Modeling eating pathology: The role of gender, sociocultural, and individual factors

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Modeling Eating Pathology:
The Role of Gender, Sociocultural, and Individual Factors
by
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Dissertation

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Abstract

Eating pathology is an increasing problem in the United States and other Western countries. This study examined gender differences and specific known psychological correlates of eating pathology. Sociocultural variables, such as thin-ideal internalization, and individual factors, such as perfectionism and experiential avoidance, were also evaluated. A sample of 257 female and 165 male undergraduates ($n = 423$) completed a battery of surveys online. Structural equation modeling (SEM) was used to model the relationships among the variables. The results show that the best fitting model included perfectionism rather than thin-ideal internalization leading to body dissatisfaction. There is support for experiential avoidance as a mediating variable between body dissatisfaction, dieting, and thin-idealization and binge eating. Results also show that men engaged in more binge eating and exercise than women and less vomiting and laxative use than women. These findings suggest that individual factors, specifically perfectionism and experiential avoidance, are strongly related to eating pathology, particularly binge eating.
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Modeling Eating Pathology:
The Role of Gender, Sociocultural, and Individual Factors

Statement of the Problem

Eating pathology, characterized by severe disturbances in eating behaviors and a distorted perception of body shape and weight (APA, 2000), is becoming an increasing problem in the United States and other Western countries. There are several models of etiology for eating pathology, including sociocultural (Striegel-Moore, Silberstein, & Rodin, 1986), familial (Minuchin, Rosman, & Baker, 1978), and individual (Polivy & Herman, 2002) factors models. Some individual variables, such as body dissatisfaction, dieting, and negative affect, have received empirical support as risk factors for eating pathology (Stice, 2002). However, several other potential risk factors have not been adequately examined. Furthermore, most of the research on eating pathology has focused exclusively on women (Lewinsohn, Striegel-Moore, & Seeley, 2000). This study modeled eating pathology risk factors that have received empirical support – body dissatisfaction, dieting, and depression – to verify the strength and direction of the relationships. The investigation also examined the influence of thin-ideal internalization, perfectionism, and experiential avoidance on eating pathology. Finally, because of the limited research on eating pathology in men, gender differences in the relationship between psychological variables and eating pathology were explored.
Eating pathology is a broad term that refers to the attitudes, behaviors, and thoughts associated with both full- and partial-syndrome eating disorders (e.g., Stice, 2002), including a preoccupation with weight and shape, restrictive eating, binge eating, and compensatory behaviors, such as vomiting and excessive exercise. The two most commonly diagnosed eating disorders are anorexia nervosa and bulimia nervosa (APA, 2000). Although anorexia and bulimia are considered distinct eating disorders, researchers (Williamson, Gleaves, & Stewart, 2004; Williamson et al., 2002) have purported that these disorders do not capture the true nature of eating-related pathology.

In the 1970s researchers and clinicians began to recognize the importance of “bulimic behaviors” (e.g., binge eating and/or purging) among the eating disorder population (DaCosta & Halmi, 1992). Discussion has continued about the degree of importance placed on low weight status versus behavioral manifestations (e.g., binging and purging) for conceptualizing and categorizing eating disorders (Vitousek & Manke, 1994). The results of one taxometric analysis suggested that anorexia—restricting type may be distinct from all other eating disorders and that the two subtypes of bulimia (purging and nonpurging) and the binge-eating/purging subtype of anorexia occur on a continuum (Gleaves, Lowe, Green, Cororve, & Williams, 2000). Conversely, the spectrum hypothesis considers the eating disorders as one syndrome with different manifestations (VanderHam, Meulman, VanStrien, & vanEngeland, 1997).

Given the current diagnostic criteria (See Tables 1 and 2), a very low percentage of people meet clinical criteria for either eating disorder (APA, 2000). However, many people display features of anorexia and bulimia, such as occasional binge eating or
Table 1

*Diagnostic Criteria for Anorexia Nervosa*

<table>
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<tr>
<th>A. Refusal to maintain body weight at or above a minimally normal weight for age and height (≤ 85% expected).</th>
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<tr>
<td>B. Intense fear of gaining weight or becoming fat, even though underweight.</td>
</tr>
<tr>
<td>C. Disturbance in the way in which one’s body weight &amp; shape is experienced, undue influence of body weight &amp; shape on self-evaluation, or the denial of seriousness of current low body weight.</td>
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<tr>
<td>D. Amenorrhea – absence of at least 3 consecutive menstrual cycles.</td>
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**Specify Type**

**Restricting Type:** During current episode, person has not regularly engaged in binge-eating or purging behavior.

**Binge-eating/purging Type:** During current episode, person has regularly engaged in binge-eating or purging behavior.

Source: APA, 2000

Table 2

*Diagnostic Criteria for Bulimia Nervosa*

<table>
<thead>
<tr>
<th>A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:</th>
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<td>(1) Eating, in a discrete period of time (e.g. within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.</td>
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<tr>
<td>(2) A sense of lack of control over eating during the episode.</td>
</tr>
<tr>
<td>B. Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting, misuse of laxatives, diuretics, enemas, or other medications, fasting, or excessive exercise.</td>
</tr>
<tr>
<td>C. Binge eating and inappropriate compensatory behaviors both occur at least twice per week for 3 months.</td>
</tr>
<tr>
<td>D. Self-evaluation is unduly influenced by body shape and weight.</td>
</tr>
<tr>
<td>E. The disturbance does not occur exclusively during episodes of anorexia nervosa.</td>
</tr>
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**Specify Type**

**Purging Type:** During the current episode, person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics or enemas.

**Nonpurging Type:** During the current episode, person has used other inappropriate compensatory behaviors, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics or enemas.

Source: APA, 2000

dietary restraint and are considered to have partial-syndrome eating disorders (Dancyger & Garfinkel, 1995). The incidence of partial-syndrome eating disorders has risen significantly
in the past few years among men and women (Crow et al., 2002; Weltzin et al., 2005). Thus, researchers have identified the need for an examination of the full spectrum of eating disturbances rather than just diagnostic levels of pathology (Smolak, Levine, & Striegel-Moore, 1996).

Body image disturbance, or body dissatisfaction, is a particularly salient variable associated with eating pathology. However, researchers have difficulty operationally defining body dissatisfaction (Slade, 1994; Thompson, 1996). Some researchers define the construct in terms of a perceptual distortion in which the person has difficulty accurately gauging her body size (e.g., Cash & Brown, 1987; Thompson, 1990, 1996). Other researchers define the construct in terms of a cognitive-evaluative dissatisfaction in which she is extremely dissatisfied with her size, shape, or some other aspect of body appearance (Cash & Brown, 1987; Thompson, 1990, 1996). In a meta-analysis examining the nature and extent of body image disturbance in anorexia and bulimia nervosa, Cash and Deagle (1997) found that attitudinal body dissatisfaction produced a substantially larger effect size ($d = 1.10-1.13$) than perceptual size estimation (i.e., distortion; $d = .61-.64$). In addition, women with eating disorders had greater perceptual distortions related to their whole body rather than specific parts (e.g., hips or thighs). Finally, compared to perceptual distortion effects, the self-ideal discrepancy effects were considerably larger (1.1 vs. 0.6).

Eating pathology tends to be co-morbid with several other psychological disorders, including depression and anxiety disorders (O’Brien & Vincent, 2003). Major depressive disorder is the most commonly diagnosed co-morbid disorder, ranging from 45-88% prevalence in various studies (e.g., Geist, Davis, & Heinman, 1998; Herzog, Keller, Sacks, Yeh, & Lavori, 1992). Furthermore, a study of comorbid disorders among a community...
A sample of adolescents found dysthymia to be highly correlated with eating disorders (Zaider, Johnson, & Cockell, 2000). Anxiety disorders are the next most-commonly diagnosed comorbid disorder with 83% of patients with anorexia nervosa and 71% of patients with bulimia nervosa having at least one lifetime diagnosis (Godart, Flament, Lecrubier, & Jeammet, 2000).

Eating pathology has been conceptualized, and thus classified, as an addictive behavior. Furthermore, research has shown that addictive behaviors are consistently highly intercorrelated (e.g., Coombs, 2004). For example, eating pathology is strongly and positively correlated with other addictive behaviors, such as alcohol and drug abuse (Wonderlich & Mitchell, 1997), smoking (Pomerleau, 1997), sexual pathologies (Eisenman, Dantzker, & Ellis, 2004), and gambling (Lesieur & Blume, 1993). Although psychologists have traditionally confined their use of the term addiction to substances that foster physical dependence, tolerance, and withdrawal (APA, 2000), research suggests experiences such as eating, gambling, sex, or shopping can foster strong attachments that have endogenous chemical underpinnings similar to that of an exogenous chemical (Holden, 2001; Orford, 2001). In one important example, Orford (2001) offered a broader conceptualization of the addictions, suggesting they be viewed as a class of excessive appetites. In his model, both primary mechanisms, such as positive incentive learning, and secondary mechanisms, such as acquired emotional regulation cycles, can account for the development of a strong attachment, an addiction, to an appetitive activity (Orford, 2001).

**Gender and Eating Pathology**

As noted earlier, research on eating pathology in men is limited (Garvin & Striegel-Moore, 2001). Even studies that focus on less severe eating pathology, such as weight and
shape dissatisfaction or dieting, consistently involve many more females than males (Garvin & Steigel-Moore, 2001). One purported reason for this discrepancy is that men account for only 10% of the cases of anorexia and bulimia (Weltzin et al., 2005). Furthermore, the prevalence rate for anorexia nervosa is approximately 0.3%-1% for young women and 0.05% for men, while the prevalence rate for bulimia nervosa is approximately 1-3% for women and 0.1% for men (APA, 2000; Hoek & van Hoeken, 2003).

Interestingly, despite differences in the prevalence of eating pathology among men and women, similarities in behavioral and psychological symptoms exist across the two groups. For example, men experience body dissatisfaction, feel significant sociocultural pressure to achieve the ideal body, and are reported to be as concerned about body image as women are (Edwards & Launder, 2000; McCabe & Ricciardelli, 2004; Mishkind, Rodin, Silberstein, & Striegel-Moore, 1986). In a longitudinal study examining disordered eating precursors in adolescent girls and boys, researchers found body dissatisfaction at Year 1 to be a significant predictor of disordered eating at Year 2 for both boys and girls (Keel, Fulkerson, & Leon, 1997). In addition to experiencing body dissatisfaction, men also engage in binge eating (McCabe & Ricciardelli, 2004). In fact, men account for 25% of the people who are diagnosed with binge eating disorder (Weltzin et al., 2005).

Important differences have been identified in eating pathology between men and women related to behavioral and psychological symptoms. First, while women’s preferred body image is thinness, men’s preferred body image is muscularity (Edwards & Launder, 2000; Stice & Agras, 1998). Second, men are much less likely to engage in compensatory behaviors such as vomiting and more likely to engage in excessive exercise to compensate for the effects of eating (Fichter & Krenn, 2003). Finally, men are more likely to engage in
binge eating and less likely to engage in dietary restraint in response to body dissatisfaction (Meyer et al., 2005).

Risk Factors

A risk factor is a variable that has been shown to predict a subsequent pathology outcome (Kraemer et al., 1997). Individual risk factors associated with eating pathology include body dissatisfaction (Stice & Shaw, 2002), dieting (Stice, Mazotti, Krebs, & Martin, 1998), and depression (Stice, Akutagawa, Gaggar, & Agras, 2000). In addition, thin-ideal internalization and perfectionism have also been identified as a risk factor by some researchers (Minarik & Ahren, 1996; Stice, Schupak-Neuberg, Shaw, & Stein, 1994).

Body Dissatisfaction. Another emerging risk factor is body dissatisfaction, which refers to negative subjective evaluations of one’s physical body, such as figure, weight, stomach, and hips (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Body dissatisfaction is hypothesized to arise primarily from sociocultural factors and is thought to increase the risk for eating pathology through these two central mechanisms: dieting and affective regulation (Stice & Shaw, 2002). The dietary pathway model from body dissatisfaction to eating pathology asserts that body dissatisfaction leads to dieting because of the commonly accepted belief that dieting is an effective weight control technique. Dieting, in turn, may spiral into anorexic symptoms if weight loss efforts are unsuccessful and/or if weight loss is socially reinforced (Fairburn, Shafran, & Cooper, 1998). In contrast, dieting might lead to binge eating to directly counter the effects of calorie deprivation (Polivy & Herman, 1985). According to the negative affect regulation pathway, body dissatisfaction contributes to negative affect because physical appearance is a central evaluative dimension.

1 Given the limited research on risk factors for eating pathology in men, the review will focus on risk factors for eating pathology in women.
for females in Western cultures (Stice & Shaw, 2002). In other words, women can feel more depressed when they cannot achieve the thin ideal.

The data from a number of studies support the hypothesis that body dissatisfaction gives rise to dieting (e.g., Cooley & Toray, 2001; Stice et al., 1998; Stice, 2001). One study examined the correlates and prospective predictors of dieting in a community sample of adolescent girls ($N = 320$) at baseline and at a nine-month follow-up interval (Stice et al., 1998). Results at the baseline interval showed measures of body dissatisfaction to be highly positively correlated with measures of dieting ($r = .51$). Controlling for initial dieting, multivariate multiple regression analyses showed initial body dissatisfaction to be a significant predictor of increases in dieting from baseline to the nine-month follow-up. Moreover, in the prospective study of bulimic pathology risk factors, results from regression growth curve modeling showed initial body dissatisfaction to be a significant predictor of increases in dieting from baseline to the one-year follow-up (Stice, 2001). Finally, in a three-year longitudinal study of eating pathology (bulimia and restraint) in college women ($N = 118$), hierarchical regression analyses showed that figure dissatisfaction explained unique variance in the prediction of dietary restraint (Cooley & Toray, 2001).

Several studies support the hypothesis that body dissatisfaction leads to negative affect (e.g., Stice, 2001; Stice & Bearman, 2001). Stice and Shaw (2003) conducted a one-year prospective study on the relationship between body image, eating, affective disturbances, and smoking onset in adolescent girls ($N = 406$). Results from regression analyses showed initial body dissatisfaction to be a significant predictor of increases in negative affect from baseline to the one-year follow-up. Another longitudinal study with a community sample of adolescent girls ($N = 231$) used growth curve analysis to examine the
relationship between body-image and eating disturbances as well as depressive symptoms (Stice & Bearman, 2001). Controlling for gender-nonspecific risk factors for depression (social support and emotionality), results showed initial body dissatisfaction to be a significant predictor of increases in depression at 10-month and 20-month follow-up intervals. In the prospective study of bulimic pathology risk factors, results from the regression growth curve modeling showed initial body dissatisfaction to be a significant predictor of increases in negative affect from baseline to the one-year follow-up (Stice, 2001).

Dieting. Dieting is considered a central feature of eating pathology (Brownell, 1991) and refers to employing intentional efforts to achieve or maintain a desired weight through reduced caloric intake (Brownell & Rodin, 1994). Dieting and dietary restraint are often used interchangeably in the literature. However, important differences exist between the two constructs. Dieting refers to intentional efforts to achieve a desired weight by implementing a negative energy balance between caloric intake and expenditure (Dahlkoetter, Callahan, & Linton, 1979). In contrast, dietary restraint refers to a tendency to oscillate between periods of caloric restriction and overeating (Heatherton, Herman, Polivy, King, & McGree, 1988). Research on eating pathology tends to conceptualize dieting as a risk factor (e.g., Stice, 2002) and dietary restraint as a symptom of eating pathology. According to restraint theory, dieting results in an elevated risk for binge eating due to the physiological effects of caloric deprivation and psychological mechanisms, such as cognitively produced disinhibition (Polivy & Herman, 1985). Dieting may also produce binge eating because violating strict dietary rules can result in disinhibited eating or the abstinence-violation effect (Marlatt & Gordon, 1985).
Research has documented the relationship between dieting and eating pathology, specifically binge eating (e.g., Stice & Agras, 1998). One prospective study examined the onset of binge eating and purging in a community sample of girls during late adolescence ($N = 543; M = 14.9$ years old; Stice, Killen, Hayward, & Taylor, 1998). Participants who were free of symptoms (binging and purging) at baseline were assessed yearly for four years. Results from survival analyses showed dieting to be a significant predictor of the onset of binge eating at yearly follow-up intervals. Another study examined risk factors for the onset of binge eating and compensatory behaviors over a 9-month period in a community sample of female adolescents ($N = 218$; Stice & Agras, 1998). Participants were categorized into two groups: 1) Binge-Free: Those who denied binge eating at both baseline and the nine-month follow-up interval and 2) Binge-Onset: Those who denied binge eating at baseline but reported it at the nine-month follow-up interval. Analysis of Variance (ANOVA) results revealed that participants in the Binge-Onset group had higher scores on measures of dieting than the Binge-Free group (Stice & Agras, 1998). Furthermore, dieting explained the highest amount of variance among all independent variables.

A longitudinal study investigated risk factors associated with the development of full- and partial-syndrome eating disorders in a large ($N = 394$) sample of 16-year-old females (Santonastaso, Friederici, & Favaro, 1999). Participants were categorized as asymptomatic, partial-, or full-syndrome at baseline and at a one-year follow-up interval. For participants who were asymptomatic at baseline, results from stepwise regression analysis showed dieting to be a significant predictor of partial-syndrome eating disorders at the one-year follow-up interval. Furthermore, among subjects who engaged in dieting, the risk of developing an eating disorder after one year was four times greater than among subjects who did not engage
in dieting (Santonastaso et al., 1999). In the prospective study of bulimic pathology risk factors, results from regression growth curve modeling showed initial dieting to be a significant predictor of increases in binge eating from baseline to the one-year follow-up (Stice, 2001).

Depression. A strong relationship exists between depression and eating pathology in females (Braun et al., 1994). Rierdan and Koff (1997) found body dissatisfaction to be associated with increased depressive symptoms in a sample of adolescent girls. A longitudinal study of female adolescents (N = 1,124) examined factors related to the onset of depression (Stice, Hayward, Cameron, Killen, & Taylor, 2000). Participants who were not depressed at baseline were assessed yearly for four years. Controlling for initial depressive symptoms, results of survival analysis showed that elevated body dissatisfaction, dietary restraint, and bulimic symptoms were significant predictors of the onset of depression at yearly follow-up intervals (Stice et al., 2000). Lewinsohn, Striegel-Moore, and Seeley (2000) examined the prevalence of depression among 800 high school girls who were categorized as having no eating disorder, a partial-syndrome eating disorder, or a full-syndrome eating disorder. Of the 19 girls who had a full-syndrome eating disorder, 16 (84%) had a concurrent episode of depression. Of the 23 girls who had a partial-syndrome eating disorder, 13 (68%) had a concurrent episode of depression.

Depression has been specifically linked to increases in binge eating (Stice, 2002). According to the affect regulation theory of eating pathology, people binge eat to control their negative emotions (Heatherton & Baumeister, 1991; McCarthy, 1990). In the prospective study of bulimic pathology risk factors, results from the regression growth curve modeling showed initial negative affect to be a significant predictor of increases in binge
eating from baseline to the one-year follow-up (Stice, 2001). In the Stice and Agras (1998) study, which examined risk factors for the onset of binge eating and compensatory behaviors over a nine-month period in a community sample of female adolescents ($N = 218$), participants in the Binge-Onset group had higher scores on measures of negative affect than the Binge-Free group.

**Thin-Ideal Internalization.** The sociocultural model of eating pathology purports that significant cultural pressure exists for women to be thin from the media, family, and peers (Striegel-Moore et al., 1986). Three constructs have received attention with respect to their relationship with body dissatisfaction: a) awareness of a thin ideal, b) internalization of a thin ideal, and c) perceived pressures to be thin (Thompson & Stice, 2001). One study suggests that peers and family are more potent influences than the media (Stice, 1998), whereas another study found that the media is more influential than peers and family (Wertheim, Paxton, Schutz, & Muir, 1997). According to the sociocultural model, the thin-ideal internalization contributes to body dissatisfaction because the ideal is extremely difficult to attain (and is often not obtained).

Support is emerging for the hypothesized effects of thin-ideal internalization on the development of eating pathology (Stice, 2002). Longitudinal studies examining a broad spectrum of risk factors for eating pathology have shown that thin-ideal internalization is correlated with body dissatisfaction. Stice (2001) conducted a prospective study of bulimic pathology risk factors in a community sample of adolescent girls ($N=231$) using random regression growth curve models. Results from the regression analyses showed initial thin-ideal internalization to be a significant predictor of subsequent growth in body dissatisfaction at 10-month and 20-month follow-up intervals. Stice and Whitenton (2002) examined risk
factors for body dissatisfaction with a community sample of adolescent girls ($N = 496$) at baseline and one-year follow-up intervals. Controlling for initial body dissatisfaction, multivariate multiple regression analyses showed initial thin-ideal internalization to be a significant predictor of increases in body dissatisfaction from baseline to one-year follow-up. Furthermore, research on eating pathology prevention programs has shown that an intervention that decreases thin-ideal internalization leads to a reduction in body dissatisfaction (Stice, Mazotti, Weibel, & Agras, 2000).

**Perfectionism.** Perfectionism has historically been associated with eating pathology (e.g., Garner, Olmstead, & Polivy, 1983). In fact, the very nature of eating pathology – relentlessly striving toward an impossible standard of thinness – is perfectionistic. Broadly speaking, perfectionism refers to the desire to attain ambitious standards or goals without failure (Brouwers & Wiggum, 1993). However, perfectionism is a multi-faceted construct and has been described as a private drive (Frost, Marten, Lahart, & Rosenblate, 1990), the desire to appear perfect in the eyes of others (e.g., Bruch, 1973), and also in terms of adaptive (positive) versus maladaptive (negative) perfectionism (e.g., Davis, 1997).

Perfectionism has been conceptualized as a unitary construct and a multi-faceted construct in eating pathology research. Research on eating pathology and perfectionism as a unitary construct is equivocal. One study found significant positive correlations between perfectionism and bulimic symptoms (e.g., Joiner, Heatherton, & Keel, 1997), but another study failed to find such a relationship (e.g., Fryer, Waller, & Kroese, 1997). In a longitudinal study examining the predictive validity of five bulimia-related indicators, Joiner, Heatherton, and Keel (1997) found perfectionism, as measured by the Perfectionism subscale of the Eating Disorders Inventory (EDI; Garner et al., 1983), to be a significant predictor of
bulimic symptoms 10 years later. However, perfectionism was not a significant predictor of current EDI Bulimia subscale scores.

Research on eating pathology and perfectionism as a multidimensional construct is also equivocal. One study examined the relationship between perfectionism and disordered eating patterns in a sample of non-clinical women using the Frost Multidimensional Perfectionism Scale (MPS-F; Frost et al., 1990). The scale assesses these five dimensions of perfectionism: Concern over Mistakes, Personal Standards, Parental Expectations, Parental Criticism, and Doubts About Action (Minarik & Ahren, 1996). Researchers found significant positive correlations between disordered eating measures and the Concern over Mistakes and Doubts About Action dimensions of perfectionism but did not find significant positive correlations between disordered eating measures and other dimensions of perfectionism, such as Personal Standards. Another study used an experimental setting to examine goal-setting behavior in relation to self-oriented and socially-prescribed perfectionism (Pliner & Haddock, 1996). Results showed that women with high scores on the Eating Attitudes Test (EAT; Garner, Olmstead, Bohr, & Garfinkel, 1982) exhibited more socially prescribed perfectionism than women with low scores on the EAT; however, the two groups did not differ in self-oriented perfectionism. Finally, a study examining adaptive (positive) and maladaptive (negative) aspects of perfectionism found that patients with eating pathology had higher scores on both positive and negative measures of perfectionism (Terry-Short, Owens, Slade, & Dewey, 1995). Despite limited research on the relationship between eating pathology and perfectionism and some equivocal findings, a recent meta-analysis concluded that perfectionism is a risk factor for eating pathology (Stice, 2002).
In sum, several variables – thin-ideal internalization, body dissatisfaction, dieting, and depression – have received strong empirical support as risk factors for eating pathology, particularly binge eating. Taken together, thin-ideal internalization contributes to body dissatisfaction because the ideal is unattainable. The increased body dissatisfaction fosters dieting and negative affect, which, in turn, leads to binge eating (Stice, 2001). Perfectionism has received some empirical support as a risk factor for eating pathology, but additional research is needed to better understand its role in the development of eating pathology.

**Experiential Avoidance.** Experiential avoidance refers to attempts to avoid, suppress, or alter the form or frequency of negatively evaluated private events such as thoughts, emotions, and bodily sensations (Hayes & Wilson, 1994). Experiential avoidance has been conceptualized as falling on the continuum of psychological acceptance, with high levels of experiential avoidance reflecting low acceptance and an unwillingness to embrace fully one’s internal subjective experience (Greco et al., 2005). Recent cross-sectional research shows that excessive attempts to avoid one’s subjective experience are correlated with adverse outcomes (Hayes, Strosahl, & Wilson, 1999). More specifically, research indicates that high levels of experiential avoidance may play a mediating role in the development of psychological distress across a broad range of conditions, including childhood sexual abuse (Marx & Sloan, 2002), anxiety sensitivity (Eifert & Heffner, 2003), substance abuse (Forsyth, Parker, & Finlay, 2003), and chronic pain (Feldner et al., 2006).

Little research has been conducted on the relationship between experiential avoidance and eating pathology. One study examined coping styles in a large sample ($N = 1,157$) of Swedish women with a history of dieting and eating disorders (Ghaderi & Scott, 2000). Controlling for depression, subjects with past or current eating disorders reported
significantly higher levels of avoidance coping than subjects with no eating disorder. In this study, avoidance coping was defined as wishful thinking and behavioral efforts to escape or avoid a problem and was assessed by the Ways of Coping Questionnaire (Ghaderi & Scott, 2000).

As stated above, eating pathology can be conceptualized as an addictive behavior and is strongly correlated with other addictive behaviors such as substance abuse, smoking, sex, and gambling. Researchers have attempted to explain why addictive behaviors are strongly interrelated. Nakken (1988) purported an "addictive personality" as an explanation for these relationships; but upon considerable examination, researchers have concluded that an addictive personality is not a sufficient explanation (Franken, 2006). More recently, researchers have suggested that functional classifications may serve as a useful method for understanding disorders that are strongly interrelated (Haynes & O'Brien, 2000). In particular, experiential avoidance has been hypothesized as a psychological construct that may underlie several disorders, including addictive behaviors (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Determining the role experiential avoidance plays in the development of eating pathology is of critical interest in this research as a means of beginning to understand its relationship to addictive behaviors, particularly behavioral addictions.

**Rationale for Current Investigation**

Eating pathology is composed of thoughts, emotions, and bodily sensations that cause significant psychological distress. Although eating pathology affects both men and women, most of the research has focused exclusively on women (Lewinsohn et al., 2000). For women, research has shown that several variables – body dissatisfaction, dieting, depression,
and thin-ideal internalization – are risk factors for eating pathology (See Figure 1). Despite equivocal findings, recent meta-analytic work concluded that the evidence supports perfectionism as a potential risk factor for eating pathology (Stice, 2001). Research has shown that experiential avoidance plays a mediating role in the development of psychological distress (e.g., Hayes et al., 1999) and may extend to eating pathology (Ghaderi & Scott, 2000). It is possible to conceptualize many of the risk factors for eating pathology as avoidance strategies related to one’s subjective experience. For example, people may engage in dieting and/or binge eating to avoid accepting their body image or to distract themselves from other issues.

The purpose of this investigation is to examine the relative contribution of several risk factors related to eating pathology. Toward this end, this study had these three aims: 1) To assess the direction and strength of the relationship among variables that are well documented to contribute to eating pathology (body dissatisfaction, dieting, and depression) and eating pathology; 2) To investigate the contribution of variables that have less support as a risk factor for eating pathology (thin-ideal internalization, perfectionism, and experiential avoidance) and thus advance our understanding of eating pathology; and 3) To examine gender differences in psychological variables and eating pathology. In addition to providing data on men, this study will allow a direct comparison between men and women on variables related to eating pathology.
Figure 1. Hypothesized model of eating pathology (Stice, 2002)

Hypotheses

1. It was expected that moderate positive bivariate correlations would be found between the following risk factors of eating pathology in women: body dissatisfaction, dieting, depression, binge eating, vomiting/laxative use, excessive exercise, thin-ideal internalization, perfectionism, and experiential avoidance.

2. It was hypothesized that there would be more support for the negative affect regulation pathway model (See Figure 2) than the dietary pathway model (See Figure 3) in explaining binge eating in women.
3. It was also hypothesized that perfectionism and the interaction of thin-ideal internalization and perfectionism would be stronger predictors of body dissatisfaction in women than thin-ideal internalization or perfectionism alone.

4. It was further hypothesized that experiential avoidance would be an independent predictor of eating pathology in women rather than a mediating or moderating variable.

5. Finally, it was hypothesized that there would be gender differences in eating pathology. Specifically, we expected that men would be more likely than women to engage in binge eating and excessive exercise and less likely than women to engage in vomiting and laxative use.

Methods

Participants

Seven hundred nineteen undergraduate students participated in the study. Because the study was designed to examine eating pathology in college students, only participants who were of traditional college age (18-25 years old) were included in the analysis. One hundred fifty-six participants (21.7%) were excluded due to age, and 103 participants (14.3%) were excluded due to incomplete data, leaving a sample of 460 students.

Due to a low response rate (8%, 23 females, 14 males), African American participants were excluded from the final sample. Due to small numbers of minority students, Asian American (n = 380), Hispanic (n = 371), and Native American (n = 80) were not recruited. There would have been insufficient power for analysis by racial categories, and grouping these racial/ethnic groups into an “other” category would have created a heterogeneous category. Results are based on a sample of 423 undergraduates, ages 18-25 (M = 21.9, SD = 2). Other sample characteristics are outlined in Table 3.
Procedure

An online survey by Survey Monkey was used to collect data. Prior to administering the survey to participants, a pilot test was conducted with students from the principal investigator’s undergraduate statistics class. The pilot test was intended to provide an estimate of how much time it would take to complete the survey. Fourteen students completed the survey, and the average completion time was 30 minutes. The range of completion time was 10 minutes to 45 minutes. The students also served as editors of the survey’s material, locating typos and spacing errors as well as verifying response choices for items.

The principal investigator obtained the list of active students’ email addresses from the Information Technology (IT) Director of Network and System Services. After the survey instrument had been finalized, an email (See Appendix J) with a link to the online survey was sent to an initial random sample of 2,500 EMU undergraduate students. The student email
addresses were randomly selected by the Microsoft Excel random number generator. The email was sent to students by the principal investigator from her email address. In the email, students were invited to participate in the study, and a link to the survey was provided. To increase participation, the principal investigator sent the initial email, a follow-up email three days later, and another email one week later. Passive informed consent for the study was obtained. The informed consent contained the following statement: “By completing and submitting the questionnaire, you will be giving informed consent for the researchers to use the information you provide” (See Appendix K).

Two hundred sixty-four students participated during this wave of data collection, resulting in a 10.6% response rate. Fifty-five participants (20.8%) were excluded due to age and 36 participants (13.6%) were excluded due to incomplete data, leaving a sample of 173 participants (133 female, 40 male). Previous research using college students’ email addresses has shown that response rates range from 10-33% (McCabe et al., 2006). Due to the low response rate, the same procedure was conducted with another random sample of 2,500 students 10 days later. Three hundred students participated during this wave of data collection, resulting in a 12% response rate. Seventy-four participants (24.7%) were excluded due to age and 39 participants (13%) were excluded due to incomplete data, leaving a sample of 187 participants (147 female, 40 male).

Power analysis revealed that 165 males were required to examine gender differences. After two waves of data collection, the sample consisted of 80 males. Therefore, a third wave of data collection two weeks later (24 days after the first wave) was conducted with a sample of 2,500 men. One hundred fifty-five students participated during this wave of data collection, corresponding to a 6.2% response rate. Twenty-seven participants (17.4%) were
excluded due to age, and 28 participants (18%) were excluded due to incomplete data, leaving a sample of 100 participants.

All participants were entered into a raffle to win one of three shopping mall gift certificates valued at $75, $125, and $250. Participants entered their email address into a separate secure database at the end of the survey. The winners of the mall gift certificates were randomly selected by the Microsoft Excel random number generator from the list of participants who completed the survey. The winners were contacted by the principal investigator via email.

**Measures**

**Demographic/Lifestyle Variables.** The questionnaire contained demographic and lifestyle variables, including gender, age, race, marital status, employment status, fraternity/sorority membership, and athletic involvement (See Appendix A). The questionnaire also assessed other pertinent lifestyle variables, including substance use, sexual behavior, and stress level.

**Body Dissatisfaction.** Attitudinal body dissatisfaction was assessed using the Body Esteem Scale (BES; Franzoi & Shields, 1984; See Appendix B). Participants indicated how positively they felt about specific body parts (e.g., waist, thighs, buttocks, appearance of stomach) as well as overarching constructs such as physical coordination, physical stamina, and physique. The 35-item instrument uses a 5-point Likert scale ranging from have strong negative feelings to have strong positive feelings. A lower score reflects greater dissatisfaction with the aspect of the body under consideration. Factor analysis by the original scale developers revealed these three factors: 1) Appearance, general feelings about appearance; 2) Weight (weight satisfaction); and 3) Attribution, evaluations attributed to
others about one’s body and appearance (Franzoi & Shields, 1984; Mendelson, Mendelson, & White, 1996). According to Franzoi (1994), the factors of the BES have adequate internal consistency (α = .78-.87) and test-retest reliability (r = .75-.87). The measure has been validated using several college samples (Barker & Galambos, 2007; Franzoi & Shields, 1984; Mendelson, McLauren, Gauvin, & Seiger, 2002). The BES Weight scale had an internal consistency of α = .91 in this study.

**Binge Eating and Compensatory Behaviors.** Items from the Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994) were used to assess binge eating and compensatory behaviors (See Appendix C). The EDE-Q is derived directly from the Eating Disorder interview (EDE; Fairburn & Cooper, 1993), a validated measure of eating pathology. The EDE-Q has 30 items overall; 22 items address attitudinal aspects of eating-disorder psychopathology, and eight items address frequency of eating-disorder behavior, such as “eating an unusually large amount of food” and purging by vomiting. A total score and four subscale scores, relating to dietary restraint, eating concerns, concerns about weight, and concerns about shape, were computed. The questionnaire focuses on the 28 days prior to its administration and is scored using a 7-point (0-6), forced-choice rating scale. The rating scale descriptors are specific to each item. A score of four or higher is considered to be in the clinical range. The questionnaire has adequate internal consistency (α = .84), temporal stability (test-retest reliability r = .80), and convergent validity with the interview version of the EDE (mean r = .81; Black & Wilson, 1996; Fairburn & Beglin; 1994; Luce & Crowther, 1999). Frequencies of eating disorder behaviors are assessed in terms of the number of episodes occurring during the past four weeks. Luce and Crowther (1999) found that the reliability of the EDE-Q items measuring occurrence and frequency of behavioral
features was adequate. Norms have been established for young adult women in the following five age bands: 18-22, 23-27, 28-32, 33-37, 38-42 years old (Mond, Hay, Rodgers, & Owen, 2006a). In this study, the internal consistency for the EDE-Q total score scale was $\alpha = .94$. The internal consistency for the Restraint, Eating Concern, Shape Concern, and Weight Concern subscales were $\alpha = .78, .80, .90$, and .83, respectively.

**Depression.** Depression was assessed using the Center for Epidemiologic Studies Depression Scale (CES-D; Devins & Orme, 1985; See Appendix D). The 20-item self-report measure assesses a one-week period of depressive symptoms with ratings of 0 (rarely or none of the time, less than 1 day), 1 (some or a little of the time, 1-2 days), 2 (occasionally or a moderate amount of time, 3-4 days), and 3 (most or all of the time, 5-7 days; Devins & Orme, 1985). The CES-D has high internal consistency; coefficient alphas of .84, .85, and .90 were found in three different samples (Radloff, 1977). The CES-D was validated in a college sample with adequate internal consistency ($\alpha = .87$; Radloff, 1991). The CES-D had an internal consistency of $\alpha = .91$ in this study. A cutoff score of 16 demonstrated high sensitivity and specificity (Weissman, Scholomskas, Pottenger, Prusoff, & Locke, 1977).

Research has documented concurrent and convergent validity for the measure. The CES-D differentiated psychiatric patients from community participants (Weissman et al., 1977). In addition, patients identified as being depressed by the Raskin Three Area Depression Scale scored higher on the CES-D than non-depressed patients and recovered depressives (Weissman et al., 1977). The CES-D is highly correlated with the Raskin Three Area Depression Scale, the Hamilton Rating Scale, and the depressive factor of the Symptom Checklist (SCL-90; Weissman et al., 1977).
**Dieting.** The Dutch Restrained Eating Scale was used as a measure of self-reported dieting (van Strien, Frijters, van Staveren, Defares, & Deurenberg, 1986; See Appendix E). Participants indicate the frequency of 10 dieting behaviors using a 5-point scale ranging from *never* to *always*. In terms of reliability, this scale has high internal consistency ($\alpha = .95$; Stice & Agras, 1998; van Strien et al., 1986) and adequate temporal stability (test-retest reliability = .74; Stice & Agras, 1998). The instrument has been validated with both clinical and non-clinical samples (Stice & Agras, 1998; Stice & Bearman, 2001; Wardle, 1987). Internal consistency of the DRES in this study was $\alpha = .92$.

Two other measures have been used to assess self-reported dieting: the Restraint Scale (Polivy, Herman, & Warsh, 1978) and the Three-Factor Eating Questionnaire Restraint Scale (Stunkard & Messick, 1985). The DRES was chosen over the Restraint Scale because the Restraint Scale has criterion confounding in that it contains items assessing binge eating (Laessle et al., 1989). The DRES was chosen over the Three-Factor Eating Questionnaire Restraint Scale because the latter scale has not been shown to have a relationship with eating pathology (Stice, Presnell, Groesz, & Shaw, 2005).

**Excessive Exercise.** Excessive exercise was assessed using the Commitment to Exercise Scale (CES; Davis, Brewer, & Ratusny, 1993; see Appendix F). The eight-item instrument assesses psychological aspects of exercise, including the degree to which feelings of well-being are influenced by exercising and the degree of adherence to exercise. Factor analysis demonstrated that a two-factor solution, each containing four items, was the best fit for the data with adequate internal consistency ($\alpha = .77$; Davis et al., 1993). The first factor, obligatory commitment, is composed of the first four items of the scale; the second factor, pathological commitment, is composed of the last four items of the scale. Other studies have
regarded the scale as unidimensional due to a high positive correlation between the two factors ($r = .74$; McLauren, Gauvin, & White, 2001). Internal consistency for the total scale score was higher ($\alpha = .88$) than the two-factor solution ($\alpha = .77$; McLauren et al., 2001). In the original measure, each item has two response anchors (e.g., not at all important – very important), and participants indicated a point on the continuum that best described their position. Another study had participants circle a number on a horizontal line between 0 and 10 (Mond, Hay, Rodgers, & Owen, 2006b). Numbers were used for this study in order to facilitate measurement. Internal consistency of the CES in this study was $\alpha = .86$ for the total score, $\alpha = .81$ for the first factor, and $\alpha = .70$ for the second factor.

*Experiential Avoidance.* The Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004) was used as a measure of experiential avoidance (See Appendix G). Exploratory and confirmatory factor analysis demonstrated that a single factor containing nine items provided the best model fit with adequate internal consistency ($\alpha = .70$; Hayes et al., 2004). Participants indicate on a 7-point Likert-type scale the degree to which each statement applies to them from *never true* (1) to *always true* (7) with higher scores reflecting greater levels of experiential avoidance. In a series of studies using clinical and non-clinical samples, the AAQ was found to correlate positively with measures of depression and anxiety such as the Beck Depression Inventory and Beck Anxiety Inventory (Hayes et al., 2004). In addition, significant correlations between the AAQ and another purported measure of experiential avoidance, the Dissociative Experiences Scale (Bernstein & Putnam, 1986), have been regarded as support for its construct and convergent validity. Experiential avoidance, as measured by the AAQ, has been found to be negatively correlated with other cognitive
processes implicated in emotion dysregulation, such as anxiety sensitivity (Forsyth et al., 2003). The AAQ had an internal consistency of $\alpha = .68$ in this study.

Another instrument, the Ways of Coping Questionnaire (WAYS; Folkman & Lazarus, 1991), was considered as a measure of experiential avoidance. The 66-item questionnaire contains these eight subscales: Confrontive Coping, Distancing, Self-Controlling, Seeking Social Support, Accepting Responsibility, Escape-Avoidance, Planful Problem Solving, and Positive Reappraisal. The WAYS was not selected for two reasons: length and cost. First, the nine-item AAQ took considerably less time to complete than the 66-item WAYS. Second, the AAQ is a public domain instrument whereas the WAYS is a copyrighted instrument, making the AAQ more feasible for inclusion in this unfunded study. Despite its marginal internal consistency, the AAQ has strong predictive validity (Hayes et al., 2004). The AAQ has been used in several recent research studies examining childhood sexual abuse (Batten, Follette, & Aban, 2001), substance abuse (Stewart, Zvolensky, & Eifert, 2002), and chronic pain (Feldern et al., 2006).

**Perfectionism.** The Frost Multidimensional Perfectionism Scale (MPS-F; Frost, Marten, Lahart, Rosenblate, 1990) was used to measure perfectionism (See Appendix H). The 35-item instrument measures five dimensions of perfectionism: concern over mistakes (COM), high personal standards (PS), parental expectations (PE), parental criticism (PC), and doubts about action (Doubts). The measure has high internal consistency for the total scale ($\alpha = .90$) as well as the subscales ($\alpha = .77-.88$; Frost et al., 1990). Parker and Adkins (1995) found coefficient alpha for the MPS-F total score was .88, while the subscales ranged from .57 to .95. Although the MPS-F has been found to be highly correlated with the Burns’ Perfectionism Scale ($r = .846$), the measure has been found to be more weakly correlated
with other perfectionism measures, including the Self-Evaluative Scale \( r = .567 \) and the Perfectionism Scale of the Eating Disorder Inventory \( r = .593 \); Frost et al., 1990). The MPS-F has been used in several studies of eating pathology (e.g., Bulik et al., 2003; Davis, 1997; Minarik & Ahrens, 1996). Internal consistency for the MPS-F total score scale was \( \alpha = .92 \). Internal consistency for the COM, PS, PE, PC, and Doubts subscales were \( \alpha = .91, .85, .78, .87, \) and \( .80 \), respectively.

**Thin-Ideal Internalization.** Thin-ideal internalization was assessed using the Sociocultural Attitudes Toward Appearance Questionnaire-3 (SATAQ-3) Internalization subscales (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004; See Appendix I). The SATAQ-3 is a 30-item questionnaire that assesses four dimensions of media influence on body image and eating pathology: information, pressures, internalization-general, and internalization-athletic. High internal consistency has been shown for the four dimensions in non-clinical \( (\alpha = .96, .92, .95, \) and \( .96, \) respectively) and clinical populations \( (\alpha = .94-.96, .94-.95, .93-.97, \) and \( .77-.84, \) respectively; Thompson et al., 2004).

The internalization-general subscale includes nine items that assess the degree to which individuals have internalized the norms for body shape and weight portrayed in the media and the degree to which they attempt to match these standards by modifying certain behaviors (Thompson et al., 2004). The internalization-athletic subscale includes five items that measure the degree to which individuals desire and strive to achieve the bodies of athletes portrayed in the media (Thompson et al., 2004). In a study that used only the two internalization subscales, internal consistency was high \( (\alpha = .90; Roehrig, Thompson, Brannick, & van den Berg, 2006) \). In this study, the SATAQ Total scale had an internal
consistency of $\alpha = .95$, while the SATAQ General Internalization and Athletic subscales had internal consistencies of $\alpha = .96$ and $\alpha = .87$, respectively.

Besides the SATAQ-3, another measure of thin-ideal internalization is the Ideal-Body Internalization Scale-Revised developed by Stice and colleagues (IBIS-R; Stice, 2001; Stice & Agras, 1998; Stice & Bearman, 2001). The SATAQ-3 subscales were chosen because research has shown that the IBIS-R appears to tap into awareness of the thin-ideal norms rather than their internalization. Factor analytic results showed that all IBIS-R items correlated highly with SATAQ-3 awareness subscale items and loaded highly onto the awareness factor not the internalization factor (Thompson et al., 2004).

Variables

All variables need to be continuous in order to conduct bivariate correlations and path coefficients (See Data Analysis). Scores for the corresponding variables are delineated below in Table 3.

Table 3

Scores Corresponding to Each Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Dissatisfaction</td>
<td>Body Esteem Scale (BES) Physical Attractiveness subscale score. Lower scores indicate greater dissatisfaction with the specific aspect of the body.</td>
</tr>
<tr>
<td>Binge Eating</td>
<td>Two EDE-Q Items: 1. How many days in the past month did you eat “what other people would regard as an unusually large amount of food?” 2. How many of these days was the consumption of large amounts of food accompanied by a sense of “loss of control?” Number of days in which an objectively large amount of food is combined with a loss of control</td>
</tr>
<tr>
<td>Dieting</td>
<td>Scores on the Dutch Restrained Eating Scale (DRES) will be averaged.</td>
</tr>
<tr>
<td>Depression</td>
<td>Center for Epidemiologic Studies-Depression Scale (CES-D) Total Score.</td>
</tr>
<tr>
<td>Experiential Avoidance</td>
<td>Acceptance and Action Questionnaire (AAQ) Total Score.</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>Frost Multidimensional Perfectionism Scale (MPS-F) Total Score.</td>
</tr>
<tr>
<td>Thin-Ideal Internalization</td>
<td>Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) General and Athletic Internalization subscale scores will be summed.</td>
</tr>
<tr>
<td>Vomiting/Laxative Use</td>
<td>How many days in the past month did you make yourself sick (vomit)/did you take laxatives as a means of controlling your shape or weight, or to counteract the effects of eating?</td>
</tr>
</tbody>
</table>
Data Analysis

For Hypothesis 1, bivariate correlations were conducted with body dissatisfaction, dieting, depression, binge eating, vomiting/laxative use, and excessive exercise. Bivariate correlations were also run with these variables and thin-ideal internalization, perfectionism, and experiential avoidance.

Hypotheses 2, 3, 4, and 5 were analyzed using structural equation modeling (SEM) with the analysis of moment structures (AMOS) program (Arbuckle, 2006). A baseline fit index was used when analyzing these hypotheses. A baseline fit index compares a baseline model with a hypothesized model (Kline, 2005). The model’s fit to the data was evaluated in terms of (a) the significance and strength of estimated parameters and (b) how well the overall model fit the observed data, as indicated by various fit indices (Weston & Gore, 2006). Models were evaluated for adequacy of fit using these three criteria: a root mean square error of approximation (RMSEA) value of .05 or lower (.05-.09 is considered a moderate fit), comparative fit index (CFI) values between .95 and 1.00 (.90-.95 is considered a moderate model fit), and incremental fit index (IFI) values between .95 and 1.00 (.90-.95 is considered a moderate model fit; Browne & Cudeck, 1993; Kline, 2005).

Hypothesis 2 was analyzed by comparing the overall fit of the negative affect pathway model (Figure 2) to the dieting pathway model (Figure 3). The negative affect and dieting pathway models are both mediation models. The mediation model is presented in Figure 4 (Baron & Kenny, 1986). Evidence for mediation is demonstrated if the following three conditions are met: 1) a significant relationship exists between the independent variable

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2 IFI and CFI should have similar values. If values are not similar, the model may be “wacky” (A. M. Young, personal communication, October 10, 2006).
and the mediator variable (Path a); 2) a significant relationship exists between the mediator variable and the dependent variable (Path b); and 3) when Paths a and b are controlled, a previously significant relationship between the independent variable and the dependent variable is no longer significant with the strongest demonstration of mediation occurring when Path c is 0 (Baron & Kenny, 1986).

![Mediation Model Diagram]

*Figure 4. Mediation model*

Given that significant bivariate correlations existed among ideal internalization, perfectionism, and thin-ideal internalization by perfectionism, Hypothesis 3 was analyzed by comparing the overall fit of the following four models: 1) thin-ideal internalization, 2) perfectionism only, 3) thin-ideal internalization by perfectionism only, and 4) all three variables (thin-ideal internalization, perfectionism, and thin-ideal internalization by perfectionism interaction).

Hypothesis 4 was analyzed using the mediation model (Figure 4) and moderation model (Figure 5) with body dissatisfaction, dieting, and thin-ideal internalization as the independent variable and binge eating as the dependent variable. According to Baron and Kenny (1986), the moderator hypothesis is supported if the interaction pathway (Path c) is significant.
**Figure 5.** Moderation model

*Hypothesis 5* was analyzed with independent samples *t*-tests as well the “multiple group analysis” function in AMOS. Gender differences were analyzed by comparing a free model with a constrained model. A free model is one in which all of the pathways for both genders were allowed to vary (Figure 6). A constrained model is one in which only one of the pathways for both genders is fixed while all of the other pathways are allowed to vary (Figure 7). Given that there were nine hypothesized pathways in the model, nine constrained models were tested. Evidence for gender differences is demonstrated if the free model has a better fit than any of the nine constrained models.
Figure 6. Structural equation modeling (SEM) multiple group analysis free model

Figure 7. Structural equation modeling (SEM) multiple group analysis constrained model
Results

Participants

Table 4 presents the sample demographics. There were no significant differences in socioeconomic status (SES), relationship status, or employment status among the female and male participants. Independent-samples $t$-tests revealed significant differences in age $t (420) = -3.611, p < .001$ and Body Mass Index (BMI) $t (410) = -3.028, p < .001$. Men were slightly older and had a higher BMI than women.

Table 4

*Descriptive Information of Participants*

<table>
<thead>
<tr>
<th></th>
<th>Women ($n = 257$)</th>
<th>Men ($n = 166$)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean ± S.D.)</td>
<td>21.63 ± 1.91</td>
<td>22.35 ± 2.08</td>
<td>$p &lt; .001$</td>
</tr>
<tr>
<td>Body Mass Index (Mean ± S.D.)</td>
<td>24.39 ± 5.78</td>
<td>26.14 ± 5.67</td>
<td>$p &lt; .001$</td>
</tr>
<tr>
<td>SES: % “middle class” or above (n)</td>
<td>81.3% (209)</td>
<td>81.3% (135)</td>
<td>$ns$</td>
</tr>
<tr>
<td>Relationship Status % Single (n)</td>
<td>79% (203)</td>
<td>83.7% (139)</td>
<td>$ns$</td>
</tr>
<tr>
<td>Employment Status % Employed (n)</td>
<td>83.3% (214)</td>
<td>78.3% (130)</td>
<td>$ns$</td>
</tr>
</tbody>
</table>

Participants were categorized according to the Center for Disease Control (CDC) classifications for weight status (See Table 5). Three percent ($n = 13$) of the sample was classified as underweight, 57% ($n = 233$) as average weight, 24% ($n = 98$) as overweight, and 16% ($n = 64$) as obese. Given the small sample size of underweight participants, this group was eliminated from group analyses.
Table 5

*Center for Disease Control (CDC) Body Mass Index (BMI) Categories*

<table>
<thead>
<tr>
<th>BMI</th>
<th>Weight Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>Average</td>
</tr>
<tr>
<td>25 – 29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td>30 &amp; above</td>
<td>Obese</td>
</tr>
</tbody>
</table>

Source: CDC, 2002

Table 6

*Differences in Eating Pathology by Weight Status Categories*

<table>
<thead>
<tr>
<th></th>
<th>Average Weight(^a) ((n = 233))</th>
<th>Overweight(^b) ((n = 98))</th>
<th>Obese(^c) ((n = 64))</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Dissatisfaction</td>
<td>32.98 ± 9.13</td>
<td>28.21 ± 8.71</td>
<td>22.05 ± 7.88</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a, b &lt; c</td>
</tr>
<tr>
<td>Binge Eating</td>
<td>3.12 ± 3.63</td>
<td>3.47 ± 3.74</td>
<td>5.37 ± 4.31</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a, b &lt; c</td>
</tr>
<tr>
<td>Depression</td>
<td>13.51 ± 9.70</td>
<td>14.82 ± 9.78</td>
<td>18.03 ± 10.29</td>
<td>(p &lt; .01)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a &lt; c</td>
</tr>
<tr>
<td>Dieting</td>
<td>2.59 ± 0.95</td>
<td>2.81 ± 0.89</td>
<td>3.06 ± .77</td>
<td>(p &lt; .01)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a &lt; c</td>
</tr>
<tr>
<td>Exercise</td>
<td>13.38 ± 9.48</td>
<td>15.10 ± 11.45</td>
<td>15.20 ± 12.50</td>
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</tr>
<tr>
<td>Experiential Avoidance</td>
<td>27.35 ± 6.66</td>
<td>28.07 ± 6.21</td>
<td>29.81 ± 6.86</td>
<td>(p &lt; .05)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a &lt; c</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>102.29 ± 18.75</td>
<td>101.04 ± 19.98</td>
<td>103.46 ± 20.97</td>
<td>ns</td>
</tr>
<tr>
<td>Thin-Ideal Internalization</td>
<td>39.3 ± 13.09</td>
<td>40.05 ± 12.08</td>
<td>40.25 ± 12.91</td>
<td>ns</td>
</tr>
</tbody>
</table>

A one-way ANOVA revealed significant group differences in levels of experiential avoidance \(F(2, 382) = 3.456, p < .05\); depression \(F(2, 392) = 5.366, p < .01\); dieting \(F(2, 392) = 7.475, p < .01\); body dissatisfaction \(F(2, 391) = 41.137, p < .001\); and binge eating \(F\).
(2, 381) = 8.615, p < .001 (See Table 6). Tukey’s Post-Hoc analyses showed that obese participants had a higher level of experiential avoidance, depression, and dieting than average weight participants. Tukey’s Post-Hoc analyses also showed that obese participants had a highest level of body dissatisfaction and binge eating, followed by overweight participants, and average weight participants.

**Descriptive Statistics**

*Sample Statistics.* This study’s sample is highly representative of the EMU student population in terms of gender and class standing (See Table 7).

*Scale-Level Descriptive Statistics.* Table 8 reports means and standard deviations for the Acceptance and Action Questionnaire (AAQ), Body Esteem Scale (BES), Center for Epidemiologic Studies Depression Scale (CES-D), Commitment to Exercise Scale (CES), Dutch Restrained Eating Scale (DRES), Frost Multidimensional Perfectionism Scale (MPS-F), and Sociocultural Attitudes Toward Appearance Questionnaire-3 (SATAQ-3) Internalization subscales. No scales exceeded ± 2.0 on either skewness or kurtosis; therefore, these scales are normally distributed.

Table 7

*Population Parameters and Sample Statistics*

<table>
<thead>
<tr>
<th></th>
<th>EMU Student Population</th>
<th>Study Sample</th>
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<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
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</tr>
<tr>
<td>Female</td>
<td>59.1%</td>
<td>Female 60.8%</td>
</tr>
<tr>
<td>Male</td>
<td>40.9%</td>
<td>Male 39.2%</td>
</tr>
<tr>
<td><strong>Class Standing</strong></td>
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<td></td>
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<tr>
<td>Freshman</td>
<td>16%</td>
<td>Freshman 17.6%</td>
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<tr>
<td>Sophomore</td>
<td>19.4%</td>
<td>Sophomore 15.4%</td>
</tr>
<tr>
<td>Junior</td>
<td>22.5%</td>
<td>Junior 21.1%</td>
</tr>
<tr>
<td>Senior</td>
<td>42%</td>
<td>Senior 45.8%</td>
</tr>
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</table>
Table 8

Scale-Level Descriptive Statistics

<table>
<thead>
<tr>
<th>Scale-Level</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Skewness</th>
<th>Kurtosis</th>
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<tbody>
<tr>
<td>Acceptance and Action Questionnaire (AAQ)</td>
<td>27.87</td>
<td>6.7</td>
<td>.192</td>
<td>-.237</td>
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<tr>
<td>Body Esteem Scale (BES)</td>
<td>30</td>
<td>9.76</td>
<td>.166</td>
<td>-.814</td>
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<tr>
<td>Center for Epidemiologic Studies Depression Scale (CES-D)</td>
<td>14.48</td>
<td>9.8</td>
<td>.831</td>
<td>.060</td>
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<tr>
<td>Commitment to Exercise Scale (CES)</td>
<td>15.57</td>
<td>12.23</td>
<td>.826</td>
<td>.194</td>
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<tr>
<td>Dutch Restrained Eating Scale (DRES)</td>
<td>2.71</td>
<td>0.93</td>
<td>.052</td>
<td>-.822</td>
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<tr>
<td>Frost Multidimensional Perfectionism Scale (MPS-F)</td>
<td>102.48</td>
<td>19.04</td>
<td>-.610</td>
<td>.622</td>
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<tr>
<td>Sociocultural Attitudes Toward Appearance Questionnaire-3 (SATAQ-3)</td>
<td>39.81</td>
<td>12.8</td>
<td>.100</td>
<td>-.365</td>
</tr>
</tbody>
</table>

*Relationships Among Eating Pathology Risk Factors in Women.* Bivariate correlations were conducted to examine the relationships between pairs of the following variables: body dissatisfaction, dieting, depression, binge eating, vomiting/laxative use, excessive exercise, thin-ideal internalization, perfectionism, and experiential avoidance in women (See Table 9). Body dissatisfaction was moderately positively correlated with all variables except exercise. Dieting was positively correlated with all other variables. Depression was negatively correlated with perfectionism and positively correlated with thin-ideal internalization, body dissatisfaction, dieting, binge eating, vomiting/laxative use, and experiential avoidance. There was no correlation between depression and exercise. Binge
Table 9

Correlations Among Eating Pathology Variables in Women

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>9.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thin-Ideal Internalization</td>
<td>--</td>
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<td>2. Body Dissatisfaction</td>
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<td>3. Dieting</td>
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<tr>
<td>4. Depression</td>
<td>.326**</td>
<td>.480**</td>
<td>.315**</td>
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<tr>
<td>5. Binge Eating</td>
<td>.284**</td>
<td>.348**</td>
<td>.130*</td>
<td>.419**</td>
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<tr>
<td>6. Vomiting/Laxative Use</td>
<td>.163**</td>
<td>.158*</td>
<td>.188**</td>
<td>.144*</td>
<td>.181**</td>
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<td>7. Exercise</td>
<td>.204**</td>
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<td>.076</td>
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<td>.001</td>
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<td>8. Perfectionism</td>
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<td>.270**</td>
<td>.320**</td>
<td>-.459**</td>
<td>-.192**</td>
<td>-.133*</td>
<td>-.130**</td>
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<td></td>
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<tr>
<td>9. Experiential Avoidance</td>
<td>.355**</td>
<td>.368**</td>
<td>.199**</td>
<td>.532**</td>
<td>.360**</td>
<td>.141*</td>
<td>-.025</td>
<td>-.351**</td>
<td>--</td>
</tr>
</tbody>
</table>

\( n = 257 \)

* \( p < .05 \); ** \( p < .01 \)

Pearson Correlation for: thin-ideal internalization, body dissatisfaction, dieting, depression, binge eating, exercise, perfectionism, experiential avoidance
Spearman’s rho correlation for: vomiting/laxative use
eating was negatively correlated with perfectionism and positively correlated with all other variables. Vomiting/laxative use was negatively correlated with perfectionism and positively correlated with thin-ideal internalization, body dissatisfaction, dieting, binge eating, and experiential avoidance. There was no relationship between vomiting/laxative use and exercise. Excessive exercise was negatively correlated with perfectionism and positively correlated with thin-ideal internalization, dieting, and binge eating. There were no correlations between excessive exercise and body dissatisfaction, depression, and vomiting/laxative use. Perfectionism was negatively correlated with depression, binge eating, vomiting/laxative use, exercise, and experiential avoidance and positively correlated with thin-ideal internalization, body dissatisfaction, and dieting. Experiential avoidance was negatively correlated with perfectionism and positively correlated with thin-ideal internalization, body dissatisfaction, dieting, depression, binge eating, and vomiting/laxative use. There was no correlation between experiential avoidance and excessive exercise. Thin-ideal internalization was positively correlated with all variables. Strength of the correlations ranged from .13 to .53.

*Structural Equation Modeling (SEM) Analyses*

*Negative Affect and Dieting Pathway Models.* The results of the negative affect regulation pathway model revealed significant relationships ($p < .001$) between body dissatisfaction and binge eating, body dissatisfaction and depression, and depression and binge eating (See Figure 8). The strength of the relationship between body dissatisfaction and binge eating dropped from .35 to .18 with the addition of depression to the model (Sobel = 4.34, $p < .001$). Therefore, depression partially mediates the relationship between body dissatisfaction and binge eating.
The results of the dietary pathway model revealed significant relationships \((p < .001)\) between body dissatisfaction and binge eating and body dissatisfaction and dieting (See Figure 9). The relationship between dieting and binge eating was non-significant. Therefore, dieting does not mediate the relationship between body dissatisfaction and binge eating.

**Figure 8.** Negative affect regulation pathway model results.

**Figure 9.** Dietary pathway model results.
Thin-Ideal Internalization, Perfectionism, and Eating Pathology. Several models were compared to determine the contribution of thin-ideal internalization and perfectionism to our understanding of binge eating. When thin-ideal internalization, perfectionism, and thin-ideal internalization by perfectionism were entered into the model (errors were correlated), each variable’s relationship to body dissatisfaction was non-significant. The model with the variable thin-ideal internalization produced a moderate model fit (RMSEA = .068, 90% CI = .019-.115; CFI = .977; IFI = .978). The strength of the relationship between thin-ideal internalization and body dissatisfaction was .33. The model with the interaction term thin-ideal internalization by perfectionism produced a good model fit (RMSEA = .043, 90% CI = .001-.094; CFI = .997; IFI = .998; See Figure 10). The strength of the relationship between the variable thin-ideal internalization interacting with perfectionism and body dissatisfaction was .37. The model that included the variable perfectionism (total MPS-F score) produced a good model fit (RMSEA = .028, 90% CI = .001-.085; CFI = .994, IFI = .995). The strength of the relationship between perfectionism and body dissatisfaction was .26.
Figure 10. Binge eating model with perfectionism predicting body dissatisfaction

Perfectionism as a Multidimensional Construct. Bivariate correlations were conducted to examine the relationships among the five dimensions (subscals) of perfectionism measured by the Frost Multidimensional Perfectionism Scale (MPS-F): Concern over Mistakes (COM), Personal Standards (PS), Parental Expectations (PE), Parental Criticism (PC), and Doubts About Action (DA). There were significant moderate positive correlations between the COM, PC, and DA subscales and binge eating of .20, .17, and .37, respectively. The correlations between binge eating and the PS and PE subscales were non-significant. A factor analysis was also conducted with the five subscales of the MPS-F (See Figure 11).
Figure 11. Factor analysis of the Frost Multidimensional Perfectionism Scale

Models with each of the significant subscales (DA, PC, and COM) were compared to the model with perfectionism as a unitary construct (See Figure 10). The model with the DA subscale produced a moderate model fit (RMSEA = .089, 90% CI = .05-.13; CFI = .943; IFI = .946). The relationship between DA and body dissatisfaction was .38, the relationship between DA and depression was .44, and the relationship between DA and dieting was non-significant. The model with the PC subscale produced a moderate model fit (RMSEA = .093, 90% CI = .04-.15; CFI = .957; IFI = .959). The relationship between PC and body dissatisfaction was .25, the relationship between PC and depression was .26, and the relationship between PC and dieting was non-significant. The model with the COM subscale produced a good model fit (RMSEA = .025, 90% CI = .01-.084; CFI = .996; IFI = .996). The relationship between COM and body dissatisfaction was .31, the relationship between COM and depression was .39, and the relationship between COM and dieting was .20. Taken together, the SEM results suggest that there is more support for perfectionism as a unitary construct than a multidimensional construct. The model with perfectionism measured with the 35-item MPS-F
produced a good model fit. The model with the nine-item Concern Over Mistakes (COM) subscale also produced a good model fit. Furthermore, the factor analysis showed the COM subscale accounted for the most variance in explaining perfectionism, suggesting that one aspect of perfectionism, concern over mistakes, has substantially more explanatory power than the other four dimensions of perfectionism.

*Measurement of Experiential Avoidance.* The Acceptance and Action Questionnaire (AAQ) is a relatively new instrument that was found to have marginal internal consistency in a previous study ($\alpha = .70$; Hayes et al., 2004). In this study, the AAQ also had marginal internal consistency of $\alpha = .68$. A factor analysis was conducted with the 9-items (See Figure 12). Item 7 was strongly correlated with the construct of experiential avoidance, while items 2, 3, 4, 5, and 9 were moderately correlated with experiential avoidance. Items 1, 6, and 8 were only mildly correlated with experiential avoidance.

![Diagram](image)

*Figure 12. Factor Analysis of the Acceptance and Action Questionnaire (AAQ)*

*Experiential Avoidance as a Moderating Variable.* The moderator model outlined in Figure 4 was used to determine whether experiential avoidance was a moderating variable. The independent variables were body dissatisfaction, dieting, and thin-ideal internalization. The moderating variable was experiential avoidance, and the dependent
variable was binge eating. According to Baron and Kenny (1986), the moderator hypothesis is supported if the interaction pathway (Path $c$) is significant. The interaction pathways for body dissatisfaction $x$ experiential avoidance, dieting $x$ experiential avoidance, and thin-ideal internalization $x$ experiential avoidance were all non-significant.

*Experiential Avoidance as a Mediating Variable.* The mediator model outlined in Figure 5 was used to determine whether experiential avoidance was a mediating variable. The independent variables were body dissatisfaction, dieting, and thin-ideal internalization. The mediating variable was experiential avoidance, and the dependent variable was binge eating. There were significant relationships between all independent variables and binge eating. There was a significant relationship between experiential avoidance and binge eating. The strength of the relationship between body dissatisfaction and binge eating dropped from .36 to .25 with the addition of experiential avoidance to the model (Sobel = 3.51, $p < .001$). Therefore, experiential avoidance partially mediates the relationship between body dissatisfaction and binge eating (See Figure 13). The strength of the relationship between dieting and binge eating became non-significant with the addition of experiential avoidance to the model; therefore, experiential avoidance partially mediates the relationship between dieting and binge eating as well (See Figure 13). This was also true for the relationship between thin-ideal internalization and binge eating (binge became non-significant with the addition of experiential avoidance to the model, showing that experiential avoidance partially mediates the relationship between thin-ideal internalization and binge eating; See Figure 13).
Figure 13. Experiential avoidance as a mediator between body dissatisfaction, dieting, and thin-ideal internalization.

Experiential Avoidance and Eating Pathology. Several models were compared to determine the contribution of experiential avoidance to our understanding of eating pathology. When experiential avoidance is entered as an independent predictor in the model, a moderate model fit is produced (RMSEA = .051, 90% CI = .034-.066; CFI = .893; IFI = .899). When experiential avoidance is entered as a mediating variable in the model, it produces a slightly better model fit (RMSEA = .049, 90% CI = .032-.065; CFI = .900; IFI = .907; See Figure 12). It should be noted that the error terms associated with the variables thin-ideal internalization and body dissatisfaction were allowed to correlate in the model.
Figure 14. Experiential avoidance as a mediator of eating pathology

Analysis of Gender Differences in Eating Pathology

Relationships Among Eating Pathology Risk Factors in Men. Bivariate correlations were conducted to examine the relationships among body dissatisfaction, dieting, depression, binge eating, vomiting/laxative use, excessive exercise, thin-ideal internalization, perfectionism, and experiential avoidance in men (See Table 10). Binge eating was correlated only with thin-ideal internalization ($r = .17$). Body dissatisfaction was positively correlated with dieting, depression, perfectionism, and experiential avoidance. There were no correlations among body dissatisfaction and binge eating, vomiting/laxative use, and exercise. Dieting was positively correlated with all variables except binge eating. There was no correlation between dieting and binge eating. Depression was positively correlated with all variables except binge eating and exercise. There were no correlations among depression and binge eating and exercise. Exercise
Table 10

**Correlations Among Eating Pathology Variables in Men**

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
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<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>9.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thin-Ideal Internalization</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>2. Body</td>
<td>.249**</td>
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<td></td>
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<tr>
<td>Dissatisfaction</td>
<td>.394**</td>
<td>.415**</td>
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</tr>
<tr>
<td>3. Dieting</td>
<td>.345**</td>
<td>.336**</td>
<td>.240**</td>
<td>--</td>
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<td></td>
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</tr>
<tr>
<td>4. Depression</td>
<td>.159*</td>
<td>.069</td>
<td>.059</td>
<td>.149</td>
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<tr>
<td>5. Binge Eating</td>
<td>.157*</td>
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<td>.179*</td>
<td>.165*</td>
<td>.015</td>
<td>--</td>
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<td></td>
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</tr>
<tr>
<td>6. Vomit/ Laxative Use</td>
<td>.260**</td>
<td>.095</td>
<td>.421**</td>
<td>.090</td>
<td>.014</td>
<td>.170*</td>
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<tr>
<td>7. Exercise</td>
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<td>.181*</td>
<td>.223**</td>
<td>.413**</td>
<td>.091</td>
<td>-192*</td>
<td>-172*</td>
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<tr>
<td>8. Perfectionism</td>
<td>.306**</td>
<td>.347**</td>
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<td>.627**</td>
<td>.105</td>
<td>.112</td>
<td>-0.41</td>
<td>-284**</td>
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</tr>
<tr>
<td>9. Experiential Avoidance</td>
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</tbody>
</table>

\(n = 165\)

\(^* p < .05; **p < .01\)

Pearson Correlation for: thin-ideal internalization, body dissatisfaction, dieting, depression, binge eating, exercise, perfectionism, experiential avoidance

Spearman’s rho correlation for: vomiting/laxative use
was positively correlated with thin-ideal internalization, dieting, and perfectionism. Perfectionism was positively correlated with all variables except binge eating. Experiential avoidance was positively correlated with thin-ideal internalization, body dissatisfaction, dieting, depression, and perfectionism.

**Gender Differences in Eating Pathology Variables.** Independent samples t-tests were conducted to examine gender differences in body dissatisfaction, dieting, depression, binge eating, vomiting/ laxative use, excessive exercise, thin-ideal internalization, perfectionism, and experiential avoidance (See Table 11). There were no gender differences in levels of depression or perfectionism. Women had greater levels of thin-ideal internalization, body dissatisfaction, dieting, emotional avoidance, restraint, eating concern, shape concern, and weight concern. Men had greater levels of binge eating and exercise.

Structural equation modeling (SEM) was also used to examine gender differences. The free model, in which all pathways are allowed to vary, produced a good model fit (RMSEA = .047, 90% CI = .018-.073; CFI = .962; IFI = .965). Eight constrained models were tested (Path I was non-significant in the initial analyses). When paths A, B, C, D, F, G, and H were constrained, they produced moderate models fits (RMSEA > .05; CFI < .95; IFI < .95), which is indicative of gender differences in those pathways. When path E was constrained, it produced a nearly equivalent model fit (RMSEA = .041, 90% CI = .018-.07; CFI = .957; IFI = .960) to the free model, which suggests that there were no gender differences in the pathway between body dissatisfaction and binge eating.
Table 11

Gender Differences in Eating Pathology Variables

<table>
<thead>
<tr>
<th></th>
<th>Women (n = 257)</th>
<th>Men (n = 166)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATABQ3 Internalization Score</td>
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<tr>
<td>Thin-Ideal Internalization</td>
<td>38.32 ± 11.69</td>
<td>42.13 ± 14.08</td>
<td><em>p &lt; .01</em></td>
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<tr>
<td>BES Total Score</td>
<td></td>
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<tr>
<td>Body Dissatisfaction</td>
<td>27.66 ±9.42</td>
<td>33.63 ± 9.16</td>
<td><em>p &lt; .001</em></td>
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<tr>
<td>DRES Average Score</td>
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<tr>
<td>Dieting</td>
<td>2.9 ± .90</td>
<td>2.42 ± .89</td>
<td><em>p &lt; .001</em></td>
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<tr>
<td>CES-D Total Score</td>
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</tr>
<tr>
<td>Depression</td>
<td>15 ± 9.78</td>
<td>13.69 ± 9.79</td>
<td>ns</td>
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<tr>
<td>AAQ Total Score</td>
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</tr>
<tr>
<td>Emotional Avoidance</td>
<td>28.56 ± 6.51</td>
<td>26.76 ± 6.87</td>
<td><em>p &lt; .01</em></td>
</tr>
<tr>
<td>MPS-F Total Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perfectionism</td>
<td>102 ± 18.6</td>
<td>103 ± 19.75</td>
<td>ns</td>
</tr>
<tr>
<td>CES Total Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td>12.39 ± 9.64</td>
<td>16.48 ± 11.36</td>
<td><em>p &lt; .001</em></td>
</tr>
<tr>
<td>EDE-Q</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge Eating</td>
<td>3.20 ± 3.72</td>
<td>3.95 ± 4</td>
<td><em>p &lt; .05</em></td>
</tr>
<tr>
<td>EDE-Q</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restraint subscale</td>
<td>12.4 ± 7.36</td>
<td>9.4 ± 6.3</td>
<td><em>p &lt; .001</em></td>
</tr>
<tr>
<td>EDE-Q</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eating Concern subscale</td>
<td>11.13 ± 7.32</td>
<td>8.36 ± 6.02</td>
<td><em>p &lt; .001</em></td>
</tr>
<tr>
<td>EDE-Q</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shape Concern subscale</td>
<td>29.78 ± 13.58</td>
<td>22.42 ± 13.21</td>
<td><em>p &lt; .001</em></td>
</tr>
<tr>
<td>EDE-Q</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight Concern subscale</td>
<td>19.46 ± 8.94</td>
<td>13.99 ± 8.54</td>
<td><em>p &lt; .001</em></td>
</tr>
</tbody>
</table>

*Note:* Thin-Ideal Internalization and Body Dissatisfaction: Lower scores indicate more thin-ideal internalization and body dissatisfaction.
Discussion

The present study first sought to confirm previous research showing that there are significant correlations between body dissatisfaction, binge eating, dieting, depression, and thin-ideal internalization (Stice, 2002). In this sample, there were moderate positive correlations among most of these variables in women, ranging in strength from .15 to .53. This study also hypothesized that there would be significant positive correlations between perfectionism and experiential avoidance and body dissatisfaction, binge eating, dieting, depression, and thin-ideal internalization, which was confirmed. The strength of the correlations ranged from .14 to .46. Of significance, perfectionism was significantly correlated with binge eating, vomiting/laxative use, and exercise. A recent meta-analysis concluded that perfectionism is a risk factor for eating pathology (Stice, 2002).
study provides more support that perfectionism is a risk factor for eating pathology, specifically binge eating.

**Negative Affect and Dietary Pathway Models in Explaining Binge Eating**

Research has shown that body dissatisfaction increases the risk for binge eating through two central mechanisms: dieting and affective regulation (e.g., Stice & Shaw, 2002). This study hypothesized that there would be more support for the negative affect regulation pathway than the dietary pathway model in explaining the onset of binge eating. Mediation analysis was conducted to determine if depression and/or dieting mediated the relationship between body dissatisfaction and binge eating. The strength of the relationship between body dissatisfaction and binge eating dropped from .35 to .18 with the addition of depression to the model; therefore, depression partially mediates the relationship between body dissatisfaction and binge eating. This result provides support for the negative affect regulation pathway. The relationship between dieting and binge eating was non-significant. Therefore, dieting does not mediate the relationship between body dissatisfaction and binge eating. The data in this study do not support the dietary pathway model.

**Perfectionism and Eating Pathology**

Perfectionism has long been associated with eating pathology (e.g., Garner, Olmstead, & Polivy, 1983); however, research on the relationship between perfectionism and eating pathology has been equivocal. This study hypothesized that perfectionism alone and the interaction of thin-ideal internalization and perfectionism would be stronger predictors of body dissatisfaction in women. There was support for this hypothesis: the model with perfectionism leading to body dissatisfaction produced the best model fit. The
model with the variable of thin-ideal internalization interacting with perfectionism leading to body dissatisfaction also produced a good model fit.

Perfectionism has been conceptualized as a unitary as well as a multidimensional construct (Joiner et al., 1997; Minarik & Ahren, 1996). The use of the Frost Multidimensional Perfectionism Scale (MPS-F) with its total scale score and five subscales (Concern over Mistakes, Personal Standards, Parental Expectations, Parental Criticism, and Doubts About Action) allowed for the examination of perfectionism as both a unitary and multidimensional construct. The results of this study showed that the Concern over Mistakes (COM), Parental Criticism (PC), and Doubts About Action (DA) subscales were significantly correlated with body dissatisfaction. However, only COM produced a good model fit. When DA and PC subscales were entered in the model, the relationship between DA and dieting was non-significant and the relationship between PC and dieting was non-significant. Taken together, the SEM results provide more support for perfectionism as a unitary construct than a multi-dimensional construct. The model with perfectionism measured with the 35-item MPS-F produced a good model fit. The model with the nine-item Concern Over Mistakes (COM) subscale also produced a good model fit. Furthermore, the factor analysis showed the COM subscale accounted for the most variance in explaining perfectionism, suggesting that one aspect of perfectionism, concern over mistakes, has substantially more explanatory power than the other four dimensions of perfectionism.
Experiential Avoidance and Eating Pathology

Research has shown that experiential avoidance, excessive attempts to avoid one’s subjective experience, is correlated with adverse outcomes (Hayes, Strosahl, & Wilson, 1999) and may extend to eating pathology. However, only one study has been conducted on the relationship between experiential avoidance and eating pathology (Ghaderi & Scott, 2000). This study hypothesized that experiential avoidance would be an independent predictor of eating pathology in women rather than a mediating or moderating variable. Moderation analysis showed that experiential avoidance was not a significant moderator of body dissatisfaction, dieting, and thin-ideal internalization. However, mediation analysis showed that experiential avoidance was a partial mediator of body dissatisfaction and binge eating. Furthermore, experiential avoidance was a complete mediator of the relationship between dieting and binge eating and thin-ideal internalization and binge eating. In the larger model with all variables, the model with experiential avoidance as a mediating variable produced a slightly better model fit than the model with experiential avoidance as an independent predictor. Overall, results of this study provide more support for experiential avoidance as a mediating variable of eating pathology rather than an independent predictor or moderating variable.

Gender Differences in Eating Pathology

Research on eating pathology in men is limited (Garvin & Striegel-Moore, 2001). Findings suggest that men are more likely than women to engage in binge eating (Meyer et al., 2005). They are also less likely to engage in compensatory behaviors such as vomiting and more likely to engage in excessive exercise to compensate for the effects of binge eating (Fichter & Krenn, 2003). The results of this study were consistent with those
findings. Men had significantly higher levels of binge eating \( (M = 3.2, SD = 3.72) \) than women \( (M = 3.95, SD = 4) \). Men also endorsed using significantly more exercise to compensate \( (M = 12.69, SD = 9.64) \) than women \( (M = 16.48, SD = 11.36) \). This study is one of the first to directly compare the behavior of men and women on this variable.

Interestingly, there were no gender differences in depression. There is considerable research to suggest that women have a higher rate of depression than men do (Blehar & Oren, 1997; National Institute of Mental Health [NIMH], 2000). Despite the fact that there were no gender differences in depression, the CES-D scores for the sample were consistent with findings from previous studies. Radloff (1991) found that the mean CES-D score for a college sample was 15.46 \( (SD = 9.67) \). Furthermore, 40.65\% of the sample had a score at or above 16, the cutoff for depression. In this sample, the mean CES-D score was slightly higher \( (M = 15.2, SD = 10.56) \), and 41.1\% of the participants had a score above the cutoff. Moreover, there were no gender differences in perfectionism.

The present study makes a unique and meaningful contribution to the better understanding of the influence of thin-ideal internalization, perfectionism, and experiential avoidance on eating pathology. The use of structural equation modeling (SEM) allowed for the examination of the relationships among perfectionism, experiential avoidance, body dissatisfaction, dieting, thin-ideal internalization, binge eating, and purging. This study provides support for the idea that perfectionism is a risk factor for eating pathology, specifically binge eating. Furthermore, the results provide support for conceptualizing perfectionism as a unitary construct rather than a multidimensional construct. This study also provides preliminary evidence that
experiential avoidance is related to eating pathology. Despite measurement limitations of the AAQ, there was support for experiential avoidance as a mediator between body dissatisfaction, dieting, and thin-ideal internalization and binge eating.

Experiential avoidance has been conceptualized as a psychological construct that may underlie several disorders, including addictive behaviors (Hayes et al., 1996). Determining the role experiential avoidance plays in the development of eating pathology was of critical interest in this research as a means of beginning to understand its relationship to addictive behaviors, particularly behavioral addictions. There was support for experiential avoidance as a mediating variable between individual psychological factors and eating pathology. This finding provides evidence that experiential avoidance plays a role in at least one behavioral addiction. Future research should examine the role of experiential avoidance in other behavioral addictions, such as gambling and compulsive sexual behavior.

Eating pathology tends to be co-morbid with several other psychological disorders (O’Brien & Vincent, 2003). The support for experiential avoidance models of eating pathology may help explain the high degree of co-morbidity of eating pathology with depression and anxiety disorders. Given that experiential avoidance refers to attempts to avoid, suppress, or alter the form or frequency of negatively evaluated private events such as thoughts, emotions, and bodily sensations (Hayes & Wilson, 1994), it may have strong explanatory power as a psychological construct that underlies several psychological disorders. Acceptance and commitment therapy (ACT) is a psychotherapeutic modality that conceptualizes experiential avoidance as a core contributor to psychological distress, particularly anxiety disorders and depression.
Findings from this study suggest that ACT may also be a viable treatment option for eating-related pathology.

_Cautions and Limitations to Interpretation_

Several limitations of the study should be acknowledged. First, eating pathology variables, including binge eating, as well as height and weight were determined by self-report. Research has suggested that people may underreport or exaggerate behaviors such as binge eating as well as their height and weight (McCabe, McFarlane, Polivy, & Olmsted, 2000). However, participants in the current study were not undergoing or seeking treatment and would have little motivation to lie about their behaviors or weight status. Furthermore, self-report questionnaires have commonly been used in research on eating pathology (e.g., Stice et al., 1996; Stice, 2001).

Second, other variables, such as socioeconomic status (SES), peer influence, and race and ethnicity could have played a role in the relationship among psychological variables and eating pathology. These moderating variables were not controlled for in this study. There is some research to suggest that there are higher rates of eating pathology among women with high SES (Harrell & Gore, 1998). In addition, peer influence has been known to influence eating behaviors in young women (Vincent & McCabe, 2000). Moreover, some research shows that Caucasian women have a higher rate of eating pathology than African American, Asian, and Hispanic women (CDC, 2002; White, Kohlmaier, Varnado-Sullivan, & Williamson, 2003). Interestingly, recent research has suggested that eating pathology is becoming increasingly prevalent among many racial and ethnic groups (Gentile, Raghavan, Rajah, & Gate, 2007). Nonetheless, future
research should address the influence of race and ethnicity, SES, and peer influence on the relationship between psychological variables and eating pathology.

Third, the Acceptance and Action Questionnaire (AAQ) was used to assess experiential avoidance (Hayes et al., 2004). Unfortunately, the AAQ has not been well-researched and has only marginal internal consistency ($\alpha = .70$; Hayes et al., 2004). The internal consistency of the AAQ in this study was found to be $\alpha = .68$. The item “When I compare myself to other people, it seems that most of them are handling their lives better than I do” was the strongest indicator of experiential avoidance. Items such as “Anxiety is bad” and “I am unable to take action on a problem if I am uncertain what is the right thing to” were poor indicators of experiential avoidance. Additional research establishing the reliability and validity of the AAQ as a measure of experiential avoidance is needed. Moreover, measurement of experiential avoidance using physiological measures may prove more beneficial than self-report measures.

Finally, limitations with this study’s sample should be acknowledged. Participants in this study were Caucasian undergraduate students from one Midwest university. The sample of participants was drawn from an undergraduate population of 18,660 (60% female, 40% male). The majority of students were Michigan residents, and more than 70% worked full- or part-time. The mean age of the population was 23.5 years, which is slightly older than most undergraduate college populations. Caution should be exercised when generalizing these findings to other college students. In addition, this study had a cross-sectional design. Prospective and longitudinal studies would allow for the examination of the course or development of eating pathology. Furthermore, the online recruiting process yielded only an overall response rate of 10%. The low response rate
and the fact that this sample is of the university undergraduate student population should be taken into consideration when interpreting these results. Moreover, this sample contained many more women \((n = 257)\) than men \((n = 165)\). This finding is consistent with research, which suggests that women are more likely to participate in research studies than men (McCabe et al., 2006). Despite this fact, this is one of the first studies to directly compare women and men on eating-pathology-related variables.

There are several models of etiology for eating pathology, including the sociocultural, familial, and individual factors models. This study focused on sociocultural variables and individual factors. The sociocultural model purports that there is significant cultural pressure for women to be thin from the media, family, and peers (Striegel-Moore, Silberstein, & Rodin, 1986); and thus women may engage in eating-related pathology to achieve this ideal. The individual factors model posits that certain cognitions and behaviors are associated with eating pathology (Polivy & Herman, 2002). Research has shown that body dissatisfaction (Stice & Shaw, 2002), dieting (Stice, Mazotti, Krebs, & Martin, 1998), and depression (Stice, Akutagawa, Gaggar, & Agras, 2000) are significantly related to eating pathology. The findings of this study suggest that individual factors have strong explanatory power for the onset of eating pathology, particularly binge eating. This study showed that perfectionism and experiential avoidance, individual factors that have been less researched, are important variables related to eating pathology. More specifically, perfectionism alone was a better predictor of body dissatisfaction than thin-ideal internalization, which adds more support to the individual factors model of eating pathology. Furthermore, there was support for
experiential avoidance as a mediating variable between binge eating and thin-ideal internalization, body dissatisfaction, and dieting.
References


New York: Harpercollins.


Appendices

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Appendix A

Demographic/Background Questionnaire

Year of Birth: 19____

Number of years of college completed: ______ years (at EMU or elsewhere)

Gender:  □ Female  □ Male

If male, are you a member of a fraternity?  □ No  □ Yes
If female, are you a member of a sorority?  □ No  □ Yes

Some people identify themselves as belonging to one or more racial or ethnic groups. Please check the box(es) below which correspond to group(s) to which you belong:

□ White or Caucasian  □ Alaskan Native
□ Black or African-American  □ Asian
□ Hispanic or Latino  □ Pacific Islander
□ American Native  □ Other

Current Marital Status: (Check One Answer)
□ Single  □ Widowed
□ Married  □ Separated
□ Divorced  □ Living with same sex partner
□ Remarried  □ Living with opposite sex partner

Do you: (Check One Answer)
□ Live in a residence hall?
□ Commute?
□ Live within walking distance of classes?

Usual employment pattern: (Check One Answer)
□ Full-Time (>35 hrs/wk)
□ Part-Time (Regular hours)
□ Part-Time (Irregular hours)
□ Unemployed, full-time student
□ Unemployed, part-time student
□ Retired/Disabled
□ Military Service

Annual household income of family of origin: (Check One Answer)
□ $150,000 or more  □ $10,000-$24,999
□ $100,000-$149,999  □ ≤$9,999
□ $75,000-$99,999  □ Don’t know
□ $50,000-$74,999  □ Prefer not to say
How would you describe the **economic situation** of your family as you were growing up? (Check one)

- [ ] We had barely enough to get by
- [ ] We had enough to get by, but no more
- [ ] We were solidly middle class
- [ ] We had plenty of “extras”
- [ ] We had plenty of “luxuries”
- [ ] Don’t know/unsure/prefer not to say

Current weight: ________ pounds

Height: _______ feet _______ inches

Within the last year have you participated in any of the following activities?

- [ ] Intercollegiate Athletics
  - [ ] No
  - [ ] Yes

- [ ] Intramural or Club Sports
  - [ ] No
  - [ ] Yes

In your lifetime, have you ever smoked one cigarette (even a puff)?  
- [ ] No
- [ ] Yes

In your lifetime, have you ever used smokeless tobacco?  
- [ ] No
- [ ] Yes

How many cigarettes have you smoked during the past 30 days? ________

Have you smoked a total of 100 cigarettes in your lifetime?  
- [ ] No
- [ ] Yes

Some of the following questions ask about how much you drink. A “drink” means any of the following:

- A 12-ounce can or bottle of beer
- A 4-ounce glass of wine
- A 12-ounce bottle or can of wine cooler
- A shot of liquor straight or in a mixed drink

On **how many occasions** have you had alcoholic beverages to drink?

In your lifetime? __________________

During the last 12 months? ____________

During the last 30 days? ____________
In the **past 30 days**, when you drank alcohol, how many drinks per occasion did you usually have? (Choose one answer.)

1 drink ______
2 drinks ______
3 drinks ______
4 drinks ______
5 drinks ______
6 drinks ______
7 drinks ______
8 drinks ______
9 or more drinks ______

**MALES:**
Think back over the **LAST 30 Days**. How many times have you had 5 or more drinks in a row? (A "drink" is a 4 oz. glass of wine, a 12-oz. bottle of beer, a wine cooler, a shot glass of liquor, or a mixed drink.) ___________ times

**FEMALES:**
Think back over the **LAST 30 Days**.
How many times have you had 4 or more drinks in a row? (A "drink" is a 4 oz. glass of wine, a 12-oz. bottle of beer, a wine cooler, a shot glass of liquor, or a mixed drink.) ___________ times

On how many occasions in the **PAST 12 MONTHS** have you used the following types of drugs? **DO NOT** include drugs used under a doctor's prescription.

Marijuana or hashish ("hash") _______ times
Cocaine in any form (e.g., "power," "crack," "freebase") _______ times
LSD ("acid") _______ times
Crystal meth ("ice") _______ times
Heroin _______ times
Inhalants (e.g., glue, aerosol spray, nitrites) _______ times
Ecstasy (MDMA) _______ times
Anabolic steroids _______ times
Based on a DOCTOR'S PRESCRIPTION, on how many occasions in the PAST 12 MONTHS have you used the following types of drugs?

Sleeping medication (e.g., Ambien, Halcion, Restoril, temazepam, triazolam) _______

Sedative/anxiety medication (e.g., Ativan, Xanax, Valium, Klonopin, diazepam) _______

Stimulant medication (e.g., Ritalin, Dexedrine, Adderall, Concerta) _____

Pain medication (e.g., opioids such as Vicodin, OxyContin, Tylenol 3 with codeine, Percocet, Darvocet, morphine, hydrocodone, oxycodone) _______

Anti-depressant medication (e.g., Prozac, Paxil, Zoloft, Wellbutrin, Effexor) _______

Asthma inhaler (e.g., Albuterol) _______

Mood stabilizer (e.g., Lithium, Depakote, Tegretol) _______

How many hours of sleep do you get during the average night? _____

On a scale from 1-10 (1 = poor, 10 = excellent), how would you rate the quality of your sleep? _____

On a scale from 1-10 (1 = poor, 10 = excellent), how would you rate your overall health? _____

On a scale from 1-10 (1 = low, 10 = high), what is your current stress level? _____

In the PAST 12 MONTHS, with how many different people have you had sexual intercourse? _____

In the PAST 12 MONTHS, how many times have you had sexual intercourse? _____
Appendix B

Body Esteem Scale (BES)

Below is a list of physical dimensions and attributes. Please indicate your **current** feelings about each dimension or attribute.

<table>
<thead>
<tr>
<th>Physical Dimension</th>
<th>Feeling Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Scent</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Appetite</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Nose</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Physical Stamina</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Reflexes</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Lips</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Muscular Strength</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Waist</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Energy Level</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Thighs</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Ears</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Biceps</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Chin</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Body Build</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Physical Coordination</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Buttocks</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Agility</td>
<td>I have strong negative feelings</td>
</tr>
<tr>
<td>Body Part</td>
<td>Strong Negative Feelings</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Width of Shoulders</td>
<td>□</td>
</tr>
<tr>
<td>Arms</td>
<td>□</td>
</tr>
<tr>
<td>Chest or Breasts</td>
<td>□</td>
</tr>
<tr>
<td>Appearance of Eyes</td>
<td>□</td>
</tr>
<tr>
<td>Cheeks/Cheekbones</td>
<td>□</td>
</tr>
<tr>
<td>Hips</td>
<td>□</td>
</tr>
<tr>
<td>Legs</td>
<td>□</td>
</tr>
<tr>
<td>Figure/Physique</td>
<td>□</td>
</tr>
<tr>
<td>Sex Drive</td>
<td>□</td>
</tr>
<tr>
<td>Feet</td>
<td>□</td>
</tr>
<tr>
<td>Sex Organs</td>
<td>□</td>
</tr>
<tr>
<td>Appearance of Stomach</td>
<td>□</td>
</tr>
<tr>
<td>Health</td>
<td>□</td>
</tr>
<tr>
<td>Sex Activities</td>
<td>□</td>
</tr>
<tr>
<td>Body Hair</td>
<td>□</td>
</tr>
<tr>
<td>Physical Conditions</td>
<td>□</td>
</tr>
<tr>
<td>Face</td>
<td>□</td>
</tr>
<tr>
<td>Weight</td>
<td>□</td>
</tr>
</tbody>
</table>
Appendix C

Eating Disorder Examination-Questionnaire (EDE-Q)\textsuperscript{3}

**Instructions:** The following questions are concerned with the past four weeks (28 days) only. Please read each question carefully. Please answer all of the questions.

Questions 1-12: Please circle the appropriate number on the right.

<table>
<thead>
<tr>
<th>On how many of the past 28 days …</th>
<th>No days</th>
<th>1-5 days</th>
<th>6-12 days</th>
<th>13-15 days</th>
<th>16-22 days</th>
<th>23-27 days</th>
<th>Every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you been deliberately trying to limit the amount of food that you eat to influence your shape or weight (whether or not you have succeeded)?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. Have you tried to exclude from your diet any foods that you like in order to influence or shape or weight (whether or not you have succeeded)?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. Have you tried to follow definite rules regarding your eating (for example, a calorie limit) in order to influence or shape or weight (whether or not you have succeeded)?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5. Have you had a definite desire to have an empty stomach with the aim of influencing you shape or weight?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. Have you had a definite desire to have a totally flat stomach?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

\textsuperscript{3} Permission to use the EDE-Q was obtained from Christopher Fairburn, D.M., FRCPsych., F.Med.Sci via email on January 17, 2007.
On how many of the past 28 days …

<table>
<thead>
<tr>
<th>Question</th>
<th>No days</th>
<th>1-5 days</th>
<th>6-12 days</th>
<th>13-15 days</th>
<th>16-22 days</th>
<th>23-27 days</th>
<th>Every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Has thinking about food, eating, or calories made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. Has thinking about shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9. Have you had a definite fear of losing control over eating?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10. Have you had a definite fear that you might gain weight?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11. Have you felt fat?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12. Have you had a strong desire to lose weight?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Questions 13-18: Please fill in the appropriate number in the boxes on the right.

<table>
<thead>
<tr>
<th>Question</th>
<th>1-5 days</th>
<th>6-12 days</th>
<th>13-15 days</th>
<th>16-22 days</th>
<th>23-27 days</th>
<th>Every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Over the past 28 days, how many TIMES have you eaten what other people would regard as “an unusually large amount of food” (given the circumstances)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Over the past 28 days, on how many DAYS have such episodes of overeating occurred (i.e., you have eaten an usually large amount of food and have had a sense of loss of control at the time)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Over the past 28 days, how many TIMES have you made yourself sick (vomit) as a means of controlling your shape or weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
17. Over the past 28 days, how many TIMES have you taken laxatives as a means of controlling your shape or weight? __________

18. Over the past 28 days, how many TIMES have you exercised in a “driven” or “compulsive” as a means of controlling your weight, shape, or amount of fat, or to burn off calories? __________

*Over the past 28 days, how many TIMES have you used diuretics as a means of controlling your shape or weight? __________

*Over the past 28 days, how many TIMES have you starved yourself as a means of controlling your shape or weight? __________

*Over the past 28 days, how many TIMES have you taken diet pills as a means of controlling your shape or weight? __________

*Over the past 28 days, how many TIMES have you smoked cigarettes as a means of controlling your shape or weight? __________

Questions 19-21: Please circle the appropriate number. Please note that for these questions the term “binge eating” means what others would regard as an usually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

<table>
<thead>
<tr>
<th>19. Over the past 28 days, on how many days have you eaten in secret (Do not count episodes of binge eating)?</th>
<th>No days</th>
<th>1-5 days</th>
<th>6-12 days</th>
<th>13-15 days</th>
<th>16-22 days</th>
<th>23-27 days</th>
<th>Every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>20. On what proportion of the time that you have eaten have you felt guilty (felt that you have done wrong) because of its effect on your shape or weight (Do not count episodes of binge eating)?</th>
<th>None of the times</th>
<th>A few of the times</th>
<th>Less than half of the time</th>
<th>Half of the time</th>
<th>More than half of the time</th>
<th>Most of the time</th>
<th>Every time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>21. Over the past 28 days, how concerned have you been about other people seeing you eat?</th>
<th>Not at all</th>
<th>Slightly</th>
<th>Moderately</th>
<th>Markedly</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

*Questions not included in original EDE-Q
Questions 22-28: Please circle the appropriate number on the right.

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all</th>
<th>Slightly</th>
<th>Moderately</th>
<th>Markedly</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. Over the past 28 days, has your WEIGHT influenced how you think about (judge) yourself as a person?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>23. Over the past 28 days, has your SHAPE influenced how you think about (judge) yourself as a person?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>24. Over the past 28 days, how much would it have upset you if you had been asked to weigh yourself once a week (no more or less often) for the next four weeks?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>25. Over the past 28 days, how dissatisfied have you been with your WEIGHT?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>26. Over the past 28 days, how dissatisfied have you been with your SHAPE?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>27. Over the past 28 days, how uncomfortable have you felt seeing your body (for example, in the mirror, in shop window reflections, while undressing, or taking a shower or bath)?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>28. Over the past 28 days, how uncomfortable have you felt others seeing your body (for example, in communal changing rooms, when swimming, or wearing tight clothes)?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix D

Center for Epidemiologic Studies-Depression Scale (CES-D)

Below is a list of the ways you might have felt or behaved. Please indicate how often you have felt this way during the PAST WEEK.

Rarely or none of the time (less than 1 day)
Some or a little of the time (1-2 days)
Occasionally or a moderate amount of time (3-4 days)
Most or all of time (5-7 days)

1. I was bothered by things that usually don’t bother me. Rare Some Occasionally Most

2. I did not feel like eating; my appetite was poor. Rare Some Occasionally Most

3. I felt that I could not shake off the blues even with help from my family or friends. Rare Some Occasionally Most

4. I felt that I was just as good as other people. Rare Some Occasionally Most

5. I had trouble keeping my mind on what I was doing. Rare Some Occasionally Most

6. I felt depressed. Rare Some Occasionally Most

7. I felt that everything I did was an effort. Rare Some Occasionally Most

8. I felt hopeful about the future. Rare Some Occasionally Most

9. I thought my life had been a failure. Rare Some Occasionally Most

10. I felt fearful. Rare Some Occasionally Most

11. My sleep was restless. Rare Some Occasionally Most

12. I was happy. Rare Some Occasionally Most

13. I talked less than usual. Rare Some Occasionally Most

14. I felt lonely. Rare Some Occasionally Most

15. People were unfriendly. Rare Some Occasionally Most

16. I enjoyed life. Rare Some Occasionally Most

17. I had crying spells. Rare Some Occasionally Most

18. I felt sad. Rare Some Occasionally Most

19. I felt that people dislike me. Rare Some Occasionally Most

20. I could not get “going”. Rare Some Occasionally Most
Appendix E

Dutch Restrained Eating Scale (DRES)

The following is a list of questions regarding your eating habits.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Occasionally</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When you have put on weight do you eat less than you usually do?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Do you try to eat less at meal-times than you would like to eat?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. How often do you refuse food or drink offered you because you are concerned about your weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Do you watch exactly what you eat?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Do you deliberately eat foods that are slimming?</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>6. When you have eaten too much do you eat less than usual the following day?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Do you deliberately eat less in order not to become heavier?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. How often do you try not to eat between meals because you are watching your weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. How often in the evenings do you try not to eat because you are watching your weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Do you take your weight into account with what you eat?</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix F
Commitment to Exercise Scale (CES)

1. How important do you think it is to your general well-being not to miss your exercise session?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at All important</td>
<td>Very Important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Does it upset you if, for one reason or another, you are unable to exercise?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Always upset</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. If you miss an exercise session, or several sessions, do you try to make them up by putting in more time when you get back?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Always</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Do you have a set routine for your exercise sessions, e.g. the same time of day, same location, same number of laps, particular exercises, and so on?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No routine</td>
<td>Strict routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Do you continue to exercise at times when you feel tired or unwell?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Always</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Do you continue to exercise even when you have sustained an exercise-related injury?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Always</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. Do you feel “guilty” that you have somehow “let yourself down” when you miss your exercise session?

0  1  2  3  4  5  6  7  8  9  10

Not at all               A great deal

8. Are there times when you turn down an invitation to an interesting social event because it interferes with your exercise schedule?

0  1  2  3  4  5  6  7  8  9  10

Never              Always
Appendix G

Acceptance and Action Questionnaire (AAQ)

Below you will find a list of statements. Please rate the truth of each statement as it applies to you. Use the following scale to make your choice.

1. I am able to take action on a problem even if I am uncertain what is the right thing to do.
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6
   - [ ] 7

2. I often catch myself daydreaming about things I’ve done and what I would do differently next time.
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6
   - [ ] 7

3. When I feel depressed or anxious, I am unable to take care of my responsibilities.
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6
   - [ ] 7

4. I rarely worry about getting my anxieties, worries, and feelings under control.
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6
   - [ ] 7

5. I’m not afraid of my feelings.
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6
   - [ ] 7

6. When I evaluate something negatively, I usually recognize that this is just a reaction, not an objective threat.
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6
   - [ ] 7

7. When I compare myself to other people, it seems that most of them are handling their lives better than I do.
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6
   - [ ] 7

8. Anxiety is bad.
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6
   - [ ] 7

9. If I could magically remove all the painful experiences I’ve had in my life, I would do so.
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6
   - [ ] 7
Appendix H
Frost Multidimensional Perfectionism Scale (MPSF)

Read each of the following statements and decide how much you agree or disagree.

Strongly agree (SA) = 5  
Agree (A) = 4  
Neutral (N) = 3  
Disagree (D) = 2  
Strongly disagree (SD) = 1

<table>
<thead>
<tr>
<th>Statement</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My parents set high standards for me.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. Organization is very important to me.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. As a child I was punished for doing things less than perfect.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. If I do not set the highest standards for myself, I am likely to end up a second rate person.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. My parents never tried to understand my mistakes.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6. It is important to me that I be thoroughly competent in everything I do.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>7. I am a neat person.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>8. I try to be an organized person.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>9. If I fail at work/school, I am a failure as a person.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>10. I should be upset if I make a mistake.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>11. My parents wanted me to be the best at everything.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>12. I set higher goals than most people.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>13. If someone does a task at work/school better than I, then I feel like I failed the whole task.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>14. If I fail partly, it’s as bad as being a complete failure.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>15. Only outstanding performance is good enough in my family.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>16. I am very good at focusing my efforts on obtaining a goal.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>17. Even when I do something very carefully, I often feel that it is not quite right</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>18. I hate being less than the best at things.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>19. I have extremely high goals.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>20. My parents have expected excellence from me.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>21. People will probably think less of me if I make a mistake.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>22. I never felt like I could meet my parents’ expectations.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>23. If I do not do as other people, it means I am an inferior human being.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>24. Other people seem to accept lower standards from themselves than I do.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Strongly agree (SA) = 5
Agree (A) = 4
Neutral (N) = 3
Disagree (D) = 2
Strongly disagree (SD) = 1

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>25. If I do not do well all the time, people will not respect me.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>26. My parents have always had higher expectations for my future than I have.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>27. I try to be a neat person.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>28. I usually have doubts about the simple everyday things I do.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>29. Neatness is very important to me.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>30. I expect higher performance in my daily tasks than most people.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>31. I am an organized person.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>32. I tend to get behind in my work because I repeat things over and over.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>33. It takes me a long time to do something “right.”</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>34. The fewer the mistakes I make, the more people will like me.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>35. I never felt like I could meet my parents’ standards.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Appendix I

Sociocultural Attitudes Toward Appearance Questionnaire-3 (SATAQ-3)

Read each of the following statements and decide how much you agree or disagree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I would like my body to look like the people who are on TV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I compare my body to the bodies of TV and movie stars.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I would like my body to look like the models who appear in magazines.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4. I wish I looked as athletic as the people in magazines.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I compare my appearance to the appearance of TV and movie stars.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I would like my body to look like the people who are in the movies.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I compare my body to that of people in “good shape.”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I compare my body to the bodies of people who appear in magazines.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I wish I looked as athletic as sports stars.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I wish I looked like the models in music videos.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
11. I compare my appearance to the appearance of people in magazines.

12. I compare my body to that of people who are athletic.

13. I try to look like the people on TV.

Appendix J

Participant Contact Email

Initial Email

Dear Student,

My name is Lindsay King, and I am a doctoral candidate in clinical psychology at EMU. You have been selected to participate in my dissertation study entitled *Eating, Emotion, and Exercise: A Web Survey*. Participating in this study involves completing an online survey that should take no more than 30 minutes. Taking part in this study is completely voluntary.

If you participate, you will be asked questions about your body image, your mood, your weight history, your physical activity levels, and your smoking habits. Participants who complete the survey are eligible to win one of three mall gift certificates valued at $250, $125, or $75.


Thank you,

Lindsay King

Follow-up Email

Dear Student,

My name is Lindsay King, and I am a doctoral candidate in clinical psychology at EMU. You have been selected to participate in my dissertation study entitled *Eating, Emotion, and Exercise: A Web Survey*. I want to extend a thank you to those of you who have already participated. For those of you who have not yet participated, the study involves completing an online survey that should take no more than 30 minutes.

If you participate, you will be asked questions about your body image, your mood, your weight history, your physical activity levels, and your smoking habits. Participants who complete the survey are eligible to win one of three mall gift certificates valued at $250, $125, or $75.


Thank you,

Lindsay King
Appendix K

Informed Consent

Eating, Emotion, and Energy: A Web Survey

Thank you for participating in this research project about eating-related attitudes, behaviors, and thoughts. Before you agree to continue, you need to know why we are doing this research, what we will be asking you to do, and that your participation will be completely anonymous. Please read the following information carefully.

What will you have to do? In this study, you will be asked to fill out an online survey that will take about 30 minutes to complete. Questions on the survey will ask about your body image, your mood, your weight history, your physical activity levels, and your smoking habits. Additional demographic and background information such as your age, weight, marital status, and employment will also be asked.

Who are the researchers? This study is being conducted by Lindsay King, doctoral candidate, and Dr. Silvia von Kluge, both in the Department of Psychology at Eastern Michigan University.

What do they hope to find out? The researchers are trying to understand the relationship between emotions and eating pathology in men and women.

Why is this research important? The relationship between emotions and eating pathology is unclear. The research team is hopeful that the information obtained through this research will contribute to our understanding of what factors play a role in the development of eating pathology in order to help people develop and maintain healthy eating habits.

Who can participate? To take part in this study, you must be at least 18 years old.

How will your privacy and confidentiality be respected? Your responses are confidential and will remain anonymous because no personally identifying information is included in the questionnaires. Your answers will be identified by a code number only. However, the Institutional Review Board at Eastern Michigan University or federal agencies with appropriate regulatory oversight may review the records.

What if you decide to stop? Taking part in this study is completely voluntary and you have the right to stop participating at any time. We appreciate as much information as you are comfortable providing.
**What are the risks?** There are no known or anticipated risks of participating in this study. If, however, answering this survey causes you distress for which you might like some assistance, please note that low cost psychological services may be available through the EMU Psychology Clinic (734.487.4987).

**Is there compensation?** Upon completion of the questionnaire, you will be directed to a website where you will enter your email address for a chance to win one of three mall gift certificates valued at $250, $125, and $75.

**What will be done with the results?** The results will be sent to scientific journals for publication and to professional conferences for presentation to other professionals. As a participant, you are entitled to meet with the researchers to obtain the results of the study and for any other questions or concerns.

**What if you feel that you know enough about the study and wish to take part?** By completing and submitting the questionnaire, you will be giving informed consent for the researchers to use the information you provide.

**Whom should you contact if you have questions about your rights as a research participant?** You may contact the Eastern Michigan University Institutional Human Subjects Review Committee. This research protocol has been reviewed and approved by the Eastern Michigan University Human Subjects Review Committee. If you have questions about the approval process, please contact Dr. Deb de Laski-Smith (734.487.0042, Interim Dean of the Graduate School and Administrative Co-chair of UHSCR, human.subjects@emich.edu).

**Whom should you contact if you have questions about the study?** Please contact Lindsay King (734.487.4987 or lking3@emich.edu) or Dr. Silvia von Kluge (734.487.1155 or svonkluge@emich.edu) of the Eastern Michigan University Department of Psychology if you have any questions or concerns.

If you have read all of the above and would like to take part in this study, click the next button below. By doing so, you are giving informed consent for us to use your responses in this study.

If you do not wish to take part in this study, just close this window.
Appendix L

Human Subjects Approval

EASTERN MICHIGAN UNIVERSITY

January 11, 2007

Lindsay King
3195 Asher Road
Ann Arbor, MI 48104

Dear Lindsay King:


After careful review of your completion application, the IRB determined that the rights and welfare of the individual subjects involved in this research are carefully guarded. Additionally, the methods used to obtain informed consent are appropriate, and the individuals participating in your study are not at risk.

You are reminded of your obligation to advise the IRB of any change in the protocol that might alter your research in any manner that differs from that upon which this approval is based. Approval of this project applies for one year from the date of this letter. If your data collection continues beyond the one-year period, you must apply for a renewal.

On behalf of the Human Subjects Committee, I wish you success in conducting your research.

Sincerely,

Deb de Laski-Smith, Ph.D.
Interim Dean
Graduate School
Administrative Co-Chair
University Human Subjects Review Committee

Note: If project continues beyond the length of one year, please submit a continuation request form by 1/12/08.