THE ROLE OF IMPULSIVITY IN THE RELATIONSHIP OF BODY DISSATISFACTION AND DISORDERED EATING

Thesis

by

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ABSTRACT

The current study sought to expand upon existing literature by examining the potential moderation of impulsivity in the relationship of body dissatisfaction and disordered eating among adolescent males and females. Participants completed behavioral and self-report measures of impulsivity, body dissatisfaction, and disordered eating behaviors.

Results revealed gender differences in the moderation of behavioral impulsivity on eating behaviors. When examining males and females together, no significant moderation was found. Among females, impulsivity significantly moderated the relationship between body dissatisfaction and scores on the Eating Concern Scale (β=.234, $t(53)=2.072$, $p=.043$). However, there were several significant findings for male participants. Impulsivity significantly moderated the relationship between body dissatisfaction and Restraint (β=-.378, $t(50)=-2.681$, $p=.010$), Shape Concern (β=-.299, $t(50)=-2.189$, $p=.035$), Global Scale (β=-.284, $t(50)=-2.056$, $p=.045$), and Days of Loss of Control while Binging (β=.418, $t(50)=2.904$, $p=.006$). The self-report measures of impulsivity revealed significant ($p<.05$) moderation of impulsivity for males and females in the relationship of body dissatisfaction and scores on the Shape Concern, Weight Concern, and Global scales. Clinical implications and the importance of impulsivity in addressing eating concerns among adolescents are discussed.

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INTRODUCTION

Studies investigating the presence of disordered eating in adolescence have shown that high school and college-aged females are at an increased risk for endorsing unhealthy weight control techniques. One study of female adolescents found that 15.7% of adolescents used appetite suppressants, 36.7% ate under 1,200 calories per day, 25.9% fasted, 7.2% used laxatives, 59.0% skipped meals, and 4.8% vomited after meals (Tylka & Subich, 2002). Although endorsed at lower rates, males have been shown to use many of the same maladaptive dieting strategies when attempting to lose weight (Rosen & Gross, 1987). Additionally, these methods can have long-term detrimental effects on one's overall health, yet studies have shown that women who choose to engage in sub-clinical disordered eating are more likely to endorse these methods as effective and safe means to maintain one's weight (Ricciardelli & McCabe, 2004).

Negative health effects resulting and predicting eating pathology include a number of biological indicators and enduring negative health consequences. Physiological and mental health indicators of Anorexia Nervosa include cardiovascular problems which may present in the form of bracycardia, mitral valve prolapsed, or peripheral edema (Pomeroy, 2004). Additionally, individuals diagnosed with this disorder may have dermatologic problems such as dry skin or carotenodermia, gastrointestinal problems such as constipation and refeeding pancreatitis, endocrine and metabolic abnormalities such as thyroid

abnormalities and infertility, and hematologic problems(Pomeroy, 2004). Individuals diagnosed with Bulimia Nervosa have been found to present with gastrointestinal problems such as dental erosion, esophageal rupture, cardiac abnormalities such as arrhthmyias and hypertension, endocrine disruption as evidence by irregular menses and hypoglycemia, and metabolic irregularities such as dehydration and electrolyte imbalances (Levine, 2002; Walsh, Wheat, & Freund, 2000). Additionally, research findings indicate that eating pathology increases one's risk for depression, suicide, anxiety, substance use, and health issues, further emphasizing the importance of effective interventions (Johnson, Cohen, Smailes, Kasen, & Brook, 2002; Stice, Hayward, Cameron, Killen, & Taylor, 2000). These negative health effects further emphasize the danger of these maladaptive eating patterns as well as the need for early intervention and understanding of contributing factors of these disorders in order to prevent long-term detrimental health effects among males and females engaging in disordered eating behaviors.

Gender Differences in Prevalence

It is important to note that both males and females are susceptible to the engagement in disordered eating behaviors. Recent research has shown that approximately 2.0% of males have been shown to suffer from a full or partial eating disorder. Although the prevalence of disordered eating is lower than prevalence rates observed in females (4.8% among females), these statistics support the need for an understanding of these behaviors in both males and

females (Woodside et al., 2001). Research has recognized an increasing rate of disordered eating and reported body dissatisfaction among males (Abell & Richards, 1996; Cohane & Pope, 2001; Adrian Furnham & Calnan, 1998); however, little research has investigated correlates that may affect the relationship of these variables. Although males who engage in disordered eating behaviors have been shown to be affected by similar psychosocial factors as women, there do appear to be differences in the pathways which predict the development of disordered eating behaviors between genders, and further understanding of these pathways will aid both intervention and prevention.

Pathways for the etiology of disordered eating have been proposed for females such that disordered eating may develop through two separate pathways. The first pathway, the restraint pathway, suggests that females internalize societal beliefs of beauty and femininity and will choose to diet to attain this desired ideal, or they will binge in response to the negative cognitions and affective consequences resulting from restrained eating. The second pathway involves interpersonal vulnerabilities that result in disturbed eating as a means of coping with the disturbance of the self through either social comparison or low self-esteem (Striegel-Moore & Cachelin, 1999). Both pathways for females emphasize the primary role of body dissatisfaction in the development of disordered eating for females; however, females are also impacted by the media, teasing from peers, sexual harassment, negative affect, parental pressures, and sexual violence (Stice, 2002).

Male pathways of disordered eating have also been proposed, and are similar to those of women (Keel, Klump, Leon, & Fulkerson, 1998). However, these models note that body dissatisfaction may be less relevant for males compared to females in the development of disordered eating; however, further research is needed to determine this relationship. Research has shown that males who endorse higher levels of body dissatisfaction are more likely to engage in excessive exercise as a means of reaching their desired weight (Ricciardelli & McCabe, 2001). Additional correlates include, but are not limited to, body mass index, pubertal timing, negative affect, body image concerns, sexual orientation, pressure from peers, pressure from media, and teasing (Ricciardelli & McCabe, 2004). These concerns may result in different outcomes of eating pathology for males and suggests that males may be affected differently by moderators of this relationship. However, empirical findings enabling the development of theoretical understandings of disordered eating among males are limited, as few studies have included male participants. Although it appears that similar pathways in the development of disordered eating exist for males and females, the effect size of predictor variables and eating outcomes may differ. Therefore, it is important to understand factors which may contribute to the gender differences observed in the method of disordered eating employed to obtain their desired weight.

Disordered Eating in Adolescents

Pubertal development is a contributor to the promotion of disordered eating behaviors in both male and female adolescents, making this age group highly susceptible to the engagement in these behaviors (Baker, Thornton, Lichtenstein, & Bulik, 2012). Disordered eating among adolescence has been examined cross-culturally, and the prevalence is high across a number of countries and ethnicities such as Hong Kong, Mexico, France, American Indians, Canadians, and United States (Jones, Bennett, Olmsted, Lawson, & Rodin, 2001; Rodgers, Ganchou, Franko, & Chabrol, 2012; Striegel-Moore et al., 2011; Tam, Ng, Yu, & Young, 2007; Thompson & Smolak, 2001; Unikel, Root, Vonholle, Ocampo, & Bulik, 2010). Interestingly, a longitudinal study by Neumark-Sztainer and colleagues (2006) found that adolescents who reported unhealthy weight-loss behaviors at Time 1 were more likely to report a higher BMI by almost one full unit, were three times more likely to be overweight, binge with loss of control, and use extreme weight loss behaviors five years later when compared to adolescents not engaging in weight control behaviors at Time 1. These findings are further supported by research that revealed that overweight preadolescents with shape and weight concerns are more likely to present with eating disorders and weight gain (Sinton et al., 2012). These studies show a concerning relationship in disordered eating such that early initiation of eating problems may result in additional weight gain and thus contribute to the maintenance of unhealthy weight loss behaviors. Similar to these findings,

previous research has shown that restrictive dieting and maladaptive eating behaviors are a significant predecessor of the onset of clinical eating disorders (Polivy & Herman, 1985). These significant risk factors further stress the importance of indentifying factors which influence male and female adolescents' engagement in disordered eating behaviors.

Body Dissatisfaction

Body dissatisfaction has been defined as the subjective negative evaluation of specific areas of one's body (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Adolescents are especially susceptible to body dissatisfaction as a dramatic increase in the level of body dissatisfaction is seen after puberty (Rosenblum & Lewis, 1999). Estimates from studies using community samples of male and female adolescents report that 46% of girls and 26% of males indicate that they are concerned about their body size and shape (D. Neumark-Sztainer, Story, Hannan, Perry, & Irving, 2002). Furthermore, although this relationship has primarily been studied in female adolescents, body dissatisfaction appears to be increasing among males, and recent studies report an increase in rates of dissatisfaction from 10% to 43% over the course of the last three decades (O'Dea & Abraham, 2002). Due to the prevalence of body dissatisfaction within Western culture, it has become normative to express some level of discontent about one's body (Rodin, Silberstein, & Striegel-Moore, 1984). This normative level of body dissatisfaction is concerning as body dissatisfaction has been shown to predict a variety of negative and risky health

behaviors amongst adolescents, including disordered eating pathology, depressive mood, and low self-esteem (Keery, van den Berg, & Thompson, 2004; Paxton, Neumark-Sztainer, Hannan, & Eisenberg, 2006; Wichstrøm, 1999). Interestingly, it has been noted that there may be gender differences in the emergence of these behaviors in adolescents such that symptoms oftentimes begin later in males compared to females, which relates to the reported increase in body dissatisfaction observed during puberty as males begin development later than females (Paxton, et al., 2006). Additionally, males reporting body dissatisfaction tend to equally report a desire to gain weight or lose weight, whereas females have internalized the thin ideal and solely desire to be thinner (Carlat & Camargo, 1991; A. Furnham, Badmin, & Sneade, 2002; Adrian Furnham & Calnan, 1998). It appears that body dissatisfaction is linked to a variety of negative behaviors for both genders, and understanding factors which lead to behaviors such as disordered eating will aid in prevention efforts.

Body Dissatisfaction and Disordered Eating

Body dissatisfaction and disordered eating behaviors are not only detrimental to psychological well-being, but unhealthy dieting practices have been shown to affect cardiovascular health, delay linear growth, and increase long-term weight gain; while overeating can lead to coronary artery disease, colorectal cancer, gout, and arthritis (Daee et al., 2002). Individuals with partial syndrome eating disorders have also been found to endorse many of the same behaviors and psychological disturbances as those meeting full diagnosis of an

eating disorder (Shisslak, Crago, & Estes, 1995). The resulting negative health and psychological effects observed in these disorders further emphasize the importance of developing successful intervention and treatment programs to limit the psychological and physiological effects that may arise from these beliefs and subsequent behaviors. Furthermore, as evidenced by a 20-year longitudinal study, rates of disordered eating continue into adulthood with slight decreases in dieting behaviors in females and a slight increase in males, especially in the presence of body dissatisfaction. Thus early intervention is essential to aid in preventing the progression of these unhealthy behaviors from adolescence into adulthood (Keel, Baxter, Heatherton, & Joiner Jr, 2007).

Although pathways have been identified in the development of body dissatisfaction and disordered eating, it remains unclear when body image dissatisfaction becomes a predictor of disordered eating (Smolak, 2004). Body dissatisfaction is one of the leading causes for the initiation and maintenance of disordered eating among adolescents and college aged individuals, and this is a robust finding in the literature (e.g., Stice & Shaw, 2002; Hart & Ollendick, 1985; Keel, Fulkerson, & Leon, 1997; Littleton & Ollendick, 2003; Mintz & Betz, 1988; Neumakr-Sztainer, Paxtoan, Haines, & Story, 2006). The relationship between body dissatisfaction and disordered eating behaviors has been well established; however, few studies have investigated variables that may affect this relationship in both males and females. This area merits much attention as only 12% of girls and 17% of boys report being satisfied with the current appearance

of their body, further stressing the importance of preventing the potential onset of disordered eating in the remaining adolescent population (Neumark-Sztainer, Story, Hannan, Parry, & Irving, 2002; Ricciardelli & McCabe 2001). Although both males and females may pursue different bodily ideals, both endorse disordered eating behaviors in order to obtain bodily standards established by Western society. Understanding individual characteristics that may predict the onset of disordered eating will aid in the prevention of these behaviors in adolescent populations.

It is important to understand the various individual characteristics which foster the etiology of disordered eating in adolescents, and it is also necessary to determine moderators which affect the onset of these eating behaviors. Various factors may affect the derivation of these behaviors and act as catalysts within these pathways, and identifying these factors will aid in further understanding the etiology and maintenance of disordered eating behaviors among males and females.

Impulsivity and Eating Behaviors

Research in the area of body dissatisfaction and disordered eating has increased in the past two decades; however, questions remain regarding the etiology of these beliefs and behaviors. As noted by Tylka (2004), there is a dearth of research regarding factors and individual characteristics that predict which individuals with body dissatisfaction are at greater risk of endorsing disordered eating behaviors. Although previous research has failed to show

impulsivity as a moderator of the relationship of body dissatisfaction and disordered eating, these studies only examined impulsivity through self-report measures and did not address all identified facets of impulsivity in adolescents (Juarascio et al., 2011; Wonderlich, Connolly, & Stice, 2004). Additionally, these studies focused solely on female populations. With growing rates of body dissatisfaction being observed among males, it is important to include males in the investigation of factors influencing disordered eating. Impulsivity has been researched in various eating disorders; however, research has failed to note if impulsivity affects the rates of disordered eating amongst adolescents reporting dissatisfaction with their body. By identifying the role of impulsivity in the etiology of these behaviors, individuals at high risk for the development of disordered eating behaviors may be better identified. Negative beliefs about one's body are normative in Western society and the high prevalence of body dissatisfaction indicates that there is a pressing need to address factors that result in these beliefs externalizing in the form of disordered eating behaviors (Rodin, Silberstein, & Striegel-Moore, 1985).

Impulsivity has been established as a multi-dimensional construct associated with the diagnosis of a variety of dysfunctional behaviors (Smith, et al., 2007; Reynolds, Ortengren, Richards, & de Wit, 2006). A study conducted by Reynolds and colleagues (2006) found that when correlating the findings of behavioral and self-report measures of impulsivity, these measures assess different components of impulsivity. Specifically, within adolescents, behavioral

impulsivity has been shown to be comprised of three dimensions: impulsive decision-making, impulsive inattention, and impulsive disinhibition (Reynolds et al., 2008). A small number of studies have failed to identify trait impulsivity as a moderator of the relationship of body dissatisfaction and disordered eating when using self-report measures to investigate levels of impulsivity; however, the potential role of behavioral impulsivity as a moderator in this relationship has not been investigated (Juarascio, Perone, & Timko, 2011; Tylka, 2004). Due to the fact that the three identified facets of behavioral impulsivity have been shown by previous research to be uncorrelated with self-report measures of trait impulsivity, as well as account for unique variance of impulsivity, behavioral facets may have a role as a moderator of this relationship which could not be accounted for through the assessment of trait impulsivity using solely self-report methods (Reynolds, Penfold, & Patak, 2008).

Although researchers have placed some eating disorders on the impulsive end of the impulsive-compulsive spectrum, research findings have found conflicting results regarding the role of impulsivity in eating behaviors. Impulsivity has been most clearly linked to binging behaviors observed in populations diagnosed with eating disorders. Specifically, women with a history of binging have been found to have lowered disinhibition (De Zwaan et al., 1994; Keep, Mitchell, Miller, Davis, & Crow, 2000). Additional research examining external behaviors representing trait impulsivity (e.g., substance abuse, delinquency, risky sexual behavior) have linked greater endorsement of these

behaviors to a higher level of reported disordered eating, further indicating that impulsivity may play a role in this relationship (Wiederman & Pryor 1995; Pisetsky et al., 2008; Piran & Robinson, 2011). Research examining purging behaviors has shown that women solely diagnosed with purging disorder have higher levels of impulsivity compared to women diagnosed with Anorexia Nervosa or Binge Eating Disorder, although their impulsivity levels were lower than women diagnosed with Bulimia Nervosa (Fink, Smith, Gordon, Holm-Denoma, & Joiner, 2009). The exact role that impulsivity may play in disordered eating is not been clearly defined; however, it is evident that levels of impulsivity are higher in these aforementioned populations (Kane, Loxton, Staiger, Dawe, 2004). No studies have investigated the three facets of impulsivity proposed by Reynolds and colleagues (2008) and their role in disordered eating, and understanding the relationship of these various facets may further elucidate individual characteristics that could contribute to the onset of these behaviors.

For example, women diagnosed with Anorexia Nervosa have been shown to have lower self-reported impulsivity, but greater levels of inattention, a facet of behavioral impulsivity (Butler & Montgomery, 2005; Favaro, Tenconi, & Santonastaso, 2006). Additionally, impulsivity has been shown to positively correlate with bulimia, yet negatively correlate with dieting behaviors and oral control (MacLaren & Best, 2009).

Research has also found reduced impulse control amongst women labeled as restrained eaters. This increase in impulsivity is evidenced in their

poor performance on tasks measuring behavioral disinhibition (Neederkoorn et al., 2004; Guerrieri, Nederkoorn, & Jansen, 2008). However, conflicting results have been found using a modified measure of behavioral disinhibition which placed high-caloric and neutral images around the target image in a behavioral impulsivity task. This study found that women that met criteria as restrained eaters performed better than unrestrained eaters on a disinhibition task (Meule, Lukito, Vogele, & Kubler, 2011). Women classified as restrained eaters have been shown to have enhanced behavioral disinhibition, these findings conflict with previous research which found restrained eaters have higher levels of self-reported impulsivity (Meule, Skirde, Freund, Vögele, & Kübler, 2012; Nederkoorn, Braet, Van Eijs, Tanghe, & Jansen, 2006; Nederkoorn, Van Eijs, & Jansen, 2004). This discrepancy suggests a lack of insight for individuals that restrict their dietary intake. It is likely that restrained eaters have greater disinhibition, but once their cognitive resources to engage in disinhibition are depleted, a drastic decrease is observed and an episode of binge eating or overeating is more likely to occur in the presence of palatable food. Some research has suggested this facet of behavioral disinhibition may explain disordered eating in this population, although further research is warranted to explain the role of impulsivity in this subset of eating behaviors (Stroebe, van Koningsbruggen, Papies, & Aarts, 2012). In addition to these findings, impulsivity measured by delay discounting and the BIS-11 has been shown to relate to the disinhibition scale of the Three Factor Eating Questionnaire, but not

the restraint scale (Yeomans, Leitch, & Mobini, 2008; Lyke & Spinella, 2004). Although there appears to be a relationship between impulsivity and disordered eating in individuals with restrained eating, many questions remain regarding their interplay and how other facets of impulsivity may contribute to these findings.

Impulsivity may also play a role in eating behaviors seen in women with Anorexia Nervosa. Women with Anorexia Nervosa appear to have higher levels of self-control; however, investigations of the role of behavioral impulsivity in Anorexia Nervosa have resulted in conflicting results (Butler & Montgomery, 2005). Some studies have shown lower impulsivity scores self-reported by women with Anorexia Nervosa, but behavioral measures reveal that this may be due to poor insight of one's behaviors. Women with Anorexia Nervosa have been shown to perform more errors of omission as well errors of commission on the Connor's Performance Task, which indicates greater levels of inattention and impulsivity (Seed, Dixon, McCluskey, & Young (2000). These findings were replicated by Butler and Montgomery (2005); however, they additionally found that women with Anorexia Nervosa did not perform more impulsively on a behavioral task assessing risk taking behaviors when compared to controls. Thus, many questions remain regarding the role of impulsivity in women diagnosed with Anorexia Nervosa; especially among adolescent populations.

Although many of the aforementioned studies were conducted using samples which met classification for an eating disorder, they indicate an

important role of impulsivity in disordered eating that has not yet been elucidated. It appears that various facets of impulsivity may relate to different eating behavior patterns, and by examining the various dimensions of impulsivity, a better understanding of the role of impulsivity in the development of disordered eating may be established. Although these past studies have provided insight on the potential role of impulsivity in disordered eating, there have been a number of differences found in impulsivity between adolescents and adults (Steinberg et al., 2008). Impulsivity is especially important to investigate during adolescence as this the period of development in which impulsivity is shown to be at its highest levels. Due to an imbalance in the desire to engage in risky behaviors and poor appraisal of potential consequences, this period emerges as a time of increased health-risk behaviors (DiClemente et al., 1996). Therefore, the role of impulsivity in the relationship of body dissatisfaction and disordered eating in adolescent populations may have a different effect sizes or outcomes.

No study, to the best of our knowledge, has addressed behavioral components of impulsivity when assessing moderators of body dissatisfaction and disordered eating, and therefore it is important to investigate if a relationship exists between these dimensions of impulsivity and disordered eating. This may aid in understanding the role that each facet of impulsivity might play in this relationship. Impulsivity could increase susceptibility to disordered eating behaviors as individuals that desire weight loss but are unable to wait for their

body to change may endorse extreme dieting behaviors, while others may act on their impulsivity through binge and/or purge behaviors. The current study focuses on the role of impulsive decision making as measured by a delay discounting task. Delay discounting has been noted as a reliable means of assessing impulsiveness, specifically in the domain of decision-making (Ainslie & Haslam, 1992; Madden, Begotka, Raiff, & Kastern, 2003). In this task, participants are presented with the option of smaller immediate rewards, or increasing larger rewards over various delays. Studies have found that discounting occurs in a hyperbolic fashion, such that the value of a reward decreases as the amount of time for the receipt of the specified reward increases. An individual's ability or inability to prefer the delayed amount as the delay increases is assessed as a means of assessing their decision-making. Following this method, greater levels of discounting equate to higher impulsivity (Kris N Kirby & Maraković, 1996). While studies have revealed that greater discounting occurs among obese participants compared to controls, no studies have incorporated this facet of impulsivity into investigations of disordered eating, although it has been found that the decision-making facet of impulsivity correlates to binge episodes observed in this population (Dawe & Loxton, 2004; Weller, Cook, Avsar, & Cox, 2008).

Current Study

Previous research has indicated a robust relationship between body dissatisfaction and disordered eating; however, there is an increased interest in

identifying moderators of this relationship as it may aid in the enhancement of treatment and prevention programs for disordered eating. A large discrepancy exists between individuals reporting body dissatisfaction and individuals who choose to engage in disordered eating behaviors such as severe dieting, maladaptive weight loss behaviors, and binge eating (Ferreiro et al., 2011; Jung & Forbes, 2007; McCabe & Ricciardelli, 2005; Striegel-Moore, Silberstein, & Rodin, 1986). However, little research has been conducted in order to investigate variables which may contribute to the discrepancy observed between body dissatisfaction and disordered eating. Due to the high prevalence of body dissatisfaction in Western society, it is suspected that there are individual differences that result in whether an individual is susceptible to engage in disordered eating habits as a means of attaining their ideal body. The current study aims to investigate that role of impulsive decision-making and how this facet of impulsivity may moderate this relationship.

Study Aim 1

To determine that there is a relationship between body image dissatisfaction and disordered eating.

Hypothesis 1. Consistent with past findings, individuals who report higher levels of body dissatisfaction will also report higher levels of disordered eating.

Study Aim 2

Explore the influence of impulsivity as a moderator of the relationship of body image dissatisfaction and disordered eating.

Hypothesis 2. It is hypothesized that trait impulsivity will moderate the relationship for individuals reporting binge eating behaviors, but will not moderate the relationship between body dissatisfaction and restrained or severe dieting behaviors. Additionally, it is hypothesized that impulsive decision-making will be a moderator in the relationship between body image dissatisfaction and disordered eating. Impulsivity will predict an increase in unhealthy dieting behaviors seen in restraint of food intake, as well as binging and purging behaviors.

Exploratory Aim

To investigate if gender differences exist in the role of impulsivity as a moderator of the relationship of body dissatisfaction and disordered eating.

Hypothesis 3. Based upon previous literature showing differences in levels of impulsivity for males and females, it is hypothesized that a gender differences will exist in the moderation effects of impulsivity in the relationship of body dissatisfaction and disordered eating, such that impulsivity will have a greater role among male adolescents.

METHOD

Participants

All participants were recruited through the Texas A&M Undergraduate Online Experiment System. Participants were first screened for eligibility for the study. Participants who met eligibility criteria were invited to participate (between the ages of 13 and 19, not currently taking ADHD medication, and fluent in English). A total of 116 undergraduates (Male = 55, Female = 61) participated in the current study. Participants ranged in age from 18 to 19 (M = 18.707, SD = 0.457). Most participants identified as Caucasian (73%), followed by Hispanic (27%), Asian (5%), Black (4%), and Native American (3%). All demographic variables, with sample demographics for males and females alone, are presented in Table 1.

Measures

Demographic Questionnaire (DQ). The DQ is designed to collect basic demographic information, including gender, age, ethnicity, race, height, weight, and classification. Body Mass Index (Weight in Pounds / (Height in inches x Height in inches)) x 703) indicated the degree of adiposity for each participant.

Eating Disorder Examination – Questionnaire (EDE-Q 6.0; Fairburn & Beglin, 1994). The EDE-Q is a 31-item questionnaire derived from the gold standard of eating disorder assessment, the Eating Disorder Examination (Fairburn & Beglin, 1994). Community norms for scores exist for adolescents, and this measures has been regarded as a valid measurement tool for the

assessment of eating behaviors in community samples (Carter, Stewart, & Fairburn, 2001; Mond, Hay, Rodgers, Owen, & Beaumont, 2004). Scores on this measure are divided into subscales addressing the following constructs: restraint (i.e., restraint over eating and food avoidance), eating concern (i.e., preoccupation with food, eating or calories and eating in secret), shape concern (i.e., preoccupation with shape or weight and fear of weight gain), and weight concern (importance of weight and dissatisfaction with weight). Additionally, participants indicate the frequency of core eating disorder behaviors over the past 28 days (i.e., binging with loss of control, using laxatives, and compulsive exercise).

The BMI-based Silhouette Matching Test (BMI-SMT; Peterson, Orsega-Smith, & Tholstrup, 2004). This measure was developed for the assessment of perceived body size and ideal body size in adolescents. The scale contains drawing of four male figures on one scale and four females on separate scales. There is a 27-box continuum below the figures which allows the participant to more precisely select a figure, or distance from a figure, which best represents their current and ideal body shape. Validity of the measure has been shown to be strong for both males and females (r = 0.71) (Peterson, Orsega-Smith, & Tholstrup, 2004). Reliability has also been shown to be strong and significant for current and ideal body size for males and females, with r scores ranging from .79-.85 ((Peterson, Ellenberg, & Crossan, 2003). Due to the on-line nature of the current study, the figures were presented with a 10-point

continuum presented below the images. Body dissatisfaction scores are determined using the calculated difference between ideal and current body shape. Similar methods have been reported in measures based this model such as this assessment of body dissatisfaction (Williamson, Davis, Bennett, Goreczny, & Gleaves, 1989).

The Adolescent Version of the Barratt Impulsiveness Scale (BIS-11-A; Fossati, Barratt, Acquarini, & Di Ceglie, 2002). The BIS-11-A is a 30-item self-report measure used to assess impulsiveness. Impulsivity is measured based upon a total score that can be further divided into six first-order factors that have been identified as motor impulsiveness, cognitive complexity, self-control, lack of delay, attention, and perseverance. Higher total scores on this measure indicate greater levels of impulsivity. Past research on the psychometrics of this measure indicate good internal consistency ($\alpha = 0.78$) with adolescent populations(Fossati, Barratt, Acquarini, & Di Ceglie, 2002). Past research has focused on the use of the total scale to determine the role of trait impulsivity in relation to disordered eating (Meule, 2013). Examples of items presented on the adolescent version of the BIS-11 include: I plan what I have to do, I make up my mind quickly, and I buy things on impulse.

Monetary-Choice Questionnaire (Kirby; Kirby, Petry, & Bickel, 1999). In this task, participants were presented with a fixed set of 27 choices between a smaller and more immediate reward versus a larger, delayed reward. Kirby et al. developed the questions such that trial order did not correlate with the smaller or

larger amounts, the ratio between these values, the difference, the delay to the larger amount, or the rate of discounting that relates to the indifference between the two rewards(1999). This measure has been used in numerous studies to investigate impulsive decision making among a variety of samples, including adolescents (Duckworth & Seligman, 2005; Petry, 2001; Wilson & Daly, 2004).

Procedure

All participants completed study measures online. Primary measures included behavioral and self-reported impulsivity, body dissatisfaction, and disordered eating questionnaires. Measures were provided via a website link made available to participants through the Qualtrics system. Participants were sampled from undergraduate psychology courses and received credit for the completion of all measure through the Texas A&M Sona System. Experimental time for the measures used in the current study required approximately 30 minutes for each participant.

Statistical Analyses

In order to assess for the relationship of body dissatisfaction, the discrepancy obtained on the BMI-BST was entered as a predictor in the multiple regression model for the scales of the EDE-Q: Eating Concern, Restraint, Shape Concern, Weight Concern, and Global. Additionally, multiple regressions were computed for reported frequency of binging, frequency of loss of control while binging, days of loss of control while binging, laxative use, vomiting, and compulsive exercise. Moderator analyses were then computed for males and

females combined, females alone, and males alone. Body dissatisfaction as measured by the BMI-BST, impulsivity as measured by the Kirby and BIS-11-A were entered into the model as predictors, as well as the interaction of the separate measures of impulsivity and body dissatisfaction. All variables were standardized before being entered into the regression model. Dependent variables were the scales of the EDE-Q as well as self-reported frequency of binging, frequency of loss of control while binging, days of loss of control while binging, laxative use, vomiting, and compulsive exercise.

Significant interactions were assessed using procedures outlined by Aiken and West (1991). This simple slope method allows for the assessment of the relationship of the significant interaction. Impulsivity was assessed at one standard deviation above the mean, at the mean, and one standard deviation below the mean. The interaction of these computed variables with body dissatisfaction were then entered into the regression model to assess their significance and beta weights. All analyses were conducted using Statistics Package for the Social Sciences software (SPSS for Windows Version 20.0, 2011).

RESULTS

Participants

A total of 119 participants completed the study; however, three males were removed from the analyses as their endorsement of body dissatisfaction indicated a desire to be larger than their current body size. Due to the differing pathways and contributing factors for males desiring to lose weight and those seeking muscularity, these individuals were excluded from the analyses. The total sample included 116 participants. Univariate ANOVAs were used to determine group differences and revealed no significant group differences between males and females for age ($F(1,102) = 2.558$, $p = .113$), grade ($F(1,102) = 1.929$, $p = .168$), ethnicity ($F(1,102) = .613$, $p = .435$), or BMI ($F(1,102) = .029$, $p = .864$). Demographic information for males and females combined, females alone, and males alone are presented in Table 1.

Regression Analyses for Disordered Eating

The correlation matrix, along with variable means and standard deviations are present in Table 2. Results of regression analyses for combined body dissatisfaction, female body dissatisfaction, and male body dissatisfaction are indicated in Table 3. Overall, body dissatisfaction significantly predicted ($p<.05$) restraint, shape concern, and global scale. For females, body dissatisfaction significantly predicted ($p<.05$) restraint, shape concern, global scale, eating concern, and weight concern. For males, body dissatisfaction significantly

predicted (p<.05) eating concern, restraint, shape concern, weight concern, global scale, and loss of control.

Moderator Analyses for Body Dissatisfaction and Delay Discounting (Kirby).

Moderator regression analyses were used to assess males and females together. In this model, body dissatisfaction, overall k-value assessing impulsivity, and their interaction were entered into the model to predict disordered eating behaviors. The correlation matrix for the standardized predictors and disordered eating variables are presented in Table 5. For both males and females combined, no model reached significance. For female participants alone, it was found that only Eating Concern was significantly predicted by the regression model (R^2= .356, F (3, 50) =9.222, p <.001), and body dissatisfaction accounted for significant unique variance (β=.463, t (53) = 3.919, p<.001) as well as the interaction of body dissatisfaction and delay discounting (β=.243, t (53) = 2.072, p=.043). All regression analyses are presented in Table 6.

When examining the simple slopes of the significant interaction, it was found that higher levels of impulsivity had a positive relationship with body dissatisfaction in the prediction of Eating Concern (B=.656, t (53) =4.666, p<.001), however low levels of impulsivity as measured by the Kirby were not significant (B=.222, t (53) =1.340, p=.186). Significant findings for female's participants are presented in Figure 2.

Among males, the regression model for k-values assess by the Kirby significantly predicted scores on the Restraint Scale (R^2= .238, F (3, 47) =4.888, *p* =.005), and body dissatisfaction (β=.460, t (50) = 3.395, *p*=.001) and the interaction (β=.-.378, t (50) = 2.681, *p*=.010) accounted for unique variance. The regression model also significantly predicted Shape Concern (R^2= .272, F (3, 47) =5.844, *p* =.002), and body dissatisfaction (β=.531, t (50) = -2.681, *p*=.010) and the interaction (β=-.299, t (50) = -2.169, *p*=.035). Additionally, the regression model significantly predicted weight concern for males (R^2= .303, F (3, 47) =6.807, *p* =.001), and body dissatisfaction (β=.553, t (50) = 4.266, *p*<.001) accounted for unique variance. The regression model for scores on the Global Scale was also significant (R^2= .269, F (3, 47) =5.775, *p* =.001) and body dissatisfaction (β=.524, t (50) = 3.950, *p*<.001) and the interaction (β=-.284, t (50) = -2.056, *p*= .045) accounted for unique variance. Finally, the regression model significantly predicted days of loss of control while binging (R^2= .206, F (3, 47) = 4.063, *p* =.012). Only the interaction (β=.418, t (50) = 2.904, *p*= .006) accounted for unique variance in the model. The correlation matrix for all variables is presented in Table 7, and all regression analyses are presented in Table 8.

When examining the simple slopes to assess the relationship of significant interactions for males, it was found that simple slopes at low levels of impulsivity were significant (B=1.020, t (50) =3.714, *p*=.001), while high levels of impulsivity were not significant (B=.050, t (50) =.043, *p*=.801) in predicting

Restraint scores. Individuals in the low impulsivity group significantly predicted Shape Concern (B=1.321, t (50) =3.731, *p*=.001), while high levels of impulsivity were not associated with shape concern (B=.309, t (50) =.202, *p*=.234). Lower levels of impulsivity also significantly predicted scores for males on the Global Scale (B=1.033, t (50) =3.621, *p*=.001), but was not significant at higher levels of impulsivity (B=.261, t (50) =1.260, *p*=.214). Days of reported loss of control while binge eating was significant at high levels of impulsivity (B=2.710, t (50) =3.185, *p*=.003) and while this relationship was not significant at low levels of impulsivity (B=-1.776, t (50) =-1.514, *p*=.137). Significant findings are presented for males in Figure 1.

Moderator Analyses for Self-Report Trait Impulsivity (BIS)

Moderator analyses were completed examining the role of body dissatisfaction, BIS total scores, and their interaction in the prediction of disordered eating for males and females. Regression models were significant for Eating Concern and Restraint scale scores, and BIS total scores accounted for unique variance. The regression model also significantly predicted Shape Concern, Weight Concern, and Global scale scores with BIS total scores and the interaction accounting for significant variance in all three models. All results are presented in Table 5.

Further investigation revealed that high levels of impulsivity had positive, significant relationships with body dissatisfaction in the prediction of Shape Concern scores. Therefore increased levels of body dissatisfaction are

significantly moderated by impulsivity in the prediction of disordered at high levels of impulsivity (B=.634, t=3.234, *p*=.002); however this relationship does not exist at low levels of impulsivity (B=-.130, t=-.556, *p*=.556). When investigating the significant interaction for Weight Concern scores, it was found that significant moderation was found at high levels of impulsivity, such that as impulsivity and body dissatisfaction increased, significantly greater scores on the Weight Concern scale were observed (B=.419, t=2.138, *p*=.035); this relationship was non-significant for low levels of impulsivity (B=-.260, t=-1.111, *p*=.269). Finally, when investigating the significant interaction for Global Scale scores, a significant positive relationship between body dissatisfaction and impulsivity was found at high levels of impulsivity (B=.441, t=2.926, *p*=.004); however, this relationship did not exist at low levels of impulsivity (B=-.144, t=-.113, *p*=.425).

DISCUSSION

Although impulsivity has been investigated as a moderator of the relationship of body dissatisfaction and disordered eating, the current study is the first to investigate the potential moderation of delay discounting and self-reported trait impulsivity in a sample of adolescents. The current study sought to further understand this relationship by investigating the role of delay discounting and self-reported impulsivity on the relationship of body dissatisfaction and disordered eating in a sample of adolescent males and females.

When assessing the moderating effects of delay discounting, no significant interactions were found in analyses that included both males and females. Therefore, impulsivity was not evidenced to be a moderator of the relationship between body dissatisfaction and disordered eating when examining males and females together. It is likely that impulsivity failed to exist as a moderator when investigating males and females due to the differences in the moderation of impulsivity observed among male and female participants, as well as the difference in the prediction of disordered eating behaviors by males and females when investigating body dissatisfaction. This is consistent with the divergent pathway outcomes that have been suggested between male and females etiologies and outcomes of disordered eating behaviors (Keel, et al., 1998; Rolls, Fedoroff, & Guthrie, 1991; Siever, 1994). Results of analyses by gender are presented below.

Significant Interactions by Gender

Females. It was found that significant interactions between body dissatisfaction and impulsivity existed in the prediction of scores on the Eating Concern Scale when discounting monetary rewards. Items on this scale address a preoccupation with food, the fear that one may not be able to control their consumption, tendency to prefer eating when they cannot be observed, eating as a means of being social, and guilt which accompanies eating behaviors (Fairburn & Beglin, 1994). The moderation of delay discounting on the relationship of body dissatisfaction and eating concern may be related to the increased levels of impulsivity that are often observed among women who are restrained eaters. It has been shown that females who are attempting to lose weight and reduce the amount of food which they consume are likely to be preoccupied with food or the calories in food, fear that they cannot control their consumption of food, and may eat in secret (Francis, Stewart, & Hounsell, 1997; Polivy, 1996) . Consistent with this finding, previous research has shown that impulsivity was related to increased intentions to diet (Nederkoorn, et al., 2004). In the same way, it may be that female adolescents who present with both high levels of impulsivity and body dissatisfaction are more likely to focus on the caloric content of their food and may fear that, due to prior experiences, they may not be able to disinhibit their desire to consume large amounts of food or high-caloric food items and consider long-term goals of weight-loss when presented with an opportunity to ingest these items.

Males. Significant interactions for males existed in the prediction of scores on the restraint scale when assessing levels of discounting of monetary rewards; however, this interaction was observed at low levels of impulsivity. The Restraint Scale includes items which endorse restraint of food consumption, avoidance of opportunities to eat, avoidance of food items, implementing strict dietary rules, and desiring an empty stomach to achieve a desired shape or weight. It may be that males that are highly impulsive and more concerned with their body image are more likely to endorse these behaviors because of an inability to control their food consumption in the presence of food. As noted previously, individuals who endorse restrained eating will often become preoccupied with food items and their nutritional value, and as a means of avoiding foods which may be deemed “non-permitted” they are better able achieve their ideal body shape (Francis, et al., 1997). Additionally, the endorsement of restrained eating patterns observed in this sample is consistent with past research investigating body dissatisfaction and eating behaviors in adolescent males (Keel, et al., 1998). Due to the fact that lower levels of impulsivity were found to moderate this relationship, it may be that a specific range of impulsivity results in restrained eating as a means of controlling or reaching one’s desired weight. As hypothesized, it appears that low levels of impulsivity may result in a desire for immediate change through restrained eating habits, while higher levels of discounting may result in a loss of control that does not allow for successful restraint of eating habits.

Additionally, higher impulsivity based upon discounting and body dissatisfaction also predicted higher scores on the Shape Concern scale among male participants. This scale addresses desiring a flat stomach, preoccupation with shape or weight, the value of one's shape, fear of gaining weight, unhappiness with current shape, discomfort with looking at one's body, avoidance of exposure to one's body, and general feelings of being fat. Although it may be intuitively apparent that body dissatisfaction would affect shape concern, the significant interaction with impulsivity is interesting as no aspects of this scale involve behaviors which could be deemed "impulsive." Yet, levels of impulsivity appear to moderate the relationship of body dissatisfaction with the Shape Concern scale. Similar findings have been found in previous research revealing that individuals with greater levels of impulsivity predict greater concern for body shape (Mobbs, Ghisletta, & Van der Linden, 2008). However, this is the first study to reveal this moderation effect in males. One explanation of these findings can be derived from previous research which has emphasized the importance of impulsivity in relation to feelings of control of eating behaviors (Gowers & Shore, 2001). Given this finding, it may be that at low levels of delay discounting, as impulsivity increases one may need to make their shape and weight goals more salient in order to control and monitor their food consumption. This is consistent with the concept of delay discounting which suggest that individuals with greater levels of discounting (more impulsive) are more likely to be focused on immediate reward and unable to delay receipt of their specified

reinforcer. Thus, this may lead to the significant moderation effect that was observed in this sample of adolescent males. In order to maintain or obtain their bodily ideal; these individuals may need to keep their shape concerns salient so they are better able to control their dietary behaviors in order to persist in their long-term goal of weight loss versus the immediate gratification of food consumption.

Delay discounting also moderated the relationship observed between body dissatisfaction and scores obtained on the Global Scale. This interaction was significant at lower levels, which is consistent with the significant interaction observed amongst two of the subscales which comprise the Global Scale. It appears that low levels of delay discounting affect the relationships of body dissatisfaction and disordered eating such that low levels of impulsivity result in a greater tendency to endorse restrictive eating habits and concerns with maintaining one's shape.

Greater discounting in combination with greater body dissatisfaction also predicted a higher number of days of loss of control when binging. This is consistent with past research indicating that higher levels of impulsivity are seen among young and adolescents males who may be classified as binge eaters (Ross & Ivis, 1999). Similarly, delay discounting moderated the relationship of body dissatisfaction and disordered eating such that higher levels of impulsivity and body dissatisfaction significantly predicted frequency of binging. This is consistent with previous research suggesting impulsivity is a key factor which

differentiates those that engage in binge eating behaviors from those that severely limit their dietary intake(Yeomans, Leitch, & Mobini, 2008). Taken with the aforementioned impact of impulsivity on control of eating behaviors, higher levels of discounting suggest a lack of control and inability to inhibit eating behavior. Together these findings suggest that, among males, lower levels of impulsivity may result in a preoccupation with one's shape that allows for restrained eating, while high levels of impulsivity result in binge eating due to loss of control.

Moreover, it is also interesting to note that impulsivity moderated this relationship for males and did not moderate this relationship in females. These results further suggest gender differences in the manner in which factors influence disordered eating in male and female adolescents.

Self-reported Impulsivity

When self-reported impulsivity was investigated, it was found that impulsivity moderated the relationship of body dissatisfaction and scores on shape concern, weight concern, and global scales. This finding is interesting as past studies have revealed that self-report measures of impulsivity fail to moderate the relationship of body dissatisfaction and disordered eating. Past research has revealed that adolescence is a period of low impulse control, and this may result in a differing role of impulsivity during adolescence compared to studies which have included adult participants (Steinberg, 2007). Specifically, it appears that in adolescence impulsivity contributes primarily to an increase in

concerns about one's physical appearance as evidenced by the prediction of scores on the shape concern, weight concern, and global scales; however, it may not allow for the discernment of which eating behaviors are most likely to be endorsed by the individual based on the interaction of body dissatisfaction and self-report impulsivity alone. Furthermore, given that this measure relies on an ability to introspectively assess one's impulsive tendencies, it could be that individuals who self-report greater levels of impulsivity need to remind themselves of their shape and weight concerns in order to maintain eating habits which maintain or promote the attainment of their ideal body.

Limitations

Although the current study is the first to investigate the role of impulsivity as a moderator of the relationship of body dissatisfaction and disordered eating, limitations exist. The current study used an adolescent sample that consisted of adolescents nearing early adulthood. Future research would benefit from sampling from a greater range of ages as impulsivity may have differing roles in the development of disordered eating habits when compared between young and older adolescents. The current study is also limited by the questionnaire format of the assessment measures. Future studies would benefit from including additional behavioral measures which would allow for additional objective assessments of impulsivity. In the same manner, real time research studies may allow for a greater understanding of how impulsivity may moderate the effect of body dissatisfaction on disordered eating behaviors.

Future Research

Future research should work to continue to investigate the role of impulsivity in adolescents; specifically, researchers should work to also examine the role of inattention and disinhibition as potential moderators of this relationship. Additionally, future research may benefit from including the assessment of the internalization of the thin-ideal to better understand the development of disordered eating amongst adolescents with body dissatisfaction. Recent research proposing a goal conflict model of eating amongst restrained eaters suggests that restrained eaters are only unable to inhibit their desire to eat when they are not presented highly palatable foods(Stroebe, et al., 2012). It may be that in adolescents this ability to restrain is also affected by delay discounting. This seems to be especially true among male participant who had significant moderation of impulsivity for both restraint and reports of binging.

Conclusions

The current study found that impulsivity does appear to moderate the relationship of body dissatisfaction and specific modes of disordered eating. Among females, this relationship was present for prediction of scores on the Eating Concern scale only, while it predicted shape concern, restraint, global scores, and days of loss of control when binging in males. These findings suggest that there appears to be distinct gender differences of the effect of behavioral impulsivity on these behaviors in the presence of body

dissatisfaction. Additionally, it does appear that trait impulsivity as assessed by self-report may provide insight into disordered eating habits among adolescents; however, additional research is warranted. Prevention efforts for disordered eating behaviors for males and females may benefit from improving ability to delay reward and increasing impulse control among adolescent males and females as a means of reducing one's likelihood of engaging in disordered eating habits as a means of attaining satisfaction with one's body. Additionally, the current study further emphasizes the importance of addressing body dissatisfaction and disordered eating among both male and female adolescents.

REFERENCES

Abell, S. C., & Richards, M. H. (1996). The relationship between body shape satisfaction and self-esteem: An investigation of gender and class differences. *Journal of Youth and Adolescence, 25*(5), 691-703.

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*, Newbury Park, CA: Sage.

Ainslie, G., & Haslam, N. (1992). Hyperbolic discounting. *Choice Over Time, 5*, 57-92.

Baker, J. H., Thornton, L. M., Lichtenstein, P., & Bulik, C. M. (2012). Pubertal development predicts eating behaviors in adolescence. *International Journal of Eating Disorders*, *45*(7), 819-826. doi: 10.1002/eat.22022

Butler, G., & Montgomery, A. (2005). Subjective self-control and behavioural impulsivity coexist in anorexia nervosa. *Eating Behaviors, 6*(3), 221-227.

Carlat, D. J., & Camargo, C. A. (1991). Review of bulimia nervosa in males. *The American Journal of Psychiatry, 148*(7), 831-843.

Cohane, G. H., & Pope, H. G. (2001). Body image in boys: A review of the literature. *International Journal of Eating Disorders, 29*(4), 373-379.

Daee, A., Robinson, P., Lawson, M., Turpin, J. A., Gregory, B., & Tobias, J. D. (2002). Psychologic and physiologic effects of dieting in adolescents. *South Med J, 95*(9), 1032-1041.

Dawe, S., & Loxton, N. J. (2004). The role of impulsivity in the development of substance use and eating disorders. *Neuroscience & Biobehavioral*

Reviews, 28(3), 343-351. doi: http://dx.doi.org/10.1016/j.neubiorev.2004.03.007

Duckworth, A. L., & Seligman, M. E. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological Science, 16*(12), 939-944. doi: PSCI1641 [pii] 10.1111/j.1467-9280.2005.01641.x

Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16*(4), 363-370. doi: 10.1002/1098-108x(199412)16:4<363::aid-eat2260160405>3.0.co;2-#

Favaro, A., Tenconi, E., & Santonastaso, P. (2006). Perinatal factors and the risk of developing anorexia nervosa and bulimia nervosa. *Archive of General Psychiatry, 63*(1), 82-88. doi: 63/1/82 [pii]10.1001/archpsyc.63.1.82

Ferreiro, A., Mezmezian, M., Olive, M., Herlicoviez, D., Fardeau, M., Richard, P., & Romero, N. B. (2011). Telethonin-deficiency initially presenting as a congenital muscular dystrophy. *Neuromuscular Disorders, 21*(6), 433-438. doi: S0960-8966(11)00073-3 [pii] 10.1016/j.nmd.2011.03.005

Fossati, A., Barratt, E. S., Acquarini, E., & Di Ceglie, A. (2002). Psychometric properties of an adolescent version of the Barratt Impulsiveness Scale-11 for a sample of Italian high school students. *Perceptual Motor Skills, 95*(2), 621-635.

Francis, J. A., Stewart, S. H., & Hounsell, S. (1997). Dietary restraint and the selective processing of forbidden and nonforbidden food words. *Cognitive Therapy and Research, 21*(6), 633-646.

Furnham, A., Badmin, N., & Sneade, I. (2002). Body image dissatisfaction: gender differences in eating attitudes, self-esteem, and reasons for exercise. *Journal of Psychology, 136*(6), 581-596.

Furnham, A., & Calnan, A. (1998). Eating disturbance, self-esteem, reasons for exercising and body weight dissatisfaction in adolescent males. *European Eating Disorders Review, 6*(1), 58-72. doi: 10.1002/(sici)1099-0968(199803)6:1<58::aid-erv184>3.0.co;2-v

Gowers, S. G., & Shore, A. (2001). Development of weight and shape concerns in the aetiology of eating disorders. *The British Journal of Psychiatry, 179*(3), 236-242.

Johnson, J. G., Cohen, P., Smailes, E. M., Kasen, S., & Brook, J. S. (2002). Television viewing and aggressive behavior during adolescence and adulthood. *Science, 295*(5564), 2468-2471.

Jones, J. M., Bennett, S., Olmsted, M. P., Lawson, M. L., & Rodin, G. (2001). Disordered eating attitudes and behaviours in teenaged girls: a school-based study. *CMAJ, 165*(5), 547-552.

Juarascio, A. S., Perone, J., & Timko, C. A. (2011). Moderators of the relationship between body image dissatisfaction and disordered eating. *Eat Disord, 19*(4), 346-354. doi: 10.1080/10640266.2011.584811

Jung, J., & Forbes, G. B. (2007). Body dissatisfaction and disordered eating among college women in China, South Korea, and the United States: Contrasting predictions from sociocultural and feminist theories. *Psychology of Women Quarterly, 31*(4), 381-393. doi: 10.1111/j.1471-6402.2007.00387.x

Keel, P. K., Baxter, M. G., Heatherton, T. F., & Joiner Jr, T. E. (2007). A 20-year longitudinal study of body weight, dieting, and eating disorder symptoms. *Journal of Abnormal Psychology, 116*(2), 422-432. doi: 10.1037/0021-843x.116.2.422

Keel, P. K., Klump, K. L., Leon, G. R., & Fulkerson, J. A. (1998). Disordered eating in adolescent males from a school-based sample. *International Journal of Eating Disorders, 23*(2), 125-132. doi: 10.1002/(sici)1098-108x(199803)23:2<125::aid-eat2>3.0.co;2-m

Keery, H., van den Berg, P., & Thompson, J. K. (2004). An evaluation of the Tripartite Influence Model of body dissatisfaction and eating disturbance with adolescent girls. *Body Image, 1*(3), 237-251. doi: 10.1016/j.bodyim.2004.03.001

Kirby, K. N., & Maraković, N. N. (1996). Delay-discounting probabilistic rewards: Rates decrease as amounts increase. *Psychonomic Bulletin & Review, 3*(1), 100-104.

Kirby, K. N., Petry, N. M., & Bickel, W. K. (1999). Heroin addicts have higher discount rates for delayed rewards than non-drug-using controls. *Journal of Experimental Psychology General, 128*(1), 78-87.

Levine, R. (2002). Endocrine aspects of eating disorders in adolescents. *Adolescent Medicine, 13*(1), 129-143, vii.

MacLaren, V. V., & Best, L. A. (2009). Female students' disordered eating and the big five personality facets. *Eating Behaviors, 10*(3), 192-195. doi: 10.1016/j.eatbeh.2009.04.001

Madden, G. J., Begotka, A. M., Raiff, B. R., & Kastern, L. L. (2003). Delay discounting of real and hypothetical rewards. *Experimental and Clinical Psychopharmacology, 11*(2), 139.

McCabe, M. P., & Ricciardelli, L. A. (2005). A prospective study of pressures from parents, peers, and the media on extreme weight change behaviors among adolescent boys and girls. *Behaviour Research and Therapy, 43*(5), 653-668. doi: 10.1016/j.brat.2004.05.004

Meule, A. (2013). Impulsivity and overeating: a closer look at the subscales of the Barratt Impulsiveness Scale. *Frontiers in Psychology, 4*.

Meule, A., Skirde, A. K., Freund, R., Vögele, C., & Kübler, A. (2012). High-calorie food-cues impair working memory performance in high and low food cravers. *Appetite, 59*(2), 264-269. doi: 10.1016/j.appet.2012.05.010

Mobbs, O., Ghisletta, P., & Van der Linden, M. (2008). Clarifying the role of impulsivity in dietary restraint: A structural equation modeling approach.

Personality and Individual Differences, 45(7), 602-606. doi: http://dx.doi.org/10.1016/j.paid.2008.06.021

Nederkoorn, C., Braet, C., Van Eijs, Y., Tanghe, A., & Jansen, A. (2006). Why obese children cannot resist food: The role of impulsivity. *Eating Behaviors, 7*(4), 315-322. doi: 10.1016/j.eatbeh.2005.11.005

Nederkoorn, C., Van Eijs, Y., & Jansen, A. (2004). Restrained eaters act on impulse. *Personality and Individual Differences, 37*(8), 1651-1658.

Neumark-Sztainer, D., Paxton, S. J., Hannan, P. J., Haines, J., & Story, M. (2006). Does body satisfaction matter? Five-year longitudinal associations between body satisfaction and health behaviors in adolescent females and males. *Journal of Adolescent Health, 39*(2), 244-251. doi: 10.1016/j.jadohealth.2005.12.001

Neumark-Sztainer, D., Story, M., Hannan, P. J., Perry, C. L., & Irving, L. M. (2002). Weight-related concerns and behaviors among overweight and nonoverweight adolescents: Implications for preventing weight-related disorders. *Archives of Pediatrics & Adolescent Medicine, 156*(2), 171-178.

O'Dea, J. A., & Abraham, S. (2002). Eating and exercise disorders in young college men. *Journal of American College Health, 50*(6), 273.

Paxton, S. J., Neumark-Sztainer, D., Hannan, P. J., & Eisenberg, M. E. (2006). Body dissatisfaction prospectively predicts depressive mood and low self-esteem in adolescent girls and boys. *Journal of Clinical Child &*

Adolescent Psychology, 35(4), 539-549. doi: 10.1207/s15374424jccp3504_5

Peterson, M., Ellenberg, D., & Crossan, S. (2003). Body-image perceptions: Reliability of a BMI-based Silhouette Matching Test. *American Journal of Health Behavior, 27*(4), 355-363.

Petry, N. M. (2001). Delay discounting of money and alcohol in actively using alcoholics, currently abstinent alcoholics, and controls. *Psychopharmacology, 154*(3), 243-250.

Polivy, J. (1996). Psychological consequences of food restriction. *Journal of the American Dietetic Association, 96*(6), 589-592.

Polivy, J., & Herman, C. P. (1985). Dieting and binging: A causal analysis. *American Psychologist, 40*(2), 193-201. doi: 10.1037/0003-066x.40.2.193

Pomeroy, C. (2004). Assessment of medical status and physical factors. *Handbook of Eating Disorders and Obesity*, 81-111.

Reynolds, B., Penfold, R. B., & Patak, M. (2008). Dimensions of impulsive behavior in adolescents: laboratory behavioral assessments. *Experimental and Clinical Psychopharmacology, 16*(2), 124-131. doi: 2008-03846-003 [pii]10.1037/1064-1297.16.2.124

Ricciardelli, L. A., & McCabe, M. P. (2001). Children's body image concerns and eating disturbance: A review of the literature. *Clinical Psychology Review, 21*(3), 325-344. doi: 10.1016/s0272-7358(99)00051-3

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

Rodgers, R. F., Ganchou, C., Franko, D. L., & Chabrol, H. (2012). Drive for muscularity and disordered eating among French adolescent boys: A sociocultural model. *Body Image, 9*(3), 318-323. doi: 10.1016/j.bodyim.2012.03.002

Rodin, J., Silberstein, L., & Striegel-Moore, R. (1984). *Women and weight: a normative discontent.* Paper presented at the Nebraska symposium on motivation.

Rolls, B. J., Fedoroff, I. C., & Guthrie, J. F. (1991). Gender differences in eating behavior and body weight regulation. *Health Psychology, 10*(2), 133.

Rosen, J. C., & Gross, J. (1987). Prevalence of weight reducing and weight gaining in adolescent girls and boys. *Health psychology, 6*(2), 131.

Rosenblum, G. D., & Lewis, M. (1999). The relations among body image, physical attractiveness, and body mass in adolescence. *Child Development, 70*(1), 50-64. doi: 10.1111/1467-8624.00005

Ross, H. E., & Ivis, F. (1999). Binge eating and substance use among male and female adolescents. *International Journal of Eating Disorders, 26*(3), 245-260. doi: 10.1002/(sici)1098-108x(199911)26:3<245::aid-eat2>3.0.co;2-r

Shisslak, C. M., Crago, M., & Estes, L. S. (1995). The spectrum of eating disturbances. *International Journal of Eating Disorders, 18*(3), 209-219.

Siever, M. D. (1994). Sexual orientation and gender as factors in socioculturally acquired vulnerability to body dissatisfaction and eating disorders. *Journal of Consulting and Clinical Psychology, 62*(2), 252.

Sinton, M., Goldschmidt, A., Aspen, V., Theim, K., Stein, R., Saelens, B., Epstein, L.H., Wilfley, D. (2012). Psychosocial correlates of shape and weight concerns in overweight pre-adolescents. *Journal of Youth and Adolescence, 41*(1), 67-75. doi: 10.1007/s10964-011-9686-y

Steinberg, L. (2007). Risk taking in adolescence new perspectives from brain and behavioral science. *Current Directions in Psychological Science, 16*(2), 55-59.

Stice, E. (2002). Risk and maintenance factors for eating pathology: a meta-analytic review. *Psychological Bulletin, 128*(5), 825.

Stice, E., Hayward, C., Cameron, R. P., Killen, J. D., & Taylor, C. B. (2000). Body-image and eating disturbances predict onset of depression among female adolescents: A longitudinal study. *Journal of Abnormal Psychology, 109*(3), 438-444. doi: 10.1037/0021-843x.109.3.438

Striegel-Moore, R. H., Rosselli, F., Holtzman, N., Dierker, L., Becker, A. E., & Swaney, G. (2011). Behavioral symptoms of eating disorders in Native Americans: Results from the add health survey wave III. *International Journal of Eating Disorders, 44*(6), 561-566. doi: 10.1002/eat.20894

Striegel-Moore, R. H., Silberstein, L. R., & Rodin, J. (1986). Toward an understanding of risk factors for bulimia. *American Psychologist, 41*(3), 246-263. doi: 10.1037/0003-066x.41.3.246

Stroebe, W., van Koningsbruggen, G. M., Papies, E. K., & Aarts, H. (2012). Why most dieters fail but some succeed: A goal conflict model of eating behavior. *Psychological Review.* Advance online publication. doi: 10.1037/a0030849

Tam, C. K. M., Ng, C. F. N., Yu, C. M., & Young, B. W. Y. (2007). Disordered eating attitudes and behaviours among adolescents in Hong Kong: Prevalence and correlates. *Journal of Paediatrics and Child Health, 43*(12), 811-817. doi: 10.1111/j.1440-1754.2007.01195.x

Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. Washington, DC, US: American Psychological Association.

Thompson, J. K., & Smolak, L. (Eds.). (2001). *Body image, eating disorders, and obesity in youth assessment, prevention, and treatment.* Taylor & Francis US.

Tylka, T. L. (2004). The relation between body dissatisfaction and eating disorder symptomatology: An analysis of moderating variables. *Journal of Counseling Psychology, 51*(2), 178-191. doi: Doi 10.1037/0022-0167-51.2.178

Tylka, T. L., & Subich, L. M. (2002). Exploring young women's perceptions of the effectiveness and safety of maladaptive weight control techniques. *Journal of Counseling & Development, 80*(1), 101.

Unikel, C., Root, T., Vonholle, A., Ocampo, R., & Bulik, C. M. (2010). Disordered eating and substance use among a female sample of Mexican adolescents. *Substance Use & Misuse, 46*(4), 523-534. doi: 10.3109/10826081003725260

Walsh, J. M., Wheat, M. E., & Freund, K. (2000). Detection, evaluation, and treatment of eating disorders. *Journal of General Internal Medicine, 15*(8), 577-590.

Weller, R. E., Cook, E. W., Avsar, K. B., & Cox, J. E. (2008). Obese women show greater delay discounting than healthy-weight women. *Appetite, 51*(3), 563-569.

Wichstrøm, L. (1999). The emergence of gender difference in depressed mood during adolescence: The role of intensified gender socialization. *Developmental Psychology, 35*(1), 232-245. doi: 10.1037/0012-1649.35.1.232

Williamson, D. A., Davis, C., Bennett, S. M., Goreczny, A. J., & Gleaves, D. H. (1989). Development of a simple procedure for assessing body image disturbances. *Behavioral assessment*.

Wilson, M., & Daly, M. (2004). Do pretty women inspire men to discount the future? *Proceedings of the Royal Society of London. Series B: Bioogicall Sciences, 271* (Suppl 4), S177-179. doi: 10.1098/rsbl.2003.0134

Woodside, D. B., Garfinkel, P. E., Lin, E., Goering, P., Kaplan, A. S., Goldbloom, D. S., & Kennedy, S. H. (2001). Comparisons of men with full or partial eating disorders, men without eating disorders, and women with eating disorders in the community. *American Journal of Psychiatry, 158*(4), 570-574.

Yeomans, M. R., Leitch, M., & Mobini, S. (2008). Impulsivity is associated with the disinhibition but not restraint factor from the Three Factor Eating Questionnaire. *Appetite, 50*(2–3), 469-476. doi: 10.1016/j.appet.2007.10.002

APPENDIX

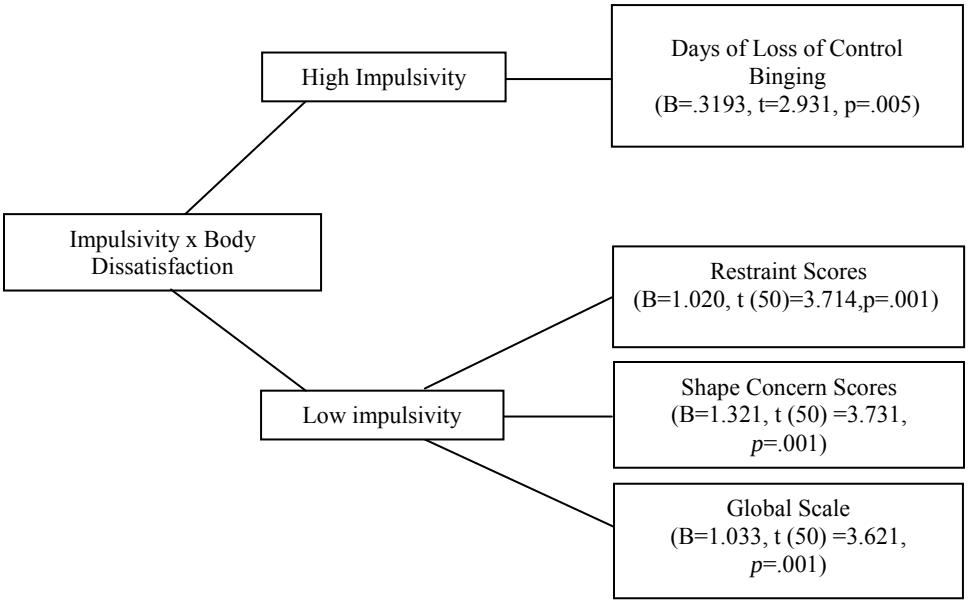

Figure 1. Significant simple slopes investigating relationship of the significant interactions in the regression models for male participants.

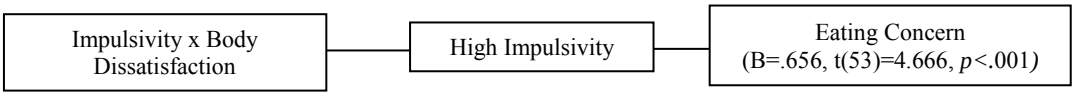

Figure 2. Significant simple slopes investigating relationship of the significant interactions in the regression models for female participants.

Table 1.

Descriptive Statistics for Males and Females, Females, and Males

	Males and Females		Females		Males	
	N	Percentage	N	Percentage	N	Percentage
Age						
18	34	29.3	22	36.1	12	21.8
19	82	70.7	39	63.9	43	78.2
Grade						
High School Senior	1	.9	0	0.0	1	1.8
Freshman	84	72.4	49	80.3	35	63.6
Sophomore	29	35.0	11	18.0	18	32.7
Junior	2	1.7	1	1.6	1	1.8
Ethnicity						
Black	4	3.4	1	1.6	3	5.5
White	73	62.9	43	70.5	30	54.5
Asian	5	4.3	1	1.6	4	7.3
Hispanic	27	23.3	13	21.3	14	25.5
Native American	3	2.6	2	3.3	1	1.8
Other	4	3.4	1	1.6	3	5.5
BMI	*M* = 24.986	*SD*= 4.574	*M*= 24.891	*SD*= 5.156	*M*= 25.091	*SD*= 3.873

Table 2.

Regression Analyses Assessing the Relationship of Body Dissatisfaction and Disordered Eating

	R^2	F (*df*)	*p*	*B*
Males and Females				
Eating Concern	.011	1.204(*1,108*)	.275	.105
Restraint	.229	5.990 (*1,108*)	.016*	.229
Shape Concern	.050	.041(*1,108*)	.019*	.223
Weight Concern	.014	1.506(*1,108*)	.222	.117
Global Scale	.028	4.176(*1,108*)	.043*	.193
Frequency of Binging	.001	.098 (*1,108)*	.754	.030
Frequency of Loss of Control when Binging	.003	.375(*1,108*)	.542	-.059
Days of Loss of Control Binging	.003	.347(*1,108*)	.557	-.057
Laxatives	<.001	<.001(*1,108*)	.993	-.001
Vomit	.005	.583(*1,108*)	.447	.073
Compulsive Exercise	.003	.375 (*1,108*)	.644	.045
Females				
Eating Concern	.133	8.473(*1,55)*	.005*	.365
Restraint	.144	9.238(*1,55)*	.004*	.379
Shape Concern	.183	12.318(*1,55)*	.001*	.428
Weight Concern	.222	15.705(*1,55)*	<.001*	.471
Global Scale	.227	16.130(*1,55)*	<.001*	.476
Frequency of Binging	.005	L297(*1,55)*	.588	-.073
Frequency of Loss of Control when Binging	.016	.898 (*1,55)*	.347	.127
Days of Loss of Control Binging	.001	.058(*1,55)*	.811	-.032
Laxatives	.013	.009 (*1,55)*	.924	-.013
Vomit	.002	.134 (*1,55)*	.715	-.049
Compulsive Exercise	.026	1.479(*1,55)*	.229	.162
Males				
Eating Concern	.092	4.954 *(1,49)*	.031*	.303
Restraint	.121	6.748 *(1,49)*	.012*	.348
Shape Concern	.198	12.097 *(1,49)*	.001*	.445
Weight Concern	.251	16.448 *(1,49)*	<.001*	.501
Global Scale	.200	12.242 *(1,49)*	.001*	.447
Frequency of Binging	.022	1.113 *(1,49)*	.297	.149
Frequency of Loss of Control when Binging	.100	5.421 *(1,49)*	.024*	.316
Days of Loss of Control Binging	.055	2.859 *(1,49)*	.097	.235
Laxatives	.001	.025 *(1,49)*	.874	.023
Vomit	--	--	--	--
Compulsive Exercise	.002	.087 *(1,49)*	.770	-.042

Table 3.

Combined Males and Females Means, Standard Deviations, and Correlations for Predictors and Dependent Variables from the EDE-Q

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Body Dissatisfaction														
2. Overall k-value	.177													
3. BIS Total	.136	.080												
4. Restraint	.229*	.053	.249**											
5. Eating concern	.105	.187*	.212*	.554**										
6. Shape concern	.223*	.135	.223*	.682**	.714**									
7. Weight concern	.117	.180	.210*	.694**	.716**	.901**								
8. Global scale	.193*	.156	.250**	.823**	.823**	.943**	.945**							
9.Frequency of Binging	.030	.067	.112	-.219*	-.045	-.106	-.135	-.144						
10. Frequency of Loss of Control when Binging	-.059	.072	.160	.114	.321**	.209*	.238*	.244**	.391**					
11. Days of Loss of Control Binging	-.057	.059	.165	-.018	.157	.038	.076	.066	.540**	.677**				
12. Laxatives	-.001	.101	.060	.029	.343**	.194*	.225*	.217*	-.010	.082	.091			
13. Purge	.073	.005	.171	.191*	.103	.165	.156	.175	-.053	.017	.009	-.020		
14. Compulsive Exercise	.045	-.153	.135	.253**	.315**	.229*	.172	.264**	.053	.137	-.012	.054	.004	
Mean	1.509	0.088	67.379	1.520	1.351	2.324	1.920	1.779	4.810	1.853	2.121	0.069	0.043	4.034
Standard Deviation	1.525	0.052	9.603	1.351	1.150	1.669	1.611	1.288	7.138	4.961	4.769	0.539	0.276	6.790

Note. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Table 4.

Moderator Analyses for Combined Body Dissatisfaction

		Model		Body Dissatisfaction			Kirby Overall			Body Dissatisfaction*Kirby Overall		
Dependent Variable	R^2	F (*df*)	*p*	*B*	t(*df*)	*p*	*B*	t(*df*)	*p*	*B*	t(*df*)	*P*
Eating Concern	.060	2.240 (3,106)	.088	.059	.600 (109)	.550	.217	2.231 (109)	.028*	.031	.316 (109)	.752
Restraint	.055	2.052 (3,106)	.111	.216	2.196 (109)	.030*	.031	.320 (109)	.750	.032	.328 (109)	.744
Shape Concern	.061	2.314 (3,106)	.080	.199	2.030 (109)	.045*	.102	1.051 (109)	.296	.026	.264 (109)	.793
Weight Concern	.047	1.760 (3,106)	.159	.075	.762 (109)	.448	.173	1.774 (109)	.079	.046	.461 (109)	.646
Global Scale	.061	2.279 (3,106)	.084	.158	1.610 (109)	.110	.144	1.485 (109)	.140	.039	.394 (109)	.695
Frequency of Binging	.008	.280 (3,106)	.036	.036	.362 (109)	.718	.062	.622 (109)	.535	-.070	-.694 (109)	.489
Frequency of Loss of Control when Binging	.011	.401 (3,106)	.752	-.080	-.791 (109)	.431	.082	.823 (109)	.412	.025	.248 (109)	.805
Days of Loss of Control Binging	.008	.302 (3,106))	.824	-.064	-.635 (109)	.527	.074	.743 (109)	.459	-.024	-.233 (109)	.816
Laxatives	.014	.489 (3,106)	.691	-.008	-.083 (109)	.934	.116	1.165 (109)	.246	-.053	.523 (109)	.602
Vomit	.007	.258 (3,106)	.856	.084	.836 (109)	.405	<.001	.002 (109)	.999	-.045	-.442 (109)	.660
Compulsive Exercise	.041	1.516 (3,106)	.215	.099	.995 (109)	.322	-.152	-1.553 (109)	.123	-.109	-1.099 (109)	.274

Table 5.

Female Means, Standard Deviations, and Correlations for Predictors and Dependent Variables from the EDE-Q

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Body Dissatisfaction													
2. Overall k-value	.226												
3. BIS Total	-.082	.119											
4. Restraint	.408**	.049	.191										
5. Eating concern	.533**	.251	.086	.534**									
6. Shape concern	.502**	.199	.094	.634**	.648**								
7. Weight concern	.507**	.217	.100	.642**	.631**	.905**							
8. Global scale	.542**	.205	.137	.802**	.768**	.937**	.938**						
9.Frequency of Binging	-.013	-.053	.127	-.225	-.097	-.135	-.198	-.192					
10. Frequency of Loss of Control when Binging	.111	.125	.219	-.016	.136	.077	.121	.089	.632**				
11. Days of Loss of Control Binging	.020	-.005	.103	-.070	-.012	-.097	-.078	-.081	.831**	.579**			
12. Purge	--	--	--	--	--	--	--	--	--	--	--		
13. Compulsive Exercise	-.062	.006	.200	.202	.158	.160	.145	.184	.007	.124	.087	--	
Mean	2.264	0.089	68.943	1.960	1.448	3.035	2.598	2.261	2.396	1.000	1.425	0.094	3.170
Standard Deviation	1.654	0.058	10.892	1.449	0.944	1.478	1.446	1.163	3.187	2.519	2.677	0.405	5.452

Note. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). -- Cannot be computed because at least one of the variables is constant. Means and Standards Deviations were derived from non-standardized variables.

Table 6.

Moderator Analyses for Female Body Dissatisfaction and Impulsivity

		Model		Body Dissatisfaction			Kirby Overall		Body Dissatisfaction*Kirby Overall		
Dependent Variable	R^2	F (*df*)	*p*	*B*	t(*df*)	*p*	*B*	t(*df*)	*P*	*B*	t(*df*)	*P*
Eating Concern	.356	9.222 (50)	<.001*	.463	3.919 (53)	<.001*	.095	.801 (53)	.427	.243	2.072 (53)	.043*
Restraint	.175	.3596 (51)	.020*	.406	3.067 (54)	.003*	-.059	-.449 (54)	.655	.079	.599 (54)	.552
Shape Concern	.303	7.391 (51)	<.001*	.440	3.619 (54)	.001*	.102	.836 (54)	.407	.193	1.597 (54)	.116
Weight Concern	.274	6.416 (51)	.001*	.477	3.845 (54)	<.001*	.134	1.080 (54)	.285	-.003	-.024 (54)	.981
Global Scale	.319	7.968 (51)	<.001*	.497	4.133 (54)	<.001*	.089	.737 (54)	.464	.125	1.044 (54)	.302
Frequency of Binging	.021	.362 (50)	.781	-.023	-.158 (53)	.875	-.076	-.525 (53)	.602	.140	.966 (54)	.339
Frequency of Loss of Control when Binging	.031	.549 (51)	.651	.072	.501 (54)	.618	.120	.839 (54)	.405	.058	.408 (54)	.685
Days of Loss of Control Binging	.037	.632 (51)	.598	-.012	-.086 (54)	.932	-.028	-.193 (54)	.848	.196	1.369 (54)	.177
Laxatives	--	--	--	--	--	--	--	--	--	--	--	--
Vomit	.006	.102 (51)	.958	-.073	-.503 (54)	.617	.009	.059 (54)	.953	.045	.311 (54)	.757
Compulsive Exercise	.102	1.939 (51)	.135	.223	1.617 (54)	.112	-.149	-1.082 (54)	.284	-.229	-1.672 (54)	.101

Table 7.

Male Means, Standard Deviations, and Correlations for Predictors and Dependent Variables from the EDE-Q

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Body Dissatisfaction														
2. Overall k-value	.177													
3. BIS Total	.136	.080												
4. Restraint	.229*	.053	.249**											
5. Eating concern	.105	.187*	.212*	.554**										
6. Shape concern	.223*	.135	.223*	.682**	.714**									
7. Weight concern	.117	.180	.210*	.694**	.716**	.901**								
8. Global scale	.193*	.156	.250**	.823**	.823**	.943**	.945**							
9.Frequency of Binging	.030	.067	.112	-.219*	-.045	-.106	-.135	-.144						
10. Frequency of Loss of Control when Binging	-.059	.072	.160	.114	.321**	.209*	.238*	.244**	.391**					
11. Days of Loss of Control Binging	-.057	.059	.165	-.018	.157	.038	.076	.066	.540**	.677**				
12. Laxatives	-.001	.101	.060	.029	.343**	.194*	.225*	.217*	-.010	.082	.091			
13. Purge	.073	.005	.171	.191*	.103	.165	.156	.175	-.053	.017	.009	-.020		
14. Compulsive Exercise	.045	-.153	.135	.253**	.315**	.229*	.172	.264**	.053	.137	-.012	.054	.004	
Mean	1.509	0.088	67.379	1.520	1.351	2.324	1.920	1.779	4.810	1.853	2.121	0.069	0.043	4.034
Standard Deviation	1.525	0.052	9.603	1.351	1.150	1.669	1.611	1.288	7.138	4.961	4.769	0.539	0.276	6.790

Note. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Table 8.

Moderator Analyses for Male Body Dissatisfaction and Behavioral Impulsivity

		Model		Body Dissatisfaction			Kirby Overall			Body Dissatisfaction*Kirby Overall		
Dependent Variable	R^2	F (*df*)	*p*	*B*	t(*df*)	*p*	*B*	t(*df*)	*p*	*B*	t(*df*)	*P*
Eating Concern	.113	1.994 (47)	.128	.336	2.299 (50)	.026	.019	.127 (50)	.899	-.142	-.933 (50)	.356
Restraint	.238	4.888 (47)	.005*	.460	3.395 (50)	.001*	-.120	-.868 (50)	.390	-.378	-2.681 (50)	.010*
Shape Concern	.272	5.844 (47)	.002*	.531	4.011 (50)	<.001*	-.077	-.573 (50)	.569	-.299	-2.169 (50)	.035*
Weight Concern	.303	6.807 (47)	.001*	.553	4.266 (50)	<.001*	.030	-1.644 (50)	.819	-.222	-1.644 (50)	.107
Global Scale	.269	5.775 (47)	.002*	.524	3.950 (50)	<.001*	-.038	-.284 (50)	.778	-.284	-2.056 (50)	.045*
Frequency of Binging	.039	.637 (47)	.595	.118	.773 (50)	.443	.140	.907 (50)	.369	.046	.290 (50)	.773
Frequency of Loss of Control when Binging	.103	1.792 (47)	.162	.296	2.014 (50)	.050*	.033	.218 (50)	.829	.059	.388 (50)	.700
Days of Loss of Control Binging	.206	4.063 (47)	.012*	.096	.693 (50)	.492	.239	1.700 (50)	.096	.418	2.904 (50)	.006*
Laxatives	.011	.170 (47)	.916	<.001	<.001 (50)	1.00	.109	.693 (50)	.429	.029	.180 (50)	.858
Purge	--	--	--	--	--	--	--	--	--	--	--	--
Compulsive Exercise	.062	1.038 (47)	.384	.038	.254 (50)	.801	-.250	-1.638 (50)	1.08	-.178	-1.137 (50)	.261

Table 9.

Moderator Analyses for Body Dissatisfaction and Self-report Impulsivity

		Model		Body Dissatisfaction			BIS Total			Body Dissatisfaction*BIS Total		
Dependent Variable	R^2	F (*df*)	*p*	*B*	t(*df*)	*p*	*B*	t(*df*)	*p*	*B*	t(*df*)	*P*
Eating Concern	.098	3.854 (3,106)	.012*	.040	.423 (109)	.673	.231	2.477 (109)	.015*	.183	1.947 (109)	.054
Restraint	.153	6.393 (3,106)	.001*	.161	1.761 (109)	.081	.264	2.923 (109)	.004*	.174	1.912 (109)	.059
Shape Concern	.148	6.136 (3,106)	.001*	.152	1.658 (109)	.100	.215	2.369 (109)	.020*	.227	2.485 (109)	.015*
Weight Concern	.106	4.192 (3,106)	.008*	.049	.522 (109)	.603	.221	2.386 (109)	.019*	.207	2.209 (109)	.029*
Global Scale	.156	6.539 (3,106)	<.001*	.116	1.270 (109)	.207	.260	2.883 (109)	.005*	.225	2.476 (109)	.015*
Frequency of Binging	.024	.873 (3,106)	.458	.025	.253 (109)	.801	.138	1.421 (109)	.158	-.074	-.756 (109)	.452
Frequency of Loss of Control when Binging	.047	1.733 (3,106)	.165	-.094	-.964 (109)	.337	.205	2.145 (109)	.034*	.037	.388 (109)	.699
Days of Loss of Control Binging	.027	2.002 (3,106)	.118	-.098	-1.012 (109)	.314	.214	2.247 (109)	.027*	.067	.695 (109)	.489
Laxatives	.005	.183 (3,106)	.908	-.014	-.144 (109)	.885	.068	.692 (109)	.490	.024	.239 (109)	.812
Vomit	.058	2.172 (3,106)	.096	.022	.229 (109)	.819	.171	1.795 (109)	.075	.151	1.578 (109)	.118
Compulsive Exercise	.046	1.714 (3,106)	.168	.051	.522 (109)	.602	.156	1.632 (109)	.106	-.150	-1.557 (109)	.122