

# Body Dissatisfaction, Living Away from Parents, and Poor Social Adjustment Predict Binge Eating Symptoms in Young Women Making the Transition to University

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**Abstract** The current study explored how body dissatisfaction and challenges associated with the transition to university predicted symptoms of binge eating. Participants were 101 female full-time first-year university students ( $M = 18.3$  years of age;  $SD = .50$ ) who completed a background questionnaire and a web-based daily checklist assessing binge eating. Hierarchical Generalized Linear Modeling results showed that participants who were more dissatisfied with their bodies were three times as likely to report symptoms of binge eating compared to participants who were less dissatisfied. Participants who lived away from home were three times as likely to report symptoms of binge eating compared to participants living with parents. Finally, poor perceived social adjustment to the university context was associated with an increased likelihood of binge eating. Discussion calls for more research exploring the role that university challenges and adjustment play in predicting eating problems.

**Keywords** Binge eating · Body dissatisfaction · Transition to university

Developmental researchers have speculated that the emergence of eating problems in adolescent girls may represent a mode of psychological accommodation to transitional challenges (Attie and Brooks-Gunn, 1992; Smolak and Levine, 1996). Transitions can contribute to stressors that may exceed coping resources, transitions may alter the match between individual needs and contextual resources, and developmental transitions may exacerbate ongoing risks (Graber and Brooks-Gunn, 1996; Maggs *et al.*, 1997). Late adolescence, and in particular the transition to university, has been identified as a period of increased risk for eating problems (Dickstein, 1989; Smolak and Levine, 1996). Although many studies of eating problems have been conducted with university student samples, few have explicitly explored the links between challenges and experiences of the university transition and eating problems. In the current study we address this gap in the literature by exploring the role that challenges associated with the university transition and adjustment to university play in predicting symptoms of binge eating across a two-week period during first semester.

Many adolescents begin to navigate the transition to adulthood at university. For example, according to Statistics Canada's Youth in Transition Survey, 70% of high school graduates in Canada pursue some form of post-secondary education (Bowlby and McMullen, 2002). The university experience is an intensive preparatory socialization process whereby new academic and social challenges are negotiated (Montgomery and Côté, 2003; Tinto, 1993). Characteristics of university life provide adolescents with opportunities and freedom to explore their identities, but at the same time new demands and norms can be stressful (Sherrod *et al.*, 1993; Tinto, 1993).

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For some students, attempts to adjust to the challenges of university may take the form of health-risk behaviors. For example, binge eating is associated with the transition to university (Striegel-Moore *et al.*, 1989). Binge eating is defined as eating unusually large quantities of food, accompanied by a loss of control over one's eating, and is a defining feature of Bulimia Nervosa (BN; APA, 1994; Steiger *et al.*, 2003). Prevalence rates for BN range from 1% to 2% in adolescent and college-aged females, and the vast majority of BN cases emerge during the college years, between the ages of 18 and 25 (Smolak and Striegel-Moore, 1996; Steiger *et al.*, 2003). Sub-threshold forms are thought to be much more prevalent (Hoek and van Hoeken, 2003; Steiger *et al.*, 2003). Striegel-Moore *et al.* (1989) found that 33% of university women reported some binge eating, both at the beginning and end of their first year of university, and that 15% started binge eating over the course of their first year. Increases in stress and feelings of ineffectiveness (among other factors) discriminated the worsening group from the stable group. Pyle *et al.* (1991) found that among first-year women, 5% of the sample met the classification for bulimia nervosa. Among those not classified as having bulimia, 25% reported binge eating at any frequency, 7% reported binge eating more than weekly, and 51% reported eating due to stress. These students also reported significant social and work related impairment. Reviewing the records of 130 college female students who accessed a university eating disorders intervention program, Schwitzer *et al.* (2001) found that 79% reported binge eating, 75% reported moderate stress, and 35% reported moderate concerns about pressure to succeed academically, although less than 1% actually had academic difficulties.

Clearly, stress and adjustment problems, broadly construed, are linked with eating problems in university women. However, no research has examined specific factors associated with the university transition that might constitute this risk. A study conducted at a large Canadian university found that a substantial minority of students (20% or more) felt that moving away from home and managing time effectively were stress-related concerns that interfered with their academic work (University of Alberta Student Counselling Services, 2003). Leaving home results in diminished direct dependence on parents and other members of established social networks (e.g., peers, siblings) and increased responsibility for self-regulation (Montgomery and Côté, 2003), and those who live away from home engage in more health-risk behaviors, such as heavy alcohol use (Kuo *et al.*, 2002). Stress associated with managing academic workloads (e.g., attending classes, completing assignments, studying) can negatively impact student success and well-being. Results from Statistics Canada's Youth in Transition study (Bowlby and McMullen, 2002) showed that almost one quarter of students who left post-secondary education before completing their

degree reported having had trouble keeping up with their workload, most or all of the time. Among a representative sample of college freshmen in the United States, 25% reported feeling frequently overwhelmed with all they had to do in the past year (Sax, 1997). Furthermore, increases in stress and depressive symptoms over the course of the first year of university predict poor subjective adjustment to the university context and poor subjective adjustment predicts lower GPA (Wintre and Yaffe, 2000). In the current study, we tested the effects of two challenges associated with transitioning to the university context on symptoms of binge eating: living away from home and heavy academic loads (as indicated by class hours). In addition, we examined the effects of subjective markers of academic and social adjustment and an objective marker of academic adjustment (GPA) on symptoms of binge eating.

Developmental transitions may also exacerbate ongoing risks (Graber and Brooks-Gunn, 1996; Maggs *et al.*, 1997). Certainly, some individuals enter university more vulnerable to eating problems than others. Vulnerability may be defined as a predisposition or susceptibility to experience negative outcomes when faced with stressful conditions (Engle *et al.*, 1996). Body dissatisfaction, which typically increases in adolescence (Smolak, 2004), is one of the most robust risk factors for eating pathology (Jacobi *et al.*, 2004; Stice, 2002). Barker *et al.* (2006) showed that elevated weight concerns, stress (trend only), and negative affect were related to an increased likelihood of reporting same-day binge eating symptoms in a sample of first-year university women. Thus, body dissatisfaction may be a vulnerability that combines with challenges of the university transition to increase the risk for eating problems. In the current study, body dissatisfaction at entrance to the first year of university is examined as a predictor of symptoms of binge eating in young women students.

#### Research questions

In the current study we explored the role that body dissatisfaction, challenges associated with the university transition, and adjustment to the university context play in predicting symptoms of binge eating. Based on our review of the literature, we posed three research questions: To what extent are binge eating symptoms in young women making the transition to university predicted by (a) body dissatisfaction at entrance to university; (b) common university challenges such as living away from parents and spending time in class; and (c) subjective (perceptions of social and academic adjustment) and objective (grade point average or GPA) markers of success in making the transition? We predicted that body dissatisfaction (i.e., vulnerability for eating problems) would increase the risk of experiencing binge eating symptoms at entrance to university. The common university

challenges of living away from home and heavy academic work loads (as indicated by class hours) were also hypothesized to increase risk for binge eating symptoms, as both can contribute to stress during the transition to university. Finally, we predicted that subjective and objective markers of poor social and academic adjustment to university would be associated with elevated symptoms of binge eating, because these markers reflect poor adaptation to transitional challenges and are associated more generally with compromised well-being.

## Method

### Participants

Participants were 101 female full-time first-year students at a large Canadian university taking part in a web-based study of health-related behaviors and academic performance. On average, participants were 18.3 years of age ( $SD = .50$ ; range = 17.5 to 19.9 years). Sixty-two percent self-identified as white, 27% Asian, 7% mixed ethnicity, 3% East Indian, and 1% black. The percentage of students in the current sample enrolled in various university faculties (e.g., Arts, Science, Physical Education) closely matched the actual faculty distribution of first-year students at the university. Eighty-seven percent of students indicated that they lived with both parents most of the time while growing up, and that 67% of their mothers and 71% of their fathers had completed a 2-year college diploma or 4-year university degree.

### Procedure

Participants were recruited from introductory English classes which serve most of the population of first-year students. To ensure that the sample consisted of students who were just beginning the transition to university, participants were required to be 19 years of age or younger, enrolled full-time, and in their first year of any post-secondary education.

Participants attended initial group sessions to sign consent forms and complete a background questionnaire. They then completed a web-based daily checklist of health behaviors (e.g., sleeping, eating, exercise, alcohol use) for 14 consecutive days over one of four two-week periods in the first three months of fall term (mid-September to late November). Participants were asked to complete the checklist as late as possible before going to sleep each night (the checklist was available from 6:00 p.m. until noon the next day). A \$5 honorarium was paid to each participant for each day a checklist was submitted. On average, participants submitted 13 checklists (range = 7 to 14; 93% completed 10 or more days) totaling 1242 days of data.

### Measures

*Binge eating symptoms.* Binge eating was measured daily in the web-based checklist using a subscale adapted from the Eating Disorders Inventory (Garner *et al.*, 1983).<sup>1</sup> The adapted subscale (described in von Ranson *et al.*, 2005) is composed of seven true-false items that were altered to reflect daily behavior for the current study. Participants were instructed to answer the items based on how they were feeling and what they were doing that day. Items assessed overeating, eating when upset, and feeling out of control while eating. The psychometric properties of similar adaptations of this subscale have been found to be strong, and include good internal reliability, stability, and criterion validity (von Ranson *et al.*, 2005). The average internal reliability coefficients across the 14 days was .72 (range = .45 to .87). Alphas were greater than .70 on 11 of the 14 days.

*Body dissatisfaction.* Two subscales from the Body-Esteem (BE) Scale for Adolescents and Adults (Mendelson *et al.*, 2001) were included in the background questionnaire. The 12-item BE-Appearance subscale (general feelings about appearance) and the 6-item BE-Weight subscale (weight satisfaction) measured body dissatisfaction. Participants indicated how often they agreed with a series of statements on a five-point Likert scale ranging from (0) *never* to (4) *always*. Examples of BE-Appearance items are “I’m proud of my body” and “I worry about the way I look.” Examples of BE-Weight items are “My weight makes me unhappy” and “I am satisfied with my weight.” Coefficient alpha for the 18 items was .95. Average scores across the 18 items were calculated, with higher scores indicating greater body dissatisfaction.

*Lives away from home.* In the background questionnaire, participants indicated whether they lived with parents, in university residence, in their own apartment, with relatives, or in some other living arrangement. Living with parents was coded as ‘0’ and living in one of the other situations was coded as ‘1.’

*Number of class hours per week.* In the background questionnaire, participants recorded the number of class hours per week for which they were registered. The distribution of self-reported class hours matched closely with registrar records of the number of courses in which participants were officially registered ( $r = .52$ ,  $p < .01$ ). The self-report measure of class hours was selected over the number of courses because there was more variability in the self-report measure of class

<sup>1</sup> The binge eating subscale utilized in this study was adapted and reproduced by special permission of Psychological Assessment Resources, Inc., 16204 North Florida Avenue, Lutz, Florida 33549, from the Eating Disorders Inventory (collectively, EDI and EDI-2) by Garner, Olmstead, and Polivy, Copyright 1983 by Psychological Assessment Resources, Inc. Further reproduction is prohibited without prior permission from Psychological Assessment Resources, Inc.

hours. Moreover, time spent in class might better reflect time commitments that could pose challenges for first-year students.

*Perceived social and academic adjustment.* The Student Adaptation to College Questionnaire (SACQ; Baker and Siryk, 1989) measured social and academic adjustment. It was administered as part of the daily checklist on the 12th day of online data collection. The 20-item Social Adjustment subscale and 24-item Academic Adjustment subscale were included. Social adjustment items assessed involvement in social activities, feelings of loneliness, and establishment of close social ties at university. Academic adjustment items assessed ability to meet academic demands and enjoyment of academic challenges. All items were scored on a nine-point Likert scale ranging from (1) *applies to me very closely* to (9) *doesn't apply to me at all*. Total scores were calculated with higher scores indicating better adjustment to university in each domain. Coefficient alphas were .85 for academic adjustment and .90 for social adjustment.

*First-term grade point average.* Official final first-term GPA, rated on a 4.0 scale, for each student was provided by the registrar's office. Although GPA was not assessed until after the first semester was finished, it was used as a predictor of first-semester binge eating symptoms because it is the end result of how the participant was doing academically.

## Results

### Descriptive statistics

Table 1 presents means and standard deviations for and correlations among the outcome and predictor variables. On average, participants reported 0 to 1 symptom of binge eating each day, and body dissatisfaction was low. Fifty-one percent of participants lived with parents and 49% lived in another situation (31% in university residence, 11% in their own apartment, 6% with relatives, 1% in another living situa-

tion). Kuo *et al.* (2002) reported that 52% of Canadian university students in their large, randomly selected, sample lived with parents. Social adjustment total scores were similar to published total scores for students in their first semester of university. The academic adjustment total scores were lower than the published totals, which are usually in the 140 to 150 point range (Baker and Siryk, 1989). Grade point average was moderate. Total binge eating symptoms were correlated with body dissatisfaction and both social and academic adjustment. Participants who reported more symptoms of binge eating on average across the 14 days also reported greater body dissatisfaction and poorer social and academic adjustment. Social adjustment and academic adjustment were positively related. Academic adjustment was positively related to GPA and negatively related to class hours. Living situation was not related to any of the other variables.

### Multilevel modeling

Preliminary data checking revealed that the outcome variable, binge eating symptoms, was highly skewed and could not be transformed to meet the normality assumption of multilevel modeling. Therefore, the binge eating variable was dichotomized (Raudenbush and Bryk, 2002; Snijders and Bosker, 1999). For each of the 14 days, individuals who reported no symptoms of binge eating received a score of 0 and participants who reported any (one to seven) symptoms of binge eating received a score of 1. The Hierarchical Generalized Linear Modeling (HGLM) option in the Hierarchical Linear Modeling (HLM) program was used to predict the log-odds (i.e., likelihood) of symptoms of binge eating (Raudenbush and Bryk, 2002). HGLM is the multilevel modeling equivalent of logistic regression, an appropriate data analysis procedure for repeated measures data with a binary outcome. HLM techniques account for nested data structures and have the advantage of including data from all 101 participants in the analyses, even if they are missing one or more days of reports on binge eating. Data

**Table 1** Means and standard deviations for and intercorrelations among total binge eating symptoms, body dissatisfaction, and university variables

Measure	<i>M</i>	<i>SD</i>	1	2	3 <sup>a</sup>	4	5	6
1. Binge eating symptoms	.53	.85	–					
2. Body dissatisfaction	1.70	.82	.34*	–				
3. Living away from home <sup>a</sup>	–	–	–.10	.02	–			
4. Class hours	18.65	3.96	–.00	–.08	–.16	–		
5. Social adjustment	119.35	26.80	–.26*	–.30*	–.05	–.09	–	
6. Academic adjustment	126.89	27.00	–.29*	–.36*	–.14	–.20*	.41*	–
7. Grade point average	2.65	.82	–.13	–.25*	–.03	.13	.17	.37*

Note. *n* = 101.

<sup>a</sup>point-biserial correlations.

\**p* < .05.

**Table 2** HGLM results testing the effects of body dissatisfaction and university variables on the likelihood of reporting symptoms of binge eating

Variable	Model 1		Model 2		Model 3	
	OR	CI	OR	CI	OR	CI
Body dissatisfaction	3.14*	(1.68, 5.87)	3.30*	(1.76, 6.20)	2.43*	(1.30, 4.54)
Living away from home			2.85*	(1.17, 6.90)	3.49*	(1.42, 8.62)
Class hours			1.04	(.92, 1.19)	.99	(.86, 1.13)
Social adjustment					.98*	(.96, .99)
Academic adjustment					.98	(.96, 1.00)
Grade point average					1.46	(.82, 2.57)

Note. OR: odds ratio. CI: 95% confidence interval of the odds ratio.

\* $p < .05$ .

from participants who completed the binge eating symptoms measure on all 14 days are weighted more heavily, but as long as one occasion of measurement is available, the case is used in the estimation of effects.

HGLM results are presented in Table 2. Model 1 tested the between-person effect of body dissatisfaction on the average likelihood of reporting symptoms of binge eating across 14 days. The effect was significant. For each unit increase in body dissatisfaction participants were about three times as likely to report symptoms of binge eating. For example, a participant who sometimes felt dissatisfied with her body (score of 2) would be three times as likely to report one or more symptoms of binge eating as a participant who was seldom dissatisfied with her body (score of 1).

In Model 2, living away from home and class hours were added to the model. Only living away from home was related to the likelihood of reporting symptoms of binge eating. The odds ratio indicated that participants who lived away from home were almost three times as likely to report symptoms of binge eating compared to participants living with parents. The body dissatisfaction effect remained significant in this model.

Perceived social and academic adjustment and GPA were added in Model 3. The significant effect of social adjustment showed that for each unit increase in social adjustment participants were slightly less likely to report symptoms of binge eating. Because the range of scores on the social adjustment measure is large (range = 38 to 176), it is more meaningful to interpret the odds ratio in terms of differences in scores 1 standard deviation apart, rather than 1 unit difference in scores (Cohen *et al.*, 2003; Raudenbush and Bryk, 2002). Thus, a student with an average social adjustment score would be 50% less likely to report symptoms of binge eating compared to a student with a social adjustment score 1 standard deviation below the mean. The effects of academic adjustment and GPA were not significant. The significant effects of body dissatisfaction and living away from home remained significant in this model.

To provide a test of the strength of association between the set of variables and the outcome, deviance statistics were compared (Kreft and De Leeuw, 1998; Snijders and Bosker, 1999). The deviance statistic for the unconditional model, a model without any predictors, was calculated as the baseline and compared to the deviance statistic for Model 3, the full model. The decrease in the deviance statistic was significant, indicating that the variables were reliably associated with the likelihood of binge eating symptoms,  $\chi^2(6, N = 101) = 30.34, p < .01$ .

A fourth model (not shown) tested the effects of interactions between body dissatisfaction and living away from home and between body dissatisfaction and social adjustment on the likelihood of reporting symptoms of binge eating. These analyses were conducted to learn whether independent risks for binge eating combined to predict even higher levels of binge eating. The main effects of body dissatisfaction, living away from home, and social adjustment and the two interaction terms were included in the model. The main effects were all significant, but neither interaction term was significant.

## Discussion

Although it has been proposed that the emergence of eating problems in late adolescence and emerging adulthood is the result of poor adaptation to transitional challenges (Attie and Brooks-Gunn, 1992; Smolak and Levine, 1996), specific challenges had not been identified or explored empirically. The current study showed that vulnerability to eating problems and challenges associated with the transition to university increase risk for symptoms of binge eating in first-year university student women.

First we assessed the effect of body dissatisfaction at entrance to university (see Table 2, Model 1) on the likelihood of reporting symptoms of binge eating. Participants who more often felt dissatisfied with their bodies were three times as likely to report symptoms of binge eating during

a two-week period during their first semester of university compared to participants who were less often dissatisfied with their bodies. That is, risk for symptoms of binge eating was greater for young women who entered university vulnerable to eating problems.

Next we tested the effects of common university challenges (Model 2), and subjective and objective markers of successful adaptation (Model 3) on the likelihood of reporting symptoms of binge eating. Model 2 results showed that living away from home was associated with an increased likelihood of reporting symptoms of binge eating. Specifically, participants who lived away from home were almost three times as likely to report symptoms of binge eating compared to participants who lived with parents. Model 3 results showed that social adjustment was associated with the likelihood of reporting one or more symptoms of binge eating. A student with an average adjustment score was 50% less likely to report symptoms of binge eating compared to a student whose social adjustment score was 1 standard deviation below the mean. Moving away from home alters established social resources (Montgomery and Côté, 2003) and poor perceived social adjustment may reflect difficulties with establishing new social support systems. Maintaining social support and social integration is associated with physical health outcomes and well-being across adulthood (Cohen, 2004), and across emerging adulthood and adolescence, decreases in social support and high levels of interpersonal stress are associated with increases in depressive symptoms (Galambos *et al.*, 2006; Rudolph, 2002). Furthermore, women with bulimia are more sensitive to interpersonal stress compared to healthy women (Steiger *et al.*, 1999). Thus, moving away from home and poor social adjustment may reflect decreases in social support and increases in interpersonal stress that, for some young women, contribute to eating problems.

It was interesting that neither the subjective (i.e., perceptions) nor the objective (i.e., first-semester GPA) marker of academic adjustment was associated with the likelihood of reporting symptoms of binge eating. Furthermore, time spent in class was unrelated to symptoms of binge eating. This lack of significance of academic variables underscores the relative importance of personal vulnerabilities like body dissatisfaction and interpersonal stresses (moving away from home and not feeling socially adapted) in predicting binge eating symptoms in first-year university student women. Rather than drawing the conclusion, however, that academic stresses and challenges are not as important as social experiences in predicting symptoms of binge eating, the results should be considered in light of the design of the study. It could be, for instance, that academic stresses accumulate over time, the effects of which are not immediately apparent in the early part of the first year of university. In fact, the participants in this study completed

their web-based checklists of symptoms in one of four two-week periods scheduled between mid-September and the end of November. It is likely that the most immediate effects of the transition to university are the socially experienced ones. Academic adjustment variables might have their impact later on in the first year, or even subsequent years of university.

To determine whether vulnerabilities combined to magnify binge eating symptoms, in a final model we tested the interactive effects of body dissatisfaction and living away from home and body dissatisfaction and social adjustment on the likelihood of reporting symptoms of binge eating. Neither interaction term was significant, which might indicate that several pathways to binge eating exist (i.e., diversity in developmental trajectories). However, low levels of binge eating symptoms were reported in this community sample and may have limited our ability to detect significant interactive effects. Significant interactions among the variables might be evident in clinical samples where binge eating behavior is more severe.

The research conducted in the current study had some shortcomings that should be noted. One limitation is that we were unable to determine direction of causality among the variables. Although body dissatisfaction was conceptualized as a temporally distal vulnerability that likely developed during adolescence, body dissatisfaction was not measured prior to the transition to university. There is evidence of moderate stability in body dissatisfaction across adolescence (Smolak, 2004), but also for change in body dissatisfaction in university samples (Vohs *et al.*, 2001). Similarly, previous levels of binge eating symptoms were not assessed. We do not know if the participants who reported symptoms of binge eating carried this behavior over from adolescence or if it emerged during the transition to university. Binge eating and other eating problems have been found to commence during the first year of university (Striegel-Moore *et al.*, 1989) and body dissatisfaction in early adolescence predicts later eating problems (Stice, 2002). Therefore, it is likely that for some individuals in the current study, vulnerabilities were carried over from adolescence and that binge eating symptoms began during the transition. The question also remains as to whether poor adjustment to university was related to prior levels of functioning or other factors that predict adjustment. For example, adolescents whose expectations of university are more complex and optimistic show better adjustment in their first year and beyond (Jackson *et al.*, 2000), but these types of measures were not included in the current study. Overall, well-being tends to improve across emerging adulthood and improvements are associated with successful negotiation of developmental challenges (Galambos *et al.*, 2006; Schulenberg *et al.*, 2004). Therefore, it is reasonable to speculate that adjustment problems may contribute to declines in well-being and that poor adjustment

to university might contribute to the emergence of binge eating symptoms. Finally, the current study only examined symptoms of binge eating in young women. Considering that binge eating is a defining feature of Binge Eating Disorder (BED) and that BED has a more even gender distribution than bulimia nervosa (Steiger *et al.*, 2003), future research should study whether adjustment to the transition to university contributes to binge eating in young men.

The current study has several strengths. For example, we undertook several of Stice's (2002) suggestions for how to move forward the study of risks for eating problems. The current study (1) tested hypotheses about the development of eating problems during a period characterized by increased risk for eating problems; (2) studied a specific outcome assessed every day across two weeks as opposed to a general measure of eating problems; (3) tested several risk factors together to determine independent effects; and (4) explored a new or understudied risk factor (i.e., university adjustment). Overall, the current study has pointed to the importance of exploring the role that specific transitional challenges and adjustment play in increasing risk for eating problems during the transition to university. In bulimia nervosa, binge eating behavior precedes compensatory behaviors (e.g., vomiting, laxative use) by one to two years (Stice *et al.*, 1998) and binge eating predicts weight gain over time and is more prevalent among obese individuals (Striegel-Moore and Franko, 2003). Identifying predictors of symptoms of binge eating in a population at risk for eating problems has important implications for treatment and prevention efforts. Because poor adjustment to university may be associated with problems that for some take the form of binge eating, helping students cope with and adjust to new challenges may prevent these and other problems from seriously affecting success and overall well-being (for an example see Stice *et al.*, 2006). Future research should move beyond simply studying eating problems in university samples to unpacking and exploring further the role of university challenges and adjustment in predicting eating problems. As more and more adolescents go on to post-secondary studies, the importance of understanding this transition and its implications for health outcomes increases.

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## References

- American Psychiatric Association (1994) Diagnostic and statistical manual of mental disorders, 4th ed. Washington, DC, Author
- Attie I, Brooks-Gunn, J (1992) Developmental issues in the study of eating problems and disorders. In: Crowther JH, Tennebaum DL, Hobfoll SE, Stephens MAP (eds) The etiology of bulimia nervosa: The individual and familial context. Hemisphere, Washington, DC, pp 35–58
- Baker RW, Siryk B (1989) Manual for student adaptation to college questionnaire. Western Psychological Services, Los Angeles
- Barker ET, Williams RL, Galambos NL (2006) Daily spillover to and from binge eating in first-year university females. *Eat Disord: J Treat Prev* 14:229–242
- Bowlby JW, McMullen K (2002) At a crossroads: First results for the 18 to 20-year-old cohort of the Youth in Transition Survey (Catalogue No. 81-591-XPE). Statistics Canada, Ottawa
- Cohen J, Cohen P, West SG, Aiken LS (2003) Applied multiple regression/correlation analysis for the behavioral sciences, 2nd ed. Lawrence Erlbaum, Mahwah, NJ
- Cohen S (2004) Social relationships and health. *Am Psychol* 59:676–684
- Dickstein LJ (1989) Current college environments: Do these communities facilitate and foster bulimia in vulnerable students? In: Whitaker LC, Davis WN (eds) The bulimic college student. Hawthorn, New York, pp 107–133
- Engle PL, Castle S, Menon P (1996) Child development: Vulnerability and resilience. *Soc Sci Med* 43:621–635
- Galambos NL, Barker ET, Krahn HJ (2006) Depression, self-esteem, and anger in emerging adulthood: Seven-year trajectories. *Dev Psychol* 42:350–365
- Garner DM, Olmstead MP, Polivy J (1983) Development and validation of a multidimensional eating disorders inventory for anorexia nervosa and bulimia. *Int J Eat Disord* 2:15–34
- Graber JA, Brooks-Gunn J (1996) Transitions and turning points: Navigating the passage from childhood through adolescence. *Dev Psychol* 32:768–776
- Hoek HW, van Hoeken D (2003) Review of the prevalence and incidence of eating disorders. *Int J Eat Disord* 34:383–396
- Jackson LM, Pancer SM, Pratt MW, and Hunsberger BE (2000) Great expectations: The relation between expectancies and adjustment during the transition to university. *J Appl Soc Psychol* 30:2100–2125
- Jacobi C, Hayward C, de Zwaan M, Kraemer HC, Agras S (2004) Coming to terms with risk factors for eating disorders: Application of risk terminology and suggestions for a general taxonomy. *Psychol Bull* 130:19–65
- Kreft I, De Leeuw J (1998) Introducing multilevel modeling. Sage: London
- Kuo M, Adlaf EM, Lee H, Gliksman L, Demers A, Wechsler H (2002) More Canadian students drink but American Students drink more: Comparing college alcohol use in two countries. *Addiction* 97:1583–1592
- Maggs JL, Schulenberg J, Hurrelmann K (1997) Developmental transitions during adolescence: Health promotion implications. In: Schulenberg J, Maggs JL, Hurrelmann K (eds) Health risks and developmental transitions during adolescence. Cambridge University Press, New York, pp 522–546
- Mendelson BK, Mendelson MJ, White DR (2001) Body-esteem scale for adolescents and adults. *J Pers Assess* 76:90–106
- Montgomery MJ, Côté JE (2003) College as a transition to adulthood. In: Adams GR, Berzonsky MD (eds) Blackwell handbook of adolescence. Blackwell, Oxford, UK, pp 149–172

- Pyle RL, Neuman PA, Halvorson PA, Mitchell MD (1991) An ongoing cross-sectional study of the prevalence of eating disorders in freshmen college students. *Int J Eat Disord* 10:666–677
- Raudenbush SW, Bryk AS (2002) Hierarchical linear models: Applications and data analysis methods, 2nd ed. Sage, Thousand Oaks, CA
- Rudolph KD (2002) Gender differences in emotional responses to interpersonal stress during adolescence. *J Adolesc Health* 30(Suppl):3–13
- Sax LJ (1997) Health trends among college freshmen. *J Am Coll Health* 45:252–262
- Schulenberg JE, Bryant AL, O'Malley PM (2004) Taking hold of some kind of life: How developmental tasks relate to trajectories of well-being during the transition to adulthood. *Dev Psychopathol* 16:1119–1140
- Schwitzer AM, Rodriguez LE, Thomas C, Salimi L (2001) The Eating Disorders NOS diagnostic profile among college women. *J Am Coll Health* 49:157–166
- Sherrod LR, Haggerty RJ, Featherman DL (1993) Introduction: Late adolescence and the transition to adulthood. *J Res Adolesc* 3:217–226
- Smolak L (2004) Body image in children and adolescents: Where do we go from here? *Body Image* 1:15–28
- Smolak L, Levine MP (1996) Adolescent transitions and the development of eating problems. In: Smolak L, Levine MP, Striegel-Moore R (eds) *The developmental psychopathology of eating disorders*. Lawrence Erlbaum, Mahwah, NJ, pp 207–233
- Smolak L, Striegel-Moore R (1996) The implications of developmental research for eating disorders. In: Smolak L, Levine MP, Striegel-Moore R (eds) *The developmental psychopathology of eating disorders*. Lawrence Erlbaum, Mahwah, NJ, pp 183–203
- Snijders T, Bosker R (1999) *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. Sage: London
- Steiger H, Bruce KR, Israël M (2003) Eating disorders. In: Weiner IB (Series Ed.) and Stricker G, Widiger TA, Weiner IB (vol. eds) *Handbook of psychology: Vol 8. Clinical psychology*. Wiley, New York, pp 173–194
- Steiger H, Gauvin L, Jabalpurwala S, Séguin JR, Stotland S (1999) Hypersensitivity to social interactions in bulimic syndromes: Relationship to binge eating. *J Consult Clin Psychol* 67:765–775
- Stice E (2002) Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychol Bull* 128:825–848
- Stice E, Killen JD, Hayward C, Taylor CB (1998) Age of onset for binge eating and purging during late adolescence: A 4-year survival analysis. *J Abnorm Psychol* 107:671–675
- Stice E, Orjada K, Tristan J (2006) Trial of a psychoeducational eating disturbance intervention for college women: A replication and extension. *Int J Eat Disord* 39:233–239
- Striegel-Moore R, Silberstein LR, Frensch P, Rodin J (1989) A prospective study of disordered eating among college students. *Int J Eat Disord* 8:499–509
- Striegel-Moore RH, Franko DL (2003) Epidemiology of binge eating disorder. *Int J Eat Disord* 34:S19–S29
- Tinto V (1993) *Leaving college*. University of Chicago Press, Chicago
- University of Alberta Student Counselling Services (2003) *Student life survey: 2000/2001 report*. University Student Services, University of Alberta
- Vohs KD, Heatherton TF, Herrin M (2001) Disordered eating and the transition to college: A prospective study. *Int J Eat Disord* 29:280–288
- von Ranson KM, Klump KL, Iacono WG, McGue M (2005) The Minnesota Eating Behavior Survey: A brief measure of disordered eating attitudes and behaviors. *Eat Behav* 6:389–403
- Wintre MG, Yaffe M (2000) First-year students' adjustment to university life as a function of relationships with parents. *J Adolesc Res* 15:9–37