Examining a Multidimensional Model of Eating Disorder Symptomatology Among College Women

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Despite many theorists’ assertions and researchers’ findings that eating disturbances have personal, sociocultural, and relational correlates, no model of eating disorder symptomatology incorporating all 3 of these domains has been proposed. The purpose of this study, then, was to examine empirically such a model. Personal, sociocultural, and relational variables were chosen, based on their solid relations with eating disorder symptomatology, to be included within the model. Theoretical frameworks and empirical findings were used to specify variable relations and paths, and the model was tested via structural equation modeling with data from 463 college women. As expected, the model fit the data adequately, and sociocultural, personal, and relational variables all made unique contributions within the model. Most model predictions were supported, and personal and relational variables were found to fully mediate the effects of the sociocultural variable on disordered eating scores.

Recently, it has been strongly recommended (e.g., Hotelling, 2001; Striegel-Moore & Cachelin, 2001) that counseling psychologists attend to openings that exist for furthering the research literature on eating disorders. Of the various suggestions made to extend knowledge within this area, moving beyond cataloging correlates of eating disorders to integrating them within models that serve to predict eating disorder symptomatology is underscored (Kashubeck-West & Mintz, 2001; Striegel-Moore & Cachelin, 1999). Indeed, such models are needed, as they explain how variables combine with one another to predict eating disorder symptomatology among women (Mazzeo & Espelage, 2002).

Because several professionals (e.g., Leung, Geller, & Katzman, 1996; Mintz & Wright, 1993; Striegel-Moore & Cachelin, 1999, 2001) have asserted that eating disorders have sociocultural (e.g., cultural pressures for thinness), personal (e.g., personality, behavioral, cognitive, and affective variables), and relational (e.g., supportive social networks) correlates, variables representing these three domains were addressed in the present research. We modeled the multifactorial nature of eating disorders, as the unidimensional nature of much extant research on eating disorders minimizes their complexity (Leung et al., 1996; Schmidt, 2003; Stice, 2002). Some extant theoretical frameworks (e.g., Fredrickson & Roberts, 1997; Stice, Nemeroff, & Shaw, 1996) do attempt to explain the relations among multiple variables in the prediction of women’s eating disorder symptomatology; however, these frameworks do not include variables representing all three domains (i.e., personal, sociocultural, and relational).

The purpose of this study, then, was to examine empirically a multidimensional model of eating disorder symptomatology that included sociocultural, personal, and relational correlates with a sample of college women. When defining the eating disorder symptomatology criterion variable, we considered many professionals’ recommendations that eating disorder symptomatology should be conceptualized along a continuum of degree that ranges from no symptoms of eating disorders to bona fide clinical eating disorders (e.g., Hotelling, 2001; Mazzeo & Espelage, 2002; Tylka & Subich, 1999, 2002a), as women at different points on the continuum experience different levels of psychological and physical sequelae (Ackard, Croll, & Kearney-Cooke, 2002). This conceptualization seemed particularly appropriate for the present research, as it is supported empirically in many studies of eating-disordered behavior among college women (e.g., Tylka & Subich, 2003).

Furthermore, Stice, Killen, Hayward, and Taylor (1998) recently argued that studies supporting the construct validity of a continuum of eating disorders (e.g., Mintz & Betz, 1988; Stice, Ziemba, Margolis, & Flick, 1996) generally have been found to hold greater statistical power and have used more psychometrically sound measures to classify women along the continuum than have studies not supporting the validity of a continuum of eating disorders (e.g., Ruderman & Besbeas, 1992). Relatedly, when researchers have followed taxometric guidelines set forth by Waller and Meehl (1998), their ensuing taxometric investigations have been supportive of the eating disorder continuum (Tylka & Subich, 2003). Waller and Meehl’s guidelines state that researchers should not choose indicators confounded with the criterion or concoct samples by mixing equal numbers of individuals from a...
proposed taxon group (e.g., women with clinical eating disorders) with individuals from a nontaxon group (e.g., women without eating disorders). Not following these guidelines, such as in the case of some studies suggestive of the discontinuity of eating disorders (e.g., Gleave, Lowe, Snow, Green, & Murphy-Eberenz, 2000), likely biased results and increased the likelihood that discontinuity was supported.

In research examining eating disorders along a continuum, two methods of operationalizing degrees of eating disorder symptomatology are represented most commonly. Some researchers use continuous scores on a measure of symptomatology (e.g., Eating Attitudes Test-26 [EAT-26]; Garner & Garfinkel, 1979); others place individuals into ordinal categories on the basis of their level of eating disturbance (e.g., Questionnaire for Eating Disorder Diagnoses [Q-EDD]; Mintz, O’Halloran, Mulholland, & Schneider, 1997). Both methods have merit, so we chose to explore both so as to determine whether they would be predicted similarly by the personal, sociocultural, and relational variables.

We further consulted the theoretical and empirical literature to identify (a) sociocultural, personal, and relational variables that consistently predict eating disorder symptomatology among women; and (b) theoretical frameworks or models describing the relations and paths among these variables. This review of the literature revealed that sociocultural, personal, and relational variables have been assessed almost exclusively via self-report questionnaires taken by the participants and not through observation of their actual sociocultural environment (for sociocultural variables) or interactions with significant others (for relational variables). Assessment of these sociocultural and relational variables, then, could be confounded somewhat with participant perceptions that may or may not be grounded in reality (Sarason et al., 1991). Although we recognize that the distinctions between these three types of variables are not always clear, we chose to follow the extant literature and classified a variable as sociocultural if it encompassed the woman’s perceptions of exposure to societal, cultural, and/or media messages or influences; relational if it characterized the woman’s assessment of relationship quality or interactions with significant others; and personal if it included the woman’s perceptions of her personality, cognitive, affective, and/or behavioral characteristics or the extent to which she endorses sociocultural messages or influences.

Across several studies (e.g., Brookings & Wilson, 1994; Grisset & Norvell, 1992; Pike, 1995; Stice, Nemeroff, & Shaw, 1996; Tylka & Subich, 1999), one sociocultural variable (i.e., pressure for thinness), four personal variables (i.e., internalization of the thin-ideal stereotype, negative affect, body image disturbance, poor interoceptive awareness), and one relational variable (i.e., social support) were found to have moderate to strong relations with eating disturbances. Many of these variables also are considered to be fundamental in extant theoretical frameworks predicting eating disorder symptomatology among women (e.g., Fredrickson & Roberts, 1997; Stice, Nemeroff, & Shaw, 1996; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). In the following sections, these variables, and theoretical propositions regarding how they combine with one another to predict eating disorder symptomatology, are discussed.

Sociocultural Factor

Sociocultural (e.g., media, family, peer, and partner) pressures for thinness have long been implicated in the development and maintenance of disordered eating behavior among women (e.g., Stice, 1994; Striegel-Moore, Silberstein, & Rodin, 1986). In fact, researchers have found that pressures to be thin are related to eating disorder symptomatology among samples of adolescent (Pike, 1995) and college (Stice, Ziemba, et al., 1996) women.

Articulating the role of sociocultural pressures in eating disorder symptomatology, Stice, Nemeroff, and Shaw (1996) speculated that pressure for thinness directly influences women’s tendencies to experience higher levels of two relevant personal variables: internalization of the thin-ideal stereotype and body image disturbance. Specifically, these authors articulated that when women are surrounded by pressures to lose weight from significant others in their lives, from media that associate thinness with well-being and success, or both, they are likely to internalize this thin-ideal image. Also, these authors suggested that, because media promote a standard of thinness that is impossible for most women to attain, women are left feeling negatively toward their bodies, and that the more women feel pressured to be thin, the more they experience body image disturbance.

Similarly, Fredrickson and Roberts (1997) proposed in their objectification theory that sociocultural variables work together with psychological variables to predict disordered eating among women. Within objectification theory, experiences with sexual objectification lead women to self-objectify and experience body shame. It could be argued convincingly that sociocultural pressures for thinness are one form of sexual objectification in that how women appear to others is strongly emphasized (Pipher, 1994). Living in a culture in which women’s bodies are sexually objectified in the form of being critiqued on the basis of weight, women learn to equate their own self-worth with their appearance, treating themselves as objects to be observed and evaluated and, consequently, experiencing higher levels of self-objectification, or more specifically, internalization of the thin-ideal stereotype (Fredrickson & Roberts, 1997). Pressure for thinness also is proposed to lead women to experience directly shame toward their bodies, as being critiqued on the basis of weight contributes to body image disturbance (Fredrickson & Roberts, 1997). Therefore, according to objectification theory, pressure for thinness (i.e., sexual objectification) predicts both internalization of the thin-ideal stereotype (i.e., self-objectification) and body image disturbance.

Lastly, some theorists (e.g., Maine, 2000; Pipher, 1994; Thompson et al., 1999) have suggested that sociocultural pressures for thinness directly predict perceptions of poor social support and negative affect (e.g., low self-esteem) among women. Being pressured by significant others to be something one is not (e.g., thin) likely leads to feeling unsupported (Pipher, 1994). Also, as women in the United States are socialized to equate their self-worth with their appearance (Fredrickson & Roberts, 1997), perceptions of pressures to be thin from media and significant others likely foster the conclusion that one’s appearance is unsatisfactory and contribute to lowered self-esteem. Indeed, within their theoretical model of eating disorder symptomatology, Thompson et al. (1999) suggested that pressure for thinness directly predicts negative affect.

The propositions set forth by Stice, Nemeroff, and Shaw (1996) and Fredrickson and Roberts (1997) are supported empirically.
Among samples of college women, pressure for thinness directly predicts unique variance in body dissatisfaction, even above and beyond the variance accounted for by internalization of the thin-ideal stereotype (Stice, Nemeroff, & Shaw, 1996). Among adolescent women, longitudinal analyses indicate that pressure for thinness is predictive of future levels of body dissatisfaction (Thompson, Coover, Richards, Johnson, & Cattarin, 1995). To our knowledge, no research to date has examined whether pressure for thinness directly predicts negative affect or poor social support, but on the basis of the theory of Thompson et al. (1999) and Pipher (1994), these relations seem defensible. Therefore, in the model designed for the present study (see Figure 1), it was specified that pressure for thinness predicts internalization of the thin-ideal stereotype (Path a), body image disturbance (Path b), poor friend (Path c) and family (Path d) social support, and negative affect (Path e).

Finally, because prominent theorists in the area of disordered eating among women (e.g., Stice, 1994; Stice, Nemeroff, & Shaw, 1996; Thompson et al., 1999) have proposed that sociocultural pressure for thinness only indirectly influences eating disorder symptomatology through its relations with personal and relational variables, we anticipated that personal and relational variables, as a set, fully mediate the relation between the sociocultural variable (i.e., pressure for thinness) and eating disorder symptomatology. This assertion has not yet been examined empirically via tests of mediation, so in addition to the other hypotheses articulated, we tested whether the fit of our model without the direct pressure for thinness–eating disorder symptomatology path differed from the fit of the model when such a path was included.

Personal Factors

Internalizing societal ideals of thinness is related to eating disorder symptomatology among samples of college women (Heinberg, Thompson, & Stormer, 1995; Stice, Ziemba, et al., 1996). The manner in which internalization of societal ideals of thinness functions is described in theoretical models proposed by Stice, Nemeroff, and Shaw (1996) and Fredrickson and Roberts (1997), who suggest that internalization of the thin-ideal stereotype, or self-objectification, predicts unique variance in body image disturbance. Women who internalize societal messages regarding ideals for attractiveness often compare their bodies with these societal ideals (Stice, 1994). As these ideals are impossible for most women to attain (e.g., Maine, 2000), they are left feeling negatively toward their bodies (Fredrickson & Roberts, 1997). This proposition is supported in numerous studies. Using samples of college women, researchers have found that self-objectification (or internalization of the thin-ideal stereotype) predicts unique variance in body image disturbance (e.g., Noll & Fredrickson, 1998). Internalization of the thin-ideal stereotype, then, is expected to predict body image disturbance within the model designed for the present study (see Path f in Figure 1).

Body image disturbance (defined in this study as body dissatisfaction, body shame, and body preoccupation with size and shape) consistently has been identified as the single strongest predictor of eating disorder symptomatology among women (e.g., Cattarin & Thompson, 1994; Phelps, Johnston, & Augustyniak, 1999). Acknowledging body image disturbance’s substantial role in predicting women’s levels of eating disturbance, researchers...
(e.g., Fredrickson & Roberts, 1997; Stice, Nemeroﬀ, & Shaw, 1996; Thompson et al., 1995) often place it in a central position in their models, suggesting that it is predicted by sociocultural pressures for thinness and by internalization of these pressures, and that it predicts eating disorder symptomatology. Proponents of such models suggest individuals with higher levels of body image disturbance are more likely to engage in attempts to modify their bodies through engaging in maladaptive weight control techniques than are individuals with lower levels of body image disturbance. Also, body image disturbance has been theorized to predict women’s poor interoceptive awareness (i.e., diﬃculty identifying emotions and signals of hunger and satiety). Objectification theory (Fredrickson & Roberts, 1997) suggests that women who feel shameful toward the size of their bodies try to decrease this shame by suppressing their hunger and satiety cues (and as a result, other internal cues) in an attempt to lose weight.

Research has supported such propositions among college women. Noll and Fredrickson (1998) found that body image disturbance predicted eating disorder symptomatology, and Mühlens-kamp and Saris-Buglama (2002) found that body shame predicted poor interoceptive awareness. Prospective studies (e.g., Cattarini & Thompson, 1994; Stice & Agras, 1998; Stice, Mazotti, Krebs, & Martin, 1998) also strongly support body dissatisfaction as a risk factor in the development of eating disturbances in that it oﬀered unique variance in the prediction of subsequent levels of eating disorder symptomatology above that accounted for by other variables such as body mass, general psychopathology, and/or internalization of the thin-ideal stereotype. Therefore, in the model created for the present study (see Figure 1), body image disturbance is anticipated to predict unique variance in both eating disorder symptomatology (Path g) and poor interoceptive awareness (Path h).

Negative affect, reﬂecting both neuroticism and low self-esteem (Watson, Suls, & Haig, 2002), is another personal factor and one that subsumes many other factors related to disordered eating, namely depression, anxiety, irrational cognitions, maladaptive coping, and a lack of impulse control (Costa & McCrae, 1992). Much empirical research has supported the relation of neuroticism and self-esteem with eating disturbances among college women (Brookings & Wilson, 1994; Lester & Petrie, 1998; Mintz & Betz, 1988; Tylka & Subich, 1999). Additionally, low self-esteem has been found to predict future levels of eating disorder symptomatology among adolescent women (Button, Sonuga-Barke, Davies, & Thompson, 1996).

Many scholars consider negative affect to be a salient variable within their models of eating disorder symptomatology. Striegel-Moore and Cachelin (1999) and Thompson et al. (1999) argued within their theoretical frameworks that negative affect is a main predisposing factor to internalizing societal images of thinness and body image disturbance, because women who experience negative emotionality are likely to self-objectify by internalizing society’s thin-ideal stereotype and to generalize negative emotionality toward their bodies. Research has supported that self-esteem is a predictor of unique variance in body image disturbance among a sample of adolescent girls (Grifﬁths & McCabe, 2000); however, to our knowledge, the proposition that negative affect predicts internalization of the thin-ideal stereotype has not yet been investigated empirically. In our model (see Figure 1), we propose that negative affect predicts unique variance in both body image disturbance (Path i) and internalization of the thin-ideal stereotype (Path j).

Additionally, a path from negative affect to poor interoceptive awareness is speciﬁed within the present model (see Path k in Figure 1). This path is consistent with the ﬁndings of Mazzeo and Espelage (2002) that a path from depression (a construct encompassed in negative affect) to alexithymia (a construct subsumed under poor interoceptive awareness) was signiﬁcant within a model of college women’s eating disorder symptomatology.

It has long been noted that poor interoceptive awareness is related to eating disorder symptomatology among women (Bruch, 1973; Garner & Olmsted, 1984). Often, women with eating disor-ders describe both a lack of desire to experience hunger, satiety, and emotions and diﬃculty identifying these internal states (Gar-ner, 1991). According to objectiﬁcation theory, poor interoceptive awareness can lead to disordered eating in women, as suppressing hunger and satiety signals ignores internal cues that operate according to an individual’s nutritional needs. Additionally, Heath-erton and Baumeister (1991) argued binge eating (and other forms of disordered eating such as restriction and purging) develops as an attempt to avoid internal self-awareness. Eating disorder symp-tomatology, then, becomes a distraction from experiencing emotions.

Research has found that poor interoceptive awareness of hunger, satiety, and emotions does in fact predict unique variance in disordered eating among high school and college women (e.g., Bourke, Taylor, Parker, & Bagby, 1992; Pike, 1995; Tylka & Subich, 1999). Using structural equation modeling (SEM) to investigate a model of eating disorder symptomatology among college women, Mazzeo and Espelage (2002) found that alexithymia predicted unique variance in disordered eating. Therefore, based on theory and empirical ﬁndings, a path from poor interoceptive awareness to eating disorder symptomatology is speciﬁed in the present model (see Path l in Figure 1).

Relational Factors

Many theorists and researchers have explored the inﬂuence of social support of friends and family on eating disorder symptomatology (e.g., Grisset & Norvell, 1992; Tiller et al., 1997). Coping theory (Sandler & Twohey, 1998) provides one conceptualization of how social support may function to predict eating disorder symptomatology. It proposes that higher levels of social support increase perceptions of self-worth and reduce negative emotionality, which then predicts a lesser tendency to engage in problematic behavior. This theory also suggests that social support directly may prevent individuals from engaging in problematic behaviors.

Moran and DuBois (2002) examined this theory among adoles-cents and found that negative affect partially mediated the relation between perceived social support and the tendency to engage in destructive problematic behaviors. Furthermore, Hirsch (1999) found that perceived family and friend social support each predicted unique variance in eating disorder symptomatology among a sample of college women, and Grisset and Norvell (1992) found that women with eating disorders perceived lower levels of family and friend social support than did women without eating disorders. Consequently, in Figure 1, we speciﬁed paths from two forms of social support (i.e., friend and family) to both negative affect
(Paths m and n, respectively) and eating disorder symptomatology
(Paths o and p, respectively).

Also, in our model, we expected that family and friend social support
would be related (see Path q in Figure 1). We anticipated a
significant relation between these two variables given scholars’
(e.g., Procidano & Heller, 1983) assertions that positive or nega-
tive relations with one social network may impact individuals’
interactions with others from different social networks (e.g., by
influencing their ability, efficacy, and/or desire to relate with
others) and empirical findings (e.g., Grissit & Norvell, 1992) that
perceptions of family and friend social support are in fact moder-
ately related. Additionally, because family and friend social sup-
port are measured via two subscales of the Perceived Support
Scale (PSS; Procidano & Heller, 1983), we expected a relation
between them in part because of method variance.

Summary

The present model (see Figure 1), then, includes variables from
the three major domains (i.e., sociocultural, personal, and rela-
tional) considered necessary in the conceptualization and predic-
tion of eating disorders (e.g., Mintz & Wright, 1993). All paths
specified by variables were grounded in extant empirical
findings or theory. Two versions of the model were tested to
determine whether fit to the data was affected by the method of
assessing eating disorder symptomatology (i.e., EAT-26; Garner &
Garfinkel, 1979, vs. Q-EDD; Mintz et al., 1997). This model is
intended to provide one framework for organizing much of the
theoretical and empirical literature on the correlates of eating
disorders, and as such could offer professionals a better under-
standing of which factors offer unique variance in the prediction of
disordered eating.

Method

Participants

Participants were 463 college women either enrolled in psychology
classes (n = 364) or members of campus sororities (n = 99) from two large
midwestern universities. This sample size exceeded the 330 participants
needed for a cases-to-parameter estimated ratio of 5:1 (i.e., 66 parameters
were estimated for the model; Bentler, 1990). Only women were studied
because many of the relations and paths specified in the model have not
been investigated with men (Tylka & Subich, 2002b).

Preliminary analyses indicated no demographic differences between
the women enrolled in psychology classes and sorority women; therefore, the
entire sample is described. The average age of the participants was 23.30
years (SD = 7.36). Twenty-eight percent of the women were freshmen,
22% were sophomores, 25% were juniors, 20% were seniors, and 5% were
postbaccalaureate or graduate students. Most women (79%) identified as
Caucasian, 11% identified as African American, 5% identified as Latina,
2% identified as Asian American, 5% identified as Native American, 5%
identified as multicultural, and 2% left this item blank. Participants were
asked to indicate their socioeconomic status by checking one of three
categories. Most women (83%) reported middle class, but 11% reported
working class, and 6% reported upper class.

Latent Variables and Instruments

Thirteen scales and subscales were used in the present study. Twelve of
these measures were hypothesized to reflect eight latent variables. The
remaining questionnaire (i.e., Q-EDD; Mintz et al., 1997) generated one
ordinal value that was used as a measured variable in the analysis of a
second version (Version 2) of the model. To provide three indicators per
latent variable, as recommended in SEM (Kelloway, 1998), four measures
(i.e., Sociocultural Attitudes Towards Appearance Questionnaire [SATAQ];
Internalization subscale; Heineberg, Thompson, & Stormer, 1995; NEO
Five-Factor Inventory [NEO-FFI]; Neuroticism subscale; Costa & McCrae,
1992; and the Eating Disorder Inventory-2 [EDI-2] Interoceptive Aware-
ness and Body Dissatisfaction subscales; Garner, 1991) were divided into
odd- and even-item composites, and four measures (i.e., EAT-26; Garner &
Garfinkel, 1979; Perceived Sociocultural Pressures Scale [PSPS]; Stice,
Ziemia, et al., 1996; and the PSS Friends and Family subscales; Procidano
& Heller, 1983) were divided into thirds (every third item was grouped,
beginning with Item 1 for the first composite score, Item 2 for the second
composite score, and Item 3 for the third composite score).

Eating disorder symptomatology. For the first version (Version 1) of
the model, the EAT-26 (Garner & Garfinkel, 1979) was used to determine
women’s eating disorder symptomatology, as several researchers (e.g.,
Mazzeo, 1999; Mazzeo & Espelage, 2002; O’Halloran & Mintz, 1997)
have suggested that it can be used as a continuous measure of eating
disturbances in nonclinical samples of women. Each of its 26 items is rated
on a 6-point scale ranging from 1 (never) to 6 (always). A sample item is,
“[I have gone on eating binges where I feel that I may not be able to stop.”
Although Garner, Olmsted, Bohr, and Garfinkel (1992) recommended that
the responses never, rarely, and sometimes receive a score of 0 and that the
responses often, very often, and always receive scores of 1, 2, and 3,
respectively, participants’ total score was equal to the average of the coded
responses to prevent skewness in the distribution of scores (i.e., this could
violate the assumptions of SEM; Tabachnick & Fidell, 1996). Estimates of
internal consistency reliability for EAT-26 scores have ranged from .91 to .94
for a sample of college women (Mazzeo, 1999) to .94 for a mixed sample of
eating-disordered and noneating-disordered individuals (Garner & Gar-
finkel, 1979). Scores on the EAT-26 demonstrated adequate stability over
a 3-week period in a sample of college women (r = .86; Mazzeo, 1999).
The EAT-26 also was found to be related strongly with other measures of
eating disorder symptomatology, such as the Drive for Thinness and
Bulimia subscales of the Eating Disorder Inventory (Brookings & Wilson,
1994), and to identify and classify correctly eating disturbances among
clinical and nonclinical samples of women, yielding concurrent and con-
struct validity evidence (Garner et al., 1982).

For Version 2 of the model, the Q-EDD (Mintz et al., 1997) was used to
classify women into the asymptomatic, symptomatic, or eating disorder
groups. This measure operationally defines Diagnostic and Statistical
Manual for Mental Disorders, 4th ed. (DSM–IV; American Psychiatric
Association, 1994) criteria for eating disorders and differentiates individ-
uals with eating disorders (i.e., a group including anorexic, bulimic, and
eating disorder not otherwise specified [EDNOS]) individuals), sympto-
amatic individuals (i.e., those who have some symptoms of disturbed eating
but do not meet DSM–IV criteria for anorexia, bulimia, or EDNOS), and
asymptomatic individuals (i.e., those who do not report behaviors consis-
tent with disturbed eating) on the basis of decision rules. Mintz et al. (1997)
examined the psychometric properties of the Q-EDD and found that
Q-EDD group ranks correspond with scores from other commonly used
eating disorder inventories. Furthermore, the Q-EDD was found to have a
98% accuracy rate for differentiating between eating-disordered and
noneating-disordered individuals, as determined by clinician diagnoses.
Q-EDD group rank was found to be stable over a 2-week period (κ = .85;
Mintz et al., 1997), and there was found to be 100% agreement reported
between two raters differentiating between eating-disordered, symptomat-
ic, and asymptomatic groups (Tylka & Subich, 1999). For the present
study, two independent raters (i.e., Johni Fiber and Rachel Zoeller, two
research assistants who were undergraduate seniors in psychology at the
time of the study) classified women into the continuum groups and dis-
cussed discrepancies until 100% agreement was achieved.
Pressure for thinness. The PSPS (Stice, Ziemba, et al., 1996) is an 8-item scale used to measure women’s reported pressure for thinness from significant others, and the media. A sample question is, “I’ve felt pressure from my family to lose weight.” Participants choose between three responses: no pressure (scored as a 1), some pressure (scored as a 3), and a lot of pressure (scored as a 5). Item responses are averaged, with higher scores representing greater pressure to be thin. Among a sample of high school and college women, the PSPS was internally consistent (α = .87), stable over a 2-week period (r = .93), and related to retrospective reports of parental pressure to lose weight during childhood (average r = .51; Stice, Ziemba, et al., 1996).

Social support of friends and family. The Friends and Family subscales from the PSS (Procidano & Heller, 1983) assessed the friend social support and family social support latent variables, respectively. Each subscale contains 20 items that measure the extent to which respondents’ needs for support, information, and feedback are fulfilled by friends (e.g., “My friends give me the moral support I need”) or family (e.g., “My family gives me the moral support I need”). Participants indicate yes, no, or don’t know to each item; responses indicative of social support are scored as a 1, and responses not indicative of support (including don’t know responses) are scored as 0. Scores associated with each subscale item are summed and can range from 0 to 20, with higher scores indicating greater perceived support from friends or family. Both subscales have been shown to be internally consistent (Friends α = .88; Family α = .90; Procidano & Heller, 1983) among samples of college students. Factor analyses upheld the unidimensionality of each subscale (Procidano & Heller, 1983). Among college students, both subscales are related to other common measures of social support (e.g., Social Conflict Scale; Abey, Abramis, & Caplan, 1985) and predict disclosing behavior with significant others, supporting their convergent, construct, and predictive validities, respectively (Procidano & Heller, 1983).

Internalization of the thin-ideal stereotype. The Internalization subscale of the SATAQ (Heinberg et al., 1995) was the first questionnaire used to assess internalization of the thin-ideal stereotype. Its eight items assess participants’ emphasis on appearance in general and on thinness in particular (e.g., “I believe that clothes look better on thin models”). Items are rated on a scale ranging from 1 (completely disagree) to 5 (completely agree). The items are averaged, with higher scores indicating greater internalization of the thin-ideal stereotype. Its items were internally consistent in previous samples of college women (e.g., α = .88; Heinberg et al., 1995). Factor analyses have indicated that all eight items load highly on one factor, supporting its unidimensionality, and its relation with the Physical Appearance State–Trait Anxiety Scale supports its convergent validity (Heinberg et al., 1995).

The first questionnaire used to assess body image disturbance was the Body Dissatisfaction subscale of the EDI-2 (Garner, 1991). This subscale reflects the belief that parts of the body (e.g., hips, buttocks) are too large (e.g., “I think that my thighs are too large”). It contains nine questions, each of which respondents rate on a scale ranging from 1 (never true of me) to 6 (always true of me). Garner (1991) recommended that item responses never true of me, seldom true of me, and sometimes true of me receive a score of 0, and the responses often true of me, very often true of me, and always true of me receive scores of 1, 2, and 3, respectively, but this method restricts the range of responses. Therefore, the coded responses (i.e., 1–6) were averaged to permit a full range of responses. Higher scores are indicative of greater body dissatisfaction. Alpha estimates range from .91 to .93 among college women (Brookings & Wilson, 1994; Tylka & Subich, 1999). Test–retest reliability estimates for this subscale are high over a 2-week period (r = .97; Wear & Pratz, 1987), and scores relate to therapist–consultant ratings of client body dissatisfaction (r = .44; Garner & Olmsted, 1984), supporting its convergent validity.

The Body Shape Questionnaire–Revised-10 (BSQ-R-10; Mazzeo, 1999) also was used to assess body image disturbance. Its 10 items measure the strength or salience of negative body image attitudes (e.g., “Have you found yourself brooding about your shape”). Items are rated from 1 (never) to 6 (always) and summed. Scores can range from 10 to 60; higher scores indicate greater body preoccupation. Mazzeo (1999) found its internal consistency reliability to be .96 among a sample of college women. Items load highly on one factor, and the total score relates to measures of body dissatisfaction (e.g., Body Esteem Scale; Franzoi & Shields, 1984) and predicts eating disorder symptomatology, supporting its unidimensionality and construct and predictive validity (Mazzeo, 1999).

Poor interoceptive awareness. The Interceptive Awareness subscale of the EDI-2 (Garner, 1991) was the first measure used to assess this latent variable. The subscale contains 10 questions that assess poor awareness of internal body states such as hunger, satiety, and emotions (e.g., “I get confused as to whether I am hungry,“ “I have feelings I can’t quite identify”). Participants indicated their level of agreement with items on a scale ranging from 1 (never true of me) to 6 (always true of me). Similar to the scoring procedure used for the EDI-2 Body Dissatisfaction subscale, item responses (i.e., 1–6) were averaged, with higher scores indicative of poorer interoceptive awareness. This subscale was internally consistent (α = .81; Garner & Olmsted, 1984) and yielded consistent scores over a 3-week period (r = .85; Wear & Pratz, 1987) among groups of college women. It is related to therapist–consultant ratings of client interoceptive awareness (r = .51; Garner & Olmsted, 1984), supporting its construct validity.
Finally, the Difficulty Identifying Feelings (DIF) subscale of the Toronto Alexithymia Scale-20 (TAS-20; Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994) was used to assess the poor interoceptive awareness latent variable. Its seven items (e.g., “I am often confused about what emotion that I am feeling”) are rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) and then averaged. Higher subscale scores indicate more difficulty identifying feelings. Among college student samples, its alphas ranged from .78 to .86 (Laquatra & Clopton, 2002). Scale scores indicate more difficulty identifying feelings. Among college emotion that I am feeling”.

Evidence for discriminant validity was supported by its lack of relation lending support for its construct validity (Bagby, Parker, & Taylor, 1994). The structure has been upheld by exploratory and confirmatory factor analyses, strongly disagree

**Procedure**

Participants were recruited from posted flyers and announcements in undergraduate psychology classes and campus sororities. The EAT-26 (Garner & Garfinkel, 1979) and Q-EDD (Mintz et al., 1997) were administered first, and the remaining questionnaires were grouped according to their respective domain (sociocultural, personal, and relational), with the domains counterbalanced. Women were either tested in small groups by an undergraduate experimenter (100% returned the questionnaires fully completed) or took the questionnaires home to fill out and brought them back to one of the experimenters (93% returned them fully completed).

All women were rewarded for their participation. Students in psychology classes received extra credit, and sorority women received a small donation ($3 per completed questionnaire) to their sorority. After returning the questionnaires, participants were given a form that listed campus resources that could assist them with any concerns that arose from completing the measures. Measures that had more than 25% of data points missing were dropped from the study. Otherwise, missing data points were handled by substituting participants’ mean scale or subscale scores for the missing value.

**Results**

**Descriptive and Preliminary Analyses**

All 463 cases were analyzed, as no outliers were identified within the dataset. We evaluated skewness and kurtosis for each measure via significance tests and visual appearance of the measure distributions. We determined that no substantial violations existed (per Tabachnick & Fidell, 1996), and therefore no measures were transformed. Table 1 presents the correlations, means, standard deviations, and internal consistency reliability estimates (i.e., alphas) of the various measures used in this study (the alpha of the Q-EDD; Mintz et al., 1997, was not calculated because of its ordered categorical nature). We found all alpha estimates to be acceptable (rs > .70). In SEM analyses, it is recommended that indicators of separate latent variables are not highly correlated (i.e., rs should be less than .90; Tabachnick & Fidell, 1996). As can be seen, many indicators of separate latent variables are related but do not reach .90.

Prior to conducting SEM, we explored the similarity between the EAT-26 (Garner & Garfinkel, 1979) and the Q-EDD (Mintz et al., 1997). A one-way analysis of variance indicated that participants responded to these measures in a similar fashion, $F(2, 460) = 234.15, p < .01$. Mean EAT-26 scores increased as group rank along the eating disorder continuum increased (asymptomatic group: $M = 2.02, SD = 0.39$; symptomatic group: $M = 2.79, SD = 0.55$; eating disorder group: $M = 3.45, SD = 0.76$).

**SEM Analyses**

We used SEM to test the hypothesized measurement and structural models that various personal, sociocultural, and relational variables predict women’s eating disorder symptomatology scores (Version 1 of the model) or ranks (Version 2 of the model). Scores derived from the measures (total scale scores, subscale scores, odd- and even-item composite scores, or every third-item composite scores) served as indicators for their respective latent variables.

Because the measurement model and Version 1 of the proposed structural model contained all continuous indicators, we used Mplus (Muthén & Muthén, 2001), a common SEM program, with a maximum likelihood (ML) estimation. Because the dependent variable (i.e., Q-EDD rank; Mintz et al., 1997) in Version 2 of the structural model was an ordered categorical variable, Mplus with a weighted least square parameter estimate (WLSMV) was used (ML cannot be used to estimate a model with an ordered categorical dependent variable). Both ML and WLSMV estimates are obtained by means of an iterative procedure that minimizes a particular fit function by successively improving the parameter estimates. The WLSMV method, however, uses a diagonal weight matrix with robust standard errors and the mean- and variance-adjusted chi-square test statistic, and the ML method uses a covariance matrix with conventional standard errors and a mean-adjusted chi-square test statistic (Muthén & Muthén, 2001).

Mplus (Muthén & Muthén, 2001) contains several indices to estimate the fit of the model to the data. When ML is used to estimate the model, the chi-square/degrees of freedom test, the comparative fit index (CFI), the Tucker-Lewis index (TLI)—also known as the nonnormed fit index (NNFI)—the standardized root-mean-square residual (SRMR), and the root-mean-square error of approximation (RMSEA) are calculated (but note that the goodness-of-fit index [GFI] and the adjusted goodness-of-fit index [AGFI] are not computed as part of the Mplus program). For models estimated by WLSMV, the chi-square/degrees of freedom test, CFI, TLI, RMSEA, and the weighted root-mean-square residual (WRMR) are calculated. Models with CFI and TLI values greater than .90, SRMR values less than .05, RMSEA values less than .08, chi-square/degrees of freedom values between 2.0 and 5.0, and WRMR values less than .90 generally indicate an adequate fit to the data (Hu & Bentler, 1995; Kelloway, 1998; Muthén & Muthén, 2001).

Following recommendations of Tabachnick and Fidell (1996), we evaluated the adequacy of the measurement model before the simultaneous evaluation of the measurement and structural components of the model. We excluded Q-EDD (Mintz et al., 1997) rank from the measurement model because it did not serve as an indicator of a latent variable. Results indicated that the measurement model provided a good fit for the data (see Table 2) and all measures loaded significantly on their respective latent factors, indicating that the hypothesized latent factors are internally consistent and exist empirically. No standardized residual exceeded an absolute value of 3.0, further
Table 1
Means, Standard Deviations, Alphas, and Correlations for the Criterion and Predictor Variables (N = 453)

| Variable (EAT-26: Odd) | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1. EAT-26: (1)         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 2. EAT-26: (2)         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3. EAT-26: (3)         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 4. Q-EDD               | .64| .68| .66|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 5. PSPS: (1)           | .48| .49| .51| .48|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 6. PSPS: (2)           | .49| .51| .47| .75|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7. PSPS: (3)           | .44| .42| .42| .46| .71| .69|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8. PSS-Friend: (1)     | -.27| -.25| -.23| -.27| -.17| -.21| -.19|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9. PSS-Friend: (2)     | -.24| -.25| -.23| -.27| -.11| -.20| -.15| .77|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10. PSS-Friend: (3)    | -.37| -.32| -.29| -.36| -.22| -.30| -.24| .78| .75|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 11. PSS-Family: (1)    | -.26| -.28| -.26| -.29| -.18| -.23| -.18| .39| .38| .42|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 12. PSS-Family: (2)    | -.19| -.19| -.20| -.23| -.14| -.19| -.17| .43| .38| .39| .83|    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 13. PSS-Family: (3)    | -.21| -.22| -.19| -.23| -.16| -.20| -.17| .41| .41| .36| .84| .86|    |    |    |    |    |    |    |    |    |    |    |    |    |
| 14. SATAQ-I: Odd       | .44| .50| .44| .42| .50| .47| .33| -.10| -.08| -.15| -.11| -.05| -.10|    |    |    |    |    |    |    |    |    |    |    |    |
| 15. SATAQ-I: Even      | .48| .53| .48| .45| .52| .51| .40| -.09| -.07| -.16| -.11| -.05| -.09| .88|    |    |    |    |    |    |    |    |    |    |    |
| 16. IBSS-R             | .38| .41| .38| .39| .41| .44| .39| -.10| -.11| -.17| -.16| -.09| -.14| .62| .66|    |    |    |    |    |    |    |    |    |    |
| 17. NEO-N: Odd         | .40| .38| .33| .41| .37| .39| .37| -.24| -.20| -.32| -.31| -.27| -.30| .38| .36| .36|    |    |    |    |    |    |    |    |    |
| 18. NEO-N: Even        | .47| .41| .39| .45| .38| .40| .38| -.36| -.31| -.41| -.35| -.32| -.34| .39| .36| .34| .74|    |    |    |    |    |    |    |
| 19. RSES               | .50| .48| .44| .45| .37| .41| .36| -.37| -.32| -.39| -.33| -.33| -.37| .45| .43| .38| .64| .75|    |    |    |    |    |    |
| 20. EDI-2-BD: Odd      | .49| .54| .52| .51| .56| .48| .49| -.19| -.15| -.23| -.13| -.10| -.13| .54| .56| .41| .31| .37| .44|    |    |    |    |    |    |
| 21. EDI-2-BD: Even     | .52| .56| .54| .50| .56| .49| .47| -.17| -.15| -.23| -.13| -.09| -.13| .54| .56| .41| .32| .38| .45| .85|    |    |    |    |    |
| 22. BSSQ-R-10          | .63| .68| .66| .64| .67| .61| .58| -.19| -.16| -.26| -.25| -.18| -.22| .64| .67| .50| .44| .51| .56| .80| .82|    |    |    |    |
| 23. EDI-2-IA: Odd      | .57| .57| .56| .51| .47| .48| .46| -.27| -.25| -.35| -.33| -.27| -.28| .49| .47| .40| .62| .63| .63| .48| .50| .62|    |    |
| 24. EDI-2-IA: Even     | .51| .49| .48| .45| .41| .46| .44| -.24| -.23| -.33| -.33| -.26| -.27| .39| .39| .35| .62| .62| .62| .38| .40| .52| .84|    |
| 25. TAS-20-DIF         | .34| .33| .31| .33| .32| .34| .34| -.31| -.28| -.38| -.33| -.30| -.29| .30| .30| .26| .60| .63| .60| .33| .34| .43| .77| .78|    |

Note. On the Q-EDD (Questionnaire for Eating Disorder Diagnoses), the asymptomatic group was coded as 0, the symptomatic group was coded as 1, and the eating disorder group was coded as 2. EAT-26 = Eating Attitudes Test-26; (1) = average of every third item, beginning with item 1; (2) = average of every third item, beginning with item 3; PSPS = Perceived Sociocultural Pressure Scale; PSS-Friend = Friend subscale of the Perceived Support Scale; PSS-Family = Family subscale of the Perceived Support Scale; SATAQ-I = Internalization subscale of the Sociocultural Attitudes Towards Appearance Questionnaire; Odd = average of odd scale items; Even = average of even scale items; IBSS-R = Ideal-Body Stereotype Scale-Revised; NEO-N = Neuroticism subscale of the NEO Five-Factor Inventory; RSES = Rosenberg Self-Esteem Scale; EDI-2-BD = Body Dissatisfaction subscale of the Eating Disorder Inventory-2; BSSQ-R-10 = Body Shape Questionnaire-Revised-10; EDI-2-IA = Interceptive Awareness subscale of the EDI-2; TAS-20-DIF = Difficulty Identifying Feelings subscale of the Toronto Alexithymia Scale-20; dash represents data that were not calculated.

*p < .01.
Next, we analyzed the two versions of the structural model (i.e., with EAT-26; Garner & Garfinkel, 1979, scores as indicators of the eating disorder symptomatology latent variable in Version 1, and Q-EDD rank; Mintz et al., 1997, in Version 2). On the Q-EDD, women classified in the asymptomatic group were coded as 0, and family social support to eating disorder symptomatology was not significant in either version (r = .08, ns), and the fit indices (see Table 2) were comparable with the original Version 2 model without this estimated path.

As researchers (e.g., Kelloway, 1998; Tabachnick & Fidell, 1996) recommend the deletion of nonsignificant model paths for parsimony, we deleted the nonsignificant family social support—eating disorder symptomatology path in Version 1 and evaluated it against the original model to determine whether model fit was different. Deleting this path resulted in a more parsimonious model in that it did not change the fit of the model, χ^2_{difference}(1) = 0.10,

Note. Dashes are provided in lieu of fit values because the fit values were not calculated with the particular estimation method. CFI = comparative fit index; TLI = Tucker-Lewis Index (also known as the nonnormed fit index); SRMR = standardized root-mean-square residual (not calculated for Version 2); RMSEA = root-mean-square error of approximation; WRMR = weighted root mean square residual (not calculated for the measurement model and Version 1); EAT-26 = Eating Attitudes Test-26; Q-EDD = Questionnaire for Eating Disorder Diagnoses.

Table 2

<table>
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<tr>
<th>Model</th>
<th>χ^2</th>
<th>df</th>
<th>χ^2/df</th>
<th>CFI</th>
<th>TLI</th>
<th>SRMR</th>
<th>RMSEA</th>
<th>WRMR</th>
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<td>.96</td>
<td>.96</td>
<td>.043</td>
<td>.059</td>
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<tr>
<td>Structural-Version 1 (EAT-26)</td>
<td>612.4</td>
<td>235</td>
<td>2.61</td>
<td>.96</td>
<td>.96</td>
<td>.047</td>
<td>.059</td>
<td>—</td>
</tr>
<tr>
<td>Structural-Version 2 (Q-EDD)</td>
<td>131.5</td>
<td>42</td>
<td>3.13</td>
<td>.92</td>
<td>.95</td>
<td>—</td>
<td>.078</td>
<td>.736</td>
</tr>
<tr>
<td>Structural-Version 1, with pressure for thinness to eating disorder symptomatology path added</td>
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<td>234</td>
<td>2.60</td>
<td>.96</td>
<td>.96</td>
<td>.047</td>
<td>.059</td>
<td>—</td>
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<tr>
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<td>—</td>
<td>.078</td>
<td>.734</td>
</tr>
<tr>
<td>Structural-Version 1, with nonsignificant path deleted</td>
<td>612.5</td>
<td>236</td>
<td>2.60</td>
<td>.96</td>
<td>.96</td>
<td>.047</td>
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<td>—</td>
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<tr>
<td>Structural-Version 2, with nonsignificant path deleted</td>
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<td>43</td>
<td>3.15</td>
<td>.92</td>
<td>.95</td>
<td>—</td>
<td>.077</td>
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</tr>
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</table>

Note. Dashes are provided in lieu of fit values because the fit values were not calculated with the particular estimation method. CFI = comparative fit index; TLI = Tucker-Lewis Index (also known as the nonnormed fit index); SRMR = standardized root-mean-square residual (not calculated for Version 2); RMSEA = root-mean-square error of approximation; WRMR = weighted root mean square residual (not calculated for the measurement model and Version 1); EAT-26 = Eating Attitudes Test-26; Q-EDD = Questionnaire for Eating Disorder Diagnoses.

Next, we determined whether the path from pressure for thinness to eating disorder symptomatology was fully mediated by the set of personal and relational variables included in the model. In our measurement model, the bivariate relation between the pressure for thinness and eating disorder symptomatology latent variables was strong (r = .63, p < .001). To test for mediation, we added a path from pressure for thinness to eating disorder symptomatology to Version 1 of the model, and we compared this model with the original Version 1 of the model (with no path from pressure for thinness to eating disorder symptomatology) to determine whether model fit changed. Our results indicated that the Version 1 model with the estimated direct pressure for thinness—eating disorder symptomatology path (see Table 2 for fit statistics; for this included path, β = .09, ns) did not provide a significantly better fit to the data than did the nested Version 1 model (the original model with no direct path from pressure for thinness to eating disorder symptomatology). χ^2_{difference}(1) = 3.70, ns. As hypothesized, the relation between pressure for thinness and eating disorder symptomatology was fully mediated by the set of personal and relational variables. We could not use a similar procedure for Version 2 of the model because of the inability to use chi-square difference tests for models estimated by WLSMV (Muthén & Muthén, 2001). However, we included a path from pressure for thinness to Q-EDD (Mintz et al., 1997) rank in Version 2 of the model to determine the size of this path and the fit indices of this increased model. This path was not significant (β = .08, ns), and the fit indices (see Table 2) were comparable with the original Version 2 model without this estimated path.

As researchers (e.g., Kelloway, 1998; Tabachnick & Fidell, 1996) recommend the deletion of nonsignificant model paths for parsimony, we deleted the nonsignificant family social support—eating disorder symptomatology path in Version 1 and evaluated it against the original model to determine whether model fit was different. Deleting this path resulted in a more parsimonious model in that it did not change the fit of the model, χ^2_{difference}(1) = 0.10,
The NEO Five-Factor Inventory; odd even items, beginning with Item 1; 2 = the average of every third item, beginning with Item 2; ED Symptom. = eating disorder symptomatology; 3 = the average of every third item, beginning with Item 3; PSPS = Perceived Sociocultural Pressure Scale; PSS-Fr = Friend subscale of the Perceived Support Scale; PSS-Fam = Family subscale of the Perceived Support Scale; NEO-N = Neuroticism subscale of the NEO Five-Factor Inventory; odd = the average of odd items; even = the average of even items; RSES = Rosenberg Self-Esteem Scale; SATAQ = Sociocultural Attitudes Towards Appearance Questionnaire; Internal. = internalization; IBSS-R = Ideal-Body Stereotype Scale-Revised; BD = Body Dissatisfaction subscale of the Eating Disorder Inventory-2 (EDI-2); BSQ-R-10 = Body Shape Questionnaire-Revised-10; IA = Interoceptive (Intero.) Awareness subscale of the EDI-2; TAS-DIF = Difficulty Identifying Feelings subscale of the Toronto Alexithymia Scale-20. The dotted latent variable is the sociocultural factor; the shaded latent variables are the relational factors; the horizontal line latent variables are the personal factors.

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The standardized path coefficients and relations are presented in Figure 2. The present study’s findings suggested that both model versions tested (i.e., EAT-26 scores; Garner & Garfinkel, 1979; and Q-EDD rank; Mintz et al., 1997) fit the data adequately and produced comparable relations and path estimates. Furthermore, empirical support was garnered for several theoretical propositions exploring eating disorder symptomatology among women, some of which have not been investigated previously. Our modeling of the present data supports the assertions of Stice, Nemeroff, and Shaw (1996) and Fredrickson and Roberts (1997) that perceptions of the target of sexual objectification in the form of pressure for thinness predicts body image disturbance both directly and indirectly through internalization of the thin-ideal stereotype. Fredrickson and Roberts (1997) further suggested that body image disturbance predicts disordered eating directly and indirectly through the tendency to suppress awareness of internal states; these relations also were supported in our model. Our results also are consistent with the propositions of Thompson et al. (1999) that pressure for thinness predicts negative affect and that negative affect predicts internalization of the thin-ideal stereotype, with Griffiths and McCabe’s (2000) contention that negative affect predicts body image disturbance and with the finding by Mazzeo and Espelage (2002) that negative affect (i.e., depression) predicted poor interoceptive awareness (i.e., alexithymia). Additionally, our findings supported Pipher’s (1994) theory that perceptions of pressure for thinness predict perceptions of social support from significant others and Sandler and Twohey’s (1998) assertion that perceptions of friend and family social support predict negative affect and that friend social support predicts disordered eating.

This study also revealed a model path that was not significant after common sources of variance were removed. Perceptions of
family social support did not account for unique variance in eating disorder symptomatology, and this is contradictory to previous research findings (e.g., Grisset & Norvell, 1992). Perhaps this discrepancy is due to the combination of variables examined within the present study; when several variables are combined within one design, it is likely that some exogenous variables share common variance in their prediction of the criterion variable(s) and, as a result, do not contribute unique variance to the prediction of the criterion variable(s) (Tabachnick & Fidell, 1996). So, it may be that for young women, perceived support from friends is a more direct influence on eating disorder symptomatology than is perceived support from family when the two are considered concurrently. Or, it may be that the weaker relations between perceived family support and the criterion variables were rendered nonsignificant when common method variance and other paths were considered in the overall model. Regardless, by examining the confluence of several variables within a multivariate design, the present study’s findings separated those model paths that do contribute unique variance from those that do not add unique variance beyond their overlap with the variance accounted for by other model paths.

Although sociocultural, personal, and relational variables accounted for unique variance within both versions of our model, it seems important to address the relative contribution of each domain. Sociocultural and personal variables received strong support as unique contributors within the model. Many strong paths from sociocultural pressures for thinness to personal variables to eating disorder symptomatology were observed (e.g., pressure for thinness predicted body image disturbance, which predicted eating disorder symptomatology). The contributions of the relational variables within the model were less substantial; both perceived friend and family social support predicted negative affect, but only perceived friend social support accounted for unique variance in eating disorder symptomatology. Although significant, this latter beta weight was relatively small, suggesting that perceptions of friend social support did not account for a large percentage of unique variance in eating disorder symptomatology. Therefore, the present data suggest that sociocultural and personal variables may be more powerful predictors of women’s disturbed eating than relational ones. Finally, consistent with theory (e.g., Stice, 1994; Thompson et al., 1999), our data indicated that personal and relational variables, as a group, fully mediated the effects of the sociocultural variable on eating disorder symptomatology, as assessed by the EAT-26 (Garner & Garfinkel, 1979).

**Implications for Theory, Practice, and Research**

This research uncovered many findings that may provide useful information for scholars interested in women’s eating disturbances; theory support and refinement, future research directions, and prevention and treatment efforts all may be informed by the present findings. In terms of theoretical yield, our findings provide clear support for the unique contribution of sociocultural, personal, and relational correlates in predicting eating disturbances, corroborating views held by theorists and researchers (e.g., Leung et al., 1996; Mintz & Wright, 1993) that eating disorders are multidimensional. Important for future theory-building efforts is our finding that the model we derived and tested from extant theoretical
and empirical literature fits the data and accounts for a substantial portion (> 60%) of the variance in young women’s eating disorder symptomatology regardless of how this symptomatology was assessed (i.e., EAT-26 scores; Garner & Garfinkel, 1979; or Q-EDD group rank; Mintz et al., 1997). Furthermore, our finding that the relation from perceived pressure for thinness to eating disorder symptomatology scores was fully mediated by the set of examined personal and relational variables seems consistent with typical conceptualizations of sociocultural influences (e.g., Stice, 1994, 2002) as the backdrop against which individual development occurs. Perceived sociocultural pressure to lose weight, then, may provide the context for a woman’s adoption of the belief that a thin body type is most attractive, her experience of negative emotionality and body image disturbance, and her perceptions of less social support, but these personal and relational variables may be the more direct contributors to eating disorder symptomatology.

Although our correlational data do not preclude the possibility that other model configurations might fit our data equally well, it is encouraging to note that the variable relations we deemed most logical and likely given prior theorizing and research were in fact upheld. Clearly, longitudinal data are needed to determine whether the present model paths accurately represent the causal relations that drive development of disordered eating among college women. Indeed, we propose that researchers consider going beyond examining variables collected at a single point in time and instead focus more of their research efforts on prospective investigations of alternative models investigating the specific directions of the variable paths.

In particular, we suggest that researchers concentrate efforts on clarifying the roles of negative affect and social support within models of disordered eating among women using longitudinal data. Despite the fact that we positioned these variables within our model in accordance with the theory and research of scholars such as Griffiths and McCabe (2000), Pipher (1994), and Mazzeo and Espelage (2002), the data in our study were taken at a single time period, and thus we cannot rule out alternate conceptualizations for the paths among model variables. For instance, negative affect could be predicted by, rather than be a predictor of, body image disturbance (Stice, Nemeroff, & Shaw, 1996) and could be an outcome (Heatherton & Baumeister, 1991; Keys, Brozek, Hendrich, Mickelsen, & Taylor, 1950; Stice, 1998) as well as a direct predictor of disordered eating (Stice, Nemeroff, & Shaw, 1996). Additionally, negative affect could predict family and friend social support (Costa & McCrae, 1992) rather than be predicted by these variables. Given that motivations underlying disordered eating are often interpersonal (e.g., to please others), it is also conceivable that poor social support may be predicted by, rather than a predictor of, disordered eating. Furthermore, negative affect and social support may moderate rather than mediate the relation between pressure for thinness and eating disorder symptomatology (Berndt & Hestenes, 1996; Tylka, 2004).

Similarly, alternative conceptualizations of other model variables also need further clarification via longitudinal designs. For instance, poor interoceptive awareness may predict internalization of the thin-ideal stereotype (rather than the reverse conceptualization that we tested), because the lack of sensitivity to internal states may predispose persons to look outside themselves for cues about what and how often they should eat, therefore increasing their receptivity to sociocultural messages about food consumption and ideal weight. Furthermore, disordered eating may concurrently

![Figure 4. Structural model of college women’s disorder symptomatology (assessed via the Questionnaire for Eating Disorder Diagnoses [Q-EDD]), with the nonsignificant family social support to eating disorder symptomatology path deleted. Presented are path coefficients for the structural model, analyzed using Mplus with weighted least square parameter estimation. The dotted latent variable is the sociocultural factor; the shaded latent variables are the relational factors; the horizontal line latent variables are the personal factors. *p < .05.](image-url)
predict and be predicted by poor interoceptive awareness given
that women with eating disturbances need to suppress hunger and
satiety cues to maintain their disordered eating behaviors.

In addition to prospective investigations designed to clarify the
mechanisms of action of these variables in models of disordered
eating, more complex models should be developed and tested that
allow for combinations of scholars’ hypotheses with regard to a
variable’s influence (e.g., exploring both mediating and moderat-
ing variables within the same model; Baron & Kenny, 1986).
Indeed, if longitudinal data were available, it might be useful to
explore models that incorporate specific feedback loops. Some
competing hypotheses evident in the literature may reflect the
point in the developmental process at which one enters the model;
that is, the process of developing disturbed patterns of eating may
be iterative, with milder forms of disturbed eating serving to
exacerbate one’s current level of body image disturbance or per-
ceived lack of social support and thereby increasing the severity of
one’s eating disturbance. Within any such investigations, however,
we suggest that researchers consider variables representative of the
sociocultural, personal, and relational domains.

We also note that most of what is known about disordered eating
is based on young adult White women. A dearth of research exists
on predictors of eating disorder symptomatology among other
groups of individuals such as women of color, older women, and
men (Kashubeck-West & Mintz, 2001; Lester & Petrie, 1998;
Tylka & Subich, 2002b). Researchers, then, need to focus their
attention on theory development regarding what variables relate to
disordered eating among these individuals and to examine those
variables with the intended focal group using cross-sectional and
longitudinal designs.

To the extent that future work supports this model and the
directionality of its paths, the present findings provide a reasonably
powerful explanation regarding the relations among a number of
variables with theoretical and practical relevance to eating disor-
ders. As such, counseling psychologists would do well to consider
treatment and prevention programs that simultaneously address the
different factors implicated in the present model. This point is
underscored by findings that women may have different etiological
pathways to eating disturbances (e.g., Stice, Nemeroff, & Shaw,
1996). Consequently, targeting concomitantly all known pathways
to eating disorder symptomatology would seem an advantage in
prevention and treatment efforts (Mintz & Wright, 1993).

The present study’s findings thus may provide direction for a
multidimensional focus on the prevention and treatment of eating
disorders. For example, focusing prevention and treatment efforts
conjointly in three specific directions—(a) lessening body image
disturbance, (b) increasing awareness of internal bodily states, and
(c) increasing levels of friend social support—could be a starting
point, as these variables accounted for 62%—63% of the variance in
our women’s eating disorder symptomatology. Also, given that
the present findings further indicated that pressure for thinness,
internalization of the thin-ideal stereotype, and negative affect
accounted for 68%—69% of the variance in body image distur-
bance, it may be reasonable for counseling psychologists to focus
on preventing and/or reducing women’s negative affect and their
internalization of the thin-ideal stereotype, and promoting accep-
tance of all body sizes to counter sociocultural pressures to be thin.
Additionally, because negative affect and body image disturbance
accounted for 66%—71% of the variance in poor interoceptive
awareness, it seems possible that improved awareness of internal
bodily states could be achieved by lowering negative affect and
body image disturbance.

Limitations

This study contained limitations that are important to acknowl-
edge. First, data were collected at a single point in time and, as a
result, no causal claims can be made about the sequence of
variables within the model. As discussed previously, there are
many alternative models that include different causal assumptions
that could fit the present data equally well. The adequate fit of the
present structural model thus does not imply that this model has
been “proven,” and it is appropriate to consider this model explor-
atory until it is cross-validated.

In addition, the exclusive use of individual self-report measures
of sociocultural and relational variables, although common to this
area of research, assessed participants’ perceptions of pressures for
thinness exerted on them by their environment and perceptions of
social support offered to them by others, and not actual levels of
these variables. Participants’ perceptions of these variables may or
may not be an accurate portrayal of reality (Lakey, McCabe,
Fisicaro, & Drew, 1996; Sarason et al., 1991). Consequently, we
encourage future researchers to use measures other than individual
self-report questionnaires when assessing sociocultural and rela-
tional variables. Although the scores on our self-report measures
likely contain variance because of the proposed environmental
influences, scores also are likely confounded with personal factors
such as personality variables and individual susceptibility to social
pressures (e.g., pressures for thinness). Perhaps researchers could
examine actual participant environments in which pressures for
thinness are likely to be high (e.g., figure skating, dance, gymnastics)
and the long-term effects this type of environment has on
personal and relational characteristics and disordered eating. Simi-
larly, feedback could be sought from significant others (e.g.,
peers, family members) with whom participants interact to gain
information on the relational aspect of their environment; social
network analysis may provide one avenue for this type of inves-
tigation. Relatedly, our exclusive use of self-reports of personal
variables also is somewhat limiting, as it relies on participants’
accurate reporting of their current level of functioning.

Finally, considerable relations among the model variables were
found within our data, which presents issues of multicollinearity
between the variables. Despite the fact that no relation between the
latent variables or indicators of separate latent variables ap-
proached .90 (i.e., the criterion for substantial multicollinearity;
Tabachnick & Fidell, 1996), there were strong relations among
several of the variables. In particular, the psychometric overlap
between the negative affect and poor interoceptive awareness (r =
.78) latent variables is notable, even though they are posited to be
conceptually distinct constructs (i.e., negative affect reflects
awareness of negative feelings, whereas poor interoceptive aware-
ness reflects uncertainty of which emotion or internal state is being
experienced). Other measures may need to be created to distin-
guish their conceptual differences. Alternatively, perhaps research-
ers could determine whether one of these variables should be
pruned within models of disordered eating.
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