

Disordered Eating and the Transition to College: A Prospective Study

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Abstract: Objective: A longitudinal study was conducted to examine whether the transition to college changed eating disorder symptoms and related attitudes. **Method:** Participants were 342 women who completed an in-depth survey in the spring of their senior year of high school and again during their first year of college. We assessed changes in body self-perception, eating-related attitudes, and disordered eating classification (nondieter, dieter, problem dieter, subclinical eating disordered, or eating disordered on the basis of criteria for bulimia nervosa in the 4th ed. of the *Diagnostic and Statistical Manual of Mental Disorders*). **Results:** Although participants viewed themselves as significantly heavier in their first year of college, dieting frequency and disordered eating classification in college did not differ from high school assessment. **Discussion:** Evidence from this study indicates that disordered eating symptoms and attitudes are established before college. However, our findings also reveal that poor self-image, dieting behaviors, and eating disorder symptoms are common among many young women, both before and during college. © 2001 by John Wiley & Sons, Inc. *Int J Eat Disord* 29: 280–288, 2001.

Key words: disordered eating; college; longitudinal

INTRODUCTION

The development of disordered eating has been traced to behaviors and attitudes expressed at an early age. Studies of adolescent girls reveal that a variety of psychological and physical risk factors predict later disordered eating, such as high levels of negative emotionality, body dissatisfaction, and early age of menarche (Graber, Brooks-Gunn, Paikoff, & Warren, 1994; Leon, Fulkerson, Perry, & Early-Zald, 1995). In addition to psychological and physical determinants, it has been suggested that certain environments or cultural climates heighten the risk of developing an eating disorder, particularly in individuals who display the aforementioned risk factors (Striegel-Moore, Silberstein, & Rodin, 1986). Some researchers have identified college as an environmental risk factor for

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the development or exacerbation of disordered eating patterns (Compas, Wagner, Slavin, & Vannatta, 1986), in part because prevalence rates of eating disorders are higher in college students than in other samples (Fairburn & Beglin, 1990). To examine whether college is associated with a change in disordered eating behaviors and attitudes, we conducted a longitudinal study that assessed students in their senior year of high school and again during their first year of college.

On one hand, it may be that there is little change in eating patterns from high school to college because the roots of disordered eating are formed early. It has long been known that young children of both sexes reject overweight bodies while preferring thin ones (Lerner & Geller, 1969). In addition, children express more negative attitudes toward obesity than they do toward a variety of other handicaps, such as missing limbs and facial disfigurement (Goodman, Richardson, Dornbusch, & Hastorf, 1963). As early as grade school, there exists a strong, negative relationship between body weight and self-perceptions of attractiveness, popularity, and academic success among girls (Guyot, Fairchild, & Hill, 1981). Moreover, a sizeable number of both boys (25%) and girls (60%) in preadolescence report having dieted recently (Childress, Brewerton, Hodges, & Jarrell, 1993).

Early adolescence in particular has been recognized as a time when many risk factors for disordered eating are established (Graber et al., 1994; Leon et al., 1995). For instance, on any given day, approximately two thirds of girls ages 14–18 are dieting (Rosen, Compas, & Tacy, 1993). Moreover, it is estimated that 40% of adolescent girls engage in unhealthy or excessive dieting behaviors (Graber et al., 1994). Dieting has been conceptualized as the first step in a downward spiral of disordered eating and resultant low self-esteem that, in turn, can lead to more severe dieting and disordered eating patterns (Heatherton & Polivy, 1992; Vohs, Bardone, Joiner, Abramson, & Heatherton, 1999). At the level of extreme eating problems, reports of greater than 25% of adolescent girls ages 14 and 16 have been documented (Graber et al., 1994).

On the other hand, some researchers have suggested that the cultural milieu of college may be a significant environmental risk factor for the onset or exacerbation of disordered eating (Compas et al., 1986; Striegel-Moore et al., 1986). College is closely associated with high levels of stress, achievement orientation, and role and identity changes, factors that are correlates of disordered eating (Rosen et al., 1993; Striegel-Moore et al., 1986). Although exact prevalence rates vary, college students have notably high rates of body dissatisfaction, dieting, and problematic eating (Heatherton, Mahamedi, Striepe, Field, & Keel, 1997; Heatherton, Nichols, Mahamedi, Keel, 1995). One study reported that almost 80% of women diet and 50% binge eat during their first year at college (Striegel-Moore, Silberstein, Grunberg, & Rodin, 1990). Evidence that disordered eating may peak in college was found in an earlier study we conducted (Heatherton et al., 1997) that compared eating and dieting patterns among women and men while they were in college and again 10 years later. Among women, weight and body dissatisfaction were found to be significantly higher during college than after college (whereas the opposite was true for men), with the percentage of women wanting to lose weight dropping from 82% during college to 68% after college. We proposed that the influence of social roles and peer expectations in college have a deleterious effect on the eating behaviors of young women and concluded that some degree of disordered eating may be normative in college women.

As noted, college is rich in factors associated with disordered eating. It may be that these factors are most salient upon first arrival, as students try to transition from high school to college. As a major life change, the transition to college typically involves changes in social and role identities, a loss of proximal social support, and possibly

geographic relocation (Compas et al., 1986). In their study of the stress associated with the transition from high school to college, Compas et al. (1986) noted, "Leaving home and entering college involves . . . academic and social demands . . . hypothesized to be a source of substantial risk and vulnerability" (p. 243), including increased stress and negative life events. Given that stress and eating disorder symptoms are positively correlated (Rosen et al., 1993) and also that the onset of dieting and disordered eating has been linked to difficulties coping with intense emotions (Johnson, Stuckey, Lewis, & Schwartz, 1982), it may be that the transition to college is a critical period for the exacerbation of disordered eating in vulnerable individuals. Supportive evidence comes from reports that the modal onset of bulimia occurs late in adolescence (American Psychiatric Association, 1994), at approximately age 18, and is associated with college matriculation (Schlesier-Stropp, 1984).

One methodological difficulty in interpreting prevalence studies stems from a lack of prospective research. Research that compares eating problems in specific groups (e.g., high school vs. college students) has traditionally used cross-sectional designs from which to draw conclusions (Howat & Saxton, 1988; Pope, Hudson, Yurgelun-Todd, & Hudson, 1984). Because cross-sectional designs contrast participants from different samples and, by definition, lack a precollege baseline, it is impossible to assess whether the move to college is associated with the development or exacerbation of disordered eating within individuals.

The Current Study

Although significantly higher prevalence rates of eating disorders are reported among college populations (Compas et al., 1986; Heatherton et al., 1997; Striegel-Moore et al., 1986), previous studies have not addressed whether disordered behaviors and cognitions change with the transition to college. To assess change in disordered eating, dieting behaviors, and eating-related attitudes, we tracked the eating patterns of over 300 participants. We surveyed students while they were in high school and again during their first year of college.

The literature on disordered eating patterns suggests two competing hypotheses. Research on adolescents indicates that disordered eating attitudes and behaviors are developed well before college, thereby suggesting that little or no change will occur from high school to college. Conversely, research relating college to increased severity of eating disorder symptoms predicts that the transition to college will be associated with the development or exacerbation of disordered eating. To test these competing hypotheses, we conducted the current study.

METHOD

Participants

Participants in this study were 342 female college students from an incoming class to Dartmouth College. Mean age at initial questioning (during high school) was 17.6 years (range 16–24, $SD = .67$). Racial composition of the group was 78% White, 11% Asian, 4% Black, 4% Hispanic, and 3% American Indian.

Procedure

High school students who were to enter Dartmouth College in the fall were sent a confidential survey on eating behaviors, health habits, and general well-being in the spring of their senior year. 93.5% of participants ($N = 481$) responded. The survey contained items relating to demographic information, body and weight factors, self-perceptions, and disordered eating behaviors (e.g., bingeing, fasting, vomiting, and laxative use). The latter specifically asked for the occurrence and frequency of such behaviors. The survey also included 26 items from the Eating Disorders Inventory (EDI; Garner, Olmstead, & Polivy, 1983) corresponding to the primary items from the Bulimia, Drive for Thinness, Maturity Fears, Perfectionism, and Interpersonal Distrust subscales (Vohs et al., 1999). The coefficient alpha for each subscale was $> .79$, comparable to previous reports of internal reliability (Garner et al., 1983).

We attempted to reassess all respondents from high school at one of three points during the following year, participants' first year of college. Follow-up surveys that closely matched the initial survey were sent according to a seasonal sampling method. Equal thirds of participants from the original survey received follow-up surveys in the fall, winter, and spring. This method was employed to assess the possibility that changes could occur either early or late during the first year of college. Preliminary analyses revealed no differences between groups by season; thus, final analyses collapsed across this variable. The final sample consisted of 342 women who completed both high school and college questionnaires.

Classifications

Body mass index (BMI) was calculated for each participant by dividing weight in kilograms by height in meters squared. Standards from the National Health and Nutritional Examination Survey (Kuczmarski, Flegal, Campbell, & Johnson, 1994) were used to categorize participants into one of five weight categories: very underweight, underweight, average weight, overweight, or obese. BMI criteria for classification of overweight and obesity were 27.3 and 32.3, which reflect BMI scores greater than 85% of women ages 20–29 (Kuczmarski et al., 1994).

Consistent with previous investigations (Heatherton et al., 1995, 1997), coders blind to assessment time classified participants into one of five categories: nondieter, dieter, problem dieter, subclinical eating disordered, and eating disordered. Classification of participants as eating disordered followed criteria for bulimia nervosa listed in the Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (American Psychiatric Association, 1994): (a) binge eating two or more times per week; (b) regular purging (either by laxative or diuretic use, exercise, or vomiting); (c) feeling out of control during a binge; (d) intense worry about bingeing (items c and d required scores of 4 or 5 on a 5-point scale); (e) scoring in the top quartile on the EDI subscales Drive for Thinness and Bulimia; (f) being dissatisfied with current weight and appearance; and (g) a strong desire to lose weight and/or chronic dieting. Participants classified as subclinical eating disordered reported responses similar to eating-disordered participants but to a lesser degree: (a) bingeing once a week, (b) feeling moderately worried about bingeing, (c) feeling somewhat out of control during binges, but (d) not regularly using purgatives. Participants classified as problem dieters reported often or sometimes dieting, scored in the top half of the EDI subscales Drive for Thinness and Bulimia, and semiregularly engaged in binge eating but did not express a loss of control or intense concern about the behavior. Dieters reported mild body dissat-

isfaction and semiregular dieting, in the absence of disordered eating patterns. Nondieters reported no signs of disordered eating and rarely, if ever, dieted. When uncertain of participants' categorization, coders followed the conservative procedure of placing them in the less disordered category.

In the subsequent analyses, comparisons of between-group differences on categorical measures were conducted using chi-square tests. For analyses in which participants serve as their own controls, we used paired t tests for continuous measures (e.g., change in BMI) and the Marginal Homogeneity test (an extension of the McNemar test, when $k > 2$) for categorical measures (e.g., eating disorder classification). The Marginal Homogeneity test provides a two-sided p value that tests the null hypothesis that the probability of being in Category X at Time 1 is the same as the probability of being in Category X and Time 2 (Marascuilo, Omelich, & Gokhale, 1988). Thus, rejection of this null hypothesis implies some change in category membership over time.

RESULTS

Preliminary Analyses

To investigate differences between participants who responded only to our initial high school questionnaire and participants who completed both high school and college questionnaires, we conducted analyses of participation rates as a function of variables such as EDI scores and dieting frequency. Participation in the follow-up survey was not predicted by high school body weight category, $X^2(3, N = 471) < 1.8$, or eating disorder classification status in high school, $X^2(4, N = 471) = 4.09, p > .38$. Participation rates were also not predicted by scores on any of the EDI subscales, frequency of dieting, or ideal weight, all $X^2s < 1$.

Physical Changes

BMI and Body Weight

Overall, the transition from high school to college was associated with a slight increase in BMI, $t(341) = 11.22, p < .0001$. Average BMI during high school was 21.5, whereas average BMI during college was 22.0. As seen in Table 1, a change in BMI is reflected in a slight increase in self-reported weight from high school to college. Participants reported gaining an average of 1.73 kg ($SD = 2.72$ kg).

Changes in Body Self-Perceptions

In addition to our classification of participants using standardized weight categories, we asked participants to classify their own body weight as underweight, average, overweight, or very overweight. Analyses using the Marginal Homogeneity test revealed that women's self-categorization increased significantly after arriving at college ($p < .001$). More women classified themselves as overweight and fewer classified themselves as average after arrival at college (Table 1). We also asked participants to rate how satisfied they were with their bodies on a scale from 1 to 7, where 1 = *very dissatisfied* and 7 = *very satisfied*. Body satisfaction changed significantly with the move to college, $t(341) = 5.68, p < .0001$. Participants were less satisfied with their bodies in college, relative to high school.

Table 1. Changes in overall weight and dieting goals: high school to college

Measure	High School		College	
	<i>n</i>	%	<i>n</i>	%
Weight group*				
Underweight	98	28.7	68	19.9
Average	231	67.7	260	76.2
Overweight	9	2.6	9	2.6
Obese	3	0.9	4	1.2
Self-categorization*				
Underweight	26	7.6	22	6.7
Average	235	69.0	201	59.1
Overweight	73	21.9	110	32.2
Very overweight	3	0.9	4	1.2
Desire to lose weight	268	78.3	277	81.2
Desire to stay same	66	19.3	57	16.7
Desire to gain weight	8	2.3	7	2.1

*Significant comparison using paired *t*-test analyses, $p < .001$.

We also found that a change in BMI significantly related to a change in body satisfaction, $r(340) = -.30$, $p < .0001$. An increase in BMI from high school to college was associated with decreased body satisfaction.

Dieting Frequency

To assess a behavioral correlate of weight self-categorization and body dissatisfaction, we asked participants at both assessments how frequently they dieted: never, rarely, sometimes, often, or always. Dieting frequency in college changed modestly from high school, ($p = .08$) in the direction of participants reporting that they dieted less frequently in college. For example, 25.1% of participants reported that they rarely dieted in high school, whereas 28.7% reported that they rarely dieted in college; 11.2% of participants reported that they usually dieted in high school, whereas only 9.6% of participants in college reported that they usually dieted. Additionally, scores on the EDI subscale Drive for Thinness did not significantly change from high school ($M = 14.9$, $SD = 7.0$) to college ($M = 14.6$, $SD = 6.6$). Although women reported increased body dissatisfaction and considered themselves to be heavier in college than in high school, these self-perceptions were not associated with corresponding cognitive or behavioral changes.

Change in Disordered Eating Status

One of our primary goals was to assess change in disordered eating patterns from high school to college. As stated earlier, participants were classified into the categories of nondieter, dieter, problem dieter, subclinical eating disordered, and clinical eating disordered. Comparisons of disordered eating classification from high school to college were conducted using the Marginal Homogeneity test. This analysis revealed no differences in eating disorder classification from high school to college, ($p = .80$). To further illustrate the stability of eating disorder classification from high school to college, we transformed the disordered eating categories into continuous variables ranging from 1 to 5 such that 1 = *nondieter* and 5 = *clinical eating disordered*. Average eating disorder classification remained remarkably stable from high school ($M = 1.90$, $SD = 1.08$) to college, ($M = 1.86$, $SD = 1.10$).

Additionally, scores on the EDI subscale Bulimia did not change significantly from high school ($M = 11.7$, $SD = 4.7$) to college ($M = 11.6$; $SD = 5.1$). Thus, these data suggest that eating patterns are well established prior to arrival at college (Table 2).

DISCUSSION

The results of our longitudinal study indicate that the transition to college does not significantly change eating patterns. To be sure, we do not want to suggest that disordered eating has “gone away” or even decreased. Rates of disordered eating and body dissatisfaction reported in this study are similar to those reported in other studies (Fairburn & Beglin, 1990; Heatherton et al., 1995). Importantly, the use of a prospective design allows us to conclude that whatever the transition to college entails, it does not affect the severity of disordered eating. It appears that disordered eating patterns are entrenched prior to the transition to college.

Nonetheless, we did find that women’s body self-perceptions change from high school to college. Relative to high school, more women in college categorized themselves as overweight and reported greater body dissatisfaction. Although changes in self-perceptions should be considered in the context of a slight weight gain from high school to college, the majority of our respondents were not overweight according to national standards.

Despite significant changes in weight self-categorization and body dissatisfaction, we did not find significant changes in EDI Drive for Thinness and Bulimia subscale scores, dieting behavior, or eating disorder classification. Moreover, despite the fact that our participants gained some weight from high school to college and perceived themselves to be heavier, there was a slight decline in frequency of dieting. It is especially notable that classification of eating disorder status showed no change from high school to college, given the significant changes in self-perceptions and body dissatisfaction and given that approximately 80% of women at both assessments reported that they wanted to lose weight.

Our findings lend support to previous studies of adolescents that have found the prevalence of eating disorders to be comparable to that found in college samples (Howat & Saxton, 1988; Pope et al., 1984). However, because these studies used cross-sectional designs, the possibility remained that the incidence of eating disorders would increase

Table 2. Changes in the eating disorder classification: high school to college

High School Category	College Category				
	Nondieter (51.8)	Dieter (23.7)	Problem Dieter (14.9)	Subclinical (6.1)	Clinical (3.5)
Nondieter (47.7)	130	25	7	1	0
Dieter (28.4)	30	43	15	5	4
Problem dieter (13.7)	12	9	22	4	0
Subclinical (7.3)	4	3	5	8	5
Clinical (2.9)	1	1	2	3	3

Note: Numbers in parentheses refer to overall percentage of respondents selecting that category in that year (i.e., 47.7% of women in high school were classified as nondieters, whereas 51.8% of women in college were classified as nondieters). All other numbers indicate the number of respondents classified into each category at each assessment.

from high school to college. The data from our longitudinal design suggest that the underpinnings of disordered eating are established well before college.

Caveats and Limitations

Null results can be due to a lack of statistical power, but lack of statistical power was not an issue in the current study. With data from approximately 600 participants at two points in time, we found significant differences in self-perceptions and EDI subscale scores from high school to college. If significant differences on other measures existed, we are confident our design would have detected them. Moreover, we have used these measures previously and found them to be sensitive to change (Heatherton et al., 1995, 1997).

This study is, however, limited by its reliance on self-reports. Although self-report studies are the most common method of examining sensitive topics, such as disordered eating behaviors, they have been criticized on several levels, including the influence of extraneous factors (Fairburn & Beglin, 1990). In addition, although disordered eating categories were based on criteria for bulimia nervosa in the Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (American Psychiatric Association, 1994) and have been shown to be a reliable indicator of bulimic symptomatology (Joiner, Heatherton, Rudd, & Schmidt, 1997), they are not diagnoses based on clinical interviews. Nonetheless, interviews are not plausible for assessing change in a large cohort moving from high school to college. Moreover, our aim was to assess a broad range of eating patterns, a goal best achieved using a survey format.

Implications for Policy

The 1980s brought a heightened awareness to the issue of eating disorders. Academic and clinical research, along with the media, highlighted the frequency of these problems for adolescent girls and young women. Subsequently, educators and school administrators established prevention and treatment programs in schools to aid in the fight against eating disorders (Striegel-Moore et al., 1986). The present study suggests that disordered eating patterns are deeply rooted by the time students have reached the end of high school. Therefore, it would appear that colleges should focus their efforts on treatment rather than prevention. Although our data do not speak directly to the acquisition of eating disorders in adolescents, we believe prevention efforts ought to be targeted at early adolescents.

CONCLUSIONS

The findings from our prospective study demonstrate that the transition to college does not increase the severity of disordered eating patterns. During this time of changing self-perceptions, dieting behaviors and eating patterns among young women remained remarkably stable. Thus, it appears that behaviors related to disordered eating are well established prior to arrival at college.

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