Body Image and Personality Predictors of Eating Disorder Symptoms During the College Years

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Abstract: Objective: Women entering college (N = 118) were longitudinally followed for 3 years with assessments of eating pathology (Restraint and Bulimia). Method: Measures taken at Time 1 included timing of onset of puberty, Figure Dissatisfaction, Ineffectiveness, Public Self-Consciousness, and mood states (Profile of Mood States). Measures were evaluated as predictors of changes in Restraint and Bulimia scores across the three-year period. Results: Both Restraint (r = .69) and Bulimia (r = .50) were quite stable across the 3 years. Mean weight gain of 5.4 pounds (p < .001) was paralleled by an increase in “ideal weight” of 4.7 pounds. Hierarchical regressions controlling for Time 1 levels of eating disorder symptoms revealed that changes in Bulimia ($R^2 = .38$, $p < .0001$) were related to the psychological measures and to Figure Dissatisfaction. Changes in Restraint ($R^2 = .61$, $p < .0001$) were significantly related to Figure Dissatisfaction. Discussion: Findings are discussed in the context of the value of longitudinal designs in identifying risk factors. Dissatisfaction with one’s figure seems to be consistently related to worsening eating pathology. © 2001 by John Wiley & Sons, Inc. Int J Eat Disord 30: 28–36, 2001.

Key words: body image; eating pathology; bulimia; restraint; personality

INTRODUCTION

A multitude of potential causes and risk factors has been related to maladaptive eating and dieting patterns. The correlational nature of the majority of studies in this area have limited results to descriptive data with no definitive support for hypothesized causes or risks. Longitudinal studies provide a better opportunity to establish risk factors for the development of pathological eating patterns. The college years may be a particularly appropriate period to study because of the significant life changes and stressors facing late adolescents entering the college environment.

This study used a 3-year longitudinal design to follow college women from their freshman to their senior years examining the influences of body image, puberty onset, and personality variables as risk factors for disordered eating and dieting patterns.

Among the most well supported risk factors for the development of maladaptive eating

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and dieting is body image. Although bulimic symptoms have been frequently found to correlate with higher BMI levels (e.g., Striegel-Moore, Schreiber, Lo, Crawford, Obarzanek & Rodin, 2000), prospective data have shown that a simple measure of BMI has not always predicted developing symptoms (Cooley & Toray, in press; Stice & Agras, 1998). It appears likely that the objective weight of the individual is of much less importance than the individual’s self-perceived body image. A high level of body dissatisfaction is a central feature of clinical eating disorders (Garfinkel, et al., 1992) and has been consistently identified as a key element of subclinical patterns of maladaptive eating and dieting. Body dissatisfaction has been found as a correlate of dieting concerns in elementary-aged girls (Hill, Oliver, & Rogers, 1992; Lawrence & Thelen, 1995) and boys (Keel, Fulkerson, & Leon, 1997) and has been one of the most consistent predictors of eating and dieting problems in longitudinal studies of adolescent girls (Attie & Brooks-Gunn, 1989; Heatherton, Mahamedi, Streepe, Field, & Keel, 1997; Killen, et al., 1996; Stice & Agras, 1998). Striegel-Moore and her colleagues found that a worsening body image corresponded to increased disordered eating in a sample of college freshman women (Striegel-Moore, Silberstein, Frensch, & Rodin, 1989). The studies do, however, fall short of unanimous agreement about the role of body image with Leon et al., failing to find it predictive of disordered eating in a 2-year follow-up (Leon, Fulkerson, Perry, & Early-Zald, 1995). A closely related construct to body dissatisfaction is the individual’s drive for thinness, and emphasis on choosing a thin ideal for their own body. This drive for thinness has also been identified as a putative risk factor in several longitudinal studies (e.g., Santonastaso, Friederici, & Favaro, 1999; Stice & Agras, 1998).

Experiencing an earlier onset of puberty has been associated with higher body fat levels and in several studies has been a predictor of worsening eating pathologies (Keel, Fulkerson & Leon, 1997). Swarr and Richards (1996) found no direct effect of pubertal status but did find pubertal status to interact with parental relationships to influence the development of eating pathologies. Other researchers have failed to find any significant influence of puberty onset on developing eating pathologies (Attie & Brooks-Gunn, 1989; Leon, et al., 1995).

There have been a number of personality variables receiving attention as potentially important in developing eating difficulties. Self-esteem, self-concept and perfectionism have received considerable attention in this regard. There is some support for the hypothesis that low self-esteem is a risk factor for developing eating pathologies with concurrently gathered data (Graber, et al., 1994) and some modest support for this connection with prospective data (Button, Sonuga-Barke, Davies, & Thompson, 1996; Striegel-Moore, et al., 1989). However, Calam and Waller (1998) found that neither self-esteem nor perfectionism at age 12 helped predict the extent of eating problems at age 19.

Rather that playing a simple and direct causal role, psychological variables may influence eating outcomes through interactions with other variables. For example, Vohs, Joiner and their colleagues have found some prospective support for their hypothesis that perfectionism combines with weight dissatisfaction and low self-esteem to increase the risk of developing bulimic symptoms (Vohs, et al., 1999).

Among several potential risk factors identified in prospective studies, a lack of awareness of emotional experience, assessed by the Interoceptive Awareness Scale of the Eating Disorders Inventory (Garner, 1991), has received some support as a risk factor (Leon, Fulkerson, Perry, & Early-Zald, 1995). Personality traits may create vulnerabilities which interact with life stressors and body dissatisfaction to promote disordered eating (Joiner, Heatherton, Rudd & Schmidt, 1997; Leon, et al., 1995).

An increased tendency to experience depression and negative emotions has been as-
sociated with disordered eating. Leon et al., (Leon, Fulkerson, Perry, & Dube, 1994) found that teachers rated adolescents at high risk for developing eating disorders as having greater internalizing problems. Prospectively, higher levels of negative affect have been associated with the onset of binging and compensatory behaviors in non-clinical populations (Stice and Agras, 1998; Stice, Killen, Hayward & Taylor, 1998).

Heatherton and Baumeister (1991) reviewed the evidence that binge eaters are, among other qualities, highly self-conscious, with a tendency to set high standards for themselves, especially about appearance. Heatherton and Baumeister suggest that binge eating may help these individuals escape from this painful self-awareness. Although this hypothesis has yet to be supported by longitudinal data, we included public self-awareness as a variable in this study.

In this longitudinal study, women entering their first year of college were followed for a 3 year period with assessments of eating and dieting pathology. A number of potential causal variables were evaluated within this design. Beyond the physical assessment of height and weight which is involved in the Body Mass Index, the participants’ level of body dissatisfaction was also included. A measure of the onset of puberty was used to examine the hypothesis that early onset of puberty would predispose individuals to eating pathology. Assessments of self-esteem, and emotional distress were included as potential psychological predictors.

METHOD

Participants

Participants were recruited from “mandatory” meetings in the residence halls during the first month of the school year. Only women were asked to volunteer (N = 225) and 86% were 18 years of age at the initial assessment (M age = 17.95). The sample was largely Caucasian (approximately 95%). Measures were administered by undergraduate research assistants. Participants were followed up at a 7 month interval, in data reported previously (Cooley & Toray, in press). Three years after the initial assessment, all participants were mailed a follow-up questionnaire with an incentive of a $5 gift certificate at a department store for completion. All participants who could be located were contacted, including those students still enrolled in the institution as well as those who could be contacted through permanent home addresses. Of the participants responding, 65% were still enrolled in the University, 25% were enrolled in another institution and 10% were no longer attending college. A comparison of the participants who completed both assessments (N = 117) and those who completed only the first assessment (N = 110) was performed on every measure reported in this paper. Simple t tests revealed participants who failed to complete the assessment were slightly heavier at the first assessment (BMI of 23.4 versus 22.3, t (211) = 2.10, p = .037). The only other difference on nine measures indicated that noncompleters scored higher on Public Self-consciousness (20.1) than did completers (18.0), t (220) = 2.51, p = .013. The relatively high rate of attrition of subjects between assessments and these differences suggest some caution should be used in generalizing the present results.

Measures

Body Mass Index (BMI). This calculation of weight in kilograms divided by height (in meters) squared was based on self-reported height and weight taken from a digital scale at the initial assessment and based on self-report at the follow-up.
**Body Image Silhouettes.** The Body Image Silhouettes (BIS) (Cooley & Toray, in press) is a rating scale presenting 12 silhouettes gradually increasing in weight. From the silhouettes subjects were asked, 1) Which figure is closest to the way you look? and, 2) Which figure is closest to how you would ideally like to look? For this study, figure dissatisfaction was calculated by comparing the “actual” figure with the “ideal” figure (the number corresponding to the ideal figure was subtracted from the number corresponding to the actual figure). The figure chosen as closest to self was highly correlated with the BMI ($r = .79$). This self-descriptive figure was also quite stable across a 7-month interval, with a re-test correlation of $.77$ ($N = 104$) (Cooley & Toray, in press).

**Restraint Scale.** This 10-item scale (Heatherton, Herman, Polivy, King, & Mcgree, 1988) assesses both concern for dieting and weight fluctuations, (e.g., “What is your maximum weight gain within a week?” or, “How often are you dieting?”) using a 5-point answer scale. These authors argue for the inclusion of both factors in a single score and present a range of validity data to support their stance. In the current sample ($N = 225$), the Alpha was .81.

**Bulimia.** The Bulimia scale of the Eating Disorders Inventory (EDI)(Garner, 1991) is a 7-item scale which, “assesses the tendencies to think about and to engage in bouts of uncontrollable overeating (bingeing).” (p.5) Items on the Bulimia scale consist of declarative statements, e.g., “I eat when I am upset,” which are rated on a 6-point frequency scale varying from Always to Never. The Bulimia scale of the EDI has well established reliability and validity (Garner, 1991). For the current sample, the alpha was .82 ($N = 225$).

**Ineffectiveness.** The Ineffectiveness scale of the Eating Disorders Inventory (Garner, 1991) is a 10-item scale which, “assesses feelings of general inadequacy, insecurity, worthlessness, emptiness, and lack of control over one's life.” (p. 5). Items on the Ineffectiveness scale consist of declarative statements, e.g., “I feel inadequate,” which are rated on a 6-point frequency scale varying from Always to Never. As with the Bulimia scale, the EDI test manual presents ample reliability and validity data for Ineffectiveness (Garner, 1991). For the current sample, the alpha was .90 ($N = 222$).

**Public Self-consciousness.** The Public Self-consciousness scale (Fenigstein, Scheier, & Buss, 1975) assesses the level of sensitivity of the individual to the opinions and impressions of others. This 7-item scale contained declarative statements, e.g., “I usually worry about making a good impression.” answered on a 6-point scale of agreement from “Always” to “Never”. The alpha for the current sample was .83 ($N = 223$).

**Profile of Mood States.** The Profile of Mood States (POMS)(McNair, Lorr, & Droppleman, 1992) contains 65 emotions rated for self-descriptive accuracy on a 5-point scale. In order to reduce the number of highly correlated factors in our design, this measure was factor analyzed. Two factors were extracted by Principal Components Analysis (SPSS) that accounted for 77% of the variance. The first factor contained the Anger, Confusion, Depression, Fatigue, and Tension scales, while the second factor consisted of the Vigor scale. The 5 combined scales were renamed, Negative Affect. With the current sample the alphas for these scales were: .84 for Vigor and .95 for Negative Affect ($N = 222$).

**Analyses**

Hierarchical regressions were used for the data, entering the original score on each measure of eating pathology as the first step of the regression. The change in $R^2$ with the
addition of potential predictive variables allowed for an examination of the variables’ power to predict the development of eating pathology across the 3 year study.

RESULTS

Weight and Body Image Changes

Participants gained an average of 5.4 pounds over 3 years (t(113) = 5.05, p <.001). The ideal weight chosen by participants showed a nearly identical growth, with a mean change of 4.7 pounds (t(113) = 7.66, p <.001). These values are shown in Table 1.

The changes in the figures from the BIS chosen as most similar to self and as the “ideal for self” paralleled the changes in weight, both figures became a little heavier. This meant that there was little change in the discrepancy between self and ideal, the correlation between discrepancies at the 2 assessments was, r = .80.

Stability of Eating and Dieting Problems

Both measures of eating and dieting pathology were quite stable over the 3-year period. The Restriction correlation was r = .69, while the Bulimia correlation was r = .50.

Prospective Analyses

Hierarchical regression was used to examine the role that the variables played in predicting changes in Restriction and Bulimia across the 3-year study. For the regressions with the levels of Restriction and Bulimia at the follow-up as dependent variables, the original score for each scale was entered as the first step in the hierarchical regression, controlling for the original level of the variable. The psychological variables were entered as the second set of variables, and the Figure Dissatisfaction measure was entered as the third set. The change in R² value as each variable set was added to the model was examined to see if the set added significantly to the regression. The Beta weights in the final model were examined to see which individual variables uniquely added to the regression. Betas were also examined for each variable entered by itself as a second step in a regression, following the Time 1 value of the dependent variable.

The Puberty onset variable did not significantly improve either regression and so it was not included in the analyses reported here.

In predicting the three-year Bulimia score, the final R² value was .38 (F(6,100) = 10.0, p <.0001). As shown in Table 2, the original Bulimia score was entered as a first step in the

Table 1. Physical and eating pathology measures across 3 years

<table>
<thead>
<tr>
<th>Variable</th>
<th>Initial Assessment</th>
<th>3 Years Later</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Weight</td>
<td>133.20</td>
<td>21.4</td>
</tr>
<tr>
<td>Body mass index</td>
<td>22.24</td>
<td>3.4</td>
</tr>
<tr>
<td>Ideal weight</td>
<td>123.02</td>
<td>11.8</td>
</tr>
<tr>
<td>Restriction</td>
<td>14.68</td>
<td>6.7</td>
</tr>
<tr>
<td>Bulimia</td>
<td>5.45</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Cooley and Toray
regression in order to control for the Bulimia level. The significance of variables entered in subsequent steps would be assessed by the improvement in the prediction of the final Bulimia level over and above this original Bulimia score. Entering the psychological measures as a block (POMS Negative Affect and Vigor, Public Self-awareness, Ineffectiveness) significantly increased the $R^2$ value by .07 ($F(4,101) = 2.52, p < .05$). When individual psychological measures were entered by themselves, both Ineffectiveness and Vigor added to prediction of the change in Bulimia. The addition of the Figure Dissatisfaction score from the BIS produced a significant increase in the $R^2$ value of .04 ($F(1,103) = 6.55, p < .02$). In the final equation, the original Bulimia score (Beta = .33) and the Figure Dissatisfaction scale of the BIS (Beta = .24) made significant unique contributions. Although none of the psychological variables made significant unique contributions in the final model, as a set of variables, they improved the predictions made by the regression equation. The addition of the Time 1 Restraint Scale to this regression did not improve the equation, nor was the univariate addition of Restraint significant.

In predicting the Restraint score at the 3-year assessment, the final $R^2$ value was .61 ($F(6,94) = 24.8, p < .0001$). (see Table 2) The psychological measures did not increase the $R^2$ significantly, however, the addition of the Figure Dissatisfaction score from the BIS produced a significant increase in the $R^2$ value of .09 ($F(1,95) = 22.48, p < .0001$). In the final equation, the original Restraint score (Beta = .48) and the Figure Dissatisfaction scale of the BIS (Beta = .36) made significant unique contributions.

**Table 2. Hierarchical regressions for bulimia and restraint at 3-year follow-up**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$ Change</th>
<th>Entry</th>
<th>Total Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulimia, Time 1</td>
<td>.27***</td>
<td>.52***</td>
<td>.33**</td>
</tr>
<tr>
<td>Block 2</td>
<td>.07*</td>
<td>.23*</td>
<td>.11</td>
</tr>
<tr>
<td>Ineffectiveness</td>
<td>.04</td>
<td>.04</td>
<td>-.08</td>
</tr>
<tr>
<td>Public Self-Awareness</td>
<td>.16</td>
<td>.16</td>
<td>.10</td>
</tr>
<tr>
<td>POMS Negative Affect</td>
<td>-.22**</td>
<td>-.22**</td>
<td>-.15</td>
</tr>
<tr>
<td>POMS Vigor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 3</td>
<td>.04**</td>
<td>.26**</td>
<td>.24**</td>
</tr>
<tr>
<td>Figure Dissatisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: $R^2$ change reflects change produced by adding all variables in the block to the model. Entry and Total Model are standardized regression coefficients. Entry is the value for the variable alone following the Time 1 value, so it reflects the individual contribution of the variable without reference to other variables. Total model is the value for the unique contribution of the variable after controlling for all the other variables in the equation. POMS = Profile of Mood States.

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

Body Image and Eating 33
DISCUSSION

Women who reported that they had experienced an earlier onset of puberty showed no vulnerability to a worsening of eating pathology symptoms during the college years. Before concluding that these results fall on the side of those researchers who have failed to find support for the puberty onset variable (e.g., Leon, et al., 1995), one must remember that this variable may have already had its impact upon eating pathology before these women reached college. Findings from this study suggest that any causal role that puberty timing played would already be active by age 18.

The strength of a longitudinal design lies, in part, with its ability to track the evolution or development of a disorder across time. If a disorder is stable, there is less value in tracking it longitudinally. Eating and dieting pathology have been found to be quite stable over periods which have varied from a few years to a decade (Attie & Brooks-Gunn, 1989; Heatherton, et al., 1997; Joiner, Heatherton, & Keel, 1997; Klesges, Klem, Epkins, & Klesges, 1991; Leon, et al., 1995). Although measures taken in early adolescence are probably not as strongly related to adult measures as those taken during late adolescence, Calam and Waller (1998) did find that measures taken at age 12 were predictive of the level of eating problems at age 19. The current results support the theme of stability of these symptoms. The Restraint measure was highly stable across the 3 year period (r = .69) and the Bulimia measure was somewhat less stable but still showed an r of .50.

The women in this study had, on the average gained about 5 pounds across the 3 years of the study. Their choice of self-descriptive figures reflected this weight gain as it rose slightly as well. Interestingly, the ideal-self choice of figures rose an identical amount, so the level of figure dissatisfaction had not increased across the 3 year period. It appears that within modest weight changes, figure dissatisfaction may represent an element of self-perception which is independent of actual weight, but is an enduring quality of self-perception.

Figure dissatisfaction was the most consistent predictive variable across both analyses. Women entering college with higher levels of figure dissatisfaction were likely to show worsening patterns of eating pathology across the college years. These results correspond to one of the most consistent findings across the small but growing number of longitudinal studies, individuals who are unhappy with their body images are vulnerable to developing eating and dieting pathologies (Attie & Brooks-Gunn, 1989; Heatherton, Mahamedi, Striepe, Field, & Keel, 1997; Killen, et al., 1996; Stice & Agras, 1998).

The personality and emotion-based measures that were used in this study assessed several areas that have been frequently identified as important in the etiology of eating pathology: self-esteem, self-consciousness, emotional distress and vigor. The results provided only partial support for the role these variables may play in developing eating and dieting problems. The variables entered as a block in the hierarchical regressions did improve the prediction of the level of bulimia but not the level of restraint. The unique effects of the individual variables, however, were not significant in the final model. If entered as individual variables, Ineffectiveness was significant for both the Bulimia and Restraint regressions. Restraint at Time 1 did not predict the development of Bulimia symptoms. This finding contradicts results of other researchers who have found that dietary restraint is a risk factor for eating pathology (e.g., Stice & Agras, 1998; Stice, Killen, Hayward & Taylor, 1998).

Psychological variables such as self-esteem and emotional distress have been very commonly found to accompany eating pathologies. One likely explanation of this relationship is that the effects of eating problems and such psychological measures are re-
ciprocals. The failure of the current study as well as some other longitudinal studies (e.g., Calam & Waller, 1998) to identify these same variables as significant suggests that these variables may be influenced by the eating problems rather than vice versa. Another possible scenario is that psychological variables may create a vulnerability which acts to aggravate eating problems only under certain conditions, such as high stress. Such interactive findings have shown some promise (Joiner, Heatherton, Rudd, & Schmidt, 1997; Leon, et al., 1995).

Several limitations of the current sample should be noted before generalizing these findings. The sample was quite homogeneous in terms of age (almost all were 18 at the beginning of the study) and race (nearly all were Caucasian). The finding that 90% of the participants were still enrolled in college suggest that there was a bias for completion for individuals still enrolled at a University, and finally, the 52% completion rate leads to some questions about the generalization of these findings to the total sample and population.

As the number of longitudinal studies grows and clearer conclusions can be drawn regarding temporal and causal relationships with eating pathologies, interventions and prevention can become more effective. The present data along with a number of other research findings suggest that dissatisfaction with one’s body and figure creates a risk for increasing eating pathology. Prevention programs aimed at this body dissatisfaction would be effective in limiting developing pathology. Cognitive behavioral approaches developed by Cash (e.g., Cash, 1996) and Rosen (e.g., Rosen, 1996) have received empirical support as effective interventions for body image problems.

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REFERENCES


