi:10.1002/eat.10237

Shields, V. R. (2013). *Measuring up*. University of Pennsylvania Press.

Silverman, R. (2012). *Stereotypes*. In M. Kosut (Ed.), *The encyclopedia of gender in media* (pp. 372-374). Thousand Oaks, CA: Sage.

Silverstein, B., Perdue, L., Peterson, B., & Kelly, E. (1986). The role of the mass media in promoting a thin standard of bodily attractiveness for women. *Sex Roles, 14*, 519-532. doi:10.1007/BF00287452

Slade, P. D., & Owens, R. (1998) A dual process model of perfectionism based on reinforcement theory. *Behavior Modification, 22*, 372-390. doi:10.1177/01454455980223010

Smith, D., Hale, B., Rhea, D., Olrich, T., & Collier, K. (2009). Big, buff and dependent: Exercise dependence, muscle dysmorphia and anabolic steroid use in bodybuilders. In L.J. Katlin (ed.), *Men and addictions: New research* (pp. 1–36). New York: Nova Science.

Smolak, L., & Stein, J. A. (2006). The relationship of drive for muscularity to sociocultural factors, self-esteem, physical attributes gender role, and social comparison in middle school boys. *Body Image, 3*(2), 121-129. doi:10.1016/j.bodyim.2006.03.002

Spencer, S. J., Logel, C., & Davies, P. G. (2016). Stereotype threat. *Annual Review of Psychology, 67*(1), 415-437. doi:10.1146/annurev-psych-073115-103235

Stanford, S. C., & Lemberg, R. (2012). Measuring eating disorders in men: Development of the Eating Disorder Assessment for Men (EDAM). *Eating Disorders: The Journal of Treatment & Prevention, 20*(5), 427-436. doi:10.1080/10640266.2012.715522

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

Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin, 128*(5), 825-848. doi:10.1037/0033-2909.128.5.825

Stice, E., & Shaw, H. E. (2002). Role of body dissatisfaction in the onset and maintenance of eating pathology: A synthesis of research findings. *Journal of Psychosomatic Research, 53*(5), 985-993. doi:10.1016/S0022-3999(02)00488-9

Stice, E., Telch, C., & Rizvi, S. (2000). Development and validation of the Eating Disorder Diagnostic Scale: A brief self-report measure of anorexia, bulimia, and binge-eating disorder. *Psychological Assessment, 12*(2), 123-131. doi:10.1037/1040-3590.12.2.123

Swami, V., & Voracek, M. (2013). Associations among men's sexist attitudes, objectification of women, and their own drive for muscularity. *Psychology of Men & Masculinity, 14*(2), 168-174. doi:10.1037/a0028437

Tabachnick, B. G., & Fidell, L. S. (2001). *Using Multivariate Statistics.* Boston: Allyn and Bacon.

Tarrant, S. (2012). Gender and masculinity: Metrosexual male. In M. Kosut (Ed.), *Encyclopedia of gender in media* (pp. 136-138). Thousand Oaks, CA: Sage.

Thompson, J. K., & Heinberg, L. J. (1999). The media's influence on body image disturbance and eating disorders: We've reviled them, now can we rehabilitate them? *Journal of Social Issues, 55*(2), 339-353. doi:10.1111/0022-4537.00119

Tiggemann, M. (2011). Sociocultural perspectives on human appearance and body image. In T. F. Cash & L. Smolak (Eds.), *Body image: A handbook of science, practice, and prevention* (2nd ed., pp. 12–19). New York: Guilford Press.

Tod, D., & Lavallee, D. (2010). Towards a conceptual understanding of muscle dysmorphia development and sustainment. *International Review of Sport and Exercise Psychology, 3*(2), 111-131. doi:10.1080/17509840903428513

Tylka, T. L., Bergeron, D., & Schwartz, J. P. (2005). Development and psychometric evaluation of the male body attitudes scale (MBAS). *Body Image, 2*(2), 161-175. doi:10.1016/j.bodyim.2005.03.001

Tylka, T. L., & Kroon Van Diest, Ashley M. (2013). The intuitive eating scale-2: Item refinement and psychometric evaluation with college women and men. *Journal of Counseling Psychology, 60*(1), 137-153. doi:10.1037/a0030893

van den Berg, P. A., Mond, J., Eisenberg, M., Ackard, D., & Neumark-Sztainer, D. (2010). The link between body dissatisfaction and self-esteem in adolescents: Similarities across gender, age, weight status, race/ethnicity, and socioeconomic status. *Journal of Adolescent Health, 47*(3), 290-296. doi:10.1016/j.jadohealth.2010.02.004

Vaterlaus, J. M., Patten, E. V., Roche, C., & Young, J. A. (2015). Getting healthy: The perceived influence of social media on young adult health behaviors. *Computers in Human Behavior, 45*, 151-157. doi:10.1016/j.chb.2014.12.013

Wade, J. C., & Brittan-Powell, C. (2001). Men's attitudes toward race and gender equity: The importance of masculinity ideology, gender-related traits, and reference group identity dependence. *Psychology of Men & Masculinity, 2*(1), 42-50. doi:10.1037/1524-9220.2.1.42

Walker, D., & Joubert, H. E. (2011). Attitudes of injecting male anabolic androgenic steroid users to media influence, health messages and gender constructs. *Drugs and Alcohol Today, 11*(2), 56-70. doi:10.1108/17459261111174019

Walker, W. R. (2009). The effects of physical and experience factors on physical self-efficacy in collegiate weight training students. (Doctoral dissertation). Retrieved from http://search.proquest.com/docview/304689845?fromunauthdoc=true

Wertsch, J. V. (2009). *Vygotsky and the social formation of mind.* Cambridge, MA: Harvard University Press.

Westerman, M. E., Charchenko, C. M., Ziegelmann, M. J., Bailey, G. C., Nippoldt, T. B., & Trost, L. (2016). Heavy testosterone use among bodybuilders: An uncommon cohort of illicit substance users. *The Journal of Urology, 195*(4), e1188-e1189. doi:10.1016/j.juro.2016.02.2799

White, P., & Gillett, J. (1994). Reading the muscular body: A critical decoding of advertisements in flex magazine. *Sociology of Sport Journal, 11*, 18-39.

Wright, S., Grogan, S., & Hunter, G. (2000). Motivations for anabolic steroid use among bodybuilders. *Journal of Health Psychology, 5*(4), 566-571.

Yang, H., & Stoeber, J. (2012). The Physical Appearance Perfectionism Scale: Development and preliminary validation. *Journal of Psychopathology and Behavioral Assessment, 34*(1), 69-83. doi:10.1007/s10862-011-9260-7

Yesalis, C., & Bahrke, M. (2002). Anabolic-Androgenic Steroids and Related Substances. *Current Sports Medicine Reports, 4*, 246-252

Tables

Table 1

Characteristics of Sample

Characteristics	%	N	M	SD
Age		184	27.17	9.06
Race/Ethnicity		184		
African American	14.1			
Arab American	11.4			
Asian American	1.6			
Caucasian	53.3			
Hispanic/Latino	14.1			
Multiethnic	3.8			
Native American	1.6			
Political Affiliation		184		
Constitution Party	1.1			
Democrat	28.3			
Green Party	.5			
Independent	7.1			
Libertarian	3.3			
Republican	19.0			
No Affiliation	38.6			
Other	2.2			
Level of Education		184		
Some high school	3.8			
High school diploma or GED	25.0			
Some collage (no degree)	42.4			
Associate's degree	12.5			
Bachelor's degree	10.3			
Graduate or professional degree	4.9			
No indication	1.1			
Religious Affiliation		182		
Buddhist				
Catholic	39.1			
Evangelical Christian	7.6			
Jewish	2.7			
Muslim	6.5			

Protestant Christian	7.6		
Other/No Affiliation	29.7		
No response	1.1		
Degree of Religiosity		183	3.07	1.81
Height (in inches)		184	70.31	2.73
Weight (in lbs.)		184	205.24	36.67
Times per week spent lifting weights		184	4.88	1.19
Hours per week spent lifting weights		184	8.97	14.80
BMI		184	29.17	4.92

Note. Degree of Religiosity measured on a 7-point Likert scale, from 1 (*Not Religious At All*) to 7 (*Highly Religious*).

Table 2

Means and Standard Deviations of Predictor and Outcome Variables

Variables	N	M	SD
Age	184	27.17	9.06
BMI	184	29.17	4.91
Hours per week lifting weights	184	8.97	3.85
Self-esteem	184	2.68	.184
Dieting behaviors	184	2.26	1.24
Male appearance satisfaction scale (MASS)			
Bodybuilding Dependence	183	2.43	.71
Mirror Checking	184	2.11	.74
Substance Use	183	2.10	.75
Satisfaction	182	2.53	.74
Intuitive eating scale			
Unconditional eating	184	3.19	.87
Eating for physical reasons	184	3.98	.79
Reliance on hunger cues	184	3.18	.91
Body food congruence	184	3.84	.82
Physical perfectionism			
Worry About Perfectionism	184	2.16	.86
Hope for Perfection	183	3.16	1.01
Male body attitude			
Body fat dissatisfaction	184	3.24	1.21
Muscularity dissatisfaction	184	3.58	.97
Intent to use anabolic steroids	184	2.34	2.52
Feminism attitudinal scale – Sexism	182	1.82	.61

Note. M = Mean, SD = Standard Deviation

Rosenberg self-esteem scale range = 1 – 4, Dieting behaviors scale range = 0 – 7, MASS range = 1 – 4, Intuitive eating scale = 1 – 5, Physical appearance perfectionism scale range = 1 – 5, Male body attitude scale range = 1 – 6, Intent to use anabolic steroids scale range = 0 – 7, Feminism Attitudinal Scale – Sexism scale range 1 – 4.

Table 3

Seven-Factor Promax-Rotated Loadings of the 24 Feminism Attitudinal Inventory Items

Item	Item Content	F1	F2	F3	F4	F5	F6	F7
6	Husband take job, woman follow	**.84**	-.27	-.12	.10	.15	-.05	-.05
12	Women should care for home	**.78**	-.01	.07	.05	-.10	-.02	-.09
21	Women worry about good wives	**.49**	.24	.04	-.02	-.16	.05	-.08
2	Men are better for politics	**.49**	.15	.14	.16	-.03	-.10	.27
19R	Children should not stand in the way	**.49**	-.05	-.08	-.24	.29	.05	-.03
5	Women need a man to be happy	**.48**	.13	-.08	.15	-.11	.20	-.06
17	Career women are masculine	**.46**	.28	.03	-.09	-.07	-.02	-.15
20	Turn women into men	.39	.24	.06	-.12	.12	.01	.09
18	Women are unhappy misfits	.07	**.64**	-.04	.01	.13	-.00	.07
13	Things are easier for girls today	-.10	**.51**	-.05	-.04	-.08	.06	.01
1	Marriage is important	.04	.32	.13	.15	-.08	-.04	.17
16	Popularity should be more important	.08	.31	-.10	-.07	-.16	.05	-.08
22R	Men discriminate in hiring	.05	-.13	**.75**	.15	-.03	.01	-.09
8R	Women earn less money than men	-.03	-.03	**.62**	-.05	.04	-.02	.08
9R	Sympathetic towards women's rights	-.05	.15	.39	-.17	.39	-.01	.01
10	Women should take husband's name	.13	-.06	.11	**.65**	-.09	-.02	-.12
11	More jobs for men	.02	.25	-.25	**.46**	.36	-.05	-.04
3	Women have the right to be unhappy	.16	.31	-.02	-.37	-.11	-.06	.04
15R	I consider myself to be a feminist	.02	-.14	.01	.04	**.56**	-.04	.00
23R	Women live full life without marriage	-.03	.11	-.04	-.01	-.08	**.79**	.09
14R	No laws preventing abortion	.21	-.28	.13	-.12	.18	.28	.10
7	There is little to stop women	.17	-.09	.02	.31	.04	-.04	**-.50**
4R	Military draft	-.04	-.02	.03	.21	.05	.24	.38
24R	Women are oppressed group	.17	.15	.28	.14	.30	.09	-.31

Note: Item numbers correspond to those on Renzetti's (1987) original Feminism Attitudinal Inventory scale. R = Reverse coded. Factor loadings of .40 and greater are shown in boldface. F1 = Sexism. F2, F3, F4, F5, F6, and F7 = item dropped from analyses

Table 4

Correlations Between Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Age	1																		
2. BMI	.24**	1																	
3. Hours	-.26***	.05	1																
4. Self-Esteem	-.07	-.03	.08	1															
5. Dieting Behavior	-.01	.24**	.02	-.03	1														
6. BB Depend.^	-.09	.11	.33***	-.05	.13	1													
7. Check.^	-.32***	-.06	.25**	-.00	.14	.61***	1												
8. Subs.^	-.14	.17*	.25**	-.02	.09	.59***	.53***	1											

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
9. Satis. ^	.07	-.18*	-.14	.13	-.14	-.07	.06	-.12	1									
10. Perm. to Eat	.04	-.14	-.15*	.10	-.41***	-.19*	-.15*	-.16*	.17*	1								
11. Eating for Phys.	.09	-.19***	-.05	-.04	-.28***	-.15	-.11	-.00	.19*	.11	1							
12. Re. on H.Cue	.05	-.05	-.01	.09	-.22***	-.13	-.08	-.05	.21***	.28***	.19*	1						
13. Body Food Con.	-.10	-.08	.20***	.26***	.09	.10	.09	.08	.05	-.34***	.25**	.08	1					
14. B.F. Diss.♩	-.04	.24***	.16*	-.14	.54***	.29**	.14	.21**	-.50***	-.50***	-.32**	-.28***	.02	1				
15. Mus. Diss.♩	-.22***	-.12	.23***	-.08	.18*	.27***	.16*	.29***	-.49***	-.22***	-.10	-.25**	.06	.60***	1			
16. W.I.P.✜	-.10	-.10	.16*	-.05	.27***	.26***	.25***	.19*	-.41***	-.33***	-.25***	-.18*	.04	.56***	.36***	1		
17. H.I.P.✜	-.02	-.03	-.05	-.02	.18*	.16*	.23***	.13	.08	.24***	-.06	-.06	.10	.28***	.12	.39***	1	
18. Steroid	-.10	.33***	.15*	.03	.14	.39***	.21**	.59***	.01	-.80	.01	-.10	.14	.06	.13	.06	.11	1

19. Sexism   -.08   -.20**   -.14   .01   -.03   .11   .12   -.01   .02   .02   -.27***   -.90   -.06   -.01   -.06   -.00   .08   -.9   1

Note: * p < .05, ** p < .01, *** p < .001. Pearson correlation coefficients were used.
^ = Muscle Appearance Satisfaction Scale; BB Depend. = Bodybuilding Dependence; Check. = Mirror Checking; Subs. = Substance Use; Satis. = Body Satisfaction
□= Intuitive Eating Scale; Per. to Eat = Unconditional Permissions to Eat; Eating for Phys. = Eating for Physical Reasons; Re. on H. Cues = Reliance on Hunger Cues
♩ = Male Body Attitudes scale; B.F. Diss. = Body Fat Dissatisfaction; Mus. Diss. = Muscularity Dissatisfaction
✤□= Physical Appearance Perfectionism scale; W.I.P. = Worry About Perfectionism; H.I.P. = Hope For Perfection

Table 5

Multiple Linear Regression Analysis Predicting Bodybuilding Dependence

Variables	B	SE	β	95% CI	p value
Age	.00	.01	.06	[-.00, .02]	.43
Hours per week lift weights	.047	.01	.25	[.02, .07]	.00
BMI	-.00	.01	-.03	[-.03, .02]	.78
Rosenberg self-esteem	-.23	.27	-.06	[-.75, .30]	.39
Intent to use steroids	.10	.02	.36	[.06, .14]	.00
Dieting behaviors	-.03	.05	-.05	[-.12 .06]	.54
Male body perfectionism					
Worry about imperfections	.07	.07	.09	[-.06, .21]	.30
Hope for perfection	.03	.05	.05	[-.07, .13]	.53
Intuitive eating					
Unconditional eating	-.02	.07	-.02	[-.15, .12]	.80
Eating for physical reasons	-.04	.07	-.04	[-.17, .10]	.60
Reliance on hunger cues	-.00	.06	-.00	[-.12, .11]	.94
Body food congruence	.02	.07	.03	[-.11, .17]	.73
Male body attitude					
Body fat dissatisfaction	.08	.07	.14	[-.05, .21]	.24
Muscularity dissatisfaction	.04	.07	.05	[-.10, .17]	.59
Sexism	.20	.08	.17	[.03, .36]	.02

Note. N = 179, B = Unstandardized Beta Coefficient, SE = Standard Error, β = Standardized Beta Coefficient, CI = Confidence Intervals.

Table 6

Multiple Linear Regression Analysis Predicting Body Checking Behaviors

Variables	B	SE	β	95% CI	p value
Age	-.02	.01	-.22	[-.03, -.01]	.00
Hours per week lift weights	.03	.02	.17	[.00, .06]	.03
BMI	-.01	.01	-.05	[-.03, .02]	.54
Rosenberg self-esteem	-.13	.30	-.03	[-.71, .45]	.66
Intent to use steroids	.05	.02	.16	[.00 .09]	.05
Dieting behaviors	.06	.05	.10	[-.04, .16]	.26
Male body perfectionism					
Worry about imperfections	.13	.08	.15	[-.023, .27]	.10
Hope for perfection	.11	.06	.16	[.00, .22]	.05
Intuitive eating					
Unconditional eating	-.03	.08	-.04	[-.18, .12]	.69
Eating for physical reasons	-.02	.08	-.02	[-.17, .14]	.83
Reliance on hunger cues	.01	.06	.01	[-.12, .13]	.92
Body food congruence	-.01	.08	-.01	[-.16, .14]	.94
Male body attitude					
Body fat dissatisfaction	-.06	.08	-.10	[-.21, .09]	.44
Muscularity dissatisfaction	.01	.07	.01	[-.14, .16]	.91
Sexism	.14	.09	.12	[-.04, .32]	.12

Note. N = 180, B = Unstandardized Beta Coefficient, SE = Standard Error, β = Standardized Beta Coefficient, CI = Confidence Intervals.

Table 7

Multiple Linear Regression Analysis Predicting Substance Use

Variables	B	SE	β	95% CI	p value
Age	-.00	.01	-.03	[-.01, .01]	.70
Hours per week lift weights	.02	.01	.11	[-.00, .05]	.09
BMI	.00	.01	.02	[-.02, .03]	.81
Rosenberg self-esteem	.01	.26	.00	[-.50, .52]	.96
Intent to use steroids	.17	.02	.56	[.13, .21]	.00
Dieting behaviors	-.05	.05	-.08	[-.14, .04]	.31
Male body perfectionism					
Worry about imperfections	.04	.07	.05	[-.09, .17]	.52
Hope for perfection	.02	.05	.02	[-.08, .12]	.74
Intuitive eating					
Unconditional eating	-.09	.07	-.101	[-.23, .04]	.17
Eating for physical reasons	.08	.07	.08	[-.06, .22]	.24
Reliance on hunger cues	.08	.05	.09	[-.03, .18]	.17
Body food congruence	-.08	.07	-.09	[-.21, .05]	.24
Male body attitude					
Body fat dissatisfaction	.05	.07	.08	[-.08, .18]	.46
Muscularity dissatisfaction	.11	.07	.14	[-.02, .24]	.10
Sexism	.12	.08	.09	[-.04, .27]	.15

Note. N = 179, B = Unstandardized Beta Coefficient, SE = Standard Error, β = Standardized Beta Coefficient, CI = Confidence Intervals.

Table 8

Multiple Linear Regression Analysis Predicting Body Satisfaction

Variables	B	SE	β	95% CI	p value
Age	.00	.01	.01	[-.01, .01]	.83
Hours per week lift weights	-.00	.01	-.01	[.03, .02]	.93
BMI	-.03	.01	-.18	[-.05, -.00]	.02
Rosenberg self-esteem	.31	.25	.08	[-.19, .81]	.22
Intent to use steroids	.02	.02	.08	[-.02, .06]	.22
Dieting behaviors	.07	.04	.12	[-.02, .16]	.11
Male body perfectionism					
Worry about imperfections	-.23	.06	-.27	[-.36, -.11]	.00
Hope for perfection	.19	.05	.26	[.09, .28]	.00
Intuitive eating					
Unconditional eating	-.05	.06	-.06	[-.18, .08]	.43
Eating for physical reasons	.02	.07	.02	[-.11, .15]	.79
Reliance on hunger cues	.06	.06	.07	[-.05, .16]	.27
Body food congruence	-.04	.05	-.04	[-.17, .09]	.55
Male body attitude					
Body fat dissatisfaction	-.14	.06	-.23	[-.267, -.01]	.03
Muscularity dissatisfaction	-.25	.06	-.33	[-.38, -.13]	.00
Sexism	-.05	.08	-.04	[-.21, .11]	.52

Note. N = 178, B = Unstandardized Beta Coefficient, SE = Standard Error, β = Standardized Beta Coefficient, CI = Confidence Intervals.

Table 9

Multiple Linear Regression Analysis Predicting Intent to Use Steroids

Variables	B	SE	β	95% CI	p value
Age	-.03	.02	-.12	[-.07, .00]	.05
Hours per week lift weights	-.01	.04	-.02	[-.09, .07]	.75
BMI	.16	.03	.30	[.09, .22]	.00
Rosenberg self-esteem	.26	.78	.02	[-1.28, 1.79]	.74
Dieting behaviors	.33	.13	.17	[.08, .61]	.01
Male body perfectionism					
Worry about imperfections	-.09	.22	-.03	[-.52, .34]	.69
Hope for perfection	.21	.16	.08	[-.11, .53]	.20
Muscle appearance satisfaction					
Bodybuilding dependence	.84	.29	.24	[.28, 1.41]	.00
Body checking	-.75	.27	-.22	[-1.29, -.21]	.01
Substance use	1.65	.25	.49	[1.15, 2.15]	.00
Satisfaction	.27	.25	.08	[-.23, .77]	.29
Male body attitude					
Body fat dissatisfaction	-.63	.20	-.31	[-1.03, -.24]	.00
Muscularity dissatisfaction	.44	.21	.17	[.03, .85]	.04
Caucasian ethnicity	-.86	.29	-.17	[-1.44, -.29]	.00
Sexism	-.07	.24	-.02	[-.55, .41]	.78

Note. N = 176, B = Unstandardized Beta Coefficient, SE = Standard Error, β = Standardized Beta Coefficient, CI = Confidence Intervals.

Table 10

Multiple Linear Regression Analysis Predicting Unconditional Permissions To Eat

Variables	B	SE	β	95% CI	p value
Age	.00	.01	.02	[-.01, .02]	.79
Hours per week lift weights	-.03	.02	-.12	[-.06, .01]	.10
BMI	.01	.02	.03	[-.03, .04]	.75
Rosenberg self-esteem	.35	.33	.07	[-.30, .99]	.29
Dieting behaviors	-.17	.06	-.24	[-.28, -.05]	.01
Male body perfectionism					
Worry about imperfections	-.10	.09	-.10	[-.28, .08]	.26
Hope for perfection	-.06	.07	-.07	[-.20, .08]	.38
Muscle appearance satisfaction					
Bodybuilding dependence	-.03	.12	-.02	[-.27, .21]	.81
Body checking	.02	.12	.02	[-.21, .25]	.86
Substance use	-.07	.12	-.06	[-.30, .17]	.58
Satisfaction	-.04	.11	-.03	[-.25, .17]	.71
Male body attitude					
Body fat dissatisfaction	-.20	.09	-.27	[-.37, -.03]	.03
Muscularity dissatisfaction	.06	.09	.06	[-.12, .23]	.54
Intent to use anabolic steroids	.00	.03	.01	[-.06, .07]	.94
Sexism	.01	.10	.01	[-.19, .21]	.92

Note. N = 176, B = Unstandardized Beta Coefficient, SE = Standard Error, β = Standardized Beta Coefficient, CI = Confidence Intervals.

Table 11

Multiple Linear Regression Analysis Predicting Eating For Physical Reasons

Variables	B	SE	β	95% CI	p value
Age	.01	.01	.10	[-.01, .02]	.20
Hours per week lift weights	.00	.02	.01	[-.03, .03]	.88
BMI	-.04	.01	-.23	[-.06, -.010]	.01
Rosenberg self-esteem	-.44	.30	-.10	[-1.02, .16]	.15
Dieting behaviors	-.08	.05	-.13	[-.19, .02]	.12
Male body perfectionism					
Worry about imperfections	-.07	.08	-.07	[-.23, .10]	.43
Hope for perfection	.05	.06	.06	[-.07, .17]	.43
Muscle appearance satisfaction					
Bodybuilding dependence	-.08	.11	-.07	[-.30, .15]	.51
Body checking	-.08	.12	-.07	[-.30, .14]	.49
Substance use	.14	.12	.14	[-.07, .36]	.19
Satisfaction	.05	.10	.05	[-.14, .25]	.60
Male body attitude					
Body fat dissatisfaction	-.12	.08	-.19	[-.28, .03]	.12
Muscularity dissatisfaction	.03	.08	.04	[-.13, .19]	.70
Intent to use anabolic steroids	.02	.03	.05	[-.04, .07]	.60
Sexism	-.39	.09	-.30	[-.58, -.21]	.00

Note. N = 176, B = Unstandardized Beta Coefficient, SE = Standard Error, β = Standardized Beta Coefficient, CI = Confidence Intervals.

Table 12

Multiple Linear Regression Analysis Predicting Reliance On Hunger Cues

Variables	B	SE	β	95% CI	p value
Age	.00	.01	.02	[-.02, .02]	.80
Hours per week lift weights	.01	.02	.05	[-.03, .05]	.55
BMI	.00	.02	.01	[-.03, .04]	.93
Rosenberg self-esteem	.22	.37	.04	[-.52, .95]	.56
Dieting behaviors	-.09	.07	-.12	[-.22, .04]	.17
Male body perfectionism					
Worry about imperfections	-.03	.10	-.03	[-.24, .17]	.75
Hope for perfection	.04	.08	.04	[-.12, .19]	.65
Muscle appearance satisfaction					
Bodybuilding dependence	-.07	.14	-.05	[-.35, .21]	.63
Body checking	-.07	.13	-.06	[-.33, .20]	.61
Substance use	.19	.14	.16	[-.08, .46]	.16
Satisfaction	.06	.12	.11	[-.11, .38]	.27
Male body attitude					
Body fat dissatisfaction	-.08	.10	-.11	[-.27, .12]	.43
Muscularity dissatisfaction	-.12	.10	-.13	[-.32, .08]	.25
Intent to use anabolic steroids	-.05	.04	-.15	[-.13, .02]	.16
Sexism	-.16	.12	-.11	[-.39, .07]	.17

Note. N = 176, B = Unstandardized Beta Coefficient, SE = Standard Error, β = Standardized Beta Coefficient, CI = Confidence Intervals.

Table 13

Multiple Linear Regression Analysis Predicting Body Food Choice Congruence

Variables	B	SE	β	95% CI	p value
Age	.00	.01	.00	[-.02, .02]	.97
Hours per week lift weights	.04	.02	.16	[.00, .07]	.05
BMI	-.03	.02	-.16	[-.06, .01]	.11
Rosenberg self-esteem	.98	.34	.22	[.31, 1.64]	.00
Dieting behaviors	.06	.06	.10	[-.05, .18]	.30
Male body perfectionism					
Worry about imperfections	.01	.09	.01	[-.18, .19]	.94
Hope for perfection	.08	.07	.10	[-.06, .22]	.28
Muscle appearance satisfaction					
Bodybuilding dependence	.04	.13	.03	[-.21, .29]	.77
Body checking	-.02	.12	-.01	[-.26, .22]	.90
Substance use	-.05	.12	-.05	[-.29, .19]	.68
Satisfaction	-.02	.11	-.01	[-23, .20]	.89
Male body attitude					
Body fat dissatisfaction	-.01	.09	-.01	[-.18, .17]	.93
Muscularity dissatisfaction	-.02	.09	-.03	[-.20, .16]	.80
Intent to use anabolic steroids	.05	.03	.14	[-.02, .11]	.17
Sexism	-.11	.11	-.08	[-.31, .10]	.32

Note. N = 176, B = Unstandardized Beta Coefficient, SE = Standard Error, β = Standardized Beta Coefficient, CI = Confidence Intervals.

Appendix A

Letter of Research Intent

Good Afternoon _____

      My name is Jacqueline Fritts and I am a graduate psychology student at the University of Michigan Dearborn. I am contacting you regarding a collaborative research project that my faculty supervisor, Dr. Jane Sheldon, and myself were interested in conducting (in addition to other opportunities for collaboration).

My main areas of interest are bodybuilders and weight lifters. As a weight-lifter myself, I am interested in conducting research on the lifestyles and attitudes of male bodybuilders and due to the private nature of the bodybuilding community, research is notably scarce.

      I am wondering if you would be interested in collaborating with me on my project and allowing me to collect questionnaire research from your gym members on your site. I will be stopping by to visit and further discuss the details of this project with you within the next week.

Looking forward to hearing back from you!

Warmly,

Jacqueline Fritts

Appendix B

Gym Manager Agreement

To Whom It May Concern: Date: _____

      We have been in communication with Jacqueline Fritts about a study she is conducting to survey bodybuilders and weightlifters. In addition, she has discussed the nature of the study in regard to her future research and the use of our facilities. Following the approval of the study by the University of Michigan-Dearborn's Institutional Review Board, we would be pleased to allow Ms. Fritts to recruit participants for the study at our gym location. Participation in the study will be completely voluntary and membership care will not be compromised as a result of participation.

Sincerely,

_____ (Manager's signature)

_____ (Manager's printed name)

_____ (Name and address of facility)

Appendix C

The University of Michigan–Dearborn
INFORMED CONSENT

Experiences, Attitudes, and Beliefs of Male Bodybuilders and Weightlifters

Purpose of the study

Jacqueline Fritts (a graduate student), Professor Jane Sheldon, and the rest of our research team from the University of Michigan–Dearborn invite you to participate in a study to learn more about bodybuilders and weightlifters. We hope that by learning about your ideas and attitudes, we can gain more information about the experiences of individuals in the bodybuilding and weightlifting communities.

Description of Subject Involvement:

If you agree to be part of the research study, you will be asked to complete several short questionnaires. The first set of questions is focused on your general background and characteristics (e.g., age, ethnicity, employment, religion, etc.), because we are trying to include a variety of different weightlifters and bodybuilders in our study. In the second set of questions, you will be asked to give your opinions and attitudes about yourself, your body, steroid and supplement use, your lifestyle, and the roles of men and women in our society.

Voluntary Nature of The Study:

Participation in this study is completely voluntary. Even if you decide to participate now, you are free to change your mind and stop at any time. If you decide to stop, your data will not be included in the study and will be destroyed.

Benefits:

Although you may not directly benefit from being in this study, others may benefit from your participation. Based on data from this study, others may become better informed about the needs of the bodybuilding and weightlifting communities and may then be able to provide services to meet these needs.

Risks and Discomforts:

The researchers have been careful to try to minimize the risks of this study. Even so, you could possibly experience discomfort from questions on the questionnaire. In case you would like to talk with someone about these experiences, we will provide you with referrals for mental health services.

Confidentiality:

If you choose to be a part of the study, your responses will be anonymous and confidential. We will not collect your name or other information that could identify you as a participant in the study.

We do plan to present and/or publish the results of this study, but will not include any information that would identify you. There are some reasons why people other than the researchers may need to see information you provided as part of the study. This includes organizations responsible for making sure the research is done safely and properly, including the University of Michigan–Dearborn.

Again, in order to ensure confidentiality, your name or personal information will not be recorded for the study.

Compensation:

To compensate you for your time and effort, you will be given a $10 Visa gift card.

Storage and Future Use of Data

The anonymous information you provide will be stored in a locked file cabinet in a locked laboratory at the University of Michigan–Dearborn for five years. Electronic copies of the data may be made available to other researchers following the completion of this research study, but will not contain information that could identify you. Use of your data for future studies will be limited to others who are conducting important research on this topic.

Contact Information:

If you have questions about this research study you may contact Jacqueline Fritts at jtfritts@umich.edu or Dr. Jane Sheldon at jsheldon@umich.edu.

If you have questions regarding your rights as a research participant, or wish to obtain information, ask questions, or discuss concerns with someone other than the researcher(s), You may contact the Dearborn IRB Administrator in the Office of Research and Sponsored Programs, 1055 Administration Building, University of Michigan–Dearborn, Evergreen Rd., Dearborn, MI 48128-2406, (313) 593-5468; the Dearborn IRB Application Specialist at (734) 763-5084, or email Dearborn-IRB@umich.edu.

Agreeing to Participate:

If you agree to participate in this study, please provide your oral consent to the researcher. We will provide you a copy of this consent form to keep. In addition, if you would like to learn the findings of this study, please email Jacqueline Fritts (jtfritts@umich.edu) and she will be happy send you a summary of the results once the study is completed.

Appendix D

Demographics Questionnaire

1. What is your age (in years)?   _____ years old

2. Which of the following best describes your race/ethnicity?   Please circle one response.
   - African American
   - Arab American
   - Asian American
   - Caucasian
   - Hispanic/Latino
   - Multiethnic
   - Native American
   - Pacific Islander
   - Other (please write in) _____

3. Which of the following best describes your political affiliation? Please circle one answer.
   - Constitution Party
   - Democrat
   - Green Party
   - Independent
   - Libertarian
   - Republican
   - No affiliation
   - Other (please write in) _____

4. Which of the following best describes your level of education? Please circle one answer.
   - Some high school (no degree)
   - High school diploma or GED
   - Some college (no degree)
   - Associate's degree
   - Bachelor's Degree
   - Graduate or Professional Degree

5. What is your current height (in feet and inches)?   _____ feet, _____ inches

6. What is your current weight (in pounds)?   _____ pounds

7. How many times per week, on average, do you lift weights?   _____ times per week

8. How many hours per week, on average, do you lift weights?   _____ hours per week

Appendix E

Rosenberg Self-Esteem Scale

Please read each statement and circle the answer that best describes how much you agree with the statement. Indicate your answer by circling a number from 1 to 4, with 1 indicating *Strongly Disagree* and 4 indicating *Strongly Agree*. Please only circle one response for each statement.

	Strongly Disagree			Strongly Agree
1. On the whole, I am satisfied with myself.	1	2	3	4
2. At times I think I am no good at all.	1	2	3	4
3. I feel that I have a number of good qualities.	1	2	3	4
4. I am able to do things as well as most other people.	1	2	3	4
5. I feel I do not have much to be proud of.	1	2	3	4
6. I certainly feel useless at times.	1	2	3	4
7. I feel that I am a person of worth, at least on an equal plane with others.	1	2	3	4
8. I wish I could have more respect for myself.	1	2	3	4
9. All in all, I am inclined to feel that I am a failure.	1	2	3	4
10. I take a positive attitude toward myself.	1	2	3	4

Appendix F

Intention to Use Anabolic-Androgenic Steroids Measure

Please read each statement and circle the answer that best describes how much you agree with the statement. Indicate your answer by circling a number from 0 to 7, with 0 indicating *Very Untrue* and 7 indicating *Very True*. Please only circle one response for each statement.

	Very Untrue						Very True	
1. I plan to use anabolic steroids in the future.	0	1	2	3	4	5	6	7
2. I have looked up information on types of steroids and how to use them.	0	1	2	3	4	5	6	7
3. I have looked up information on how to obtain steroids.	0	1	2	3	4	5	6	7
4. I have talked with people who use steroids about getting or using steroids.	0	1	2	3	4	5	6	7
5. I have learned about getting and using steroids.	0	1	2	3	4	5	6	7

Appendix G

Physical Appearance Perfectionism Scale

Please read each statement and circle the answer that best describes how much you agree with the statement. Indicate your answer by circling a number from 1 to 5, with 1 indicating *Strongly Disagree* and 5 indicating *Strongly Agree*. Please only circle one response for each statement.

	Strongly Disagree				Strongly Agree
1. I am not satisfied with my appearance.	1	2	3	4	5
2. I hope my body shape is perfect.	1	2	3	4	5
3. I am never happy with my appearance no matter how I dress.	1	2	3	4	5
4. I hope that I look attractive.	1	2	3	4	5
5. I worry that my appearance is not good enough.	1	2	3	4	5
6. I hope others admire my appearance.	1	2	3	4	5
7. I hope others find me attractive.	1	2	3	4	5
8. I wish I could completely change my appearance.	1	2	3	4	5
9. My appearance is far from my expectations.	1	2	3	4	5
10. I worry about others' being critical of my appearance.	1	2	3	4	5
11. I often think about shortcomings of my appearance.	1	2	3	4	5
12. I hope I am handsome.	1	2	3	4	5

Appendix H

Muscle Appearance Satisfaction Scale

Please read each statement and circle the answer that best describes how much you agree with the statement. Indicate your answer by circling a number from 1 to 4, with 1 indicating *Strongly Disagree* and 4 indicating *Strongly Agree*. Please only circle one response for each statement.

	Strongly Disagree			Strongly Agree
1. When I look at my muscles in the mirror, I often feel satisfied with my current muscle size.	1	2	3	4
2. If my schedule forces me to miss a day of working out with weights, I feel very upset.	1	2	3	4
3. I often ask my friends and/or relatives if I look big.	1	2	3	4
4. I often spend money on muscle-building supplements.	1	2	3	4
5. It is OK to use steroids to add muscle mass.	1	2	3	4
6. I often feel like I am addicted to working out with weights.	1	2	3	4
7. If I have a bad workout, it is likely to have a negative effect on the rest of my day.	1	2	3	4
8. I would try anything to get my muscles to grow.	1	2	3	4
9. I often keep working out even when my muscles or joints are sore from previous workouts.	1	2	3	4
10. I often spend a lot of time looking at my muscles in the mirror.	1	2	3	4
11. I spend more time in the gym working out than most others who work out.	1	2	3	4

12. To get big, one must be able to ignore a lot of pain.   1   2   3   4

13. I am satisfied with my muscle tone/definition.   1   2   3   4

14. My self-worth is very focused on
    how my muscles look.   1   2   3   4

15. I often ignore a lot of physical pain
    while I am lifting to get bigger.   1   2   3   4

16. I must get bigger muscles by any means necessary.   1   2   3   4

17. I often see reassurance from others that
    my muscles are big enough.   1   2   3   4

18. I often find it difficult to resist
    checking the size of my muscles.   1   2   3   4

Appendix I

Male Body Attitude Scale

Please read each statement and circle the answer that best describes how often you think each statement. Indicate your answer by circling a number from 1 to 5, with 1 indicating *Never* and 6 indicating *Always*. Please only circle one response for each statement.

	Never					Always
1. I think I have too little muscle on my body.	1	2	3	4	5	6
2. I think my body should be leaner.	1	2	3	4	5	6
3. I wish my arms were stronger.	1	2	3	4	5	6
4. I feel satisfied with the definition in my abs (i.e., stomach muscles).	1	2	3	4	5	6
5. I think my legs are *not* muscular enough.	1	2	3	4	5	6
6. I think my chest should be broader.	1	2	3	4	5	6
7. I think my shoulders are too narrow.	1	2	3	4	5	6
8. I am concerned that my stomach is too flabby.	1	2	3	4	5	6
9. I think my arms should be larger (i.e., more muscular).	1	2	3	4	5	6
10. I feel dissatisfied with my overall body build.	1	2	3	4	5	6
11. I think my calves should be larger (i.e., more muscular).	1	2	3	4	5	6
12. I think I have too much fat on my body.	1	2	3	4	5	6
13. I think my abs are *not* thin enough.	1	2	3	4	5	6

14. I think my back should be larger
    and more defined.   1   2   3   4   5

15. I think my chest should be larger
    and more defined.   1   2   3   4   5   6

16. I feel satisfied with the definition in my arms.   1   2   3   4   5   6

17. I feel satisfied with the size and shape
    of my body.   1   2   3   4   5   6

18. Has eating sweets, cakes, or other high calorie
    foods made you feel fat or weak?   1   2   3   4   5   6

19. Have you felt excessively large
    and rounded (i.e., fat)?   1   2   3   4   5   6

20. Have you felt ashamed of your body
    size or shape?   1   2   3   4   5   6

21. Has seeing your reflection
    (e.g., in a mirror or window) made you feel
    badly about your size or shape?   1   2   3   4   5   6

22. Have you been so worried about your body
    size or shape that you have been feeling that
    you ought to diet?   1   2   3   4   5   6

Appendix J

Intuitive Eating Scale-2

Please read each statement and circle the answer that best describes how much you agree with the statement. Indicate your answer by circling a number from 1 to 5, with 1 indicating *Strongly Disagree* and 5 indicating *Strongly Agree*. Please only circle one response for each statement.

	Strongly Agree				Strongly Disagree
1. I try to avoid certain foods high in fat, carbohydrates, or calories.	1	2	3	4	5
2. I find myself eating when I'm feeling emotional (e.g., anxious, depressed, sad), even when I'm not physically hungry.	1	2	3	4	5
3. If I am craving a certain food, I allow myself to have it.	1	2	3	4	5
4. I get mad at myself for eating something unhealthy.	1	2	3	4	5
5. I find myself eating when I am lonely, even when I'm not physically hungry.	1	2	3	4	5
6. I trust my body to tell me when to eat.	1	2	3	4	5
7. I trust my body to tell me what to eat.	1	2	3	4	5
8. I trust my body to tell me how much to eat.	1	2	3	4	5
9. I have forbidden foods that I don't allow myself to eat.	1	2	3	4	5
10. I use food to help me soothe my negative emotions.	1	2	3	4	5
11. I find myself eating when I am stressed out, even when I'm not physically hungry.	1	2	3	4	5

12. I am able to cope with my negative emotions (e.g., anxiety, sadness) without turning to food for comfort.   1   2   3   4   5

13. When I am bored, I do NOT eat just for something to do.   1   2   3   4   5

14. When I am lonely, I do NOT turn to food for comfort.   1   2   3   4   5

15. I find other ways to cope with stress and anxiety than by eating.   1   2   3   4   5

16. I allow myself to eat what food I desire at the moment.   1   2   3   4   5

17. I do NOT follow eating rules or dieting plans that dictate what, when, and/or how much to eat.   1   2   3   4   5

18. Most of the time, I desire to eat nutritious foods.   1   2   3   4   5

19. I mostly eat foods that make my body perform efficiently (well).   1   2   3   4   5

20. I mostly eat foods that give my body energy and stamina.   1   2   3   4   5

21. I rely on hunger signals to tell me when to eat.   1   2   3   4   5

22. I rely on my fullness (satiety) signals to tell me when to stop eating.   1   2   3   4   5

23. I trust my body to tell me when to stop eating.   1   2   3   4   5

Appendix K

Dieting Behaviors Scale

Please read each statement and circle the answer that best describes how often you feel about eating, dieting, and how much you exercise. Indicate your answer by circling a number from 0 to 5, with 0 indicating *Never* and 5 indicating *Always.* Please only circle one response for each statement.

How Often…

	Never					Always
1. have you skipped meals?	0	1	2	3	4	5
2. have you exercised more to lose weight?	0	1	2	3	4	5
3. have you drunk diet soda (or lots of water) instead of eating?	0	1	2	3	4	5
4. have you tried to lose weight to look a certain way?	0	1	2	3	4	5
5. have you eaten diet foods (e.g., Lean Cuisine or fat-free yogurt) and drinks (e.g., diet soda) instead of regular food?	0	1	2	3	4	5
6. have you eaten smaller portions (amounts) so you could lose weight or not gain weight?	0	1	2	3	4	5
7. have you cut out sweets or snacks so you wouldn't get fat?	0	1	2	3	4	5

Appendix L

Gender Role Attitudinal Inventory

Please read each statement and circle the answer that best describes how much you agree with the statement. Indicate your answer by circling a number from 1 to 4, with 1 indicating *Strongly Disagree* and 4 indicating *Strongly Agree*. Please only circle one response for each statement.

	Strongly Agree			Strongly Disagree

1. For a women, marriage should be
   more important than a career.   1   2   3   4

2. Most men are better suited emotionally.
   for politics than are most women   1   2   3   4

3. Women are right to be unhappy about their
    role in American society,
   but wrong in the way they are protesting.   1   2   3   4

4. If there is a military draft, both men and
   women should be included in it.   1   2   3   4

5. For a women to be truly happy, she needs
   to have a man in her life.   1   2   3   4

6. If a husband and wife have an equally good career
   opportunity, but in different cities, the husband
   should take the job and the wife should follow.   1   2   3   4

7. If women want to get ahead, there is little to stop them.   1   2   3   4

8. Many women who do the same work as their
   male colleagues earn substantially less money.   1   2   3   4

9. In general, I am sympathetic with the
   efforts of women's liberation groups.   1   2   3   4

10. A wife should willingly take her husband's
name at marriage.   1   2   3   4

11. There are some jobs and professions that
are more suitable for men than for women.   1   2   3   4

12. Women should take care of running their
homes and leave running the country up to men.   1   2   3   4

13. Things are much easier for girls growing up
today than they were
were for girls growing up 10 years ago.   1   2   3   4

14. There should be no laws preventing a women
from having an abortion if she wants one.   1   2   3   4

15. I consider myself to be a feminist.   1   2   3   4

16. For a woman in college, popularity is
more important than grade point average.   1   2   3   4

17. Career women tend to be masculine and domineering.   1   2   3   4

18. Many of those in women's right organizations
today seem to be unhappy misfits.   1   2   3   4

19. A woman should not let bearing children
stand in the way of a career if she wants it.   1   2   3   4

20. The leaders of those women's liberation
movement are trying to turn
women into men and that won't work.   1   2   3   4

21. Women should worry less about their rights and
more about becoming good wives and mothers.   1   2   3   4

22. Men tend to discriminate against women in
hiring, firing, and promotion.   1   2   3   4

23. A women can live a full and happy life
without marrying.   1   2   3   4

24. When you get right down to it, women are an
oppressed group and men are the oppressors.   1   2   3   4

Appendix M

Thank You/Psychology Services Reference List

Thank you for your participation in our study. We hope that by exploring how bodybuilders and weight lifters feel about themselves and their lifestyles, we can expand knowledge and learn more. Without individuals like yourself, advances in health care may not be made.

This sheet is provided as a reminder that should your participation in this project lead to a desire to seek additional services, you may contact any of the agencies listed below.

Psychological Services

Henry Ford Medical Center- Fairlane	313-982-8100
Ross Halpern, Ph.D.	734-222-6046
Jeff Kuentzel, Ph.D.	313- 600-9840
Michigan Modern Psychology	313-561-9064
Self-help groups on depression	www.mpas.org

Substance Abuse Services

Judith Kovach	248-353-1662
Rebecca Rank	248-642-6243

Please feel free to contact any of these agencies and once again thank you for your participation.

Jacqueline Fritts
University of Michigan –Dearborn