5-1-2007

Similarities Between Etiological Models of Eating Disorder Symptomatology and Muscle Dysmorphia Symptomatology

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SIMILARITIES BETWEEN ETIOLOGICAL MODELS OF EATING DISORDER SYMPTOMATOLOGY AND MUSCLE DYSMORPHIA SYMPTOMATOLOGY

A Thesis
Presented to
The Faculty of the Department of Psychology
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
Of the Requirements for the Degree
Master of the Arts

By
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May 2007
SIMILARITIES BETWEEN ETIOLOGICAL MODELS OF EATING DISORDER SYMPTOMATOLOGY AND MUSCLE DYSMORPHIA SYMPTOMATOLOGY

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May 14, 2007
Acknowledgements

First, I would like to acknowledge my thesis advisor, Dr. Rick Grieve. Thank you for your months of dedicated hard work in helping me to make this project a reality. Thank you also to Dr. Pitt Derryberry for your guidance in conducting my statistical analyses. Also, to Dr. Melissa Hakman, thank you for your helpful comments on the initial draft of my thesis.

Next I would like to acknowledge my fiancé, John Lamanna. Thank you for all your support through everything. I am also thankful to my parents, Gregg and Donna Jonda for standing behind me as I follow my dreams. I also owe gratitude to my sister and brother, Laurie and Christopher Jonda, for their support.

Finally I would like to thank the Clinical Psychology faculty and the staff at the Counseling and Testing Center for helping me to develop my professional skills. I will certainly take all that I have learned and use it to grow in my future career endeavors. I also owe thanks to my amazing classmates. Thank you for all of your support throughout these two years.
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Muscle Dysmorphia (MD) has recently been conceptualized as the male form of Eating Disorders (ED), although it is not currently classified as an ED. The current study compares etiological models of MD symptomatology (based on Grieve’s [2007] conceptual model of MD) and ED symptomatology (based on Stice’s [1994] conceptual model of Bulimia Nervosa). In both models, it was hypothesized that sociocultural influences on appearance (SIA) would predict body dissatisfaction (BD), and that this relationship would be mediated by self-esteem (SE) and perfectionism (P); that BD would predict negative affect (NA); and that NA would predict MD and ED symptomatology. Two-hundred-forty-seven female and 101 male college students at a mid-south university completed the study via on-line data collection. All participants completed the Sociocultural Attitudes Toward Appearance Questionnaire-3, the State Self-Esteem Scale, the Multidimensional Perfectionism Scale, the Positive and Negative Affect Scale, The Eating Attitudes Test-26, and the Muscle Dysmorphic Disorder Inventory. Women completed the Body Shape Questionnaire, and men completed the Male Body Attitudes Scale. Multiple regression analyses were conducted to test each model’s fit. In both models, most predictor paths were significant. However, in the MD model, SIA and P combined did not predict BD. The combined effects of SIA, SE, P, and BD failed to predict NA in both models. In the MD model, the combined effects of SIA,
SE, P, BD, and NA failed to predict MD symptomatology. These results suggest that ED symptomatology and MD symptomatology etiological models are somewhat similar. It is suggested that P and NA be removed from future etiological models of MD.
Introduction

Eating Disorders, conditions in which individuals engage in maladaptive eating behaviors in order to obtain a thin physique, are established types of mental disorders. There is much evidence to suggest that women suffer from two widely diagnosed Eating Disorders, Anorexia Nervosa and Bulimia Nervosa, at a much higher rate than do men (American Psychiatric Association, 2000).

Anorexia Nervosa is characterized by an intense dissatisfaction with one’s body shape or weight, self-evaluation based on body shape and weight, failure to maintain a body weight of at least 85% of expected weight, an intense fear of gaining weight, and, in postmenarcheal females, amenorrhea (i.e., the absence of at least three consecutive menstrual cycles). Bulimia Nervosa is characterized by intense dissatisfaction with body weight and shape, periods of binge eating and inappropriate behaviors to compensate for the binge. Such inappropriate behaviors include purging, abusing laxatives and diet pills, exercising excessively, and fasting (APA, 2000).

Typically, women develop Eating Disorders in order to meet a socially prescribed ideal of thinness. Because men are not held to the same standards of thinness as women, men generally do not develop Eating Disorders in an attempt to become thin. Society holds men to a different body shape standard than women – that of a muscular physique. Pope, Phillips, and Olivardia (2000) termed this muscular physique the “Adonis Complex.” Just as some women develop psychopathology (i.e., Eating Disorders) in an attempt to meet the culturally prescribed thin ideal, it is reasonable to hypothesize that men also develop some form of psychopathology in an attempt to meet the culturally prescribed muscular ideal. Currently, there is no diagnosable mental disorder in the
Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2000) for men who go to extreme lengths to develop a muscular physique.

In recent years, the term “Muscle Dysmorphia” has been coined to describe men’s dissatisfaction with their body shape and the measures they take to develop a more muscular physique (Olivardia, 2001; Pope, Gruber, Choi, Olivardia, & Phillips, 1997). Muscle Dysmorphia is conceptualized as a rough counterpart to Eating Disorders. Like Eating Disorders, Muscle Dysmorphia is characterized by body dissatisfaction, but involves a desire to become larger than one’s current size. Both Muscle Dysmorphia and Eating Disorders involve an intense dissatisfaction with one’s body shape and the pathological measures one takes to change one’s body shape. The pathological measures involved in Muscle Dysmorphia include steroid abuse, unhealthy eating practices, and excessive exercise. In fact, some have called Muscle Dysmorphia the “reverse anorexia” (Pope, Katz, & Hudson, 1993).

Although Muscle Dysmorphia has not officially been named a psychological disorder, Olivardia (2001) has developed diagnostic criteria for Muscle Dysmorphia. The diagnostic criteria include a preoccupation that one’s body is not sufficiently lean and muscular. Also, the preoccupation must cause clinically significant distress or impairment in several areas as exhibited by at least two of the following four criteria: a) The individual gives up activities in order to adhere to his or her exercise schedule, b) Situations in which the individual’s body is exposed to others creates marked distressed, or the individual avoids these situations, c) Preoccupation with body size and muscularity causes significant distress or impairment in social, occupational, or other areas of functioning, d) The individual continues to exercise and use performance-enhancing
substances despite harmful physical or psychological consequences. Finally, the focus of
the preoccupation is on being muscular and lean, not fat, as in Anorexia Nervosa.

Because some have speculated that Muscle Dysmorphia is truly a type of Eating
Disorder (Goodale, Watkins, & Cardinal, 2001; Grieve, 2006), it has become necessary
to provide empirical evidence for this assertion. Muscle Dysmorphia and Eating
Disorders are similar in that they both involve an intense dissatisfaction in one’s body
shape and the maladaptive methods used to change one’s body shape. One way to infer a
connection between the two disorders is to determine if they both have the same
etiological path. If it can be shown that both Muscle Dysmorphia and Eating Disorders
are caused by the same factors, and thus have the same etiological path, perhaps it can be
inferred that the two disorders are similar enough to be categorized in the same cluster of
disorders (i.e., Eating Disorders).

The goal of the current study was to determine if Muscle Dysmorphia is
comparable enough to Anorexia Nervosa and Bulimia Nervosa to be classified as an
Eating Disorder. This determination was made by examining the relationships among the
predictors of the symptoms of Muscle Dysmorphia and the symptoms of Eating
Disorders. The relationships that were examined are sociocultural influences on
appearance, self-esteem, perfectionism, body dissatisfaction, and negative affect. These
etiological paths were developed using variables included in Grieve’s (2007) model of
the etiology of Muscle Dysmorphia and Stice’s (1994) model of the etiology of Bulimia
Nervosa. Models of the hypothesized paths are diagrammed in Figures 1 and 2.
Figure 1. Development of Symptoms of Eating Disorders in Women

Figure 2. Development of Symptoms of Muscle Dysmorphia in Men

The Eating Disorders model

The etiological model for the symptoms of Eating Disorders is based, in part, on Stice’s (1994) model of the sociocultural influences of Bulimia Nervosa (see Figure 3 for a replication of Stice’s model). In the current study, a model of Eating Disorder development, not of Bulimia Nervosa development, is tested. Stice’s model has been altered in the current study in order to compare it to a Muscle Dysmorphia symptomatology etiological model. Currently, there is much controversy in the Muscle Dysmorphia literature as to how Muscle Dysmorphia should be compared to Eating Disorders. Because there is no real consensus on if or how Muscle Dysmorphia should be compared to any specific Eating Disorder, the model in the current study tests generalized eating pathology which can be diagnostic of either Eating Disorder (i.e., Bulimia Nervosa or Anorexia Nervosa).

In his model, Stice identifies many sociocultural influences on appearance that lead women to internalize pressures to be thin. Sociocultural influences on appearance may come from the media, peers, and family members. These influences pressure women to internalize the thin ideal. In Stice’s model, the relationship between family, peer, and media influences and the internalization of the thin ideal is moderated by two personality constructs, self-esteem and identity confusion. Individuals with high self-esteem and well-formed identities are less likely to internalize the pressures to be thin. Stice then proposed that the internalization of the thin ideal leads to body dissatisfaction. Weight moderates the relationship between internalization and body dissatisfaction because an individual’s actual body weight contributes to his or her level of body dissatisfaction. In turn, body dissatisfaction can predict restrained eating and negative
affect. Restrained eating and negative affect contribute to Bulimic symptomatology. The relationship between restrained eating and Bulimic symptomatology is moderated by family, peer, and media modeling, coping skills, and impulsivity. Coping skills also moderate the relationship between negative affect and bulimic symptomatology.

While the hypothesized developmental path of Eating Disorders for the present study is based on Stice’s (1994) model, it is not an exact replication. Stice’s model and the model in the current study differ in three ways. First, perfectionism is included in the model for the current study as a predictor of body dissatisfaction while it was not a part of Stice’s model. Perfectionism was added to the model in the current study because perfectionism has been found to interact with body dissatisfaction and self-esteem in predicting symptoms of Eating Disorders in women (Bardone, Vohs, Abramson, Heatherton, & Joiner, 2000; Vohs, Bardone, Joiner, Abramson, & Heatherton, 1999; Vohs, et al., 2001). Also, Grieve (2007) includes perfectionism in his etiological model of the symptoms of Muscle Dysmorphia. Second, Stice’s model is much more comprehensive than the model proposed for the current study. Stice proposed that the relationships among sociocultural influences on appearance, internalization of pressures, body dissatisfaction, and disordered eating are moderated by many personal factors (i.e., self-esteem, identity confusion, weight, family, peer, and media modeling, coping skills, and impulsivity). In the current study, no moderators are considered and only two mediators are considered: self-esteem and perfectionism. And, only the relationship between sociocultural influences on appearance and body dissatisfaction is hypothesized to have mediation. Of all the personal factors considered in the models of Stice (1994), Bardone et al. (2000), and Vohs et al. (1999; 2001), self-esteem and perfectionism are
being considered in the current study because there is much evidence to suggest that they contribute to the etiology of Bulimia Nervosa. Also, Stice’s model is theoretical and would be very difficult to test empirically, considering the multitude of variables it contains. Third, internalization of pressures is not directly measured in the current study. It is not measured in the current study because internalization of pressures is built into the measure that was used for the sociocultural effects on appearance (i.e., SATAQ-3; Thompson, van den Berg, Roehrig, Guarda, & Heinberg, [2004]). Some research also suggests that sociocultural messages about appearance can directly predict body dissatisfaction. For example, Green and Pritchard (2003) found that in adult men and women family pressure predicted body dissatisfaction. In addition, media influence also predicted body dissatisfaction in women. Also, Keery, van den Berg, and Thompson (2004) found that parent, media, and peer influences predict body dissatisfaction in women, and all relationships are moderated by comparison to others and internalization of the influences. The findings of Keery et al. (2004) finding suggests these individual cognitive factors (comparison and internalization) affect the relationship between sociocultural influences and body dissatisfaction. Sociocultural influences have also been found to predict body dissatisfaction (Stanford & McCabe, 2005) and muscle-building behaviors (Smolak, Murnen, & Thompson, 2005) in adolescent boys.
Figure 3. Model of the sociocultural influences on the etiology of Bulimia Nervosa

Adapted from: "Review of the evidence for a sociocultural model of bulimia nervosa and an exploration of the mechanisms of action," by E. Stice, 1994, Clinical Psychology Review, 14, p. 646.
The Muscle Dysmorphia Model

Grieve (2007) proposed an etiological model of Muscle Dysmorphia. Similar to models of Eating Disorders, Grieve suggests that socioenvironmental factors, emotional factors, psychological factors, and cognitive variables contribute to the development of Muscle Dysmorphia. The socioenvironmental factors Grieve proposes are media pressure and sport participation. Grieve indicates that messages about the muscular ideal are transmitted through popular media such as television, movies, and magazines. Participation in sports that value muscle mass and weight is also an important factor that can lead to the symptoms of Muscle Dysmorphia. There is a non-recursive, or bidirectional, relationship between sport participation and body mass. Sport participation influences ideal body internalization.

Emotional factors such as body dissatisfaction and negative affect are also included in Grieve’s (2007) model. Body dissatisfaction refers to the discrepancy between one’s actual and ideal body size. Men who are dissatisfied with their bodies either perceive themselves as obese and want to lose weight or perceive themselves as underweight and want to gain muscle mass. Also, overweight men may want to build muscle mass as well as lose weight. In Grieve’s model, there is a non-recursive relationship between body dissatisfaction and low self-esteem, negative affect, and body distortion. Body dissatisfaction is affected by media pressure and ideal body internalization. In Grieve’s (2007) model, negative affect provides motivation for the behavioral symptoms of Muscle Dysmorphia. There is also a non-recursive relationship between negative affect and body dissatisfaction, body distortion, and low self-esteem.
Psychological factors such as ideal body internalization and self-esteem are also a part of Grieve’s (2007) model. For men, ideal body internalization refers to the acceptance of the muscular ideal body shape. In this model, ideal body internalization influences low self-esteem and body dissatisfaction and is influenced by media pressure and sport participation. Like negative affect, low self-esteem provides motivation for the behavioral symptoms of Muscle Dysmorphia. In this model, there is a non-recursive relationship between low self-esteem and body dissatisfaction and negative affect. Low self-esteem is also influenced by ideal body internalization.

Perfectionism, a cognitive variable, is also part of the model. Perfectionism is defined as the striving for unrealistic goals. For men, the pursuit of the muscular ideal is often an unrealistic goal. In Grieve’s (2007) model, perfectionism influences both body dissatisfaction and Muscle Dysmorphia.

Ideal body internalization, body dissatisfaction, and body distortion are the three most important variables in Grieve’s (2007) model. Grieve believes that a focus on these three body related constructs are necessary for the development of Muscle Dysmorphia. Media pressure, perfectionism, low self esteem, negative affect, sport participation and body mass are less important variables in the model because they either influence ideal body internalization, body dissatisfaction, and body distortion, or they mediate the relationships between these body-focused constructs and Muscle Dysmorphia. Figure 4 is a reproduction of Grieve’s model.
Figure 4. Development of Muscle Dysmorphia in Men

The proposed Muscle Dysmorphia symptomatology model in the current study is different from Grieve’s (2007) model for Muscle Dysmorphia in a number of ways. First, the model in the current study is not as comprehensive as Grieve’s model. Grieve breaks the socioenvironmental component of the model into three distinct predictors: sport participation, media pressure, and ideal body internalization. The current study’s model addresses media pressure and ideal body internalization together as part of a broader examination of the sociocultural influences on men’s appearance. The current study’s model does not address sport participation, although some items on the sociocultural influences scale (i.e., SATAQ-3) used in the current study do address the desire to look like athletes. Also, Grieve addresses three body related constructs: body mass, body dissatisfaction, and body distortion. The current study’s model directly assesses body dissatisfaction only because body dissatisfaction is part of both Grieve’s and Stice’s models. Information about the participants’ body mass was gathered, but was not part of the Muscle Dysmorphia symptomatology model in the current study. Second, the relationships among constructs implied in Grieve’s model are slightly different than the relationships that were tested in the current model. Grieve suggests that many of the constructs in his Muscle Dysmorphia model have a non-recursive, or bi-directional, causal relationship. In the current study’s model, the relationships among constructs are hypothesized to have a recursive, or unidirectional, causal relationship. In order to simplify data analyses, only unidirectional relationships were tested.

In conclusion, Grieve’s (2007) model is somewhat similar to Stice’s (1994) model in that they both consider sociocultural, psychological, and cognitive factors in the development of eating and body shape related psychopathology. Grieve proposes that
because the symptoms of both Eating Disorders and Muscle Dysmorphia are similar, the etiology for both disorders may be parallel. Comparing modifications of Grieve’s model and Stice’s model may validate this hypothesis. Because both Grieve’s and Stice’s models describe a similar etiological path for the symptoms of Muscle Dysmorphia and the symptoms of Eating Disorders, the current study investigated whether or not the symptoms of Muscle Dysmorphia and the symptoms of Eating Disorders develop along the same etiological path.

*The Current Study*

Portions of Stice’s model have been validated (e.g., Crowther, Kichler, Sherwood, & Kuhnert, 2002; Jonda & Crowther, 2006; Ricciardelli & McCabe, 2001). While his model is tested in the current study, it is not the goal of the study to further validate his model. The model is tested for the etiology of the symptoms of Eating Disorders simply to act as a comparison to the model for the etiology of the symptoms Muscle Dysmorphia.

It is necessary first to review previous research on the relationships among the sociocultural influences on appearance, self-esteem, perfectionism, body dissatisfaction, negative affect, and the symptoms of Eating Disorders and the symptoms of Muscle Dysmorphia. More research has been conducted on Eating Disorders than has been conducted on Muscle Dysmorphia. Therefore, more evidence regarding the relationships between the above mentioned predictors and the symptoms of Eating Disorders are discussed than the relationships between the predictors and the symptoms of Muscle Dysmorphia.
Literature Review

Sociocultural Influences on Appearance

There is evidence to indicate that appearance for both men and women is influenced by society (Stice, 2002). A thin physique has been established as the ideal for women (Thompson & Stice, 2001), and a muscular physique is the ideal for men (Ridgeway & Tylka, 2005). The thin-ideal was first established through research in the early 1980's (e.g., Garner, Garfinkel, Schwartz, & Thompson, 1980), whereas research for men’s muscular ideal first appeared more recently (Pope et al., 1997; Phillips, O’Sullivan, & Pope, 1997). Consequently, a larger body of evidence exists in support of the thin-ideal for women than for the muscular ideal for men.

One common source of sociocultural information regarding appearance is the media. Magazines, a popular media outlet, often publish photographs of models that fit both male and female ideal appearance standards. For this reason, individuals may gain information about society’s ideal appearance from magazines (Stice, 2002). Some studies have analyzed how photographs in magazines have evolved over time to reflect the ideal appearance standards. Garner et al. (1980) suggests that the ideal female physique became progressively thinner over time. They analyzed Playboy magazine centerfold models and Miss America pageant contestants from 1959 to 1978. They found that these women became thinner as time progressed. In a similar study investigating sociocultural influences on male physiques, Leit, Pope, and Gray (2000) found that Playgirl magazine centerfold models increased in musculature from 1973 to 1997. Focus on the muscular physique as also been evident in advertising. Pope, Olivardia, Borowiecki, and Cohane (2001) found that between 1958 and 1998, the number of
unclothed men in women’s magazines increased over time, whereas the number of uncloth- ed women in women’s magazines remained approximately the same. The results of these studies suggest that magazines reflect the sociocultural appearance ideals for both men and women.

There is also evidence that peers can be a source of sociocultural information about body shape and dieting. Wardle and Watters (2004) conducted an experiment using 9- and 11-year-old girls who attended school with, and were thus exposed to, older teenage girls (i.e., more than two years older than the participants). They found that as compared to 9- and 11-year-old girls who were not exposed to older teenage girls, 9- and 11-year-old girls who were exposed to older teenage girls had a thinner ideal body size, perceived themselves as more overweight, more strongly believed others would like them more if they were thinner, and had higher levels of eating pathology. Stanford and McCabe (2002) found that both men and women report that messages about ideal image from same sex and from opposite sex peers are more important than messages from parents. Gleason, Alexander, and Somers (2000) found that teasing about weight during childhood is negatively correlated with body image in young adulthood.

Sociocultural influences on appearance have also been found to predict some of the constructs of interest in the present study. For example, Tylka and Subich (2004) found that, for women, pressure to be thin significantly predicted internalization of the thin-ideal, body image disturbance, and negative affect. Body image also significantly predicted Eating Disorder symptomatology. Commensurate with Stice’s (1994) model, research has also suggested that sociocultural influences about appearance have a greater impact on the eating behaviors of women with Bulimia Nervosa than women with
Anorexia Nervosa. Sociocultural influences on appearance also predict some of the constructs of interest for men. For example, Duggan and McCrea (2004) found that men who used muscle- and fitness-related magazines had higher levels of body dissatisfaction.

Keery, van den Berg, and Thompson (2004) wanted to determine how internalization of the thin ideal and appearance comparison to others mediate the relationships among three specific sociocultural influences (peer, parents, and media) and body dissatisfaction and eating problems. They found that internalization of the thin ideal and appearance comparison fully mediated the relationship between parent influences and body dissatisfaction. Internalization of the thin ideal and appearance comparison partially mediated the relationship between peer and media influences and body dissatisfaction. Following Baron and Kenny’s (1986) method for detecting mediation, there must first be a direct influence between the predictor (in this case sociocultural influences) and the criterion (in this case body dissatisfaction). The finding of Keery et al. (2004) that sociocultural influences can have a direct relationship on body dissatisfaction (without direct measurement of the internalization of the thin ideal) supports the assertion in the current study’s model that sociocultural influences have a direct relationship with body dissatisfaction.

Research has indicated that sociocultural influences can affect the symptomatology of Muscle Dysmorphia and of Eating Disorders (e.g., exercising and dieting practices), even in adolescents. Family members, especially parents, can also have an influence on attitudes toward appearance. Stanford and McCabe (2005) investigated how parents, peers and the media can influence adolescent boys’ body image
and body change strategies. They found that parental messages can significantly predict body satisfaction, satisfaction with muscles, amount of exercise, and food intake. Perhaps consistent with gender specific appearance ideals, Stanford and McCabe (2005) found that messages from fathers were more associated with building muscle, while messages from mothers were more associated with losing weight. Their research suggested that parents have more influence on their sons’ appearance than do the media or peers.

Smolak, Murnen, and Thompson (2005) also found parent, media, and peer influences to significantly predict muscle-building practices in adolescent boys. In addition, they analyzed the mediating effects of social comparison on the relationships between the parent, media, and peer influences as well as muscle-building practices. They found that in each instance, social comparison mediates the relationship between the sociocultural influence and muscle building practices. This finding suggests that sociocultural influences are more salient in predicting muscle-building techniques when the individual compares himself to others.

Field et al. (2001) described findings similar to Stanford and McCabe (2005) and Smolak et al. (2005). In a study examining dieting practices of adolescent boys and girls, they found that parents and the media have a significant influence on adolescents’ dieting behaviors. However, they found that peers have a negligible effect. Field et al. also found that body mass index (BMI) is not associated with weight concerns for girls whereas BMI is associated with weight concerns for boys. That is, girls tend to have concerns about their weight, regardless of their actual weight. Boys, however, tend to develop concerns about their weight only when their BMI is high.
These findings provide support for the current study. The evidence regarding sociocultural influences on appearance suggests that it is often the primary predictor of body dissatisfaction and Eating Disorder symptomatology and Muscle Dysmorphia symptomatology. Also, this research suggests that a complex path of variables contribute to Eating Disorder and Muscle Dysmorphia symptomatology.

Perfectionism

Perfectionism, a dispositional variable, has also been related to the development of eating disordered behavior (Bardone et al., 2000; Frost, Marten, Lahart, & Rosenblate, 1990; Vohs et al., 1999; Vohs et al., 2001). Perfectionism is a multifaceted construct. Perfectionists may be described as overly concerned with mistakes, likely to doubt the quality of their work, and usually place a great deal of value on others’ views about them (Frost et al., 1990). Frost et al. (1990) identified six components of perfectionism based on the accepted definition of perfectionism: concern over mistakes, doubts about actions, personal standards, organization, parental criticism, and parental expectations. Although Frost et al. (1990) did not specifically examine the relationships between perfectionism and maladaptive eating patterns, they did determine that those who scored higher on measures of perfectionism experienced more frequent and more varied symptoms of psychopathology.

Some studies have used the Multidimensional Perfectionism Scale (MPS; Frost et al., 1990) to investigate the associations between perfectionism and the symptoms of Eating Disorders. Bulik et al. (2003) and Minarek and Ahrens (1996) found that concern over mistakes and doubts about actions significantly predict Eating Disorder symptoms. Few studies have investigated the relationships between perfectionism and Muscle
Dysmorphia. However, one study (Henson, 2003) found that using the MPS, perfectionism predicts symptoms of Muscle Dysmorphia.

Hewitt and Flett (1991) conceptualized perfectionism differently than Frost et al. (1990). Hewitt and Flett (1991) described three components of perfectionism: self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism. Each component describes a different source of perfectionism. Sherry, Hewitt, Besser, McGee, and Flett (2004) investigated how self-oriented and socially prescribed perfectionism relate to Eating Disorder symptomatology. They found that the ability of self-oriented perfectionism to predict Eating Disorder symptomatology is dependent upon the level of socially prescribed perfectionism. This finding is relevant to the current study because it suggests that individuals use societal standards of perfectionism to determine their own levels of perfectionism as it relates to their eating patterns. Although the perfectionism scale used in the current study (Multidimensional Perfectionism Scale; Frost, Marten, Lahart, & Rosenblate, 1990) does not have a socially prescribed perfectionism subscale, it does have two subscales (Parental Criticism and Parental Expectations) which address one sociocultural construct, parental influence.

Perfectionism has been found to predict dietary restraint, one of the symptoms of Eating Disorders. McLaren, Gauvin, and White (2001) found that three dimensions of perfectionism (Self-Oriented Perfectionism, Socially Prescribed Perfectionism, and Perfectionistic Self-Presentation) along with excessive commitment to exercise significantly predicted dietary restraint. Further, they found that excessive commitment to exercise partially mediated the relationship between these three components of
perfectionism and dietary restraint, suggesting that excessive commitment to exercise may partially account for the relationship between perfectionism and dietary restraint.

Although perfectionism is often described in the Eating Disorder literature as a maladaptive trait, one study has examined how some aspects of perfectionism can influence body esteem, rather than body dissatisfaction. Davis (1997) found that normal perfectionism (i.e., high strivings conducive to healthy psychological functioning) can predict body esteem. However, this relationship between normal perfectionism and body esteem is significant only when levels of neurotic perfectionism (i.e., setting unattainable high standards) are low. In addition Davis (1997) found that when levels of normal and neurotic perfectionism are high, body dissatisfaction is most pronounced.

Although several studies have linked perfectionism with eating pathology, little research has yet determined the nature of the relationship between them. In one of the few studies to examine this relationship, Halmi et al. (2005) conducted a study that investigated the relationships among perfectionism, Obsessive-Compulsive Personality Disorder, and Obsessive-Compulsive Disorder in individuals with Eating Disorders. Using a sample of individuals with Eating Disorders, they found that perfectionism was more closely associated to Obsessive Compulsive Personality Disorder than to Obsessive Compulsive Disorder. This finding suggests that Obsessive Compulsive personality features may explain the link between perfectionism and eating pathology.

**Self-Esteem**

Low self-esteem has been shown to be more common in individuals with Eating Disorders than those without Eating Disorders. Jacobi, Paul, de Zwaan, Nutzinger, and Dahme (2004) found that individuals with Anorexia Nervosa or Bulimia Nervosa
reported lower self-esteem than healthy control participants, even when levels of
depression were controlled. Low self-esteem has also been associated with laxative
abuse among patients with Anorexia Nervosa (Kovacs & Palmer, 2004). Differences in
self-esteem have also been identified between those with restrained eating behaviors and
those with unrestrained eating behaviors in a non-clinical sample. Joshi, Herman, and
Polivy (2004) found that those with restrained eating behaviors had lower state self-
estime than those with unrestrained eating behaviors.

Research has also shown that adolescents who fully meet the criteria for Bulimia
Nervosa have lower self-esteem than those who only purge (Binford & le Grange, 2005).
Wilksch and Wade (2004) compared self-esteem among women with Anorexia Nervosa,
those with restrained eating behaviors, and those with unrestrained eating behaviors.
After controlling for depression, they found that those with Anorexia Nervosa and those
with restrained eating behaviors had lower scores on measures of global self-esteem and
physical appearance-related self-esteem. These findings are applicable to the current
study because they suggest that lower levels of self-esteem are associated with increased
pathological eating behaviors.

Research has indicated that self-esteem is associated with many of the variables
which contribute to the Eating Disorder symptomatology model. Wiseman, Peltzman,
Halmi, and Sunday (2004) found that, for early adolescent boys and girls, self-esteem
was negatively correlated with body satisfaction and drive for thinness. Gleason,
Alexander, and Somers (2000) found that self-esteem is negatively correlated with body
image in both male and female college students. Gilbert and Meyer (2005) investigated
self-esteem and body dissatisfaction in a longitudinal study. They assessed self-esteem in
female college students during their first week of college. A follow-up session was conducted 33 weeks later. Gilbert and Meyer found that women with low self-esteem were more susceptible to body dissatisfaction at the end of the 33 week period than were women with high self-esteem.

Self-esteem can also predict disordered eating. Ross and Wade (2004) found that self-esteem predicted both dietary restriction (suggestive of Anorexia Nervosa) and uncontrolled eating (suggestive of Bulimia Nervosa) in female college students.

**Body Dissatisfaction**

Another important component of the Eating Disorder symptomatology and Muscle Dysmorphia symptomatology models is body dissatisfaction. Research has found that it is a necessary condition for these disorders to develop (APA, 2000; Olivardia, 2001). One must be dissatisfied with one’s body to want to change his or her body shape.

There is much research to support body dissatisfaction in women (e.g., Brownell & Rodin, 1994; Rodin, Silberstein, & Striegel-Moore, 1985). It is estimated that approximately 39% of women report currently trying to lose weight (Hill, 2002). Stice and Shaw (2002) propose that body dissatisfaction plays a large role in the onset and duration of eating pathology. They also suggest that body dissatisfaction is predicted by society’s idealization of thinness, perceived pressure to be thin, and a deviation of one’s body shape from the thin ideal body shape. However, there is less research to support men’s body dissatisfaction, but evidence to support it has increased in recent years (Olivardia, Pope, Borowiecki, & Cohane, 2004; Furnham & Calnan, 1998; McCreary & Sasse, 2000).
Ridgeway and Tylka (2005) asked 30 undergraduate men what they believed to be the most desirable physical characteristics in men. In general, the participants indicated that men prefer a large, muscular, and lean physique. Specifically, they found that men believe a lean and muscular abdominal area, large and strong upper arms and chest, broad shoulders, large and strong upper legs, large and defined calves, defined buttocks, and large necks are the most desirable physical characteristics for men.

Some research has suggested that men’s preferred body shape is more muscular than their current body shape (Grieve, Newton, Kelley, Miller, & Kerr, 2005). The preference for a more muscular physique is not unique to American men, but has been identified in other Western countries. Pope, Gruber, et al., (2000) found that men from Austria, France, and the United States desired a physique that was an average of 28 pounds more muscular than their current physique.

There is also evidence to suggest that exposure to photographs of muscular men can decrease body satisfaction among men. Lorenzen, Grieve, & Thomas, (2004) found that men who were shown photographs of muscular men had lower levels of body satisfaction after viewing the photographs than before viewing the photographs. Men who were shown photographs of average-sized men showed no change in body satisfaction. In a similar study, Baird and Grieve (2006) found that men’s body satisfaction decreased after participants were shown advertisements featuring male models that fit the muscular ideal.

Some studies have also been conducted to examine the predictors of body dissatisfaction in males and females. In a study of a large sample of adolescent boys and girls, Presnell, Bearman, and Stice (2003) found that increased body mass, negative
affect, and pressure from peers to be thin are significant predictors of body dissatisfaction. Gender was found to interact with BMI to predict increases in body dissatisfaction over a 9-month period. Presnell et al. found that BMI predicts body dissatisfaction for girls, but not for boys, suggesting that girls become increasingly dissatisfied with their bodies as their BMI increases, whereas boys do not become increasingly dissatisfied as their BMI increases.

Most research studying body dissatisfaction is done using college students or adolescents. However, Green and Pritchard (2003) found that body dissatisfaction extends into adulthood for both men and women. Their work also has promising implications for the current study. Green and Pritchard found self-esteem to be a significant predictor of body dissatisfaction in both men and women. In addition, they found media influence to be a significant predictor of body dissatisfaction in women.

It is important to note that men and women differ in terms of ideal body shape. This assertion is relevant to the current study. Past research has indicated that men’s and women’s ideal body shape differs for different body parts. Stanford and McCabe (2002) found that men prefer a larger upper body and torso area than do women, but that men prefer a smaller lower body than do women. Commensurate with past research, Stanford and McCabe found that women prefer a body shape that is smaller than their current size.

Negative Affect

Negative affect has also been identified as an important component in the development of the symptoms of Eating Disorders. Stice (1994) posits that negative affect predicts Bulimic symptomatology, and Grieve (2007) proposes that negative affect predicts the symptoms of Muscle Dysmorphia.
In the current study, negative affect is hypothesized to be a mediator between body dissatisfaction and the symptoms of Eating Disorders and between body dissatisfaction and Muscle Dysmorphia. Ricciardelli and McCabe (2001) replicated portions of Stice’s (1994) model, investigating the role of negative affect as a mediator between body dissatisfaction and Bulimic behavior in young adolescent boys and girls. Consistent with Stice’s (1994) model, Ricciardelli and McCabe (2001) found that for adolescent girls and boys who wanted to be thinner, negative affect mediated the relationship between body dissatisfaction and Bulimic behavior. For adolescent boys who wanted to be bigger, negative affect was significantly correlated to body dissatisfaction. The results of this study are relevant to the current study because it suggests that negative affect plays a role in both the Eating Disorders symptomatology model and the Muscle Dysmorphia symptomatology model.

One study showed the importance of negative emotion in the maintenance of Eating Disorders. Overton, Selway, Strongman, and Houston (2005) found that women with Eating Disorders have more severe and more variant levels of both positive and negative emotions. They also suggest that women with Eating Disorders use eating disordered behaviors as a way to regulate their emotional states, thus leading to the maintenance of the disorder.

Some studies have investigated the differences in affect between women who have been diagnosed with an Eating Disorder and those who have not been diagnosed with an Eating Disorder. Kitsantas, Gilligan and Kamata (2003) used the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) to investigate the differences in affect among women with Eating Disorders, women at-risk for Eating
Disorders, and women who had healthy weights and eating habits. They found that women with Eating Disorders scored significantly higher on the negative affect scale and significantly lower on the positive affect scale than either women at-risk for Eating Disorders or women with healthy weights and eating habits.

Stice’s (1994) model posits that negative affect and dietary restraint contribute to Bulimic symptoms. Subsequent research hypothesized that negative affect and dietary restraint are such robust components of the Eating Disorder model that Bulimia Nervosa can be subtyped based on these two components (Stice & Agras, 1999; Grilo, 2004). Although their original hypothesis suggested distinct subtypes based on negative affect or dietary restraint, Stice and Agras (1999) were unable to find distinct subtypes based on negative affect and dietary restraint, but found that women with Bulimia Nervosa fit either a dietary restraint profile or a mixed dietary restraint-negative affect profile. Grilo (2004) replicated Stice’s and Agras’ (1999) findings. In addition, Grilo (2004) also found that the mixed dietary restraint-negative affect profile was more likely than the dietary restraint alone profile to yield binge eating, eating-related psychopathology, and body dissatisfaction. Although the results of these two studies do not provide support of a purely negative affect subtype of Bulimia Nervosa, they give support for the importance of negative affect in the Eating Disorder model and also suggest that negative affect can lead to more severe Eating Disordered behaviors.

Negative affect was also found to be a significant predictor of body dissatisfaction in the Presnell et al. (2004) study. They found that gender also interacts with negative affect to predict body dissatisfaction. Interestingly, negative affect significantly predicted increases in body dissatisfaction over a 9-month period for boys, but not for girls.
Although negative affect is not considered as a predictor of body dissatisfaction in the current study, the results of the Presnell et al. study provide evidence that negative affect may be an important component in the etiological models of the symptoms of Eating Disorders and the symptoms of Muscle Dysmorphia.

**Relationships Among Variables**

Perfectionism has been found to interact with self-esteem and body dissatisfaction to predict Bulimic symptoms (Bardone et al., 2000; Vohs et al., 1999; Vohs et al., 2001). Vohs et al. (1999) examined the interaction of perceived weight status, perfectionism, and self-esteem in the prediction of Bulimic symptoms. Their hypothesis was that perfectionists would experience Bulimic symptoms if they perceived themselves to be overweight and if they had low self-esteem. Perfectionists with high self-esteem who also viewed themselves as overweight would not be vulnerable to bulimic symptoms (Vohs et al., 1999). Regression analyses supported the hypothesis. For perfectionist women who felt overweight, only a low level of self-esteem predicted Bulimic symptoms.

Vohs et al. (2001) conducted a similar study that examined how perfectionism, body dissatisfaction, depression, anxiety, and self-esteem predicted Bulimic symptoms. Hierarchical regression analyses indicated that perfectionism alone was found to be a poor predictor of bulimic symptoms. Results indicated that only the interaction between perfectionism, self-esteem, and body dissatisfaction could significantly predict symptoms of Bulimia Nervosa. This interaction was found to be the only significant predictor even after the effects of anxiety and depression were controlled.
Shaw, Stice, and Springer (2004) tested Vohs and her colleagues’ (1999, 2001) Perfectionism x Body Dissatisfaction x Self-Esteem etiological model with a large sample of 11- to 15- year-old girls. They hypothesized that the model would have a stronger predictive ability with their sample than with Vohs’ sample because the younger age group is within the period of peak risk for Bulimic symptoms. The participants were assessed once each year for four years. Measurements of perfectionism, body dissatisfaction, and self-esteem measured at time 3 were tested to predict bulimic symptomatology at Time 4. Only body dissatisfaction was found to be a significant predictor of bulimic symptoms.

There is some indication that a perception of being overweight before puberty can influence perfectionism, body dissatisfaction, and Bulimic behavior. Ackard and Peterson (2001) found that women who believed they were overweight before puberty had higher scores on measures of perfectionism, body dissatisfaction, and Bulimic symptoms than women who believed they were average weight or underweight before puberty. These results suggest that a perception of being overweight at a young age can have lasting effects.

The vast majority of literature on the relationships between perfectionism, body shape, and weight concerns has been done on women. Recently, evidence for this relationship has been found using men (Davis, Karvinen, & McCreary, 2005). They found that perfectionism significantly predicts drive for muscularity, especially in men who also become anxious easily and who are focused on physical appearance and bodily fitness.
Henson (2003) tested portions of Grieve’s (2007) Muscle Dysmorphia etiological model. Specifically, she examined the relationships among body dissatisfaction, perfectionism, negative affect, and Muscle Dysmorphia symptoms on a sample of undergraduate men. Contrary to her expectations, she found perfectionism and body dissatisfaction to be negatively correlated with the symptoms of Muscle Dysmorphia. She posits that these results were due to the low levels of Muscle Dysmorphia found in their sample. It may be that men with sub-clinical levels of Muscle Dysmorphia are not affected by perfectionism as it relates to body dissatisfaction.

Current study

The purpose of the current study is to compare etiological models of the symptoms of Eating Disorders and the symptoms of Muscle Dysmorphia. The models consider the predictive effects of sociocultural influences on appearance, perfectionism, self-esteem, body dissatisfaction, and negative affect on symptomatology. The models have been adapted from theoretical models of the etiology of Bulimia Nervosa (Stice, 1994) and Muscle Dysmorphia (Grieve, 2006). In his model, Stice considers the effects of sociocultural influences on appearance, self-esteem, body dissatisfaction, and negative affect on the development of Bulimia Nervosa. Grieve also considers the effects of sociocultural influences, self-esteem, body dissatisfaction, and negative affect, but also the effects of perfectionism on the development of Muscle Dysmorphia. In the current study, these predictors are hypothesized to predict the symptoms of Eating Disorders and the symptoms of Muscle Dysmorphia.

It was expected that sociocultural influences on appearance would predict body dissatisfaction. This relationship would be mediated by self-esteem and perfectionism.
Body dissatisfaction would predict negative affect. Negative affect would predict the symptoms of Eating Disorders and the symptoms of Muscle Dysmorphia. It is hoped that these constructs would predict symptomatology according to the hypothesized predictor path. If the same constructs predict both Eating Disorder symptomatology and Muscle Dysmorphia symptomatology, perhaps it can be inferred that Muscle Dysmorphia should be classified as a type of Eating Disorder.
Method

Participants

Participants in the current study were recruited from undergraduate Psychology courses at Western Kentucky University. Participants were awarded for their participation with course credit, at the discretion of their instructors. A total of 101 men and 247 women completed the study. Ages of the participants ranged from 17 years to 44 years (M = 19.13, SD = 2.01). The sample was 87.4% Caucasian (N = 304), 6% African American (N = 21), 1.1% Hispanic (N = 4), 1.1% Native American (N = 4), and 0.9% Asian American (N = 3). A multi- or biracial ethnicity (N = 4) was reported by 1.1% of the sample, and 2.3% reported “other” ethnicities (N = 8).

Men reported exercising an average of 4.02 days per week (SD = 1.76) and using supplements to alter their body shape an average of 2.28 times per week (SD = 2.95). Men’s average Body Mass Index was 25.41 (SD = 0.53). Women reported exercising an average of 3.45 days per week (SD = 1.85) and using supplements to alter their body shape an average of 1.59 times per week (SD = 1.82). Women’s average Body Mass Index was 23.36 (SD = 4.28). As of 2002, women in the United States ages 20 to 29 had an average Body Mass Index of 26.6. Men in the United States ages 20 to 29 had an average Body Mass Index of 26.8 (Ogden, Fryar, Carroll, & Flegal, 2004).

The goal of the current study was to determine if the symptoms of Muscle Dysmorphia and the symptoms of Eating Disorders can be predicted by the same constructs. The constructs hypothesized to predict the symptoms of Muscle Dysmorphia and the symptoms of Eating Disorders include sociocultural influences on body shape, self-esteem, perfectionism, body satisfaction, and negative affect. The hypothesized
predictor paths are illustrated in Figures 1 and 2. A correlational design was used to test the specific relationships outlined in Figures 1 and 2. Sociocultural influences on appearance are hypothesized to predict self-esteem, perfectionism, and body dissatisfaction. Self-esteem and perfectionism are hypothesized to predict body dissatisfaction. Body dissatisfaction is hypothesized to predict negative affect. Negative affect is hypothesized to predict the symptoms of Eating Disorders in women and the symptoms of Muscle Dysmorphia in men.

Measures

Biographical Information. Participants were asked to provide biographical information including their height, weight, gender, age, ethnicity, exercise frequency, and supplement use frequency (see Appendix B).

Questionnaires. Scores on the following questionnaires were calculated by simply summing the values of the respondent's choices for each respective measure.

Internalization of Sociocultural Influences on Body Shape. The Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3; Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004) is a 30-item scale that measures societal influence toward physical appearance. The SATAQ-3 has four subscales. The Internalization-General subscale measures the influence of media on the internalization of attitudes, the Information subscale assesses the media sources of appearance based information, the Pressures subscale measures the pressure to attain a certain appearance from media influences, and the Internalization-Athlete subscale measures influence to have an athletic appearance. Items are worded in the form of statements and include, for example, “I compare my appearance to the appearance of TV and movie stars”
(Internalization-General subscale), “TV programs are an important source of information about fashion and ‘being attractive’” (Information subscale), “I’ve felt pressure from TV or magazines to lose weight” (Pressures subscale), and “I compare my body to that of people who are athletic” (Internalization-Athlete subscale). Items are rated on a five-point Likert scale ranging from 1 (definitely disagree) to 5 (definitely agree). Higher scores indicate higher levels of internalization. In the current study, a total composite score of all subscales was used to calculate level of acceptance of sociocultural influences on appearance.

Thompson et al. (2004) found the SATAQ-3 to have excellent internal consistency. The Cronbach’s alpha values are as follows: Total Scale (.94), Internalization-Athlete (.89), Internalization-General (.92), Information (.94), and Pressures (.94). Internal consistency in the current sample was excellent (α = .94). In addition, the SATAQ-3 has strong concurrent validity with the Eating Disorders Inventory-2 (EDI-2; Garner, 1991). Participants in the SATAQ-3 standardization sample also completed the EDI-2. EDI-2 scores divided these participants into eating disordered, eating disturbed, and control groups. Eating disordered and eating disturbed participants scored significantly higher than control participants on the Pressures subscale, $F(2,205) = 43.12, p < .0001$ and the Internalization-General subscale, $F(2,205) = 59.25, p < .0001$. On the Information subscale, eating disturbed participants scored significantly higher than the eating disordered or control participants, $F(2,205) = 7.33, p < .01$. The Internalization-Athlete subscale was not given to eating disordered patients, but results indicated eating disturbed participants scored higher on this scale than control participants, $t(190) = 4.46, p < .001$. In a later study on patients with Eating Disorders,
Calogero, Davis, and Thompson (2004) found the SATAQ-3 to have good internal consistency. In addition, they found that patients with Bulimia Nervosa scored higher on the Pressures, Internalization-General, and Internalization-Athlete subscales.

There are two versions of the SATAQ-3. The above description is the version of the scale that is applicable to women only. Thompson is currently developing a version of the SATAQ-3 that is applicable to men (J. K. Thompson, personal communication, March 7, 2006). Psychometric properties will be available from the authors at a later time, but are expected to be similar to the SATAQ-3 applicable to women. In the current study, the internal consistency for the male version was the same as the female version ($\alpha = .94$). This new version was used for men in the study while the published version of the SATAQ-3 was used for women. Appendix C is the female version, and Appendix D is the male version.

*Self-Esteem.* The State Self-Esteem Scale (SSES; Heatherton & Polivy, 1991) is a 20-item scale that measures state changes in self-esteem. The SSES has three subscales that capture components of self-esteem and include performance, social, and appearance self-esteem. Sample items include, “I am confident about my abilities” (Performance subscale), “I feel self conscious” (Social subscale), and “I am pleased with my appearance right now” (Appearance subscale). The response format is a five-point Likert scale. Possible response choices range from 1 (“not at all”) to 5 (“extremely”). Respondents are to determine the extent to which the statements apply to them at the time they are completing the measure. Higher scores indicate higher levels of self-esteem. The obtained scores are the sum of the raw scores of all the items.
There were three studies conducted in the standardization of the SSES. The ranges of average total and subscale scores for men across the three studies are as follows: Total ($M = 71.94 - 74.83$); Performance ($M = 25.51 - 27.00$); Social ($M = 25.13 - 26.83$); and Appearance ($M = 21.28 - 21.48$). The ranges of average total and subscale scores for women across the three studies are as follows: Total ($M = 69.57 - 77.51$); Performance ($M = 24.96 - 28.81$); Social ($M = 25.14 - 27.46$); and Appearance ($M = 18.93 - 21.11$).

The SSES has excellent internal consistency ($\alpha = .92$). A similar Cronbach’s alpha value was found in the current sample ($\alpha = .91$). Significant correlations between the SSES and Rosenberg Self Esteem Scale (Rosenberg, 1965), $r = .72$, and between the SSES and the Janis-Field Feelings of Inadequacy Scale (Janis & Field, 1959), $r = .76$, suggest the SSES has good concurrent validity. The SSES also has good construct validity. In the standardization studies, participants were given the SSES at the same time they experienced failure in performance-, social-, and appearance-related situations. Heatherton and Polivy (1991) found that during times of failure, state self-esteem as measured by the SSES, decreased. In the current study, the individual scores from all subscales were summed to create a composite, total raw score.

**Perfectionism.** The Multidimensional Perfectionism Scale (MPS; Frost et al., 1990) is a 35-item self-report questionnaire that assesses perfectionism. The six subscales and sample items include Concern over Mistakes (e.g., “People will probably think less of me if I make a mistake.”), Personal Standards (e.g., “If I do not set the highest standards for myself, I am likely to end up a second-rate person.”), Parental Expectations (e.g., “My parents have set very high standards for me.”), Parental Criticism
(e.g., “As a child, I was punished for doing things less than perfect.”), Doubts about Actions (e.g., “Even when I do something very carefully, I often feel that it is not quite right.”), and Organization (e.g., “I am an organized person.”). Participants respond to each item using a five-point Likert scale. Choices range from 1 (“strongly agree”) to 5 (“strongly disagree”). Higher scores indicate higher levels of perfectionism. In the current study, the individual scores from all subscales were summed to create a composite, total raw score.

The MPS has good internal consistency with alpha levels ranging from .77 to .93 (Frost et al., 1990). The MPS internal consistency value was excellent in the current study (α = .90). Purdon, Antony, and Swinson (1999) found the MPS to have strong concurrent validity with the Hewitt and Flett (1991) Multidimensional Perfectionism Scale. The Total Perfectionism score in the Frost et al. MPS was found to correlate strongly with the three Hewitt and Flett subscales: Other-Oriented Perfectionism (r = .46), Self-Oriented Perfectionism (r = .65), and Socially-Prescribed Perfectionism (r = .71). The MPS can be found in Appendix E.

**Body Dissatisfaction.** The Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987) is a 34-item self-report questionnaire that assesses body dissatisfaction. This questionnaire assessed body dissatisfaction in women only. This questionnaire asks participants to consider how they have felt over the past four weeks. Questions relate to degree of fatness (e.g., “Have you been afraid that you might become fat [or fatter]?”) and body composition (e.g., “Have you worried about your flesh not being firm enough?”) or to the relationship of food intake and body composition (e.g., Has eating even a small amount of food made you feel fat?”). Response choices are arranged on a six-
point Likert scale of 1 ("never") to 6 ("always"), with higher scores indicating greater concern about body shape. Although the BSQ addresses various body shape related concerns, it has no subscales and yields only one, total score. In the current study, the individual items were summed to calculate the total composite raw score. The raw score was used for analyses.

Results of the analyses in the current study yielded excellent internal consistency for the BSQ (α = .97). The measure has acceptable concurrent validity with the Eating Disorder Inventory Body Dissatisfaction subscale (r = .66) (Garner, Olmstead, & Polivy, 1983) and the Eating Attitudes Test (r = .35; Garner & Garfinkel, 1979). Both the Eating Disorder Inventory and the Eating Attitudes Test are used for clinical and research purposes. The BSQ was standardized on a group of patients with Bulimia Nervosa and on a group of normal control participants. Cooper et al. (1987) found the mean BSQ scores of the patient group (M = 136.9) and the control group (M = 81.5) to be significantly different (t = 19.6, df = 172, p < .0001), suggesting that the BSQ has good discriminant validity.

The Male Body Attitudes Scale (MBAS; Tylka, Bergeron, & Schwartz, 2005) was used to assess body dissatisfaction in men. The MBAS is a 24-item scale that measures men’s attitudes about, and satisfaction with, their bodies. Its three subscales measure body fat (e.g., “I think I have too much fat on my body.”), muscularity (e.g., “I think my chest should be broader.”), and height (e.g., “I wish I were taller.”). Response choices indicate the degree to which respondents agree with the statements and are arranged on a six-point Likert scale of 1 (“never”) to 6 (“always”). Higher scores indicate higher levels
of body dissatisfaction. In the current study, the raw scores from all subscales were summed to create a composite body dissatisfaction variable.

Tylka et al. found the MBAS to have excellent internal consistency. In the standardization sample, Cronbach’s alpha for the entire MBAS was .91, .93 for the body fat subscale, .90 for the muscularity subscale, and .88 for the height subscale. The current study yielded excellent internal consistency for the MBAS (α = .93). Test-retest reliability was also tested over a two-week period and determined the MBAS has excellent test-retest reliability. Reliability values are .91 for the total scale, .94 for the body fat subscale, .88 for the muscularity subscale, and .81 for the height subscale. The MBAS has good concurrent validity with other scales of body esteem and drive for muscularity. In the standardization sample, scores on the MBAS were significantly correlated with scores on the Body Esteem Scale (Franzoi & Shields, 1984), the Drive for Muscularity Scale (McCreary & Sasse, 2000), and the Swansea Muscularity Attitudes Questionnaire (Edwards & Launder, 2000).

**Negative Affect.** The Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item scale that measures both positive affect (extent to which the respondent experiences pleasurable mood states) and negative affect (extent to which the respondent experiences aversive mood states). Respondents are asked to rate the extent to which they have experienced each feeling or emotion over a specified period of time. Response choices range from “very slightly or not at all” to “extremely.” Higher scores on the positive affect scale indicate higher levels of positive affect, and higher scores on the negative affect scale indicate higher levels of negative affect. The PANAS was standardized on respondents who rated their mood during various time periods (i.e.,
moment, today, past few days, past week, past few weeks, year, and in general). For the
time period used in the current study (past few weeks), the mean positive affect score was
32.0 ($SD = 7.0$) and the mean negative affect score was 19.5 ($SD = 7.0$). In the current
study, only the negative affect scale was used in data analyses. Individual scores from all
the negative affect items were summed to create a composite, total raw score.

Internal consistency was good for each time period. The positive affect scale’s
Cronbach’s alpha ranged from .86 to .90, and the negative affect scale’s Cronbach’s
ranged from .84 to .87. The current study yielded internal consistency results comparable
to that found in the standardization sample ($\alpha = .88$). Test-retest reliability was also good
after an eight-week interval. The test-retest reliability for the positive affect scale ranged
from .47 to .68 and for the negative affect scale ranged from .39 to .71. The PANAS’
strong concurrent validity is demonstrated by its significant correlations with other
measures of general psychological distress (i.e., the Hopkins Symptoms Checklist;
Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974), anxiety (i.e., the State-Trait
Anxiety Inventory State Anxiety Scale; Spielberger, Gorsuch, & Lushene, 1970), and
depression (i.e., the Beck Depression Inventory; Beck, Ward, Mendelson, Mock, &
Erbaugh, 1961).

Eating Disorder Symptomatology. The Eating Attitudes Test-26 (EAT-26;
Garner, Olmsted, Bohr, & Garfinkel, 1982) is a 26-item scale that assesses behaviors
associated with eating pathology. Its items are divided into three factors: (1) dieting (e.g.,
Engage in dieting behavior), (2) bulimia and food preoccupation (e.g., Vomit after I have
eaten), and (3) oral control (e.g., Take longer than others to eat meals). Participants
respond to each item by indicating how often the statement applies to them. Response
choices are arranged on a six-point Likert scale from 1 (“never”) to 6 (“always”). Higher scores indicate higher levels of eating pathology. In the current study, both males and females completed the EAT-26. In the current study, the individual scores from all subscales were summed to create a composite, total raw score.

The EAT-26 has strong validity. It has adequate internal consistency as indexed by the intercorrelations between the EAT-26 and Factor 1 ($r = .93$), Factor 2 ($r = .64$), and Factor 3 ($r = .60$). Analyses also indicated that the EAT-26 has strong construct validity. When compared to non-eating disordered control participants, patients with Anorexia Nervosa scored higher on the EAT-26 overall ($t = 16.9, p < .0001$) and on Factor 1 ($t = 12.13, p < .0001$), Factor 2 ($t = 15.65, p < .0001$), and Factor 3 ($t = 12.91, p < .0001$). Finally, its concurrent validity was established by the strong relationships between the EAT-26 and many symptoms and associated features of Anorexia Nervosa. The EAT-26 correlates strongly with Body Dissatisfaction ($r = .44$), Body Image, ($r = .57$), and symptoms of depression, anxiety, interpersonal sensitivity, obsessionality, and somatization ($r = .42$). In the current study, the EAT-26 had good internal consistency for the men’s data ($\alpha = .83$) and for the women’s data ($\alpha = .89$).

Muscle Dysmorphia Symptomatology. The Muscle Dysmorphic Disorder Inventory (MDDI; Hildebrandt, Langenbucher & Schlundt, 2004) is a 13-item questionnaire that assesses symptoms of Muscle Dysmorphia. Participants respond to items on a five-point Likert scale. Responses range from 1 (“never”) to 5 (“always”). Higher scores indicate higher levels of Muscle Dysmorphia symptomatology. In the current study, both male and female participants completed the MDDI.
The MDDI has three subscales that measure different constructs associated with Muscle Dysmorphia. The Drive for Size (DFS) subscale includes items that relate to concerns of being small or weak and desires to be stronger or more muscular (e.g., “I think my body is too small.”). The Appearance Intolerance (AI) subscale includes items that assess anxiety and concern over body size (e.g., “I worry about aspects of my appearance that would not bother most people”). The Functional Impairment (FI) subscale assesses how workout schedules impair social and occupational functioning and also how the schedules can influence affect (e.g., “I feel depressed when I miss one or more workout days.”). In the current study, the individual scores from all subscales were summed to create a composite, total raw score.

The MDDI was standardized using men with at least 6 continuous months of weightlifting experience (Hildebrandt et al., 2004). One sample of men (N = 42) completed the MDDI twice over a two-week period. Average scores after the first week are as follows: MDDI total (M = 18.79, SD = 6.73), DFS (M = 7.45, SD = 2.94), AI (M = 6.12, SD = 2.50), and FI (M = 6.40, SD = 2.86). Average scores after the second week are as follows: MDDI total (M = 19.95, SD = 6.61), DFS (M = 6.98, SD = 3.50), AI (M = 5.86, SD = 3.58), and FI (M = 6.64, SD = 2.84). The MDDI has good test-retest reliability for the total MDDI score (r = .87) and for each of the subscales (DFS: r = .87, AI: r = .81, FI: r = .83).

The MDDI subscales have good internal consistency. In the standardization sample, the scale had an overall Cronbach’s alpha of .81 and alphas for the subscales were α = .77 (Appearance Intolerance), α= .80 (Functional Impairment), and α= .85 (Drive for Size). In the current sample, the MDDI had good internal consistency for the
men’s data ($\alpha = .80$) and poor internal consistency for the women’s data ($\alpha = .68$). The MDDI has strong convergent validity with other measures of body image disturbance such as Bulimic and Obsessive Compulsive symptomatology, number of supplements used, amount of time spent exercising, body dissatisfaction, physique anxiety, drive for bulk, and desired muscle.

**Procedure**

After Human Subjects Review Board approval, participants were recruited from undergraduate Psychology courses. At the discretion of their instructors, participants were awarded for their participation with course credit. Students whose instructors were willing to give extra credit for participating were given access to an online data collection system. This system allowed them to search for various studies in which to participate. Those who chose to participate in the current study read the online consent form (see Appendix A). If they gave their consent to participate, they clicked a button that read “Yes.” The “Yes” button was a link to the current study’s questionnaires.

Because some questionnaires (i.e., sociocultural influences on appearance and body dissatisfaction) were gender specific, participants’ self-reported gender determined which of these questionnaires they would be administered. Women completed the questionnaires in the following order: SATAQ-3 female version, SSES, MPS, BSQ, PANAS, MDDI, EAT-26. Men completed the questionnaires in the following order: SATAQ male version, SSES, MPS, MBAS, PANAS, MDDI, EAT-26. Although the results of the MDDI were analyzed for men only and the EAT-26 were analyzed for women only, all participants completed both measures. This procedure was conducted in order to capture the full range of symptomatology for both men and women. All
participants completed the questionnaires in the same order. It would have been beneficial to have counterbalanced the questionnaires in order to control for order effects. However, this procedure was not implemented due to software limitations.
Results

The men’s descriptive statistics are summarized in Table 1, and the women’s descriptive statistics are summarized in Table 2. Occasionally, participants failed to respond to specific questions and their responses were not included in the total for that item. Therefore, some of the descriptive statistics include fewer than the total number of participants.

Table 1

<table>
<thead>
<tr>
<th>Measure</th>
<th>Sample Size (N)</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociocultural influences</td>
<td>100</td>
<td>87.61</td>
<td>22.06</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>100</td>
<td>75.17</td>
<td>11.35</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>96</td>
<td>105.46</td>
<td>18.87</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>99</td>
<td>69.18</td>
<td>22.47</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>99</td>
<td>20.98</td>
<td>7.74</td>
</tr>
<tr>
<td>Muscle Dysmorphia</td>
<td>100</td>
<td>26.03</td>
<td>7.71</td>
</tr>
<tr>
<td>Disordered Eating</td>
<td>98</td>
<td>6.57</td>
<td>7.42</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>99</td>
<td>25.41</td>
<td>5.23</td>
</tr>
</tbody>
</table>

*Note.* The above statistics were obtained from the following measures:

- Sociocultural attitudes toward appearance scale (SATAQ; Male Version)
- State self-esteem scale (SSES)
- Multidimensional perfectionism scale (MPS)
- Male Body Attitudes Scale (MBAS)
- Positive and negative affect scale (PANAS)
- Muscle Dysmorphic Disorder Inventory (MDDI)
- Eating Attitudes Test-26 (EAT-26)
- BMI = \( \frac{\text{weight in pounds}}{\text{height in inches}^2} \)
Table 2

*Women's descriptive statistics*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Sample Size (N)</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociocultural influences a</td>
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<td>97.96</td>
<td>21.70</td>
</tr>
<tr>
<td>Self-esteem b</td>
<td>246</td>
<td>69.39</td>
<td>13.42</td>
</tr>
<tr>
<td>Perfectionism c</td>
<td>243</td>
<td>107.64</td>
<td>16.88</td>
</tr>
<tr>
<td>Body Dissatisfaction d</td>
<td>242</td>
<td>94.78</td>
<td>36.99</td>
</tr>
<tr>
<td>Negative Affect e</td>
<td>243</td>
<td>23.41</td>
<td>7.85</td>
</tr>
<tr>
<td>Muscle Dysmorphia f</td>
<td>245</td>
<td>24.63</td>
<td>6.30</td>
</tr>
<tr>
<td>Disordered Eating g</td>
<td>236</td>
<td>11.13</td>
<td>11.05</td>
</tr>
<tr>
<td>Body Mass Index h</td>
<td>243</td>
<td>23.36</td>
<td>4.28</td>
</tr>
</tbody>
</table>

*Note.* The above statistics were obtained from the following measures:

- Sociocultural attitudes toward appearance scale (SATAQ; Male Version)
- State self-esteem scale (SSES)
- Multidimensional perfectionism scale (MPS)
- Male Body Attitudes Scale (MBAS)
- Positive and negative affect scale (PANAS)
- Muscle Dysmorphic Disorder Inventory (MDDI)
- Eating Attitudes Test-26 (EAT-26)

It is important to compare the mean scores found in the current sample to those in the standardization samples in order to understand where scores in the current sample fall in relation to the general population. Thompson et al. (2004) do not give average values for the SATAQ-3 female version total scores, but they do provide average values for the subscales. The Information subscale in the current study ($M = 28.67$) yielded an average
value that was the same as the one found in the standardization sample ($M = 28.67$). The average Pressures score found in the current sample ($M = 23.29$) was higher than that found in the standardization sample ($M = 17.98$). The Internalization-General average score in the current sample ($M = 29.88$) was higher than in the standardization sample ($M = 23.76$). The Internalization-Athlete average score was also higher in the current sample ($M = 16.17$) than in the standardization sample ($M = 14.74$). No standardization information is yet available for the SATAQ male version.

The mean self-esteem score in the SSES standardization sample ranged from 71.94 – 74.83 (Heatherton & Polivy, 1991). In the current sample, the men’s mean self-esteem score was slightly higher than that of the standardization sample and the women’s mean self-esteem score was slightly lower than that of the standardization sample. Women’s BSQ scores were similar to women who did not meet the criteria for Bulimia Nervosa in the BSQ standardization sample ($M = 71.9$, $SD = 23.6$; Cooper et al., 1987). The mean level of negative affect on the PANAS in the standardization sample was 19.5 ($SD = 7.0$; Watson, Clark, & Tellegen, 1988). Both men and women in the current sample reported higher levels of negative affect. Men in the current sample ($M = 26.03$, $SD = 7.71$) reported higher levels of Muscle Dysmorphia symptomatology than the two groups of men in the MDDI standardization sample ($M = 18.79$, $SD = 6.73$ and $M = 19.95$, $SD = 6.61$; Hildebrandt et al., 2004). Women in the current sample also reported higher levels of Eating Disorder symptomatology than did non-eating disordered controls in the standardization sample ($M = 9.9$, $SD = 9.2$; Garner et al., 1982). In the standardization samples of the MPS and the MBAS, no mean values were given for the total composite or subscale scores.
Comparison of means

There were significant differences in the mean scores of men and women on the dependent variables (Disordered Eating and Muscle Dysmorphicia). Women had significantly higher levels of Disordered Eating than men, $t(333) = 4.58, p = .001$. There were also significant differences in scores on two of the Disordered Eating subscales. Women ($M = 8.00, SD = 7.98$) had significantly higher scores than men ($M = 3.72, SD = 5.16$) on the Dieting subscale, $t(337) = 4.94, p = .000$. Women ($M = 1.30, SD = 2.59$) also had significantly higher scores than men ($M = 0.69, SD = 1.59$) on the Bulimia and Food Preoccupation subscale, $t(344) = 2.19, p = .03$. No significant differences were found between men and women on overall scores from the Muscle Dysmorphicia scale. However differences were found between men and women on two of the Muscle Dysmorphicia subscales. On the Drive for Size subscale, men ($M = 11.09, SD = 4.25$) had significantly higher scores than women ($M = 7.46, SD = 3.15$), $t(345) = 8.76, p = .000$. Surprisingly, on the Appearance Intolerance subscale, women ($M = 10.46, SD = 4.09$) had significantly higher scores than men ($M = 7.65, SD = 3.68$), $t(345) = 8.76, p = .000$.

Significant differences were also found between men and women on self-esteem. Men had significantly higher levels of self-esteem than women, $t(345) = 3.80, p = .000$. On the Performance subscale of the self-esteem measure, men ($M = 27.57, SD = 4.33$) had significantly higher scores than women ($M = 25.89, SD = 4.94$), $t(346) = 2.99, p = .003$. On the Social subscale of the self-esteem measure, men ($M = 25.82, SD = 5.35$) had significantly higher scores than women ($M = 24.45, SD = 5.59$), $t(346) = 2.11, p = .04$. On the Appearance subscale of the self-esteem measure, men ($M = 21.77, SD =
4.37) also had significantly higher scores than women \((M = 19.09, SD = 4.91)\), \(t(345) = 4.77, p = .000\).

No significant differences were found between men and women on the total Perfectionism scale, but a significant difference was found between men and women on the Organization subscale of the Perfectionism scale. Women \((M = 22.98, SD = 5.12)\) had significantly higher scores than men \((M = 21.07, SD = 5.51)\), \(t(340) = 3.05, p = .002\).

Men and women also differed in terms of body size. Men reported a significantly higher body mass index than women, \(t(340) = 3.76, p = .000\). Men \((M = 2.28, SD = 2.95)\) also reported using supplements more times per week than women \((M = 1.59, SD = 1.82)\), \(t(346) = 2.65, p = .008\). In addition, men \((M = 4.02, SD = 1.76)\) reported exercising more days per week than women \((M = 3.45, SD = 1.85)\), \(t(344) = 2.65, p = .009\). Because men and women completed different measures of the sociocultural influences on appearance and body dissatisfaction, comparisons could not be made for these constructs.

Analyses were also conducted on the variables of interest based on racial background. No significant differences were found between Caucasian and non-Caucasian women or men for the variables of interest. Another analysis was conducted in which Caucasians were compared to African Americans. Caucasians were not compared to any other specific racial group due to the small sample size of all minority racial groups except African Americans. Caucasian females had significantly higher levels of acceptance of sociocultural influences on appearance \((M = 98.68, SD = 21.64)\) than African American females \((M = 83.62, SD = 23.53)\), \(t(229) = 2.43, p = .02\). Caucasian
females also had significantly higher levels of body dissatisfaction ($M = 94.92, SD = 35.95$) than African American females ($M = 66.45, SD = 30.49$), $t(226) = 2.58, p = .01$.

No differences were found between Caucasian men and African American men on the basis of acceptance of sociocultural influences about appearance or body dissatisfaction. These results suggest that sociocultural influences on appearance are internalized mainly by Caucasian women, and ethnicity may act as a protective factor against these influences.

**Correlations**

Bivariate correlation analyses were conducted in order to assess the relationships between the predictor and criterion variables. For women, it was hypothesized that there would be relationships among sociocultural influences on appearance, self-esteem, perfectionism, body dissatisfaction, negative affect, and the symptoms of Eating Disorders. For men, it was hypothesized that there would be relationships among sociocultural influences about appearance, self-esteem, perfectionism, body dissatisfaction, negative affect, and Muscle Dysmorphia symptoms. Because analyses of the etiological models of the symptoms of Eating Disorders and the symptoms of Muscle Dysmorphia use only female and male data respectively, the correlations were also analyzed separately on the basis of gender. Relationships among all variables for both men and women were found to be statistically significant. Table 3 summarizes the correlations of men’s data; Table 4 summarizes the correlations of women’s data.
Table 3  
*Correlations among variables of interest for men’s data*

<table>
<thead>
<tr>
<th>Sociocultural influences</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-esteem (1)</td>
<td>-.530</td>
<td></td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Body Dissatisfaction (2)</td>
<td>.645</td>
<td>-.677</td>
<td></td>
<td>.00</td>
<td>.02</td>
<td>.00</td>
</tr>
<tr>
<td>Negative Affect (3)</td>
<td>.203</td>
<td>-.579</td>
<td>.449</td>
<td></td>
<td>.004</td>
<td>.00</td>
</tr>
<tr>
<td>Perfectionism (4)</td>
<td>.398</td>
<td>-.413</td>
<td>.317</td>
<td>.291</td>
<td></td>
<td>.026</td>
</tr>
<tr>
<td>Muscle Dysmorphia (5)</td>
<td>.521</td>
<td>-.518</td>
<td>.693</td>
<td>.396</td>
<td>.390</td>
<td></td>
</tr>
<tr>
<td>Disordered Eating (6)</td>
<td>.415</td>
<td>-.432</td>
<td>.521</td>
<td>.316</td>
<td>.228</td>
<td>.526</td>
</tr>
</tbody>
</table>

_Note._ Correlations are below the diagonal, significance values are above the diagonal.
Table 4  
Correlations among variables of interest for women’s data

<table>
<thead>
<tr>
<th></th>
<th>Sociocultural influences</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-esteem</td>
<td>-0.414</td>
<td>--</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.627</td>
<td>-0.694</td>
<td>--</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>0.296</td>
<td>-0.639</td>
<td>0.515</td>
<td>--</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>0.403</td>
<td>-0.341</td>
<td>0.400</td>
<td>0.300</td>
<td>--</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Muscle Dysmophia</td>
<td>0.418</td>
<td>-0.566</td>
<td>0.642</td>
<td>0.425</td>
<td>0.363</td>
<td>--</td>
<td>0.00</td>
</tr>
<tr>
<td>Disordered Eating</td>
<td>0.493</td>
<td>-0.490</td>
<td>0.694</td>
<td>0.453</td>
<td>0.398</td>
<td>0.518</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note.* Correlations are below the diagonal, significance values are above the diagonal.

Path Analysis

Multiple regression analyses were conducted in order to analyze the predictive relationships among the variables of interest. The analyses were conducted separately for men and for women. Figure 5 shows the standardized beta coefficients for women, and Figure 6 shows the standardized beta coefficients for men.

Regression analyses partially supported the women’s model of the etiology of Eating Disorder symptomatology. Sociocultural influences about appearance significantly predicted body dissatisfaction. Self-esteem significantly predicted body dissatisfaction. Perfectionism also significantly predicted body dissatisfaction. However, body dissatisfaction did not predict negative affect. Finally, negative affect predicted
disordered eating. The entire women’s model predicted 51% of the variance in the symptoms of eating disorders.

Regression analyses also partially supported the men’s etiological model of Muscle Dysmorphia symptomatology. Sociocultural influences about appearance significantly predicted body dissatisfaction. Self-esteem significantly predicted body dissatisfaction. However, perfectionism did not significantly predict body dissatisfaction. As in the women’s Eating Disorder symptomatology model, body dissatisfaction did not predict negative affect. Finally, negative affect did not predict Muscle Dysmorphia symptomatology. The entire men’s model predicted 52% of the variance in Muscle Dysmorphia symptomatology.
Figure 5. The women’s Eating Disorder symptomatology etiological model. Values are standardized beta weights for the relationships among predictors.
Figure 6. The men's Muscle Dysmorphia symptomatology etiological model. Values are standardized beta weights for the relationships among predictors.
Discussion

The purpose of the current study was to compare etiological models of Eating Disordered symptomatology and Muscle Dysmorphic symptomatology. For both models, it was hypothesized that self-esteem and perfectionism would mediate the relationship between sociocultural influences about appearance and body dissatisfaction. Also, it was hypothesized that body dissatisfaction would predict negative affect, and that negative affect would predict the symptoms of Muscle Dysmorphia in men and symptoms of Eating Disorders in women. It was hoped that an etiological model of Muscle Dysmorphic symptomatology in men would be comparable to the etiological model of Eating Disordered symptomatology in women, thereby providing some support for the classification of Muscle Dysmorphia as a type of Eating Disorder.

Because the symptoms of Eating Disorders are most commonly observed in women and the symptoms of Muscle Dysmorphia are most commonly observed in men, the etiological model for the symptoms of Eating Disorders was tested for women only, and the etiological model for the symptoms of Muscle Dysmorphia was tested for men only. Results yielded significant correlations among all variables.

For both men and women, sociocultural influences about appearance were significantly correlated with body dissatisfaction. That is, increased sensitivity to, and acceptance of, cultural standards about appearance was associated with increased levels of body dissatisfaction. The scale used to measure sociocultural influences about appearance in the current study (SATAQ-3; Thompson et al., 2004) assesses the acceptance of body shape standards perpetuated by the media. Media outlets such as television, magazines, movies, and advertisements often show images of women who are
abnormally thin and images of men who are abnormally muscular. Research has shown that over time, women in media images have become progressively thinner, (Garner et al., 1980) and men in media images have become progressively more muscular (Leit, Pope, & Gray, 2000). This disparity between ideal body shape and average body shape creates unattainable standards for most individuals. The majority of individuals will not be able to achieve the culturally prescribed thin ideal for women and the culturally prescribed muscular ideal for men. Thus, individuals who are sensitive to sociocultural influences about appearance realize they cannot achieve such high standards and become dissatisfied with their own body shape.

Media, peers, and parents are the three primary sociocultural influences on appearance (Stice, 1994). Many studies have found relationships between body dissatisfaction and media influences (Baird & Grieve, 2006; Lorenzen, Grieve, & Thomas, 2004; Shroff & Thompson, 2006; Yamamiya, Cash, Melnyk, Posavac, & Posavac, 2005), between body dissatisfaction and peer influences (Gleason et al., 2000; Stanford & McCabe, 2002; and Wardle & Watters, 2004;), and between body dissatisfaction and parental influences (Duggan & McCrea, 2004; Field et al., 2001; Keery et al., 2004; Smolak et al., 2005; Stanford & McCabe, 2005). Although the sociocultural influences scales used in the current study do not assess parental influences, the perfectionism scale assesses two forms of parental influences: parental expectations and parental criticism. In the current study parental expectations was correlated with body dissatisfaction for females ($r = .19, p = .002$) and for males ($r = .34, p = .001$). Parental criticism was also correlated with body dissatisfaction for females ($r = .26, p = .001$) and for males ($r = .42, p = .000$). Although these constructs do not directly measure
parental influences about body shape, they do corroborate past research that parental messages can be related to body dissatisfaction.

Some research has shown that ethnicity may act as a protective factor against the internalization of the thin ideal. Warren, Gleaves, Cepeda-Benito, Fernandez and Rodriguez-Ruiz (2005) found that ethnicity moderates the relationship between internalization of the thin ideal and body dissatisfaction. They found that the relationships were stronger for European American women than for Mexican American or Spanish women. Although no significant differences were found between Caucasians and Hispanics, Caucasians had significantly higher levels of acceptance of sociocultural influences on appearance and significantly higher levels of body dissatisfaction than African Americans. The results of the current study and past studies may suggest that ethnicity acts as a protective factor against acceptance of sociocultural influences on appearance and body dissatisfaction.

It was hypothesized that perfectionism and self-esteem would mediate the relationship between sociocultural influences about appearance and body dissatisfaction. Both perfectionism and self-esteem were found to be significantly correlated with sociocultural influences about appearance and body dissatisfaction. Increased levels of perfectionism were found to be associated with increased levels of acceptance of sociocultural influences about appearance and increased levels of body dissatisfaction. The association between perfectionism and acceptance of sociocultural influences is logical because society favors a “perfect” physique. Research has found links between perfectionism and body dissatisfaction in women (Vohs et al., 2001) but not in men (Henson, 2003). Concurrent with past findings, perfectionism was found to be a
significant predictor of body dissatisfaction for women but not for men in the current study. It may be that women, but not men, become dissatisfied with their bodies because they feel the need to look perfect.

Self-esteem was also found to be significantly negatively correlated with sociocultural influences about appearance and body dissatisfaction in the current study. Lower levels of self-esteem were associated with higher levels of acceptance of sociocultural influences and higher levels of body dissatisfaction. Research has shown self-esteem to be associated with body dissatisfaction (Gilbert & Meyer, 2005; Gleason et al., 2000; and Wiseman et al., 2004) for both men and women.

In the current study, self-esteem was also found to be negatively correlated with the symptoms of Eating Disorders and of Muscle Dysmorphia. Those with lower levels of self-esteem have more symptoms of eating disordered behavior and of muscle dysmorphic behavior. Research has found associations between self-esteem and Bulimic and Anorexic symptomatology in patients with Eating Disorders (Binford & le Grange, 2005; Jacobi et al., 2004; Kovacs & Palmer, 2004; Joshi et al., 2004; and Wilksch & Wade, 2004). There is also some evidence for the association between low self-esteem and certain components of Muscle Dysmorphia in men such as body dissatisfaction, muscle belittlement, muscle displeasure, not liking one’s body, dissatisfaction with body proportion, feeling fat, and feeling out of shape (Olivardia, Pope, Borowieck, & Cohane, 2004).

It has been suggested that perfectionism, low self-esteem and body dissatisfaction interact to predict Bulimic symptomatology (Bardone et al., 2000). That is, women who have low self-esteem, high levels of perfectionism, and perceive themselves as
overweight are at the highest risk for developing Bulimic symptomatology. This combination predicted Bulimic symptomatology in college-age females (Holm-Denoma, Gordon, Bardone-Cone, Vohs, Abramson, Heatherton, & Joiner, 2005; Vohs et al., 2001; and Vohs et al., 1999), but not in adolescent girls (Shaw et al., 2004).

Negative affect was found to be significantly correlated with body dissatisfaction. Those with higher levels of negative affect are more dissatisfied with their bodies than those with lower levels of negative affect. The findings of the current study are consistent with previous research that found negative affect to be a mediator between body dissatisfaction and Eating Disorder symptoms (Ricciardelli & McCabe, 2001). It is likely that those who are dissatisfied with their bodies have negative emotions that are associated with their dissatisfaction. The results of the current study suggest that global negative affect (not just as it relates to body shape) is associated with body dissatisfaction.

Negative affect was also found to be significantly correlated with both Eating Disorder symptomatology and Muscle Dysmorphia symptomatology. Past research has also found negative affect to be associated with Eating Disordered symptoms in women (Kitsantas et al., 2003 and Overton et al., 2005). Little research has been conducted on the associations between negative affect and Muscle Dysmorphia symptoms. It is logical to argue elevated levels of negative emotions would be associated with maladaptive eating and exercise behaviors. In fact, some have argued that negative affect is an important component in the maintenance of Bulimic symptomatology (Grilo, 2004; Stice, 1994; and Stice & Agras, 1999).
Path Analysis

Multiple regression analyses were conducted in order to test the predictive relationships among the variables within the two models. For both men and women, sociocultural influences about appearance predicted body dissatisfaction. These results suggest that, although societal messages about appearance are different for men and women, both men and women are receptive to these messages. They both also become dissatisfied with their bodies, based on their level of acceptance of societal messages.

Also, the combined effects of sociocultural influences and self-esteem predicted body dissatisfaction for both men and women. This finding suggests that, for some men and women, sociocultural influences combined with self-esteem affect level of body dissatisfaction, perhaps because those with low self-esteem are more receptive to sociocultural messages. Self-esteem may act as a buffer between the acceptance of sociocultural influences and body dissatisfaction. That is, those with low levels of self-esteem are more vulnerable to sociocultural messages about appearance, and are therefore more likely to be dissatisfied with their bodies.

The combined influences of sociocultural influences and perfectionism significantly predicted body dissatisfaction for women, but not for men. This finding suggests that women who are perfectionist interpret sociocultural influences and feel that they need to have perfect bodies like the women in the media. Men’s body dissatisfaction is apparently not affected by the combination of their interpretation of sociocultural influences and their perfectionism. Individuals with high levels of perfectionism are vulnerable to societal messages and form perfectionist and unachievable goals about their
appearance. Because having the perfect physique is impossible, those who try to achieve this goal will generally fail, thus causing them to be dissatisfied with their body shape.

Although perfectionism overall failed to predict body dissatisfaction in men, several of the perfectionism subscales did significantly predict body dissatisfaction. The concern over mistakes ($\beta = .396, p = .00$), doubts about actions ($\beta = .403, p = .00$), parental criticism ($\beta = .419, p = .00$), and parental expectations ($\beta = .342, p = .001$) subscales each predicted body dissatisfaction in men. These findings suggest that men become dissatisfied with their bodies in an effort to please or respond to their parents. Also, they may be overly concerned about making mistakes with respect to their physique and doubt that their methods for achieving their desired physique are effective.

Body dissatisfaction did not predict negative affect in the women's Eating Disorder symptomatology model or in the men's Muscle Dysmorphia symptomatology model. This finding suggests that body dissatisfaction does not predict a global negative affective state. The negative affect scale used in the present study tests global negative affect, not affect specifically related to body shape. It may also be that another variable, besides negative affect, such as restrained eating, which is not part of the models tested in the current study, mediates the relationship between body dissatisfaction and Eating Disordered symptomatology and the relationship between body dissatisfaction and Muscle Dysmorphia symptomatology. Stice (1994) includes restrained eating as well as negative affect as a mediator of the relationship between body dissatisfaction and Eating Disorder symptomatology in his model of the development of Bulimic Symptomatology.

Finally, negative affect predicted Disordered Eating symptomatology in women but did not predict Muscle Dysmorphia symptomatology in men. The failure of the model
to predict Muscle Dysmorphia symptomatology in men may be because there are two non-significant predictors (perfectionism and negative affect) in the model. From the results of the current study, it appears that men do not become dissatisfied with their bodies because they are attempting to have a perfect physique. Also, it appears that being dissatisfied with one’s body does not necessarily cause a global state of negative affect in men. Finally, because men do not have high levels of negative affect in response to body dissatisfaction, the symptoms of Muscle Dysmorphia cannot be predicted by negative affect.

Perhaps negative affect should be left out of future Muscle Dysmorphia etiological models, but should remain in future Eating Disorder etiological models. When negative affect is not included, body dissatisfaction predicts Muscle Dysmorphia symptomatology in men ($\beta = .605, p = .000$).

It is also notable that the two models explain similar amounts of variance in symptomatology. The men’s model predicted 52% of the variance in Muscle Dysmorphia symptomatology, and the women’s model predicted 51% of the variance in Eating Disorder symptomatology. This similarity may suggest that both describe similar etiologies between the symptoms of Eating Disorders and the symptom of Muscle Dysmorphia.

**Limitations**

There are several limitations to the current study. First, data was collected entirely from a college sample. There was limited variability in the participants’ age, education level, racial background, geographic origin, and socioeconomic status. Future studies should select a more diversified sample in order to increase generalizability of the
findings. Also, participants who would likely have had higher levels of symptomatology were not recruited. Individuals selected from fitness centers and weight loss facilities may have reported higher levels of body dissatisfaction and symptomatology. Recruiting from a clinical sample may have yielded stronger relationships among the variables. Second, only self-report data were collected. Self-report measures are limited by what the respondents are willing to report and by what they are able to bring into conscious awareness. Finally, the total variance accounted for by the models could have been increased if all the variables that were included in Stice’s (1994) and Grieve’s (2007) models were tested in the current study. Additional variables which Stice includes are the thin ideal, centrality of appearance to female gender, importance of appearance for success, family influences, peer influences, identity confusion, internalization of pressures, weight, restrained eating, family, peer and media modeling, coping skills, and impulsivity. The additional variables which Grieve includes are sport participation, ideal body internalization, body mass, and body distortion. However, Stice’s and Grieve’s models are theoretical and would be very difficult to test empirically in their entirety.

Implications of the findings

The results of the current study partially support the hypothesis that the etiological models of Eating Disordered symptomatology and Muscle Dysmorphic symptomatology are parallel. The models differed in that perfectionism significantly predicted body dissatisfaction in the Eating Disordered symptomatology model but not in the Muscle Dysmorphic symptomatology model.

It is notable that body dissatisfaction failed to predict negative affect in both the Eating Disorder symptomatology model and the Muscle Dysmorphia symptomatology
model. It may be that both men and women who accept sociocultural messages, are perfectionistic, have low self-esteem, and are dissatisfied with their bodies do not necessarily have negative moods. Also, negative affect significantly predicted the symptoms of Eating Disorders but did not significantly predict the symptoms of Muscle Dysmorphia. Stice (1994) includes negative affect as a predictor of Bulimia Nervosa in his etiological model. Although Grieve (2007) includes negative affect in his model, he does not hypothesize that there is a direct relationship between negative affect and the symptoms of Muscle Dysmorphia. He posits that there is a relationship between body dissatisfaction and Muscle Dysmorphia symptomatology via body distortion. Perhaps these two etiological models capture the role of negative affect in the etiological models correctly: for women, negative affect predicts Eating Disorder symptomatology, but it does not predict Muscle Dysmorphia symptomatology for men. Negative affect seems to be a non-significant predictor of Muscle Dysmorphia symptomatology and should be interpreted with caution in future models. Perhaps in a clinical sample, negative affect would be a significant predictor.

The results of this study show that there are many similarities between the etiological models of Eating Disordered symptomatology and Muscle Dysmorphic symptomatology. The findings of the current study provide some evidence to suggest that Eating Disorders and Muscle Dysmorphia have similar etiologies. More research is needed in order to conclusively determine that Muscle Dysmorphia is the “male Eating Disorder,” but these findings do provide some supportive evidence.
References


regulation of positive as well as negative emotion experience. *Journal of Clinical Psychology in Medical Settings, 12,* 39-56.


APPENDIX A

INFORMED CONSENT DOCUMENT
Eating, Exercise, and Personal Attitudes

You are being asked to participate in a study that will assess your ideas about your eating, exercise, and attitudes about yourself and your body. Please read the following material carefully. It describes the purpose of the study, the procedure to be used, risks and benefits of your participation, and what will happen to the information that is collected from you. This study is being conducted through Western Kentucky University. The University requires that you give your signed agreement to participate in this study. You must be at least 18 years of age in order to participate.

The investigator will explain to you in detail the purpose of the study, the procedures used, and the potential benefits and risks of participation. You may ask him/her any questions you have to help you understand and discuss with the researcher any questions you may have.

If you then decide to participate in the study, please sign on the next page of this form in the presence of the person who explained the study to you. You should be given a copy of this form to keep.

1. Nature and Purpose of the Project: This study looks at how college students view their eating and exercise attitudes and their attitudes about themselves and their bodies.

2. Explanation of Procedures: Your participation in this study will require you to complete a brief demographics survey and complete nine questionnaires. These questionnaires will ask you about your media consumption, personal disposition, body satisfaction, eating habits, and exercising habits.

3. Discomfort and Risks: The risks to participation appear to be small. There is always a slight chance that any item could bring about problems. Please let the researcher know if at any time a question has bothered you.

4. Benefits: You may be able to receive extra credit for your psychology course, if your instructor offers such credit (be sure to check with your instructor). Your instructor should offer alternative forms of extra credit. Also, you are contributing to the scientific process. Another benefit to you is that you have helped contribute to research on eating, exercise, and personal attitudes.

5. Confidentiality: Your identity will be completely anonymous. There will be no way for researchers to know who completed which questionnaires. The data collected from you will be combined with data collected from other people. The data gathered will be used to answer the research hypothesis of this study.

6. Refusal/Withdrawal: Refusing to be in this study will have no effect on any future services you may receive from Western Kentucky University. Anyone who agrees to participate in this study is free to quit at any time with no penalty.
7. Questions: If you have any questions about the study, please ask them at this point. If you think of questions later on, direct them to Rick Grieve, Ph.D., at (270) 745-4417, Monday-Friday from 9:00 am until 4:30 pm.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

Signature of Participant _____________________________ Date _____________

Witness _____________________________ Date _____________

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY THE WESTERN KENTUCKY UNIVERSITY HUMAN SUBJECTS REVIEW BOARD
Dr. Phillip E. Myers, Human Protections Administrator
TELEPHONE: (270) 745-4652
APPENDIX B

BIOGRAPHICAL INFORMATION
Please complete the following to the best of your ability.

1. What is your gender?  
   Male  Female

2. How old are you?  
   __________ years

3. What is your ethnicity?  
   Caucasian  African American  
   Asian American  Native American  
   Hispanic  Multi-/Bi-racial  
   Other

4. How many days per week, on average, do you exercise?  
   0 1 2 3 4 5 6 7

5. How many times per week, on average, do you use supplements in an effort to change your body shape?  
   0 1 2 3 4 5 6 7 8 9 10 11 12 13 14  more than 14
APPENDIX C

SOCIOCULTURAL ATTITUDES TOWARD APPEARANCE QUESTIONNAIRE-3

FEMALE VERSION
Please read each of the following items carefully and indicate the number that best reflects your agreement with the statements.

<table>
<thead>
<tr>
<th>Definitely Agree</th>
<th>Mostly Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Mostly Disagree</th>
<th>Definitely Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

1. TV programs are an important source of information about fashion and being “attractive.”
2. I’ve felt pressure from TV or magazines to lose weight.
3. I do not care if my body looks like the bodies of people who are on TV.
4. I compare my body to the bodies of people who are on TV.
5. TV commercials are an important source of information about fashion and being “attractive.”
6. I do not feel pressure from TV or magazines to look pretty.
7. I would like my body to look like the models who appear in magazines.
8. I compare my appearance to the appearance of TV and movie stars.
9. Music videos on TV are not an important source of information about fashion and “being attractive.”
10. I’ve felt pressure from TV and magazines to be thin.
11. I would like my body to look like the people who are in movies.
12. I do not compare my body to the bodies of people who appear in magazines.
13. Magazine articles are not an important source of information about fashion and “being attractive.”
14. I’ve felt pressure from TV or magazines to have a perfect body.
15. I wish I looked like the models in music videos.
16. I compare my appearance to the appearance of people in magazines.
17. Magazine advertisements are an important source of information about fashion and “being attractive.”
18. I’ve felt pressure from TV or magazines to diet.
19. I do not wish to look as athletic as the people in magazines.
20. I compare my body to the bodies of people in “good shape.”
21. Pictures in magazines are an important source of information about fashion and “being attractive.”
22. I’ve felt pressure from TV or magazines to exercise.
23. I wish I looked as athletic as sports stars.
24. I compare my body to that of people who are athletic.
25. Movies are an important source of information about fashion and “being attractive.”
26. I’ve felt pressure from TV or magazines to change my appearance.
27. I do not try to look like the people on TV.
28. Movie stars are not an important source of information about fashion and “being attractive.”
29. Famous people are an important source of information about fashion and “being attractive.”
30. I try to look like sports athletes.
APPENDIX D

SOCIOCULTURAL INFLUENCES TOWARD APPEARANCE QUESTIONNAIRE

MALE VERSION
Please read each of the following items carefully and indicate the number that best reflects your agreement with the statements.

<table>
<thead>
<tr>
<th>Definitely</th>
<th>Mostly</th>
<th>Neither Agree</th>
<th>Mostly</th>
<th>Definitely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td>Disagree nor Disagree</td>
<td>Agree</td>
<td>Agree</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1. TV programs are an important source of information about fashion and being “good-looking.”
2. I’ve felt pressure from TV or magazines to change my appearance or body shape.
3. I do not care if my body looks like the bodies of men who are on TV.
4. I compare my own body to the bodies of men who are on TV.
5. TV commercials are an important source of information about fashion and being “good-looking.”
6. I do not feel pressure from TV or magazines to have a perfect body.
7. I would like my body to look like the men who appear in magazines.
8. I compare my appearance to the appearance of TV and movie stars.
9. Music videos on TV are not an important source of information about appearance.
10. I’ve felt pressure from TV and magazines to change my looks or body shape.
11. I would like my body to look like the bodies of men who are in movies.
12. I do not compare my body to the bodies of men who appear in magazines.
13. Magazine articles are not an important source of information about fashion and being “good-looking.”
14. I’ve felt pressure from TV or magazines to have a perfect body.
15. I wish I looked like the men in music videos.
16. I compare my appearance to the appearance of men in magazines.
17. Magazine advertisements are an important source of information about fashion and being “good-looking.”
18. I’ve felt pressure from TV or magazines to diet or change my eating habits.
19. I do not wish to look as athletic as the men in magazines.
20. I compare my body to the bodies of men who are in “good shape.”
21. Pictures in magazines are an important source of information about fashion and looking good.
22. I’ve felt pressure from TV or magazines to exercise.
23. I wish I looked as athletic or muscular as sports stars.
24. I compare my body to the bodies of men who are athletic or muscular.
25. Movies are an important source of information about fashion and being “good-looking.”
26. I’ve felt pressure from TV or magazines to change my appearance.
27. I do not try to look like the men on TV.
28. Movie stars are not an important source of information about fashion and appearance.
29. Famous people provide us with information about fashion and how to look good.
30. I try to look like sports athletes.
APPENDIX E

STATE SELF-ESTEEM SCALE
This is a questionnaire designed to measure what you are thinking at this moment. There is, of course, no right answer for any statement. The best answer is what you feel is true for yourself at this moment. Be sure to answer all of the items, even if you are not sure of the best answer. Again, answer these questions as they are true for you RIGHT NOW.

Not at all  A little bit  Somewhat  Very much  Extremely

1 2 3 4 5

1. I feel confident about my abilities.
2. I am worried about whether I am regarded as a success or failure.
3. I feel satisfied with the way my body looks right now.
4. I feel frustrated or rattled about my performance.
5. I feel that I am having trouble understanding things that I read.
6. I feel that others respect and admire me.
7. I am dissatisfied with my weight.
8. I feel self-conscious.
9. I feel as smart as others.
10. I feel displeased with myself.
11. I feel good about myself.
12. I am pleased with my appearance right now.
13. I am worried about what other people think of me.
15. I feel inferior to others at this moment.
16. I feel unattractive.
17. I feel concerned about the impression I am making.
18. I feel that I have less scholastic ability right now than others.
19. I feel like I’m not doing well.
20. I am worried about looking foolish.
APPENDIX F

MULTIDIMENSIONAL PERFECTIONISM SCALE
Please indicate how much you agree with the following statements.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Agree Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1. My parents set very high standards for me.
2. Organization is very important to me.
3. As a child, I was punished for doing things less than perfect.
4. If I do not set the highest standards for myself, I am likely to end up a second-rate person.
5. My parents never tried to understand my mistakes.
6. It is important to me that I be thoroughly competent in everything I do.
7. I am a neat person.
8. I try to be an organized person.
9. If I fail at work/school, I am a failure as a person.
10. I should be upset if I make a mistake.
11. My parents wanted me to be the best at everything.
12. I set higher goals than most people.
13. If someone does a task at work/school better than I, then I feel like I failed the whole task.
14. If I fail partly, it is as bad as being a complete failure.
15. Only outstanding performance is good enough in my family.
16. I am very good at focusing my efforts on attaining a goal.
17. Even when I do something very carefully, I often feel that it is not quite right.
18. I hate being less than the best at things.
19. I have extremely high goals.
20. My parents have expected excellence from me.
21. People will probably think less of me if I make a mistake.
22. I never felt like I could meet my parents’ expectations.
23. If I do not do as well as other people, it means I am an inferior human being.
24. Other people seem to accept lower standards from themselves than I do.
25. If I do not do well all the time, people will not respect me.
26. My parents have always had higher expectations for my future than I have.
27. I try to be a neat person.
28. I usually have doubts about the simple everyday things I do.
29. Neatness is very important to me.
30. I expect higher performance in my daily tasks than most people.
31. I am an organized person.
32. I tend to get behind in my work because I repeat things over and over.
33. It takes me a long time to do something “right.”
34. The fewer mistakes I make, the more people will like me.
35. I never felt like I could meet my parents’ standards.
APPENDIX G

BODY SHAPE QUESTIONNAIRE
We should like to know how you have been feeling about your appearance over the PAST FOUR WEEKS.

1. Has feeling bored made you brood about your shape?
2. Have you been so worried about your shape that you have been feeling that you ought to diet?
3. Have you thought that your thighs, hips or bottom are too large for the rest of you?
4. Have you been afraid that you might become fat (or fatter)?
5. Have you worried about your flesh not being firm enough?
6. Has feeling full (e.g., after a large meal) made you feel fat?
7. Have you felt so bad about your shape that you have cried?
8. Have you avoided running because your flesh might wobble?
9. Has being with thin women made you feel self-conscious about your shape?
10. Have you worried about your thighs spreading out when sitting down?
11. Has eating even a small amount of food made you feel fat?
12. Have you noticed the shape of other women and felt that your own shape compared unfavorably?
13. Has thinking about your shape interfered with your ability to concentrate (e.g., while watching television, reading, listening to conversations)?
14. Has being naked, such as when taking a bath, made you feel fat?
15. Have you avoided wearing clothes which make you particularly aware of the shape of your body?
16. Have you imagined cutting off fleshy areas of your body?
17. Has eating sweets, cakes, or other high calorie food made you feel fat?
18. Have you not gone out to social occasions (e.g., parties) because you have felt bad about your shape?
19. Have you felt excessively large and rounded?
20. Have you felt ashamed of your body?
21. Has worry about your shape made you diet?
22. Have you felt happiest about your shape when your shape when your stomach has been empty?
23. Have you thought that you are the shape you are because you lack self control?
24. Have you worried about other people seeing rolls of flesh around your waist or stomach?
25. Have you felt that it is not fair that other women are thinner than you?
26. Have you vomited in order to feel thinner?
27. When in company have you worried about taking up too much room (e.g., sitting on a sofa or a bus seat)?
28. Have you worried about your flesh being dimply?
29. Has seeing your reflection (e.g., in a mirror or shop window) made you feel bad about your shape?
30. Have you pinched areas of your body to see how much fat there is?
31. Have you avoided situations where people could see your body (e.g., communal changing rooms or swimming baths)?
32. Have you taken laxatives in order to feel thinner?
33. Have you been particularly self-conscious about your shape when in the company of other people?
34. Has worry about your shape made you feel you ought to exercise?
APPENDIX H

MALE BODY ATTITUDES SCALE
This scale has a number of statements and questions about your body. Please indicate how often each statement or question applies to you.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Usually</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I think I have too little muscle on my body.</td>
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<td>2</td>
<td>3</td>
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<td>5</td>
<td>6</td>
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<tr>
<td>2. I think my body should be leaner.</td>
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<td>3. I wish my arms were stronger.</td>
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<td>4. I feel satisfied with the definition in my abs (i.e., stomach muscles).</td>
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<td>5. I think my legs are not muscular enough.</td>
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<td>6. I think my chest should be broader.</td>
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<td>7. I think my shoulders are too narrow.</td>
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<td>8. I am concerned that my stomach is too flabby.</td>
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<td>9. I think my arms should be larger (i.e., more muscular).</td>
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<tr>
<td>10. I feel dissatisfied with my overall body build.</td>
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<tr>
<td>11. I think my calves should be larger (i.e., more muscular).</td>
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<td>12. I wish I were taller.</td>
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<tr>
<td>13. I think I have too much fat on my body.</td>
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<tr>
<td>14. I think my abs are not thin enough.</td>
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<tr>
<td>15. I think my back should be larger and more defined.</td>
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<tr>
<td>16. I think my chest should be larger and more defined.</td>
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<tr>
<td>17. I feel satisfied with the definition in my arms.</td>
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<tr>
<td>18. I feel satisfied with the size and shape of my body.</td>
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<tr>
<td>19. I am satisfied with my height.</td>
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<tr>
<td>20. Have you felt that your own body size or shape compared unfavorably to other men?</td>
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<tr>
<td>21. Has eating sweets, cakes, or other high calorie food made you feel fat or weak?</td>
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<td></td>
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<tr>
<td>22. Have you felt your muscle tone was way too low?</td>
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<tr>
<td>23. Have you felt excessively large and rounded (i.e., fat)?</td>
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<td></td>
</tr>
<tr>
<td>24. Have you felt ashamed of your body size or shape?</td>
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<tr>
<td>25. Has seeing your reflection (e.g., in a mirror or window) made you feel badly about your size or shape?</td>
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<tr>
<td>26. Has seeing muscular men made you feel badly about your own size or shape?</td>
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<tr>
<td>27. Have you been so worried about your body size or shape that you have been feeling that you ought to diet?</td>
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<tr>
<td>28. Have you ever felt that you were way too focused on your body size or shape?</td>
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<tr>
<td>29. Have you been particularly self-conscious about your body size or shape when in the company of other people?</td>
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</tbody>
</table>
APPENDIX I

POSITIVE AND NEGATIVE AFFECT SCALE
This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt that way during the last few weeks.

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite a bit</th>
<th>Extremely</th>
</tr>
</thead>
</table>
APPENDIX J

EATING ATTITUDES TEST-26
Current weight: _________  Highest weight (excluding pregnancy): _______
Height: _________  Lowest adult weight: _______
Ideal weight: _______

Please choose one response for each of the following statements:

Always  Usually  Often  Sometimes  Rarely  Never

1. Am terrified about being overweight.
2. Avoid eating when I am hungry.
3. Find myself preoccupied with food.
4. Have gone on eating binges where I feel that I may not be able to stop.
5. Cut my food into small pieces.
6. Aware of the calorie content of foods that I eat.
7. Particularly avoid foods with a high carbohydrate content (e.g. bread, potatoes, rice, etc.)
8. Feel that others would prefer if I ate more.
9. Vomit after I have eaten.
10. Feel extremely guilty after eating.
11. Am preoccupied with a desire to be thinner.
12. Think about burning up calories when I exercise.
13. Other people think that I am too thin.
14. Am preoccupied with the thought of having fat on my body.
15. Take longer than others to eat my meals.
16. Avoid foods with sugar in them.
17. Eat diet foods.
18. Feel that food controls my life.
19. Display self control around food.
20. Feel that others pressure me to eat.
21. Give too much time and thought to food.
22. Feel uncomfortable after eating sweets.
23. Engage in dieting behavior.
24. Like my stomach to be empty.
25. Have the impulse to vomit after meals.

In the past 6 months have you:
A. Gone on eating binges where you feel that you may not be able to stop? (Eating much more than most people would eat under the same circumstances.)
   _____ Yes    _____ No
   If you answered yes, how often during the worst week:____________________
B. Ever made yourself sick (vomited) to control your weight or shape?
   _____ Yes    _____ No
   If you answered yes, how often during the worst week:____________________
C. Ever used laxatives diet pills or diuretics (water pills) to control your weight or shape?
   _____ Yes    _____ No
If you answered yes, how often during the worst week:

D. Ever been treated for an eating disorder?

  ____ Yes  _______ No

  When:________________________
APPENDIX K

MUSCLE DYSMORPHIA DISORDER INVENTORY
Listed below are statements related to your body, appearance, and daily activities. Please indicate how often each statement applies to you.

<table>
<thead>
<tr>
<th>Never</th>
<th>Seldom</th>
<th>Somewhat</th>
<th>Usually</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1. I think my body is too small.
2. I wear loose clothing so that people cannot see my body.
3. I hate my body.
4. I wish I could get bigger.
5. I think my chest is too small.
6. I think my legs are too thin.
7. I feel like I have too much body fat.
8. I wish my arms were bigger.
9. I am very shy about letting people see me with my shirt off.
10. I feel anxious when I miss one or more workout days.
11. I pass up social activities (e.g., watching football games, eating dinner, going to see a movie, etc.) with friends because of my workout schedule.
12. I feel depressed when I miss one or more workout days.
13. I pass up chances to meet new people because of my workout schedule.