

Spring 2015

Body Image Self-Discrepancies and Compulsive Exercise:  
Exploring the Role of Approach and Avoidance  
Motivational Selves

Kristin A. Chandler

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BODY IMAGE SELF-DISCREPANCIES AND COMPULSIVE EXERCISE:  
EXPLORING THE ROLE OF APPROACH AND AVOIDANCE MOTIVATIONAL  
SELVES

by

KRISTIN CHANDLER

(Under the Direction of Brandonn Harris)

ABSTRACT

According to Brewer, Davis, Kalmbach, Kaptein, Katzman and Kirsch (1997), problematic exercise occurs in approximately 80% of anorexia nervosa patients and 55% of bulimia nervosa patients. Thus, a comprehensive understanding of unhealthy exercise is necessary for its assessment as well as eating disorder prevention and intervention. One term used to describe unhealthy exercise is compulsive exercise. Although compulsive exercise has been regarded as problematic in the development, treatment, and outcome of eating disorders, little research has investigated the risk factors for this behavior. Given the influence of body image disturbances on disordered eating and the relationship between compulsive exercise and disordered eating attitudes, this is extremely problematic. In the present study, it was hypothesized that the avoidance body self (feared for fat self) would be a stronger predictor of compulsive exercise behavior than approach body selves (hoped for thin self). Further, it was hypothesized that while these body image discrepancies would be significant predictors of compulsive behavior for both men and women, women would experience larger discrepancy scores than men. Overall, it was found that the ideal body self significantly predicted the avoidance and rule-driven behavior subscale as well as the exercise rigidity subscale. However, the ought and feared body selves did not significantly predict any of the compulsive exercise subscales. Further, it was found that women had larger ideal, ought and feared discrepancy scores than men.

INDEX WORDS: Body Image, Compulsive Exercise, and Self-Discrepancy.

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KRISTIN CHANDLER

Masters of Science in Kinesiology, Georgia Southern University, 2015

A Thesis Submitted to the Graduate Faculty of Georgia Southern University in Partial

Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE IN KINESIOLOGY

STATESBORO, GEORGIA

2015

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KRISTIN CHANDLER

Major Professor: Brandonn Harris  
Committee: Ashley Walker  
Daniel Czech

Electronic Version Approved:  
Spring 2015

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## CHAPTER 1

### INTRODUCTION

Exercise is an important component of a healthy lifestyle. However, when associated with a maladaptive body image, exercise can become an unhealthy behavioral feature associated with eating disorders (Brown, Holland, & Keel, 2014). According to Brewer, Davis, Kalmbach, Kaptein, Katzman and Kirsch (1997), problematic exercise occurs in approximately 80% of anorexia nervosa patients and 55% of bulimia nervosa patients. Thus, a comprehensive understanding of unhealthy exercise is necessary for its assessment as well as eating disorder prevention and intervention. One term used to describe unhealthy exercise is compulsive exercise. Often associated with significant body image and eating disturbances, compulsive exercise has been defined as a pre-occupation with exercise, closely associated with disordered eating, which is often performed in a rigid fashion and invariably continued despite illness or injury (Goodwin, Haycraft, & Meyer, 2011). Further, compulsive exercise has been shown to be associated with higher levels of dietary restraint, weight and shape concerns, drive for thinness, and body dissatisfaction (Meyer & Taranis, 2011).

Despite the importance of compulsive exercise in understanding eating disorders, little attention has been paid to the link between compulsive exercise and eating disorder-related attitudes and behaviors. A study by Meyer and Taranis (2011) found not only that compulsive exercise was associated with increased levels of eating disorder psychopathology and behavior, but that the negative reinforcement component of compulsive exercise, defined by continued exercise in order to avoid negative emotional consequences, was significantly associated with increased eating psychopathology and frequency of purging behaviors. Moreover, researchers

have long recognized eating disorders as ineffective coping mechanisms used to manage uncomfortable emotions.

Given the affect regulatory function of restriction and bulimic behaviors, Lawson, Lockwood and Waller (2007) suggested that compulsive behaviors such as exercise, serve a similar regulatory function in eating disorders. This is supported by the fact that compulsivity is often associated with a wide range of negative emotions (Lawson et al., 2007). Further, the affect regulatory role of exercise has been well-established with mood regulation as one of the most frequently endorsed motivations for exercise (Callaghan, 2004). In fact, researchers have suggested that any behavior under voluntary control can be used to regulate emotions (Albino, Cooper, Jackson, & Mintz, 2003). This suggestion is further supported by patient reports that exercise is being maintained for the regulation of negative affect as much as it is to expend calories (Davis & Woodside, 2002). Moreover, among eating disordered patients, compulsive exercise has been shown to be associated with elevated levels of negative affect. Specifically, compulsive exercise has been found to be associated with increased levels of anxiety in both anorexia nervosa and bulimia nervosa patients (Bennett, Devlin, Foltin, Klein, Schebendach, & Walsh, 2004).

In addition to anxiety, compulsive exercise has been shown to be associated with higher levels of depression among eating disorder patients (Penas-Lledo, Vaz Leal, & Waller, 2002). Researchers have suggested that the inability to cope appropriately with adverse mood states such as anxiety or depression, is a central component in the maintenance of eating disorders and therefore, compulsive exercise may function as a means of compensating for or suppressing adverse emotional states in eating disordered patients (Cooper, Fairburn, & Shafran, 2003). Researchers further suggest that compulsive exercise may function as a mood modulatory

behavior in eating disordered patients. In other words, compulsive exercise may become a habitual method of affect regulation in so far that among eating disordered patients who exercise compulsively, exercise may become the primary and only means by which they regulate their emotional states (Ingledrew & Markland, 1997). Overall, the use of exercise in order to regulate emotions mirrors the regulatory function of restriction and purging behaviors in eating disorders.

Likewise, Murray, Maguire, Russell and Touyz (2011) found compulsive exercise to be a key feature of muscle dysmorphia as well as a drive for muscularity associated with decreased social functioning, increased steroid use, and increased drug and alcohol use among males. Similarly, it was found that among adolescent girls, pre-morbid levels of exercise were significantly associated with current clinical levels of eating disorder activity among girls with anorexia nervosa and that their problems with exercise began before the onset of any eating problems (Brewer et al., 1997). Therefore, compulsive exercise has not only been shown to play a significant role in the onset of eating disorders, but appears to negatively affect both males and females. In addition, Solenberger (2001), found hospital record analyses which indicated that eating disorder patients who were compulsive exercisers, required a longer length of hospitalization than non-compulsive exercisers. Although compulsive exercise has been regarded as problematic in the development, treatment, and outcome of eating disorders, little research has investigated the risk factors for this behavior. Given the influence of body image disturbances on disordered eating and the relationship between compulsive exercise and disordered eating attitudes, this is extremely problematic. Potential risk factors for compulsive exercise need to be explored. Specifically, greater attention must be paid to the influence of body image discrepancies on compulsive exercise tendencies.

Higgins's (1987) self-discrepancy theory provides such a framework for examining the relationship between body image discrepancies and compulsive exercise. According to Steer and Woodman (2011), much of the body image research asks participants to report their actual body self (actual weight and size), their ideal body self (weight and size they would ideally like to be), their ought body self (weight and size they feel obliged to be, either by personal or external pressures), and their feared body self (weight and size that they worry about or are afraid of becoming). Higgins (1987) proposed that discrepancies between the actual self and the ideal self, referred to as ideal discrepancies, result in the absence of positive outcomes and the presence of negative outcomes such as depression. He also proposed that individuals possess an ought self, defined by feelings of duty, obligation and responsibility, and that congruence between the actual self and the ought self result in the presence of positive outcomes. However, discrepancies between these selves, referred to as ought discrepancies, result in the presence of negative outcomes such as anxiety (Steer & Woodman, 2011).

In addition to the ideal and ought selves specified within Higgins's (1987) theory, a number of researchers have proposed that individuals possess an undesired or feared self (Steer & Woodman, 2011). For instance, Ogilvie (1987) proposed that the feared self is more likely to be derived from personal experience, is less abstract, and therefore, may represent a stronger, more stable reference of self. However, the feared self has continued to be somewhat neglected in the self-concept literature. A notable exception, however, is work done by Carver, Lawrence and Scheier (1999), which incorporated the feared self into Higgins's framework by giving consideration to the motivational qualities of the different selves. Higgins (1987) argued that the ideal and ought selves are motivationally approach-oriented in nature in that one desires to approach these selves (e.g. "I want to be thinner"). Carver et al. (1999) further suggested that the

feared self is avoidance motivational as individuals are motivated to avoid the feared self or becoming fat. Specifically, Carver et al. (1999) proposed that when individuals are close to their feared self, their primary motivation is to escape or avoid it and all other selves have little motivational impact. Therefore, it is only when individuals gain distance from the feared self that they can focus on approaching a more positive body image.

As previously stated, compulsive exercise has been shown to negatively affect both men and women. However, little attention has been given to gender differences within self-discrepancy research. In fact, Higgins' self-discrepancy theory (1987) makes no proposals with regard to gender differences within these body image discrepancy scores. Moreover, while a majority of studies focus exclusively on women, no rationale is provided as to why women are targeted. A notable exception is Hemmings and Woodman (2008) who suggested that men and women have different body image self-representations that moderate how self-discrepancies are related to affect. For example, it has been shown that female adolescents have significantly higher body dissatisfaction (e.g. eating behaviors aimed at becoming thinner, anxiety with regard to showing one's body in public) than their male counterparts (Castro, Gila, Guete, Pombo, & Toro, 2005).

Overall, Hemmings and Woodman (2008) found that the feared body fat discrepancy moderated the relationship between approach body self-discrepancies and anxiety for women only (not men). Interestingly enough, Hemmings and Woodman (2008) also found that neither men nor women were significantly concerned with their feared muscularity for it to influence any association between approach body self-discrepancies and affect. In other words, fear of becoming fat as opposed to fear of becoming muscular was the only significant concern. As stated earlier, compulsive exercise is closely associated with negative affect and anxiety, which

suggests that discrepancy differences may exist with regard to compulsive behavior when we account for gender. Given the lack of research investigating gender differences and the tendency to focus exclusively on women in self-concept literature, the study aims to explore this topic further.

Moreover, although self-discrepancy research has clearly demonstrated the importance of considering the interaction between approach and avoidance selves, little attention has been given to the predictive value of body discrepancy scores with regard to health-related behaviors. Thus, the purpose of the present study is to examine the ideal, ought and feared body selves as predictors of compulsive exercise as well as gender differences that exist within these discrepancy scores. Based on previous research, we hypothesize that the avoidance body self (feared for fat self) will be a stronger predictor of compulsive exercise behavior than approach body selves (hoped for thin self). Further, we hypothesize that gender differences will emerge among these discrepancy scores and more specifically, that women will experience larger ideal, ought and feared body image discrepancies than men.

## CHAPTER 2

### Method

#### **Participants**

Three hundred ten undergraduate students (118 male, 192 female) enrolled in exercise science courses at a university located in the Southeast United States between the ages of 18 and 29 ( $M = 20.10$ ,  $SD = 2.10$ ) were recruited via convenience sampling. The sample consisted primarily of white, non-collegiate athletes majoring in exercise science. The mean BMI (BMI; weight (lbs) divided by height squared ( $\text{in}^2$ )) of the sample was 23.2 ( $SD = .474$ ). The study was approved by the institutional ethics board and written informed consent was obtained from all participants.

#### **Instrumentation**

In addition to completing questionnaires in this study assessing relevant constructs, participants completed a demographic questionnaire (see Appendix C) in order to gather basic information. Participants provided demographic information consisting of age, gender, ethnicity, year in school, major, athletic status, height, and weight. Height and weight information was collected in order to calculate participants' body mass index (BMI) which has been used in this line of research to provide psychometric support for contour drawing scales (Gray & Thompson, 1995).

**Contour drawing rating scale.** As shown in Figure 1, the Contour Drawing Rating Scale, (CDRS; Gray & Thompson, 1995) consists of nine female and nine male contour drawings of graduated sizes, ordered from thin (figure 1) to overweight (figure 9). In this study, participants were instructed to circle the body size or figure that best represents their current weight and size (actual self), the figure that represents the weight and size they would ideally

like to be (ideal self), the figure that represents the weight and size they feel obliged to be (ought self) and the figure that represents the weight and size that they are afraid of becoming (feared self). Female and male participants received both sets of contour drawings; however, they were instructed only to respond to the figures that represent the gender that they identify with. In order to assess participants' perceived body image and body image discrepancies, three body discrepancy scores were calculated for each participant (ideal, ought and feared discrepancy score) by subtracting their ideal, ought and feared body self scores from their actual body self score. The CDRS (Gray & Thompson, 1995) was shown to have a significant one week test-retest reliability ( $r = .78, p < .001$ ).

In addition, concurrent validity of the drawings for assessing perceived body size was demonstrated by examining the degree of correspondence between an individual's self-reported weight and current self ratings. Contour drawing selections were strongly correlated with reported weight ( $r = .71, p < .001$ ). A similar analysis of concurrent validity was conducted between actual self ratings and body mass index in which results reflected previous findings ( $r = .59, p < .001$ ). In the present study, body mass index and participants' actual body self scores were significantly related ( $r = .626, p < .001$ ).

**Compulsive exercise test.** The Compulsive Exercise Test (CET) is a 24- item self-report measure designed to assess the cognitive, behavioral and emotional aspects of compulsive exercise (See Appendix C; Meyer, Taranis & Touyz, 2011). The CET generates five subscales including 1) Avoidance and Rule-Driven Behavior 2) Weight Control Exercise 3) Mood Improvement 4) Lack of Exercise Enjoyment and 5) Exercise Rigidity. Participants were asked to indicate the strength of their agreement or disagreement with each particular item or statement (e.g. "I feel extremely guilty if I miss an exercise session") on a 6-point Likert scale, ranging



from “0 – never true” to “5 – always true.” Each participant received five scores representing their average score on each subscale. Higher scores indicate greater compulsivity towards exercise. Although a total CET score can be calculated as well, a majority of the research focuses primarily on the average scores of each subscale. The authors indicated that the results supported the internal consistency of the CET as the cronbach’s alpha for the overall scale was good (alpha = .85). The present study also demonstrated good internal consistency for each subscale: Avoidance and Rule-Drive Behavior ( $\alpha = .874$ ), Weight Control Exercise ( $\alpha = .730$ ), Mood Improvement ( $\alpha = .662$ ), Lack of Exercise Enjoyment ( $\alpha = .808$ ) and Exercise Rigidity ( $\alpha = .741$ ).

Furthermore, according to the authors, the CET has good psychometrics and has been validated for use in adolescent samples. Concurrent validity was demonstrated by associating the five subscales of the CET with the Compulsive Exercise Scale (CES). CET total was significantly associated with CES and significant subscale associations ranged from .41 to .70. Convergent validity was also established by associating the CET with the Eating Disorder Inventory (EDI). CET total was significantly positively correlated with EDI total and significant associations between the CET and EDI subscales ranged from .29 to .77.

## **Procedure**

The study was approved by the institutional ethics board and written informed consent was obtained from all participants. Instructors of exercise science and healthful living courses were contacted and asked for permission to recruit their students as participants in the current study. If permission was granted, a time was established at the beginning or end of class to administer surveys. Students were informed that the study was an investigation of the influence of body image discrepancies on compulsive exercise tendencies and that the surveys were

completely anonymous, voluntary and would not impact their grade in the course. Those students who had previously completed the surveys in another class were instructed not to participate a second time. Survey completion took approximately 10 to 15 minutes. After completing the informed consent form and demographic questionnaire, participants were provided with definitions of each of the body selves (Higgins, 1987) as follows:

- (a) Actual self - your actual body fatness refers to how fat you feel you actually are at this point in time.
- (b) Ought self - your ought body fatness refers to how fat you feel obliged to be, either by personal or outside pressures.
- (c) Ideal self - your ideal body fatness refers to how fat you would ideally like to be.
- (d) Feared self - your feared body fatness refers to how fat you fear or worry about being.

These definitions were presented prior to completing the surveys and were included in the written instruction section of the Contour Drawing Rating Scale. Further, participants were provided both male and female sets of contour drawings; however, they were instructed only to respond to the drawings of the gender that they identify with. Participants then completed the Contour Drawing Rating Scale and the Compulsive Exercise Test. The order of administration of these tests was counterbalanced as some participants completed the Contour Drawing Rating Scale first and others completed the Compulsive Exercise Test first. Finally, the students were debriefed and thanked for their participation.

### **Data Analysis**

A correlational design/prediction study was used in order to examine body image discrepancies as predictors of compulsive exercise, as well as gender differences that exist within these discrepancy scores. After calculating the ideal, ought and feared discrepancy scores, five

stepwise multiple regression analyses were conducted in which the three discrepancy scores and gender were used to predict five compulsive exercise behaviors (subscales) among men and women: Avoidance and Rule-Driven Behavior, Weight Control Exercise, Mood Improvement, Lack of Exercise Enjoyment and Exercise Rigidity. During analysis, only two of the three original items were used to calculate the Lack of Exercise Enjoyment subscale. Further, an alpha rejection level of .05 was used and the beta value of each predictor variable was determined in order to examine its strength and unique predictive value with regard to compulsive exercise behaviors. Descriptive analyses were also run using information gathered from the demographic questionnaire. Prior to administering these surveys, analyses of central tendency (mean), variability (standard deviation, standard error of the mean), skewness and kurtosis were conducted in order to evaluate assumptions of normality and homogeneity of variance. Further, in order to establish reliability of the CET and the CDRS, internal consistency analyses were conducted. Body mass index (BMI) was also calculated using height and weight information previously gathered and then correlated with participants' actual body self score in order to establish validity of the CDRS. SPSS version 21 was used for all analyses.

## CHAPTER 3

### Results

Data were screened for outliers and adherence to statistical assumptions, and then analyzed with correlational analyses among variables. Bivariate correlations for the measured variables are presented in Table 1. Normality assumptions were checked and box plots were used to isolate outliers, which resulted in the omission of 29 participants in order to avoid skewed analyses.

#### **Body image self-discrepancies and compulsive exercise.**

The three discrepancy scores (ideal, ought, and feared) were entered into the stepwise multiple regression analysis in an attempt to predict compulsive exercise tendencies. It was found that the ideal discrepancy was significantly, negatively correlated with the Avoidance and Rule-Driven Behavior subscale ( $r = -.161, p = .004$ ) and the Exercise Rigidity subscale ( $r = -.140, p = .007$ ); however, no other significant correlations among variables were found. The ideal discrepancy significantly predicted avoidance and rule-driven behavior among men and women,  $F(1, 313) = 7.426, p = .007, R^2 = .020$ , as well as the exercise rigidity component of compulsive exercise,  $F(1, 313) = 6.222, p = .013, R^2 = .016$ . No significant relationships between the ought and feared self discrepancies and compulsive exercise subscales were found and thus, regression models were not generated. Statistical analyses indicated that multicollinearity was not a concern. Correlations between predictor variables were moderate and VIF and tolerance values fell within recommended ranges.

#### **Gender differences within body image self-discrepancies**

A MANOVA was conducted in order to determine whether the predictive values of these discrepancy scores were stronger among men or women. Overall, the MANOVA demonstrated

that men and women significantly differed on at least one of the body image self-discrepancy scores,  $F(3, 300) = 257.63, p < .001, \eta^2 = .720$ . More specifically, the test of between subject effects revealed that the ideal discrepancy scores were significantly different among men and women,  $F(1, 302) = 57.941, p < .001, \eta^2 = .161$  as well as the ought discrepancy scores,  $F(1, 302) = 526.831, p < .001, \eta^2 = .082$  and the feared discrepancy scores,  $F(1, 302) = 11.962, p = .001, \eta^2 = .038$ . It was found that women ( $M = 1.28, SD = 1.22$ ) had larger ideal discrepancy scores than men ( $M = 0.23, SD = 1.10$ ), larger ought discrepancy scores ( $M = 1.05, SD = 1.68$ ) than men ( $M = 0.10, SD = 1.36$ ) and larger feared discrepancy scores ( $M = -2.68, SD = 1.60$ ) than men ( $M = -1.97, SD = 2.00$ ).

## CHAPTER 4

### Discussion

The primary purpose of the present study was to determine whether the ideal, ought and feared body selves are predictors of compulsive exercise and to examine, more specifically, whether approach or avoidance motivational selves more strongly predict compulsive exercise behaviors. Based on previous research, it was hypothesized that the avoidance body self (feared self) would be a stronger predictor of compulsive exercise behavior than approach body selves (ideal and ought body selves). Results indicated that the ideal discrepancy significantly predicted the avoidance and rule-driven behavior and exercise rigidity components of compulsive exercise; however, no significant relationships between the ought and feared self discrepancies and compulsive exercise subscales were found; thus, this hypothesis was not supported. Rather, approach motivational selves, specifically the ideal body self, more strongly predicted compulsive exercise tendencies. In other words, individuals are more likely to engage in compulsive exercise behaviors as a result of their hope of becoming thin as opposed to their fear of becoming fat.

As previously stated, Higgins' self-discrepancy theory provides a framework for examining the relationship between body image discrepancies and compulsive exercise. Higgins (1987) proposed that discrepancies between the actual self and the ideal self, referred to as ideal discrepancies, result in the absence of positive outcomes and the presence of negative outcomes such as depression. He also proposed that individuals possess an ought self, defined by feelings of duty, obligation and responsibility, and that congruence between the actual self and the ought self result in the presence of positive outcomes. However, discrepancies between these selves, referred to as ought discrepancies, result in the presence of negative outcomes such as anxiety

(Steer & Woodman, 2011). In addition to the ideal and ought selves, a number of researchers have proposed that individuals possess an undesirable or feared self, which is motivationally avoidance-oriented as individuals strive to avoid the feared self or becoming fat (Steer & Woodman, 2011).

It was surprising that the avoidance selves did not emerge as significant predictors of compulsive exercise behavior. Despite limited research on the feared self within the self-concept literature, several studies have highlighted the importance of considering the feared self in order to gain a better understanding of the relationship between body image and health-related behaviors. For instance, Carver and colleagues (1999) proposed that when individuals' actual selves more closely approximate their feared self, their primary motivation is to escape or avoid it and all other selves have little motivational influence. Otherwise stated, it is only when individuals gain distance from the feared self that they can focus on approaching a more positive body image. Likewise, a study by Steer and Woodman (2011) indicated that the relationship between ought body fat discrepancies and social physique anxiety was moderated by proximity to the feared fat self. Thus, the relationship between ought body fat discrepancies and social physique anxiety was strong only when women were far from their feared body selves.

Looking more specifically at the role of avoidance and approach motivational selves, Dalley, Pollet, and Vidal (2013) found that expectancies of acquiring a feared fat self and a hoped for thin self mediated the relationship between body size and body esteem. However, the pathway through the feared fat self was stronger than that of the hoped for thin self (Dalley, et al., 2013). Therefore, it appears that the primary motivation of compulsive exercise may be to avoid the feared fat self. Although numerous studies provided evidence for the influential role of this feared self, the present study found no support for the feared self when predicting

compulsive exercise, which suggests that further research is need in order to clarify this relationship. Overall, the ideal self was the only body self that significantly predicted components of compulsive exercise behavior. Perhaps this is the result of the internalization of the western “thin ideal” as culture plays a significant role in forming appearance ideals, including ideal body shapes and sizes (Fallon, 1990). Further, the notion that ideal body image discrepancies may motivate men and women’s self-perceptions is supported by research on gender schemas (Bern, 1981). In other words, gender schemas may be incorporated into the self-concept and thus, serve as a model against which the self is evaluated (Bernstein, Crane, Markus, & Siladi, 1982). Failure to live up to the standards of the gender schema may translate into a negative self-concept, lead to distorted thinking as well as behavioral coping (Borchert & Heinberg, 1996). Therefore, it is the degree to which we fail to meet our ideal that is implicated in body image disturbance, disordered eating or compulsive exercising.

The secondary purpose of the study was to examine gender differences among these discrepancy scores. It was hypothesized not only that gender differences would emerge among these discrepancy scores, but that women would elicit larger discrepancy scores than men. Results indicated that women had higher ideal, ought and feared body image discrepancy scores than men and therefore, perceive greater incongruences between the identified body selves. Thus, this hypothesis was supported. Based on these findings, it is possible that women experience more negative outcomes with regard to their approach body selves and more positive outcomes with regard to their avoidance body self.

Congruent with the previous finding, it could be that culture plays a significant role in the development of body image discrepancies, particularly among women. In the United States culture, concern with body image has been historically more prevalent among women than men



as women report higher levels of body dissatisfaction than men at all ages (Cash, Janda, & Winstead, 1986; McCabe & Ricciardelli, 2004). More specifically, women tend to desire a thinner figure, express more anxiety about becoming fat and are more likely to diet than men (Brown & Cash, 1989). Explanations for such body image concerns may target sociocultural expectations of thinness for women as unrealistic, unattainable and unhealthy ideals are found throughout the media including, television, magazines, advertisements and the internet. Along these lines, several cross-sectional studies have indicated that reading fashion and glamour magazines negatively impacts young women's healthy weight control behaviors (Neumark-Sztainer, Story, Utter, & Wall, 2003). Further, Harrison (2001) found that media exposures activated ideal discrepancies (thin-rewarded media portrayal) and that media-induced activation of ideal discrepancies was associated with negative affect and eating disorders. Similarly, Bessenoff (2006) found that young women exposed to thin-ideal advertisements were less satisfied with their bodies and experienced greater negative affect than those women exposed to advertisements lacking thin-ideal images. These findings suggest that body image self-discrepancies influence body satisfaction and thus, result in goals for changing one's body shape and size.

Although women are regularly exposed to thin-ideal images, the question remains as to whether these images are attainable. A study by Arciszewski and colleagues (2012) examined the effect of the threat aroused by the perception of thin-ideal images combined with beliefs about the malleability of the body on perceived body image self-discrepancies. It was not only found that women had greater body self-discrepancies when confronted with threatening thin ideals, but that the size of this discrepancy was influenced by the way in which women were made to think about their bodies, malleable or fixed. In other words, perceptions about the shape of their

body were influenced by body image threats and beliefs about their body's malleability.

Participants perceived themselves more accurately when they were under threat aroused by the thin-ideal images; however, this effect was only found for women who had been led to believe that their body was malleable (Arciszewski et al., 2012). Overall, the beliefs, attitudes and perceptions that women hold about their bodies stem from a wide variety of sources and these perceptions, in turn, play a critical role in the dejection and agitation-related affect that women experience.

Moreover, it is possible that in United States culture, where women are primarily defined by their appearance, cultural prescriptions about body size may take precedence in shaping women's body images (Borchert & Heinberg, 1996). Interestingly enough, over the last century, the western ideal of the female body image has significantly decreased in terms of weight and size despite the fact that the average women in western culture has become larger over the years (Ahrens, Gray, Mosimann, & Wiseman, 1992). In addition, it has been found that the extent to which women internalize the western ideal predicts body dissatisfaction and that women who do not adopt the western view of the "ideal body" are less likely to develop eating disorders and body dissatisfaction (Becker, Burwell, Gilman, Herzog, & Hamburg, 2002). In other words, constantly viewing thin bodies may alter a woman's perception of what "normal" and "ideal" bodies entail. Further, a meta-analysis of studies investigating the effects of viewing western idealized images concluded that exposure to those images not only induces but enhances body dissatisfaction (Groesz, Levine, & Murnen, 2001).

Ogden (2010) proposed that body dissatisfaction can be defined as a discrepancy from the ideal or a discrepancy between how individuals perceive themselves and how they would ideally like to look. Body image discrepancies, on the other hand, represent a distress about the

physical incongruence between the actual body and ideal body as well as a discomfort with the personal and social connotations attached to that incongruence (Govender & Martin, 2011). It therefore follows that the discrepancies between women's actual body self and ideal body self are central to body dissatisfaction which in turn, contributes to negative affect (Dittmar & Halliwell, 2006). The findings of the present study support this idea as women were found to have larger ideal body image discrepancies compared to men.

In the United States, 64-84% of women exhibit body dissatisfaction, typically preferring a smaller figure than their present frame; that is, their ideal size is smaller than their current body size perception (Janowsky & Pruis, 2010). In fact, body dissatisfaction has become so pervasive among women that it was coined "normative discontent" by Rodin, Silberstein and Striegel-Moore in 1984. This high prevalence of body dissatisfaction among women is a serious concern given the established relationship between body dissatisfaction and poor self-esteem, maladaptive cognitions, greater anxiety and depression as well as engagement in unhealthy behaviors such as smoking, disordered eating, steroid use, and compulsive exercise (Grogan, 2008). As such, understanding the nature and extent of body dissatisfaction is essential and may play an influential role in the development of appropriate interventions for women,

Although there are multiple factors that contribute to the development of body image problems, society's conceptualization of the ideal female body, as reflected in mass media, may strongly influence women's body image assessment. Given previous research and the findings of the present study, a potential avenue for future research may involve exploring why the nature of body image discrepancies differs for men and women. In other words, information gathered from this study can be used to gain a better understanding of gender differences with regard to body image concerns. Along the same lines, including gender as a predictor variable may serve as an

additional source of knowledge. By including gender in the regression model, there exists the possibility of accounting for greater variance and uncovering differences among men and women with regard to compulsive exercise. Similarly, conducting a study aimed at identifying the direction of body image discrepancies may prove beneficial and reveal useful information with regard to gender, race and ethnicity. For instance, why is it that the ideal body self is larger than the actual body self for some men and women, while others favor a smaller body shape and size? Along the same lines, one can explore whether race plays a significant role in the direction of ideal body image discrepancies. Further research on the feared self is also needed with regard to compulsive exercise.

Overall, the present study identified a potential risk factor of unhealthy/problematic exercise as individuals' perception of their ideal body weight and size significantly predicted components of compulsive exercise. This, in turn, may suggest that approach motivational selves (ideal self) have a stronger predictive value than avoidance motivational selves and therefore, individuals are more likely to engage in compulsive exercise tendencies as a result of a hope of becoming thin rather than a fear of becoming fat. Not only do these findings allow for the development of specific interventions for those classified as compulsive exercisers, but it fills in the gaps in the self-concept literature with regard to gender and highlights the importance of considering culture when assessing body image discrepancies. Despite the fact that the study established a clearer relationship between body image concerns and health-related behaviors, it is important to note that several limitations exist.

For instance, there are multiple factors, including gender that were not assessed within the regression model and failure to do so may account for the low variance found within the study. Further, by employing surveys or self-report measures, there is the possibility that

participants are simply responding in a socially desirable manner and that their ideal, ought and feared body image discrepancies are a mere reflection of society's standards. It is also important to note that visual-analog scales typically embrace a thin-to-fat range and thus, may not account for those individuals pursuing more muscular builds. In other words, the Contour Drawing Rating Scale used in this present study may not accurately represent those individuals who failed to identify with the body image options provided on the scale. In all, participants may have idealized a body image shape and size more muscular in nature as opposed to the lean and thin builds provided. Likewise, participants were selected from one geographic location and thus, may be unrepresentative of the larger population. In other words, the results may only reflect the ideal physique for this particular sample. Finally, although the measures were adequately tested and reliability was confirmed, there exists the potential for human error. Nevertheless, the present study supported one of the initial hypotheses, provided avenues for future research and paved the way for understanding gender differences with regard to body image concerns.

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## APPENDICES

### Literature Review

#### **Exercise Dependence/Addiction**

Exercise and physical activity have long been considered fundamental tools, essential in the promotion of health and the enhancement of mood and quality of life. In general, a large percentage of the population reports increased levels of well-being following physical activity. In fact, a study by Howard and Zmijewski (2003) demonstrated that 87.2% of individuals reported increased levels of psychological well-being following physical exercise. Unfortunately, taken to the extreme, one may develop a dependence on exercise or a craving for physical activity that may entail harmful health consequences. Exercise dependence has been defined as a process in which individuals commit to exercise in spite of an apparent difficulty, such as an injury or illness that would normally prevent them from engaging in such activity (Antunes, Borba de Gimenez, De Mello Santiago, Modolo, Tufiks, & Tulio de Mello, 2011). This dependence, in turn, may contribute to physiological or psychological disorders. Overall, several terms have been used to describe this phenomenon.

For instance, the term, “positive addiction,” has been used to describe athletes who report an increased sense of euphoria with increased miles or training and use large doses of exercise in order to obtain these increased feelings of euphoria (Antunes et al., 2011). Negative addiction, on the other hand, describes athletes who report a decreased sense of anxiety and depression after exercise and use large doses of exercise in order to obtain this relief (Antunes et al., 2011). Both terms demonstrate aspects of exercise dependence, the characteristics of tolerance and withdrawal. Along the same lines, Downs and Hausenblas (2004) identified exercise addiction based on seven criteria including: an increase in the amount of exercise necessary in order to feel

the desired effect (tolerance), experiencing negative effects such as anxiety, irritability, and restlessness in the absence of exercise (withdrawal), unsuccessful attempts to reduce exercise levels (lack of control), an inability to stick to one's intended routine as evidenced by exceeding amounts of time dedicated to exercise (intention effects), a great deal of time spent preparing, engaging in and recovering from exercise (time), continuing to exercise despite awareness that this activity is creating exacerbating physical, psychological and interpersonal problems (continuance) and reduction in other social, occupational or recreational activities as a result of exercise.

Like other behavioral addictions, exercise addiction is often referred to as being compulsive as intrusive thoughts, obsessions and ruminations are often experienced when individuals have an urge or craving to engage in exercise behavior (Freimuth, Kim, & Moniz, 2011). Further, research has indicated that exercise, like a compulsion, is maintained by its mood-altering effects. These effects often extend beyond anxiety reduction to include lessening other negative effects such as anger, depression and boredom. Interestingly enough, eating disorders are found to be the most common disorder associated with exercise addiction as approximately 39% to 48% of individuals suffering from eating disorders suffer from exercise addiction as well (Downs & Hausenblas, 2004). A study by Bennett, Jones, Lawson, Olmsted and Rodin (2001), reported that girls with normal body mass index were dissatisfied with their body mass and height. This pre-occupation with exercise is closely associated with the development of exercise dependence in women as well as eating disorders such as anorexia nervosa and bulimia nervosa as negative psychological symptoms related to physical exercise have a direct relation to changes in body image perception.



Moreover, one of the most difficult issues in defining exercise addiction remains how to distinguish healthy exercise behaviors from exercise addiction. In order to reap the health benefits of exercise, the behavior needs to be engaged in relatively frequently and for an extended duration; however, it does not involve creating negative consequences in the form of physical injury and time taken away from other important activities. In order to address this question and more clearly understand exercise dependence and addiction we need to take into consideration the various types of unhealthy or problematic exercise.

### **Unhealthy and Problematic Exercise**

As previously stated, exercise is an important component of a healthy lifestyle. However, when associated with a maladaptive body image, exercise can become an unhealthy behavioral feature of eating disorders (Brown, Holland, & Keel, 2014). According to Brewer, Davis, Kalmbach, Kaptein, Katzman and Kirsch (1997), problematic exercise occurs in approximately 80% of anorexia nervosa patients and 55% of bulimia nervosa patients. Thus, a comprehensive understanding of unhealthy exercise is necessary for its assessment as well as eating disorder prevention and intervention. The terms used to describe unhealthy or problematic exercise can be grouped into three domains: excessive, compulsive, and compensatory exercise.

**Excessive and compensatory exercise.** Excessive exercise has been characterized as excessive frequency, duration and intensity of exercise (Davis & Fox, 1993) while compulsive exercise has been defined as exercise to prevent or reduce feelings of distress (Meyer & Taranis, 2011). Compensatory exercise, on the other hand, has been defined as exercise to compensate for the effects of food intake on weight or shape (Crowther, Engler, Harrington, & LePage, 2008). Although researchers agree that excessive, compulsive and compensatory exercise are problematic, there remains much debate as to which of these forms of exercise most significantly

impacts eating pathology. A study by Hetta and Seigel (2001) found that only compulsive attitudes towards exercise were significantly associated with body image and eating disturbances among young-adult women. In addition, Brown, Holland and Keel (2014) found that both compulsive and compensatory features of exercise were the most significant predictors of disordered eating and eating disorder diagnoses. Thus, greater attention must be paid toward compulsive exercise and the risk factors for these behaviors.

**Compulsive exercise.** Compulsive exercise, often associated with significant body image and eating disturbances, has been defined as a pre-occupation with exercise, closely associated with disordered eating, which is often performed in a rigid fashion and invariably continued despite illness or injury (Goodwin, Haycraft, & Meyer, 2011). Further, compulsive exercise has been shown to be associated with higher levels of dietary restraint, weight and shape concerns, drive for thinness and body dissatisfaction (Meyer & Taranis, 2011). Despite the importance of compulsive exercise in understanding eating disorders, little attention has been paid to the link between compulsive exercise and eating disorder-related attitudes and behaviors. A study by Meyer and Taranis (2011) found not only that compulsive exercise was associated with increased levels of eating disorder psychopathology and behavior, but specifically that the negative reinforcement component of compulsive exercise, defined by continued exercise in order to avoid negative emotional consequences, was significantly associated with increased eating psychopathology and frequency of purging behaviors. Moreover, researchers have long recognized eating disorders as ineffective coping mechanisms used to manage uncomfortable emotions.

Given the affect regulatory function of restriction and bulimic behaviors, Lawson, Lockwood and Waller (2007) suggested that compulsive behaviors such as exercise, serve a

similar regulatory function in eating disorders. This is supported by the fact that compulsivity is often associated with a wide range of negative emotions (Lawson et al., 2007). Further, within the literature, the affect regulatory role of exercise has been well-established with mood regulation as one of the most frequently endorsed motivations for exercise (Callaghan, 2004). In fact, researchers have suggested that any behavior under voluntary control can be used to regulate emotions (Albino, Cooper, Jackson, & Mintz, 2003). This suggestion is further supported by patient reports that exercise is being maintained for the regulation of negative affect as much as it is to expend calories (Davis & Woodside, 2002). Moreover, among eating disordered patients, compulsive exercise has been shown to be associated with elevated levels of negative affect. Specifically, compulsive exercise has been found to be associated with increased levels of anxiety in both anorexia nervosa and bulimia nervosa patients (Bennett, Devlin, Foltin, Klein, Schebendach, & Walsh, 2004).

In addition to anxiety, compulsive exercise has been shown to be associated with higher levels of depression among eating disordered patients (Penas-Lledo, Vaz Leal, & Waller, 2002). Researchers have suggested that the inability to cope appropriately with adverse mood states such as anxiety or depression, is a central component in the maintenance of eating disorders and therefore, compulsive exercise may function as a means of compensating for or suppressing adverse emotional states in eating disordered patients (Cooper, Fairburn, & Shafran, 2003). Researchers further suggest that compulsive exercise may function as a mood modulatory behavior in eating disordered patients. In other words, compulsive exercise may become a habitual method of affect regulation in so far that among eating disordered patients who exercise compulsively, exercise may become the primary and only means by which they regulate their

emotional states (Ingledrew & Markland, 1997). Overall, the use of exercise in order to regulate emotions mirrors the regulatory function of restriction and purging behaviors in eating disorders.

Additionally, compulsive exercise has not only been shown to play a significant role in the onset of eating disorders, but appears to negatively affect both males and females. Murray, Maguire, Russell, and Touyz (2011) found compulsive exercise to be a key feature of muscle dysmorphia as well as a drive for muscularity associated with decreased social functioning, increased steroid use, and increased drug and alcohol use among males. Further, research has concluded that males are becoming equally as dissatisfied with their bodies as females (Garner, 1997); however, this body dissatisfaction is characterized as a desire to gain weight and enhance muscularity rather than lose weight (McCreary & Sasse, 2000). Among adolescent girls, it was found that pre-morbid levels of exercise were significantly associated with current clinical levels of eating disorder activity among girls with anorexia nervosa and that their problems with exercise began before the onset of any eating problems (Brewer et al., 1997). In addition, compulsive exercise has been established as one of the last symptoms to subside in eating disorders.

For example, Solenberger (2001), found hospital record analyses which indicated that eating disorder patients who were compulsive exercisers, required a longer length of hospitalization than non-compulsive exercisers, had a higher risk of relapse, and poorer long-term outcome. Despite support for compulsive exercise as an important factor in the development of eating disorders, little is known about the factors that contribute to the maintenance of compulsive exercise. Perfectionism, described as a personality trait characterized by having and striving for high personal standards, has been established as a critical factor in the development and maintenance of eating disorders (Frost, Lahart, Marten, & Rosenblate, 1990).

Research suggests that perfectionism is not only a correlate of compulsive exercise, but found among men and women, competitive and non-competitive runners, and eating disorder patients (Ackard, Brehm, & Steffen, 2002). For example, negative emotion associated with an inability to exercise, exercising solely for weight or shape reasons and rigid adherence to an inflexible exercise routine are all significant components of compulsive exercise found to be associated with eating pathology. Davis (1997) suggested that compulsive exercisers often strive to achieve a perfect routine and any failure to reach this standard results in self-rumination. Similarly, Meyer and Taranis (2011) found that self-criticism accounted for this relationship between high personal standards and compulsive exercise.

### **Sociocultural Pressures**

As previously stated, although compulsive exercise has been regarded as problematic in the development, treatment, and outcome of eating disorders, risk factor research into compulsive exercise has been somewhat neglected from the literature. However, given the close link between disordered eating attitudes and compulsive exercise, it has been suggested that common risk factors underpin both eating disorders and compulsive exercise behaviors (Eisler & le Grange, 1990). In fact, sociocultural factors such as family, peers, and cultural messages through the media have all been implicated in the development of disordered eating behaviors and weight concerns (Dunkley, Paxton, & Wertheim, 2001). With regard to parental and familial influences, it has been suggested that direct family communication and attitudes toward appearance, eating and exercising contributed to the development of disordered eating attitudes and behaviors (Bleckley, Clopton, & Young, 2004). Further, work done by Bleckley and colleagues (2004), demonstrated that weight and shape concerns transmitted from parents and

parental pressure to be thin were related to bulimic behaviors of young women and body dissatisfaction among adolescent males.

In addition to the effects of the family environment, research concerning the influence of peers on eating disturbances has suggested that the peer environment plays a crucial role in the development of adolescents' weight-related attitudes and behaviors (Hutchinson, Rapee, & Taylor, 2010). For example, Muir, Paxton, Schutz and Wetheim (1999) found friendship groups to be highly influential in affecting body image concerns and extreme weight loss behaviors among adolescent girls. Furthermore, Berkey, Camargo, Colditz, Field, and Taylor (1999) found that as peer groups placed a greater emphasis on thinness, the likelihood that an adolescent girl would engage in purging behaviors increased. Similar effects were found among adolescent males with regard to the influence of peer groups on body image and dieting behaviors (Mayer, Meesters, Muris, & van de Blom, 2005).

Moreover, it has been suggested that these dieting and weight control behaviors occur as a result of the internalization of the "thin ideal" prevalent in western culture, as it contributes to increased body dissatisfaction as well as weight and shape concerns. In other words, just as messages from peers are internalized, this cultural "thin ideal" can be transmitted through media messages (Alsaker, Knauss, & Paxton, 2007). For instance, among adolescent girls, reading fashion magazines has been shown to increase the desire for thinness and media information regarding weight loss methods has been associated with increased dietary restraint (Hayden, Levine, & Smolak, 1994). Similarly, the media influence on the development of weight and shape self-perceptions and its role in shaping exercise behaviors such as increasing muscle size has been demonstrated among adolescent boys (McCabe & Ricciardelli, 2003).

In addition to their influence on eating disturbances, environmental factors, such as the media and the influence of family and peers, have also been shown to play a key role in the development of eating disorders and to be closely linked to eating disorder symptomology (Harter & Kiang, 2006). Specifically, Goodwin, Haycraft and Meyer (2011) found that sociocultural influences differed slightly between males and females. Messages to become more muscular and media pressure to be thin significantly predicted compulsive exercise in males while media pressure to be thin was the only significant predictor of compulsive exercise in females (Goodwin, Haycraft, & Meyer, 2011). Although sociocultural influences may differ slightly among males and females, factors such as family, peer groups and the media have been found to be significantly positively associated with compulsive exercise. Given the influence of sociocultural pressures and body image disturbances on disordered eating and the relationship between compulsive exercise and disordered eating attitudes, greater attention must be paid to the influence of body image discrepancies on compulsive exercise tendencies.

### **Self-Discrepancy Theory**

Higgins's (1987) self-discrepancy theory provides such a framework for examining the relationship between body image discrepancies and compulsive exercise. According to Steer and Woodman (2011), much of the body image research asks participants to report their actual body self (actual weight and size), their ideal body self (weight and size they would ideally like to be), their ought body self (weight and size they feel obliged to be, either by personal or external pressures) and their feared body self (weight and size that they worry about or are afraid of becoming). Higgins (1987) proposed that discrepancies between the actual self and the ideal self, referred to as ideal discrepancies, result in the absence of positive outcomes and the presence of negative outcomes such as depression. He also proposed that individuals possess an ought self,

defined by feelings of duty, obligation and responsibility, and that congruence between the actual self and the ought self result in the presence of positive outcomes. However, discrepancies between these selves, referred to as ought discrepancies, result in the presence of negative outcomes such as anxiety (Steer & Woodman, 2011).

In addition to the ideal and ought selves specified within Higgins's (1987) theory, a number of researchers have proposed that individuals possess an undesirable or feared self (Steer & Woodman, 2011). For instance, Ogilvie (1987) proposed that the feared self is more likely to be derived from personal experience, is less abstract and thus, may represent a stronger, more stable reference of self. However, the feared self has continued to be somewhat neglected in the self-concept literature. A notable exception, however, is Carver, Lawrence and Scheier (1999) who incorporated the feared self into Higgins's framework by giving consideration to the motivational qualities associated with the different selves. Higgins (1987) argued that the ideal and ought selves are motivationally approach-oriented in that one desires to approach these selves (e.g. "I want to be thinner"). Carver and colleagues (1999) further suggested that the feared self is avoidance motivated as individuals are motivated to avoid the feared self or becoming fat. Specifically, Carver et al. (1999) proposed that when individuals are close to their feared self, their primary motivation is to escape or avoid it and all other selves have little motivational influence. In other words, it is only when individuals gain distance from the feared self that they can focus on approaching a more positive body image. Thus, this research highlights the importance of considering the feared self in order to gain a better understanding of the relationship between body image and health-related behaviors.

**The feared self.** For instance, a study examining the ought, ideal and feared body image self-discrepancies as predictors of anxiety and happiness found that the relationship between



approach body fat discrepancies and affect was consistent with Higgins' (1987) theory; however, this relationship was moderated by the distance from the feared self for women only (Hemmings & Woodman, 2008). In other words, the relationship between approach body selves and affect was strong only when women were far from their feared body selves (Hemmings & Woodman, 2008). Similarly, a study by Steer and Woodman (2011) indicated that the relationship between ought body fat discrepancies and social physique anxiety was moderated by proximity to the feared fat self. Once again, the relationship between ought body fat discrepancies and social physique anxiety was strong only when women were far from their feared body selves. Looking more specifically at the role of avoidance and approach motivational selves, Dalley, Pollet, and Vidal (2013) found that expectancies of acquiring a feared fat self and a hoped for thin self mediated the relationship between body size and body esteem. However, the pathway through the feared fat self was stronger than that of the hoped for thin self (Dalley, et al., 2013). Therefore, it appears that the primary motivation of compulsive exercise may be to avoid the feared fat self.

As previously stated, perfectionism has been found to be associated with compulsive exercise and has been implicated in the development and maintenance of female eating pathology (Stice, 2002). Given the association between eating pathology and dietary restraint, this relationship can be observed within the self-discrepancy framework. Specifically, a study by Dalley, Pollet and Toffanin (2012) examined the mediational role of a hoped for thin self and a feared fat self among young college women. It was hypothesized that women higher in perfectionistic strivings would engage in dietary restraint in the hope of acquiring the thin ideal and that women higher in perfectionistic concerns would engage in dietary restraint as they fear the consequences of acquiring a fat or overweight self. The authors found that the perceived

likelihood of acquiring a feared fat self mediated both perfectionistic concerns and perfectionistic strivings on dietary restraint; however, the mediational pathway from perfectionistic concerns to dietary restraint was stronger than that from perfectionistic strivings (Dalley, et al., 2012). In other words, women high in perfectionistic concerns were more likely to engage in dietary restraint out of fear of acquiring a fat self.

In addition to negative affect and anxiety, the role of the feared self has also been explored with regard to optimism. Optimism, long associated with physical and mental benefits, has recently been found to be related to positive body image (Carver, Scheier, & Segerstrom, 2010). Researchers have suggested that optimism may influence body self-discrepancies through an expectancy judgment about acquiring a feared fat self (Dalley & Vidal, 2013). Thus, with increasing levels of optimism, women might perceive it less likely that they will acquire a feared fat body and as a result, approach a more positive body image. Consistent with this belief, researchers have demonstrated that only the perceived likelihood of acquiring a feared fat self (not hoped for thin self) mediated dispositional optimism on positive body image (Dalley & Vidal, 2013). Overall, the results of various studies suggest further exploration into the role of the feared fat self.

Moreover, in order to address these body image concerns it may be important to gain a better understanding of the way in which women perceive themselves as well as the thought processes behind these perceptions. Following previous studies on the effects of self-discrepancies on body perception, Arciszewski, Berjot, and Finez (2012) suggested that the different body image self-discrepancies result from different processes and in particular, from specific perceptions. For example, several cross-sectional studies have indicated that reading fashion and glamour magazines negatively impacts young women's healthy weight control

behaviors (Neumark-Sztainer, Story, Utter, & Wall, 2003). Furthermore, Harrison (2001) found that media exposures activated either ideal discrepancies (thin-rewarded media portrayal) or ought discrepancies (fat-punished media portrayal) and that media-induced activation of both ideal and ought discrepancies was associated with negative affect and eating disorders. Similarly, Bessenoff (2006) found that young women exposed to thin-ideal advertisements were less satisfied with their bodies and experienced greater negative affect than those women exposed to advertisements lacking thin-ideal images. These findings suggest that body image self-discrepancies influence body satisfaction and thus, result in goals for changing one's body shape and size.

Although women are regularly exposed to thin-ideal images, the question remains as to whether these images are attainable. A study by Arciszewski et al. (2012) examined the effect of the threat aroused by the perception of thin-ideal images combined with beliefs about the malleability of the body on perceived body image self-discrepancies. It was not only found that women had greater body self-discrepancies when confronted with threatening thin ideals, but that the size of this discrepancy was influenced by the way in which women were made to think about their bodies, malleable or fixed (Arciszewski et al., 2012). In other words, perceptions about the shape of their body were influenced by body image threats and beliefs about their body's malleability. Participants perceived themselves more accurately when they were under threat aroused by the thin-ideal images; however, this effect was only found for women who had been led to believe that their body was malleable (Arciszewski et al., 2012).

Overall, it appears that women were able to perceive their body shape more accurately when exposed to the thin-ideal images as this ideal appeared more attainable to them. The beliefs, attitudes and perceptions that women hold about their bodies stem from a wide variety of sources

and these perceptions, in turn, play a critical role in the dejection and agitation-related affect that women experience.

## **Gender**

As previously stated, compulsive exercise has been shown to negatively affect both men and women. However, little attention has been given to gender differences within self-discrepancy research. In fact, Higgins' self-discrepancy theory (1987) makes no proposals with regard to gender differences within these body image discrepancy scores. Moreover, while a majority of studies focus exclusively on women, no rationale is provided as to why women are targeted. A notable exception is Hemmings and Woodman (2008) who suggested that men and women have different body image self-representations that moderate how self-discrepancies are related to affect. For example, it has been shown that female adolescents have significantly higher body dissatisfaction (e.g. eating behaviors aimed at becoming thinner, anxiety with regard to showing one's body in public) than their male counterparts (Castro, Gila, Guete, Pombo, & Toro, 2005).

Overall, Hemmings and Woodman (2008) found that the feared body fat discrepancy moderated the relationship between approach body self-discrepancies and anxiety for women only (not men). Interestingly enough, Hemmings and Woodman (2008) also found that neither men nor women were significantly concerned with their feared muscularity for it to influence any association between approach body self-discrepancies and affect. In other words, fear of becoming fat as opposed to fear of becoming muscular was the only significant concern. As we know, compulsive exercise is closely associated with negative affect and anxiety, which suggests that discrepancy differences may exist with regard to compulsive behavior when we account for gender.

## Assessing Self-Discrepancy and Exercise Compulsion

In order to measure the variables and constructs previously described, several instruments have been employed by previous researchers. For instance, the Contour Drawing Rating Scale (CDRS) consists of nine female and nine male contour drawings ordered from thin to overweight (Gray & Thompson, 1995). Participants are instructed to circle the body size or figure that best represents their current weight and size (actual self), the figure that represents the weight and size they would ideally like to be (ideal self), the figure that represents the weight and size they feel obliged to be (ought self) and the figure that represents the weight and size that they are afraid of becoming (feared self). In order to assess participants' perceived body image and body image discrepancies, three body discrepancy scores are calculated for each participant (ideal, ought and feared discrepancy score) by subtracting their ideal, ought and feared body fat scores from their actual body fat score. The CDRS (Gray & Thompson, 1995) was shown to have a significant one week test-retest reliability ( $r = .78, p < .001$ ).

In order to establish validity, participants were presented with the nine female and male contour drawings in random order. The participants were then instructed to order the contour drawings from thinnest to heaviest and to report any figures that they believed to be anorexic or obese. Participants were also asked to select the same-sex contour drawing that they believed most accurately depicted their actual body size. Participants repeated the self-rating and rank ordering procedures one week after initial participation. In addition, concurrent validity of the drawings for assessing perceived body size was demonstrated by examining the degree of correspondence between an individual's self-reported weight and current self ratings. Contour drawing selections were strongly correlated with reported weight ( $r = .71, p < .001$ ). A similar

analysis of concurrent validity was conducted between self ratings and body mass index in which results reflected previous findings ( $r = .59, p < .001$ ).

Similarly, the Photographic Figure Rating Scale (PFRS), designed to measure actual-ideal body image discrepancies, consists of ten photographic figures of real women representing each of the established BMI categories (Furnham, Salem, Swami, & Tovee, 2008) Participants are asked to select the figure that best represents their actual body size and that which represents their ideal body size. Both ratings are made on a 10-point scale, with 1 representing the figure with the lowest BMI and 10 representing the figure with the highest BMI. Test-retest reliabilities on the Photographic Figure Rating Scale were examined by correlating current self-rating, ideal body size rating and body dissatisfaction scores during the first administration and after three weeks (Furnham et al., 2008). Test-retest reliabilities were significant for current self-ratings ( $r = .90, p < .001$ ), ideal body size ratings ( $r = .88, P < .001$ ) and body dissatisfaction scores ( $r = .85, P < .001$ ). In addition, construct validity for the PFRS was established by examining the degree of correlation between participants' self-ratings and BMI ( $r = .80, P < .001$ ). Further, according to Furnham et al. (2008), construct validity was supported by finding that body dissatisfaction as measured by the PFRS was negatively correlated with Body Appreciation Scale scores ( $r = -.35, P < .001$ ). The main drawback of the PFRS, however, is that the scale only consists of female drawings or figures.

Likewise, the Selves Questionnaire, is a free-response measure designed to assess the frequency and quality of self-discrepancies (Higgins, 1987). Participants are asked to list up to 10 words to describe the attributes that they believe they actually possess, that they believe one of their parents ideally would like for them to possess and that they believe their parents feel they ought to possess. Participants were also asked to rate the extent to which they possessed each

attribute on a 4-point scale, ranging from 1 (slightly) to 4 (extremely). Scores were obtained by comparing the words/synonyms across the domains and the ratings for each characteristic were taken into account. For example, a score of +2 was awarded if a word/synonym was used in more than two domains and numerical ratings were identical (Higgins, 1987). Scores ranged from + 2 to -2. The Selves Questionnaire was shown to have an interrater reliability coefficient range from .80 to .87 (Higgins, 1987) and a test-retest reliability for the actual-ought discrepancy of .53 for an interval of 4-6 weeks.

With regard to compulsive exercise, the Compulsive Exercise Test (CET), is a 24- item self-report measure designed to assess the cognitive, behavioral and emotional aspects of compulsive exercise (Meyer, Taranis, & Touyz, 2011). The CET generates five subscales including 1) Avoidance and Rule-Driven Behavior 2) Weight Control Exercise 3) Mood Improvement 4) Lack of Exercise Enjoyment and 5) Exercise Rigidity. Participants are asked to indicate the strength of their agreement or disagreement with each particular item or statement (e.g. "I feel extremely guilty if I miss an exercise session") on a 6-point Likert scale, ranging from "0 – never true" to "5 – always true." Each participant receives five scores representing their average score on each subscale. Higher scores indicate greater compulsivity towards exercise. Although a total CET score can be calculated as well, a majority of the research focuses primarily on the average scores of each subscale. The authors indicated that the results supported the internal consistency of the CET as the cronbach's alpha for the overall scale was good (alpha = .85) with alpha coefficients ranging from acceptable to high and a mean item-total correlation of 0.48.

Furthermore, according to the authors, the CET has good psychometrics and has been validated for use in adolescent samples. Concurrent validity was demonstrated by associating the

five subscales of the CET with the Compulsive Exercise Scale (CES). CET total was significantly associated with CES and significant subscale associations ranged from .41 to .70. Convergent validity was also established by associating the CET with the Eating Disorder Inventory (EDI). CET total was significantly positively correlated with EDI total and significant associations between the CET and EDI subscales ranged from .29 to .77. Overall, the Compulsive Exercise Test appears to be the most commonly used and most recent measure of compulsive exercise behaviors.



## APPENDIX B

### *Research Questions*

The primary research questions for this study are:

1. Are the ideal, ought and feared body selves significant predictors of compulsive exercise?
2. Will approach or avoidance motivational selves more strongly predict compulsive exercise behaviors?
3. Will gender differences emerge among these discrepancy scores?
4. Will the predictive values of these discrepancy scores be stronger among men or women?

### *Hypotheses*

1. The ideal, ought and feared body selves will be significant predictors of compulsive exercise.
2. The avoidance body self (feared for fat self) will be a stronger predictor of compulsive exercise behavior than approach body selves (hoped for thin self).
3. Gender differences will emerge among the discrepancy scores.
4. Women will have larger ideal, ought and feared discrepancy scores than men.

### *Limitations*

1. Participants will be selected from one geographic location and thus, are unrepresentative of the larger population.
2. By using self-report measures we are unclear as to whether participants are responding in a socially desirable manner.

### *Delimitations*

1. The sample consists primarily of male and female undergraduate students between the ages of 18 and 25, enrolled in exercise science courses at a university located in the Southeast United States.
2. Although various tests assessing compulsive exercise behaviors and body image discrepancies exist, the Compulsive Exercise Test (CET) and the Contour Drawing Rating Scale (CDRS) will be used in order to measure these variables.

### *Assumptions*

1. Participants will respond truthfully on the Contour Drawing Rating Scale and the Compulsive Exercise Test.
2. Participants will clearly understand the difference between actual, ideal, ought and feared body selves.
3. The sample selected is generalizable to and representative of the larger target population, consisting of undergraduate exercise science students, ages 18 to 25, in the Southeastern United States.
4. The majority of exercise science students are exposed to and generally knowledgeable of health-related behaviors and physical activity guidelines given the nature of the discipline and coursework.
5. The Compulsive Exercise Test and the Contour Drawing Rating Scale are valid and reliable measures of the variables being assessed in this study.

### *Definitions of Key Terms*

1. Compulsive Exercise- often associated with significant body image and eating disturbances, compulsive exercise has been defined as a pre-occupation with exercise, closely associated with disordered eating, which is often performed in a rigid fashion and invariably continued despite illness or injury (Goodwin, Haycraft, & Meyer, 2011).
2. Actual self - your actual body fatness refers to how fat you feel you actually are at this point in time (Higgins, 1987).
3. Ideal self -your ideal body fatness refers to how fat you would ideally like to be (Higgins, 1987).
4. Ought self - your ought body fatness refers to how fat you feel obliged to be, either by personal or outside pressures (Higgins, 1987).
5. Feared self -your feared body fatness refers to how fat you fear or worry about being (Higgins, 1987).
6. Ideal discrepancy score- the difference between one's actual body fat score and ideal body fat score (Higgins, 1987).
7. Ought discrepancy score- the difference between one's actual body fat score and ought body fat score (Higgins, 1987).
8. Feared discrepancy score- the difference between one's actual body fat score and feared body fat score (Higgins, 1987).
9. Body Mass Index (BMI) - technique used to assess body fat percentage by dividing weight in kilograms (kg) by height in meters squared (Esmat, 2012).

10. Disordered eating- a term used to describe a wide range of irregular eating patterns and behaviors that does not warrant a diagnosis of a specific eating disorder such as anorexia nervosa or bulimia nervosa. Disordered eating is more common than eating disorders and symptoms typically occur less frequently. Changes in eating patterns due to temporary stressors, athletic events or even illness may be considered disordered eating (Collins, 2010).
11. Eating disorder- any of a range of psychological disorders characterized by abnormal or disturbed eating habits (Collins, 2010).

APPENDIX C

Demographic Questionnaire

Directions: Please complete the following demographic information.

**Gender (please circle):**                      Male                                      Female

**Age:** \_\_\_\_\_

**Major:** \_\_\_\_\_

**Height:** \_\_\_\_\_

**Weight:** \_\_\_\_\_

**Year in School (please circle):**

Freshman

Sophomore

Junior

Senior

5<sup>th</sup> Year or Graduate

**Race (please circle):**

White

African American

Asian

American-Indian and Alaska Native

Native Hawaiian and Pacific Islander

Other \_\_\_\_\_

**Ethnicity (please circle):**

Hispanic/Latino

Non-Hispanic/Latino

**Athletic Status (please Circle):**

Collegiate Athlete

Non-collegiate athlete

## APPENDIX D

### Compulsive Exercise Test

#### Instructions

Listed below are a series of statements regarding exercise. Please read each statement carefully and circle the number that best indicates how true each statement is of you. Please answer all the questions as honestly as you can.

Never true	Rarely true	Sometimes true	Often true	Usually true	Always true				
0	1	2	3	4	5				
1) I feel happier and/or more positive after I exercise.				0	1	2	3	4	5
<hr/>									
2) I exercise to improve my appearance.				0	1	2	3	4	5
<hr/>									
3) I like my days to be organized and structured of which exercise is just one part.				0	1	2	3	4	5
<hr/>									
4) I feel less anxious after I exercise.				0	1	2	3	4	5
<hr/>									
5) I find exercise a chore.				0	1	2	3	4	5
<hr/>									
6) If I feel I have eaten too much, I will do more exercise.				0	1	2	3	4	5
<hr/>									
7) My weekly pattern of exercise is repetitive.				0	1	2	3	4	5
<hr/>									
8) I do not exercise to be slim.				0	1	2	3	4	5
<hr/>									
9) If I cannot exercise I feel low or depressed.				0	1	2	3	4	5
<hr/>									
10) I feel extremely guilty if I miss an exercise session.				0	1	2	3	4	5
<hr/>									
11) I usually continue to exercise despite injury or illness, unless I am very ill or too injured.				0	1	2	3	4	5
<hr/>									
12) I enjoy exercising.				0	1	2	3	4	5
<hr/>									
13) I exercise to burn calories and lose weight.				0	1	2	3	4	5
<hr/>									
14) I feel less stressed and/or tense after I exercise.				0	1	2	3	4	5
<hr/>									
15) If I miss an exercise session, I will try and make up for it when I next exercise.				0	1	2	3	4	5

16) If I cannot exercise I feel agitated and/or irritable.	0	1	2	3	4	5
17) Exercise improves my mood.	0	1	2	3	4	5
18) If I cannot exercise, I worry that I will gain weight.	0	1	2	3	4	5
19) I follow a set routine for my exercise sessions, e.g. walk or run the same route, particular exercises, same amount of time, and so on.	0	1	2	3	4	5
20) If I cannot exercise I feel angry and/or frustrated.	0	1	2	3	4	5
21) I do not enjoy exercising.	0	1	2	3	4	5
22) I feel like I've let myself down if I miss an exercise session.	0	1	2	3	4	5
23) If I cannot exercise I feel anxious.	0	1	2	3	4	5
24) I feel less depressed or low after I exercise.	0	1	2	3	4	5



**Table 1.** Bivariate correlations of body image self-discrepancies and compulsive exercise subscales

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	Ideal	Ought	Feared
Avoidance and Rule-Driven Behavior	-.161**	-.065	-.056
Weight Control Exercise	-.051	.048	-.061
Mood Improvement	-.014	-.005	-.042
Lack of Exercise Enjoyment	.037	.045	-.008
Exercise Rigidity	-.140*	-.095	-.052

---

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

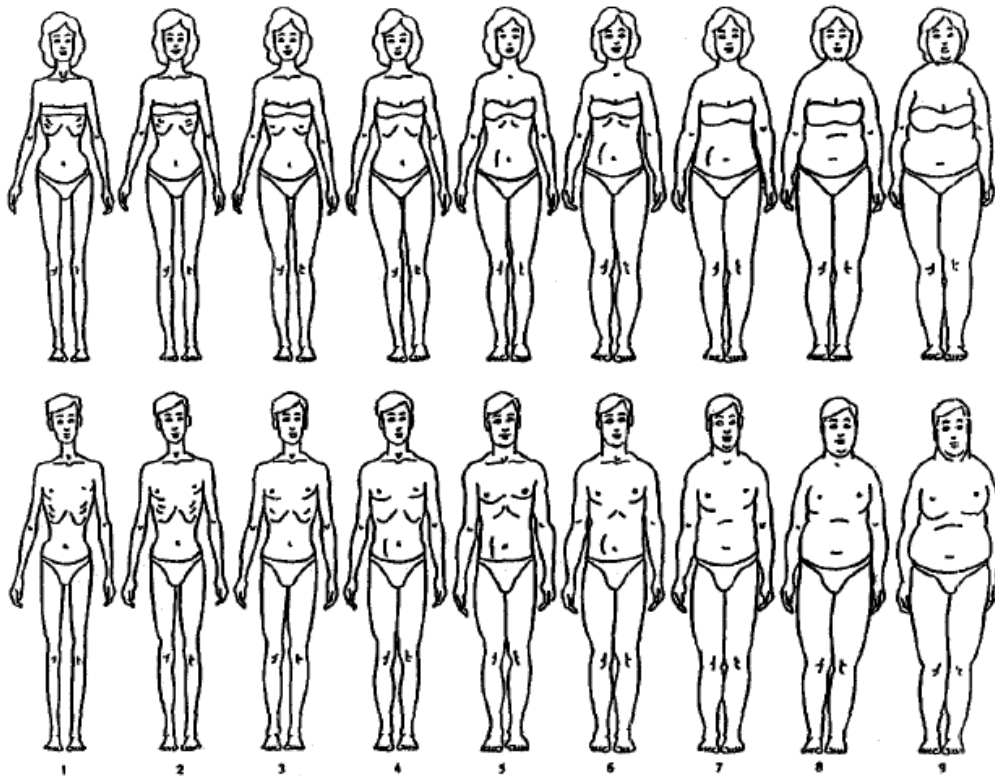
**Figure 1.**

**Instructions**

Below is a series of male and female contour drawings. Please circle the four figures that best represent your actual (A), ideal (I), ought (O) and feared (F) body selves and then mark each selection with either an “A,” “I,” “O,” or “F.” Please only circle the figures for the gender that you identify with and complete the task as honestly as you can.

- (a) Actual self - your actual body fatness refers to how fat you feel you actually are at this point in time.
- (b) Ought self - your ought body fatness refers to how fat you feel obliged to be, either by personal or outside pressures.
- (c) Ideal self - your ideal body fatness refers to how fat you would ideally like to be.
- (d) Feared self - your feared body fatness refers to how fat you fear or worry about being.

**CONTOUR DRAWING RATING SCALE 263**



**FIGURE 1** Contour Drawing Rating Scale.

