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The course of binge eating from adolescence to young adulthood

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Abstract

Objective—The course of binge eating in adolescence is variable and little is known about factors maintaining binge eating behaviors. The current study sought to characterize the course of binge eating and identify psychosocial factors associated with its maintenance.

Methods—A population-based sample reported on binge eating, depression symptoms, self-esteem, and body satisfaction at 5-year intervals spanning early/middle adolescence [Time 1 (T1)], late adolescence/early young adulthood [Time 2 (T2)] and early/middle young adulthood [Time 3 (T3)]. Logistic regression examined factors predicting maintenance or cessation of binge eating.

Results—A total of 15.8% of participants with binge eating at T1 continued to report binge eating at T2, and 42.0% of participants with binge eating at T2 continued to report binge eating at T3. From T1 to T2, improvements in self-esteem predicted cessation of binge eating. From T2 to T3, cessation of binge eating was predicted by improved body satisfaction, greater decreases in depression symptoms, and greater improvements in self-esteem.

Conclusions—Binge eating is relatively stable from late adolescence/early young adulthood to early/middle young adulthood, but less so from middle/late adolescence to late adolescence/early young adulthood. Improvements in psychosocial functioning during this timeframe may improve the outcome of binge eating, although mechanisms responsible for psychosocial changes (e.g., treatment involvement) require further investigation. Self-esteem appears to be a particularly salient factor involved in binge eating cessation and should be targeted in prevention and treatment programs.

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Keywords

Binge eating; longitudinal; psychosocial functioning; maintenance; adolescent

Binge eating (overeating while feeling a sense of loss of control; American Psychiatric Association, 2000) is prevalent among youth, and is associated with obesity and psychosocial impairment (Stice, Presnell, & Spangler, 2002; Tanofsky-Kraff et al., 2011). The course of binge eating from childhood to young adulthood is unclear (Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011; Stice, Marti, Shaw, & Jaconis, 2009; Tanofsky-Kraff et al., 2011), and although research has identified several predictors of binge eating onset (e.g., Stice & Agras, 1998; Stice et al., 2002), little is known about factors predicting its maintenance or cessation. Understanding the course of binge eating and factors associated with its maintenance could assist with treatment planning and intervention development.

Two primary theories have been proposed to explain binge eating onset and maintenance: cognitive-behavioral models posit that appearance concerns contribute to dietary restraint, which then promotes binge eating, while affect regulation theories suggest that binge eating is a method of coping with negative affect (Haedt-Matt & Keel, 2011). Overweight youth exhibit both higher shape and weight concerns and greater negative affect (Mond, van den Berg, Boutelle, Hannan, & Neumark-Sztainer, 2011), which could explain their elevated rates of binge eating. In terms of maintenance, youth with persistent binge eating tend to report greater initial eating-related psychopathology (Stice & Agras, 1998; Tanofsky-Kraff et al., 2011) and depressive symptoms (Tanofsky-Kraff et al., 2011) relative to youth whose binge eating resolves, although studies using different measurement techniques have not supported this latter finding (Stice & Agras, 1998). To date, however, no research has examined how psychosocial *changes* relate to the onset or maintenance of adolescent binge eating. Some data suggest that body dissatisfaction, self-esteem, and depression symptoms mediate binge eating treatment outcome in adults (Dingemans, Spinhoven, & van Furth, 2007; Hilbert et al., 2007), but it is unclear if these factors maintain binge eating in non-clinical adolescent samples.

The overall aim of this study was to characterize the course of binge eating from adolescence to young adulthood. First, we examined rates of binge eating maintenance and cessation at two follow-up time points over a 10-year time-span. Next, we sought to identify predictors of maintenance/cessation of binge eating, as well as new onset binge eating, at follow-up. We expected that improved depression symptoms, self-esteem and body satisfaction would be associated with cessation of binge eating at follow-up, and that worsening of these symptoms would predict new onset binge eating, consistent with existing theories of binge eating (Haedt-Matt & Keel, 2011). This study was designed to inform prevention and early intervention programs by identifying markers of binge eating outcomes over time. The examination of psychosocial changes from adolescence to young adulthood represents a significant improvement over existing studies.

METHOD

Study Design and Population

Participants were involved in Project EAT (Eating Among Teens and Young Adults), a 10-year longitudinal study of eating, weight and psychosocial factors among young people (Neumark-Sztainer et al., 2011). Data were collected during middle/late adolescence [Time 1 (T1)] and at 5- and 10-year follow-up [Time 2 (T2): late adolescence/early young adulthood; Time 3 (T3): early/middle young adulthood]. All study protocols were approved by University of Minnesota's Institutional Review Board.

Of the original 4,746 EAT-I participants, 1,902 (40.1%) had data available at all three time points. The analytic sample included participants who responded at all three time points and was partitioned into subsamples who reported T1 and/or T2 binge eating (n=234) and those who did not (n=1,668). The analytic subsample of T1 and/or T2 binge eaters was 85% female, 58% Caucasian, and 14.8 years old, on average at T1; approximately a third of participants fell in each of the low, middle, and high socioeconomic categories. Except for having a higher proportion of females, the analytic subsamples were demographically similar. A total of 323 adolescents reported binge eating at T1, of whom 132 (40.8%) are included in follow-up analyses. A comparison of these individuals and those who were lost to follow-up revealed that baseline depression symptoms, body satisfaction, and self-esteem differed by less than 0.20 standard deviations (all ps>.05 after controlling for BMI, gender, age, race, and SES). Overall, participants with complete follow-up data were more likely to be female, Caucasian, and from a higher socioeconomic category (ps<.05).

Measures

To examine data longitudinally, key items used in this paper were consistent across the three study waves. All measures had adequate two-week test-retest reliability. Self-reported height and weight were used to calculate body mass index (BMI; kg/m^2). Analyses of 125 Project EAT-III participants for whom measured height and weight were also available showed high correlations between self-reported and measured BMI (rs≥.95). Age, sex, and race/ethnicity were based on self-report. The main determinant of socioeconomic status (SES) was educational attainment by either parent, which appears to be a valid proxy for most adolescents and emerging young adults (Lien, Friestad, & Klepp, 2001). Binge eating was assessed by asking, “In the past year, have you ever eaten so much food in a short period of time that you would be embarrassed if others saw you?”; “During the times when you ate this way, did you feel you couldn't stop eating or control what or how much you were eating?” Affirmative responses to both questions (kappa=.64) were classified as binge eating (American Psychiatric Association, 2000). Body satisfaction was measured using a modified version of the Body Shape Satisfaction Scale (Pingitore, Spring, & Garfield, 1997), in which respondents rate their satisfaction with 10 aspects of their body (e.g., body shape, thighs). Scores range from 10-50 with higher scores reflecting greater satisfaction (α=.92). Depression symptoms were assessed with a six-item scale for adolescents (Kandel & Davies, 1982) which inquires about affective, cognitive, and somatic aspects of depression over the previous year. Scores range from 6-18; higher scores indicate greater depressive symptoms (α=.84). Self-esteem was assessed using six items from the Rosenberg Self-

Esteem Scale (Rosenberg, 1965). Scores range from 6 to 24, with lower scores indicating lower self-esteem (α=.71).

Statistical Analysis

Two sets of analyses were conducted, one focused on predictors of binge eating onset, and the other on predictors of binge eating cessation among individuals who were bingeing at T1 (early/middle adolescence; *n*=132) and/or T2 (late adolescence/early young adulthood; *n*=130). Among individuals who were not bingeing at T1 or T2, logistic regression examined T1 to T2 changes in BMI, body satisfaction, depression symptoms, and self-esteem as predictors of T3 (early/middle young adulthood) binge eating. Separate logistic regression models were then fit using T1 variables to predict T2 binge eating cessation (among those bingeing at T1), and T2 variables to predict T3 binge eating cessation (among those bingeing at T2). An additional four models were fit which included *changes* in these variables as predictors of cessation. Models involving change variables controlled for the baseline value of the change variable to ensure that individual differences in functioning at the previous time point did not confound our results. All models additionally controlled for age cohort, sex, race/ethnicity (categorized as non-Hispanic white versus all others), and SES. Because attrition from the T1 sample was not random, data were weighted with the inverse of the estimated probability that an individual responded at all three time points. The use of non-response sampling weights along with subpopulation analysis generates estimates that represent the demographic composition of the original Project EAT sample corresponding to the analytic subgroups.

RESULTS

Of the 132 participants reporting early/middle adolescent (T1) binge eating, 28 (15.8% based on non-response sampling weights) continued bingeing in late adolescence/early young adulthood (T2). Of the 130 reporting late adolescent/early young adult binge eating, 58 (42.0% based on non-response sampling weights) continued bingeing in early/middle young adulthood (T3).

Predictors of new onset binge eating

Increased depression symptoms (OR=1.15; CI=1.06-1.24; $p<.001$), and decreased self-esteem (OR=0.85; CI=0.79-0.92; $p<.001$) and body satisfaction (OR=.97; CI=0.94-0.99; $p=.04$) from T1 to T2 all predicted new onset binge eating at T3. Thus, each 1-unit increase in depression symptoms predicted a 15% greater odds of binge eating onset; each 1-unit decrease in self-esteem predicted a 15% greater odds of binge eating onset; and each 1-unit decrease in body satisfaction predicted a 3% greater odds of binge eating onset. T1 to T2 changes in BMI were not related to T3 binge eating onset ($p=.41$).

Predictors of binge eating cessation

Increased T1 to T2 self-esteem was associated with T2 binge eating cessation ($p=.03$): each 1-unit increase in T1 to T2 self-esteem predicted 21% greater odds of T2 binge eating cessation. Decreased depression symptoms ($p=.009$), and increased self-esteem ($p=.004$) and body satisfaction, at a trend level ($p=.05$), from T2 to T3 all were associated with T3 binge

eating cessation. Each 1-unit decrease in T2 to T3 depression symptoms predicted 24% greater odds of binge eating at cessation T3; each 1-unit increase in self-esteem predicted 23% greater odds of cessation; and each 1-unit increase in body satisfaction predicted 6% greater odds of cessation. Table 1 reports further detail.

DISCUSSION

This investigation found that binge eating was relatively stable from late adolescence/early young adulthood to early/middle young adulthood but less so during the transition from middle/late adolescence to late adolescence/early young adulthood. Improved body satisfaction, depression symptoms, and self-esteem all predicted binge eating cessation during the former time-span (although it is also possible that remitted binge eating led to changes in these factors over time), while worsening symptoms predicted new onset binge eating in young adulthood. Overall, results suggest that improved psychosocial functioning may be associated with better binge eating outcomes during the transition from adolescence to young adulthood.

Interestingly, few predictors of binge eating cessation emerged during the middle/late adolescence to late adolescence/early young adulthood time-span, yet several psychosocial changes predicted cessation from late adolescence/early young adulthood to early/middle young adulthood. Differences in understanding the term “binge eating” throughout development may explain our findings. It is also possible that while remission of binge eating earlier in adolescence is the more normative trajectory, for a subset of the population, binge eating and other psychopathology are more pervasive and persistent.

Study strengths included the diverse, community-based sample, and the 10-year follow-up period, which is longer than that included in other longitudinal studies. Because data were derived from a large epidemiological study, “gold-standard” measures were not feasible, thus, brief self-report measures were used to assess anthropometric and psychosocial variables. As treatment-seeking was not assessed, it is possible that our results do not reflect a naturalistic progression of binge eating and other psychosocial symptoms. Finally, our analytic sample was biased towards females, Caucasians, and those of a higher SES category, although data were derived from a diverse epidemiological dataset and thus reflect the occurrence of binge eating within a population of adolescents and young adults.

In summary, binge eating appears to be relatively stable during the transition from late adolescence/early young adulthood to early/middle young adulthood, and improvements in psychosocial functioning may be associated with better binge eating outcomes. Results should inform prevention and treatment research. Future research should replicate our findings and explore potential mediators of the relations among self-esteem, depression symptoms, body satisfaction, and binge eating.

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Table 1

Adjusted odds ratios for binge eating cessation based predictors at the previous time point in individuals reporting Time 1 (*n*=132) and/or Time 2 (*n*=130) binge eating

Predictor variable	T1 *M* (*S.D.*)	T2 *M* (*S.D.*)	Odds ratio (confidence interval) for binge eating cessation at T2	Odds ratio (confidence interval) for binge eating cessation at T3
Body mass index	24.2 (5.5)	26.2 (6.1)	1.10 (1.00-1.21); *p*=.06	0.95 (0.88-1.04); *p*=.26
Body satisfaction	27.1 (9.3)	26.7 (8.6)	1.00 (0.94-1.06); *p*=.88	1.01 (0.95-1.06); *p*=.84
Depression symptoms	12.5 (2.7)	13.0 (3.1)	0.96 (0.81-1.13); *p*=.58	0.92 (0.81-1.05); *p*=.21
Self-esteem	15.8 (3.5)	16.4 (3.9)	1.04 (0.92-1.18); *p*=.52	1.03 (0.91-1.15); *p*=.67
Change in body mass index*	2.3 (4.2)	2.5 (4.8)	0.93 (0.81-1.07); *p*=.31	0.98 (0.88-1.09); *p*=.70
Change in body satisfaction*	-0.9 (10.4)	-0.7 (9.3)	1.01 (0.96-1.07); *p*=.68	1.06 (1.00-1.13); *p*=.05
Change in depression symptoms*	0.5 (3.4)	-0.8 (3.2)	0.89 (0.73-1.09); *p*=.28	0.81 (0.68-0.95); *p*=.009
Change in self-esteem*	0.03 (4.0)	0.7 (4.0)	1.21 (1.02-1.44); *p*=.03	1.23 (1.07-1.41); *p*=.004

Note: Analyses controlled for demographic variables and non-response sampling weights. T1=early/middle adolescence; T2= late adolescence/ early young adulthood; T3=early/middle young adulthood.

**M* (*S.D.*) values reflect change scores from T1 to T2 (column T1) and from T2 to T3 (column T2). Analyses additionally controlled for the baseline value of the change variable.