Moderators of the Relationship Between Body Image Dissatisfaction and Disordered Eating

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Moderators of the Relationship Between Body Image Dissatisfaction and Disordered Eating

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Various affective and personality variables may impact the relationship between body dissatisfaction and disordered eating symptomatology. The current study was a post-hoc analysis examining potential moderators (depression, anxiety, and impulsivity) of this relationship in college women. Four-hundred and seventy-two (472) enrolled college women between the ages of 18 and 55 participated in this study. Moderation analyses indicated that anxiety, depression, and dieting significantly moderated the relationship between body dissatisfaction and disordered eating, whereas impulsivity did not. Findings can be used to generate hypotheses for education and prevention programs on college campuses.

Disordered eating, dieting, body image dissatisfaction, and eating disorders are prevalent on college campuses (Cohen & Petrie, 2005; Halmi, Falk, & Schwartz, 1981; Heatherton, Nichols, Mahamedi, & Keel, 1995; Hoyt & Ross, 2003; Striegel-Moore, Silberstein, French, & Rodin, 1989). In spite of this, it seems that eating- and body-related issues may be under-reported in students presenting for treatment. As a defined presenting problem, Hoyt and Ross (2003) found that few students actually present specifically for the treatment of eating disorders at a college counseling centers and, in the course of conducting assessments, it often becomes apparent that students

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have subclinical levels of eating disorder symptomatology. These subclinical levels are often referred to as disordered eating, that is, some form of unhealthy weight regulation behavior, such as skipping meals, avoiding fats/carbohydrates, or fasting (Tylka, 2004).

In order to more effectively prevent disordered eating, it may be necessary to target variables that moderate the relationship between body image dissatisfaction and disordered eating (Schwitzer, et al., 2008). This may serve the purpose of identifying and reaching more students who are at risk. As Tylka noted (2004), there is a dearth of research regarding what moderates the relationship between body dissatisfaction and disordered eating. Historically, variables that have been investigated as risk factors for or correlates of eating pathology include body image (Cohen & Petrie, 2005; Tylka, 2004), pressure to be thin (Stice, 2002), internalization of sociocultural ideals (Stice, 2002), perfectionism (Tylka, 2004), negative affect (Cohen & Petrie, 2005; Stice, 2002), and impulsivity (Wonderlich, Connolly & Stice, 2004). Even though experienced clinicians may probe for some of these variables in greater detail, less-seasoned clinicians or those without direct experience treating disordered eating clients may not know to assess or probe for these variables in students who do not meet the "at risk" criteria. This is true for both clinical intakes and screening programs. Thus, an analysis of these variables and how they may interact with one another (especially with body image) is relevant in terms of providing clinicians a framework from which to work.

The current study is a post-hoc analysis of data collected at three large universities in the Mid-Atlantic region. The purpose of the original study (Timko & Perone, 2005) was to understand the relationships among various affective and disordered eating variables with regard to flexible and rigid control over eating. In that study, the Eating Attitudes Test-26 (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) was the primary measure of disordered eating administered. The EAT-26 is also the typical measure used for eating disorder screening on college campuses. Thus, the data set lent itself to a post-hoc analysis of variables that may moderate the relationship between body image and disordered eating in college women. The current study focused on a variety of affective and personality variables and examined their interaction with body image to determine which interact with and predict disordered eating. The purpose of these analyses was to provide initial exploratory data that would, in turn, inform and generate hypotheses regarding more appropriate outreach programming.

METHOD

Participants

A concerted effort was made to solicit the participation of students in a variety of classes so that a diverse cross-section of the undergraduate study

body was represented. Of the students who were present in class on the day that the instruments were provided, 694 returned questionnaires. Only 55 (7.9%) were excluded from the study due to incomplete data, leaving a total sample size of 639. Of these, 472 (74%) were women and 167 (26%) were men. Due to the small number of men who had clinically significant scores on the EAT-26 ($n = 3$), only data for the women are included in this analysis and described herein.

Procedure and Measures

Students in various undergraduate classes (e.g., health, English, psychology, sociology, etc.) were invited to complete a questionnaire packet; the subject pool represented 20+ majors. Questionnaire packets were handed out in envelopes either at the beginning or end of classes (depending on the instructors' preference) and participants were given 25 minutes to complete the packet. Participation in this study was optional; volunteers were not given any compensation for participating in the study, nor were they penalized for not participating. The study was approved by the institutional review board at each university.

The questionnaire packet contained an information sheet that explained the rights of a voluntary participant, a cover sheet for demographic data, and several standardized measures. The demographic data requested included: age, gender, ethnicity, marital status, height and weight (used to calculate BMI), year in school, academic major, and questions inquiring whether the participant was on a diet to lose or maintain weight.

The measures and the order in which they were presented to the participants are as follows: The Beck Depression Inventory-Second Edition (BDI-II; Beck, Brown, & Steer, 1996), Eating Inventory (EI; Stunkard & Messick, 1985), Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987), State-Trait Anxiety Inventory (STAI; Spielberger, 1983), Eating Attitudes Test-26 (EAT-26; Garner et al.,1982), and the Barratt Impulsiveness Scale, Version 11 (BIS-11; Barratt, 1959). The participants also were asked to describe how many times they had lost various amounts of weight and whether they felt like a "yo-yo" dieter. These measures were chosen based on their relevance for a previous study (see Timko & Perone, 2005).

DATA ANALYSIS

The data were analyzed in two stages. First, *t*-tests were used to discern if there were any significant differences in affective variables, impulsivity, and body image satisfaction between those who scored 20 or above on the EAT-26 and those who scored below 20. The EAT-26 is traditionally

dichotomized such that those scoring 20 or above are encouraged to see a qualified professional to determine if they meet diagnostic criteria for an eating disorder (Garner et al., 1982). Dichotomizing the EAT-26 for the first stage of data analysis allowed for comparison of those with likely disordered eating patterns, versus those without, on the affective variables of interest.

The current study sought to partially replicate a study by Tylka (2004) to determine whether depression, anxiety, impulsivity, and dieting moderated the relationship between body dissatisfaction and disordered eating. Hence, the second stage of data analysis focused on moderators of the relationship between body image dissatisfaction and disordered eating. The EAT-26 scores were treated as continuous variables during this stage. The independent variable (BSQ) and possible moderators were all centered. A single moderation analysis was run for each variable using the SIMPLE program to calculate interactions in the regressions (O'Connor, 1998). The SIMPLE program provides syntax that automatically calculates slope analysis as recommended by Aiken and West (1991).

RESULTS

The women in this study were between the ages of 18 and 55, with an average age of 20.82 (SD = 3.54 years). The majority of the participants identified as Caucasian (n = 392, 81.3%). The rest described themselves as African-American (n = 47, 10%), Asian (n = 12, 2.5%), Hispanic (n = 10, 2.1%), and Other (n= 11, 2.3%). The participants had an average BMI of 22.67 (SD = 3.69) with a range of 15.51–45.72. The average age was 20.82 (SD = 3.54 years). According to the Body Mass Index (BMI; height in cm/[weight in kg^2]), 6.8% of the sample were underweight, 73.5% were normal weight, 15.5% were overweight, and 4.2% were obese. With regards to dieting behavior, 230 women reported that they were not currently on a diet (48.7%), 106 reported being on a diet to lose weight (22.5%), and 97 said they were on a diet to maintain weight (20.6%). A small proportion of the women stated they were on a diet both to maintain and to lose weight (N = 39, 8.3%). Three-hundred and eighty-six (386) females scored below 20 on the EAT-26 (81.8%) and 86 scored 20 or above (18.2%).

There were significant differences between females who scored above the cutoff of 20 on the EAT-26 and those who scored below; namely, high EAT-26 scores were associated with high levels of depressive symptoms (BDI-II), non-planning impulsivity (BIS-Plan), body dissatisfaction (BSQ), anxiety (STAI-State and STAI-Trait), and greater frequency of weight cycling and amount of weight lost during cycling. Higher levels of eating disorder symptomatology were not associated with any difference in BMI and cognitive or motor impulsivity. See Table 1 for a review of the significant findings.

TABLE 1 Differences in Multiple Measures Between Participants Who Scored 20 and Above on Tthe EAT-26 Versus Those Who Scored Below 20

	EAT-26 ≥ 20		EAT-26 < 20				
Measure	*M*	*SD*	*M*	*SD*	*t*	*p*	Cohen's *d*
BDI[§]	14.38	10.35	9.51	7.99	−4.14	<.001	0.53
BISCOG	21.47	2.75	21.91	2.66	1.33	.184	0.16
BISMOT	27.32	3.73	27.15	3.59	−0.40	.689	0.04
BISNPLN	27.24	3.31	26.46	3.03	−2.09	.037	0.25
BMI[§]	23.37	5.20	22.51	3.23	−1.47	.145	0.19
BSQ[§]	139.80	29.07	85.96	32.31	−15.21	<.001	1.75
SANX	46.49	10.69	40.05	10.90	−4.97	<.001	0.60
TANX	47.91	9.31	41.10	10.00	−5.78	<.001	0.70
TIMES CYCLED[§]	9.68	13.97	5.24	5.89	−2.89	<.001	0.41
WEIGHT LOST[§]	52.02	59.90	26.69	34.27	−3.79	<.001	0.52

[§]Equal variances not assumed.

Moderation analysis (Aiken & West, 1991) was used to determine which variables moderated the relationships among the dependent variable, disordered eating (EAT-26 scores), and the independent variable, body dissatisfaction (BSQ scores). The results of the moderation analyses indicate that there were significant interactions for all variables with the exception of the impulsivity variables[1] (STAI-S: $F[1, 468] = 6.60$, $p = .01$, R^2 change = .01; STAI-T: $F[1, 468] = 4.29$, $p = .04$, R^2 change = .01; BDI: $F[1, 467] = 6.50$, $p = .01$, R^2 change = .01), such that the relationship between BSQ and EAT-26 was stronger at both one standard deviation below the mean (STAI-S: $\beta = 0.54$, $SE = 0.05$, 95% CI: 0.44–0.64; STAI-T: $\beta = 0.56$, $SE = 0.06$, 95% CI: 0.45–0.67; BDI: $\beta = 0.56$, $SE = 0.05$, 95% CI: 0.47–0.66) and at one standard deviation above the mean (STAI-S: $\beta = 0.71$, $SE = 0.04$, 95% CI: 0.62–0.80; STAI-T: $\beta = 0.70$, $SE = 0.04$, 95% CI: 0.61–0.78; BDI: $\beta = 0.71$, $SE = 0.04$, 95% CI: 0.62–0.79) for measures of anxiety (STAI-S, STAI-T) and depression (BDI). This indicates that the relationship between body dissatisfaction and disordered eating is still present when affective variables are low; however, it is even stronger when women have higher levels of state anxiety, trait anxiety, or depression. The same is true for those with a history of weight cycling; that is, the more times a woman cycled (went on and off diets; $F[1,467] = 9.37$, $p = .002$, R^2 change = .01; $\beta = 0.77$, $SE = 0.05$, 95% CI: 0.67–0.86) and the more weight she lost overall on the diets ($F[1, 467] = 9.62$, $p \leq .002$, R^2 change = .01; $\beta = 0.77$, $SE = 0.05$, 95% CI: 0.67–0.87), the stronger the relationship between body image dissatisfaction and disordered eating.

[1] Lack of Attention: $F(1, 468) = 0.31$, $p = .58$, R^2 change ≤ 0.01; Non-planning: $F(1, 468) = 2.30$, $p = 0.13$, R^2 change ≤ 0.01; Motivation: $F(1, 468) = 0.004$, $p = .95$, R^2 change ≤ 0.01.

As the finding regarding weight cycling indicates a link between dieting history and disordered eating, a further analysis was conducted. Namely, current dieting status was investigated as a moderator of the relationship between scores on the BSQ and the EAT-26. For this analysis, all women who indicated they were dieting to both lose and to maintain weight were excluded. This left an overall N of 432. The results indicated a significant interaction ($F[2, 427] = 11.71$, $p \leq .01$, R^2 change $= .03$). However, the slope was much steeper when one was dieting to lose weight ($B = .70$, $t[427] = 12.23$, $p \leq .01$, 95% CI: 0.59–0.81) than when one was dieting to maintain weight ($B = .44$, $t[427] = 5.79$, $p \leq .01$, 95% CI: 0.28–0.58) or not dieting ($B = .68$, $t[427] = 10.27$, $p \leq .01$, 95% CI: 0.55–0.80). Therefore, body image dissatisfaction is a stronger predictor of disordered eating in women who are dieting to lose weight.

DISCUSSION

The current study adds to a body of literature on disordered eating in college women by demonstrating which variables predict higher disordered eating amongst individuals with body image dissatisfaction. As Tylka (2004) noted, it is important that we begin to understand more complex relationships between body image and disordered eating. In this study, negative affect and dieting history/current-dieting status moderated the relationship between body dissatisfaction and disordered eating. Both state and trait anxiety were found to be significant. This implies that not only does a high level of current anxiety increase one's risk for developing disordered eating habits, but also that a stable tendency to respond to stressful situations with anxiety can increase the likelihood of disordered eating. Therefore, during screening programs it may be useful to query those with subthreshold scores on the EAT-26 for histories of dieting, current dieting status, and mood disturbances. A presence of anxiety and/or dieting may indicate that the individual is at greater risk for disordered eating. Current affective states are usually assessed in a clinical intake; however, it may be relevant to probe for more longstanding tendencies of anxiety.

Depression moderated the relationship between body dissatisfaction and disordered eating, such that when affective symptoms were more severe, so was eating pathology and body image dissatisfaction. Many women who present for treatment in college counseling centers will not necessarily report disordered eating (Mintz & O'Halloran, 2000), even though they may be actively engaging in such behaviors. Due to the comorbidity of disordered eating and affective disorders and the role affective disorders can play in moderating the effect of poor body image, questions regarding disordered eating should be included as a matter of course.

Interestingly, impulsivity was not shown to moderate the relationship between body dissatisfaction and disordered eating. This was surprising, given that, anecdotally, impulsivity is considered to be an element of disordered eating and some researchers have begun to classify certain disordered eating behaviors (such as bingeing) on the impulsivity end of a compulsive-impulsive continuum (Lochner & Stein, 2006). It was hypothesized that those with greater levels of impulsivity would be more likely to "act" on their body dissatisfaction by either dieting or purging, yet this hypothesis was not borne out. Although the measure used in this study has the advantage of tapping into three elements of impulsivity shown to play a role in other psychiatric disorders (i.e., motor activation, lack of planning, and lack of attention; Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001), impulsivity was not found to be a significant moderator. One possible reason that impulsivity may not have been predictive was that the nature of the sample did not allow for the categorization of individuals into groups based on behaviors more characteristic of bulimia (e.g., bingeing and purging) or anorexia (e.g., restriction); a moderating effect of impulsivity may be found when behavioral and symptom profiles are taken into consideration. "Lack of planning" was, however, significantly different between women who scored high versus low on the EAT-26. Seeing higher levels of impulsivity in a more "clinical" sample is not uncommon (Waxman, 2009); thus it not surprising that women who scored in the "at-risk" range on the EAT-26 would also have higher levels of impulsivity. The difference between at-risk women on impulsivity, combined with the lack of a moderation effect, indicates that impulsivity may play an independent role in the development of maladaptive eating patterns. This should be explored in future research

Dieting was found to be related to eating disorder symptomatology such that a greater history of weight cycling (going on and off a diet) and a greater amount of overall weight lost during these periods of dieting strengthened the relationship between body image dissatisfaction and disordered eating. This adds to research indicating that dieting contributes to the development of disordered eating. This is particularly relevant given that the majority of the sample was of a normal weight. Furthermore, current dieting status (as determined by an affirmative answer to the question(s) "Are you dieting to lose [maintain your] weight?") tends to impact the development of disordered eating. Dieting to lose weight appears to have a greater impact than dieting to maintain weight. The fact that the latter also impacts the development of disordered eating is worthy of further investigation, given the number of women who engage in weight watching or other weight control behaviors designed to avoid weight gain (as opposed to increase weight loss).

The results of the current study may be used to generate hypotheses regarding how to improve or better target assessment and programming that focuses on disordered eating and body image for college students. Women who report long-standing patterns of anxiety, current anxiety, or

depression, or those who report currently dieting to lose weight should always be assessed for disordered eating. Students who report high levels of impulsive behaviors (e.g., cutting, shoplifting) should also be assessed for disordered eating. Prevention programs may want to include elements that are aimed at reducing affective problems to decrease the likelihood of eating problems. Targeting underlying anxiety and depression in outreach and educational programs may encourage individuals who are in the early stages of an eating disorder or who do not yet have rigid disordered eating patterns to seek out help or engage in treatment. In summary, engaging female students early on in the development of unhealthy eating patterns may reduce the likelihood of them developing more problematic behaviors (Schwitzer, Rodriguez, Thomas & Salimi, 2001), and targeting moderating factors (e.g., anxiety) could reduce female students' need to rely on maladaptive eating and dieting patterns to cope with their affective experience.

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