Published in final edited form as:

Int J Eat Disord. 2013 November ; 46(7): 663–668. doi:10.1002/eat.22160.

Self-Efficacy Beliefs and Eating Behavior in Adolescent Girls At-Risk for Excess Weight Gain and Binge Eating Disorder

Deborah R. Glasofer, Ph.D.^{1,2}, David A.F. Haaga, Ph.D.³, Louise Hannallah, B.A.^{4,5}, Sara E. Field, B.A.^{4,5}, Merel Kozlosky, M.S., R.D.⁶, James Reynolds, M.D.⁷, Jack A. Yanovski, M.D., Ph.D.⁵, and Marian Tanofsky-Kraff, Ph.D.^{4,5}

¹Division of Clinical Therapeutics, New York State Psychiatric Institute, New York, NY

²Department of Psychiatry, College of Physicians and Surgeons of Columbia University, New York, NY

³Department of Psychology, American University, Washington, DC

⁴Department of Medical and Clinical Psychology, Uniformed Services University of the Health Sciences (USUHS), Bethesda, MD

⁵Section on Growth and Obesity, Program in Developmental Endocrinology and Genetics, Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, DHHS, Bethesda, MD

⁶Nutrition Department, Clinical Center, NIH, DHHS

⁷Nuclear Medicine Department, Hatfield Clinical Research Center, NIH, DHHS

Abstract

Objective—To examine the relationship between self-related agency beliefs and observed eating behavior in adolescent girls with loss of control (LOC) eating.

Method—One-hundred eleven adolescent girls (14.5±1.7y; BMI: 27.1±2.6 kg/m²) were administered the General Self-Efficacy Scale and the Weight Efficacy Lifestyle Questionnaire (WEL). Adolescents then participated in a laboratory test meal.

Results—Greater general and eating self-efficacy were associated with fewer episodes of LOC eating. General self-efficacy was inversely related to total intake at the meal ($p < 0.01$). Only the WEL availability subscale score, but not the other WEL subscales, was inversely related to total energy, snack, and dessert intake ($ps < 0.05$).

Discussion—General self-related agency beliefs may be important in relation to energy consumption. Among girls susceptible to disordered eating and obesity, the domain-specific belief in one's ability to refrain from eating when food is widely available may be especially salient in determining overeating in the current food environment. Further research is therefore needed to assess the predictive validity of these beliefs on eating and weight outcomes.

Pediatric obesity is an urgent public health problem.¹ The “toxic environment” framing of obesity, proposed by epidemiology and public health experts as a way to understand the problem as a consequence of environmental changes, proposes that the Western environment drives overeating, weight and excess gain.² The toxic environment, which promotes less expensive, more palatable and convenient unhealthy foods, is characterized by

encouragement of over-consumption of energy and discouragement of physical activity. This theory is bolstered by data supporting the extent to which animal and human biology may be not well-adapted to the modern world. In animals, overeating can be stimulated by mere exposure to a high variety of palatable foods³ or to unhealthy foods.⁴ A dysfunction in self-regulation is also evident among youth, with evidence that children will eat when they are not hungry if provided unlimited access to palatable options.^{5, 6} Adult studies have attempted to distinguish environmental from biological explanations for body weight. Siblings who migrate to a Western culture evidence significantly higher body mass index (BMI, kg/m²) when compared to their counterparts in a native, Eastern country.⁷ Similarly, members of the Pima Native American tribe who live in the U.S. tend to weigh more than those who remain in Mexico.⁸ Overall, these findings provide compelling evidence in favor of the toxic environment argument.

In this environment, some fare better than others. Its impact may be particularly dire for those who are susceptible to eating and weight problems. For example, disturbed eating behaviors, including binge eating and dieting, have been associated with weight gain and obesity onset.^{9–11} The experience of perceived loss of control (LOC) while eating, regardless of the amount of food consumed, has been associated with adiposity,^{12, 13} and predictive of excess weight gain over time^{14, 15} and the development of partial or full-syndrome binge eating disorder.¹⁶ Therefore, it seems plausible that the over-availability of unhealthy foods may have especially harmful consequences for those *already* experiencing disinhibited eating behavior.

When considering how to characterize who might be most susceptible to the toxic environment, Bandura's social-cognitive theory offers a well-established framework.¹⁷ Self-efficacy beliefs, defined as the "conviction that one can successfully execute the behavior required to produce the outcomes,"¹⁷ enable a sense of personal agency and play a unique role in motivational and behavioral processes including health-related decisions. Since self-efficacy beliefs pervade all areas of functioning, every individual holds personal efficacy beliefs in a variety of specific domains.

Both general and domain-specific self-efficacy have been associated with health behavior among adolescents. In a school-based study of 7th–12th grade girls, general self-efficacy explained a significant proportion of the variance on teens' reported health-promoting lifestyle.¹⁸ Physical activity and healthy eating behavior self-efficacy has been inversely related to BMI and degree of adiposity.^{19, 20} Moreover, overweight teens report lower self-efficacy for healthy eating behaviors than their non-overweight peers.¹⁹ Studies conducted over brief time-spans suggest that self-efficacy is also a good predictor of eating and weight-related behaviors for adolescents.^{21–23} In a 2-week study examining health behaviors in 279 adolescents, Baker and colleagues found that among girls, self-related agency beliefs regarding eating predicted stronger intentions to eat healthy and intentions were significant predictors of behavior.²³

To date, however, research linking self-efficacy beliefs to behavioral patterns has relied primarily upon self-report measures. Subjective recall of health behavior is known to be biased when compared to objective assessments. Under-reporting of caloric intake is common.²⁴ We examined the relationship between self-efficacy beliefs about eating and eating behavior among adolescent girls deemed at-risk for excess weight gain given their current weight *and* disinhibited eating behavior. We anticipated that low general and eating self-efficacy would be associated with disinhibited eating behavior. To evaluate the link between self-efficacy beliefs and behavior more rigorously, we objectively measured eating behavior in a controlled laboratory setting that included a large array of available foods, much like the foods present in the toxic environment. We hypothesized that reported self-

efficacy would be associated with energy intake such that lower self-efficacy would be associated with greater intake and unhealthy food choices during a standardized buffet meal.

Methods

Participants

Adolescent girls at-risk for inappropriate weight gain were recruited for an excess weight gain prevention program (Clinicaltrials.gov ID: NCT00263536). Recruitment methods and procedures are described elsewhere.²⁵ This study was approved by the institutional review boards of the NICHD and USUHS. The adolescents, and their parents, were told prior to the start of the prevention study that they would be participating in a range of assessments related to eating and weight, including questionnaires, physical and biological measures (e.g., blood draws, body composition testing), and eating behavior paradigms. Written consent and assent were provided by parents and girls, respectively.

All adolescents who were involved in the weight gain prevention program took part in this study ($N = 111$, $BMI = 27.1 \pm 2.6 \text{ kg/m}^2$, $BMI \text{ z-score} = 1.5 \pm 0.3$). The sample was racially diverse, comprised of 25% African American, 3% Asian, 54% Caucasian, 18% Mixed or 'Other' adolescents. Participants were ages 12–17 years at study entry, and were deemed at high-risk for excessive weight gain by virtue of a BMI between the 75th and 97th percentiles for age and sex^{26, 27} and the endorsement of at least one LOC eating episode in the month prior to baseline assessment.¹⁴ A history of anorexia or bulimia nervosa was also an exclusionary criterion. Individuals meeting criteria for binge eating disorder were permitted into the study. Other inclusion and criteria are described elsewhere.²⁵

Procedures

All data were collected across two baseline visits, prior to the prevention program.

Psychological Measures

General self-efficacy: The general self-efficacy subscale (GSES) of the *Self-efficacy Scale*²⁸ consists of 17 items assessing global self-efficacy beliefs such as, "Failure just makes me try harder." These items are rated using a 5-point Likert scale, with high scores indicating greater self-efficacy. Studies of the measure's content and criterion validity support its use.^{28, 29} The reported reliability coefficient of the GSES in adolescent samples ranges from 0.83–0.86,³⁰ and an alpha of 0.85 was reported in one prior study completed with teens as young as age 12.²⁴ Reports of the instrument's reliability in adolescents are consistent with estimates reported in adult samples.^{28, 29} Internal consistency in the present investigation was 0.83.

Eating self-efficacy: The *Weight Efficacy Lifestyle Questionnaire*³¹ (WEL) consists of 20 items designed to measure five dimensions of situational eating self-efficacy: availability, negative emotions, social pressure, physical discomfort, and positive activities. Respondents are asked to rate their confidence in resisting overeating in different situations. Higher scores represent more eating self-efficacy. Studies of the measure's internal consistency, construct validity, convergent validity with another eating self-efficacy measure, and predictive validity (of weight loss) support its use.^{31, 32}

LOC Eating: The *Eating Disorder Examination* version 12.0³³ (EDE) with edits from version 14.0, is a semi-structured interview that assesses disordered attitudes and behaviors related to eating, body-shape and weight, and diagnoses specific DSM-IV-TR eating disorders.³⁴ Tests of the EDE's discriminant validity, internal consistency, concurrent validity³⁴ and test-retest reliability³⁵ support its use, and the measure has previously been

used in adolescent samples with good reliability.³⁶ The EDE interview was used to exclude those meeting criteria for anorexia nervosa or bulimia nervosa, and to determine the frequency of LOC eating during the past month. Trained interviewers administered the EDE.

Body Composition—Measurement of height (measured three times to the nearest 1 mm) was performed using a stadiometer (Holtain, Crymmych, Wales) calibrated before each child's height measurement to the nearest 1 mm. Weight to the nearest 0.1 kg was obtained using a calibrated digital scale (Scale-Tronix, Wheaton, IL). From these measurements, BMI (kg/m^2) and BMI z-score were calculated.³⁷ Body composition, including total lean body mass (kg) and percent body fat mass, were assessed by dual-energy X-ray absorptiometry (DXA) using a Hologic QDR-4500A or Discovery instrument (Bedford, MA)

Laboratory Test Meal—Following an overnight fast initiated at 10:00 PM the night before, each adolescent participated in a standardized laboratory test meal³⁸ at 11:00 AM. All girls ate alone and unobserved. The 9835-kcal buffet meal included a wide array of foods (Table 1) with items varying in macronutrient composition (12% protein, 51% carbohydrate, 37% fat across all foods). At the onset of the meal, participants received a tape-recorded instruction to “Let yourself go and eat as much as you want.” All foods were weighed on electronic balance scales in gram weights; foods consumed were determined by subtraction of food weights after the meal from initial weights. Food energy and macronutrient content were calculated using the USDA National Nutrient Database for Standard Reference and nutrient information from food manufacturers. This paradigm effectively models disinhibited eating in overweight girls.³⁸

Data Analytic Plan

Analyses were conducted using SPSS for Windows, 18.0.³⁹ Analyses were run first including the whole sample and then omitting the participants who met criteria for binge eating disorder. Because findings did not differ, results from the whole sample are provided. Pearson correlation coefficients were computed to examine the bivariate relationships between the variables of interest. The distribution of LOC episodes was skewed, with a median number of LOC episodes of 2 and a range from 1 to 39. Therefore, LOC episodes were log-transformed. Total energy intake (kcal) was log-transformed to achieve normal distribution. Arcsine transformations were performed on percent protein, fat, and carbohydrate of test meal intake. Energy intake (kcal) by food group was calculated by summing intakes of items in a particular group. To test the hypothesis that self-efficacy would be inversely related to energy consumption, separate linear regressions were conducted for each dependent variable (food intake) with each self-efficacy variable. Age, race, height, lean body mass (kg) and percent fat mass were entered as covariates into each model. None significantly contributed to any model of total intake, and therefore covariates were removed. Height and fat mass were significant contributors to models of macronutrient intake and were thus retained as covariates in these analyses. Total energy intake was also included as a covariate in all models of macronutrient consumption and food groups. All tests of significance were based on an alpha set at 0.05.

Results

One-hundred eleven participants with a mean age of 14.5 ± 1.7 years were studied. On average, participants experienced 4.2 episodes (SD: 5.5) of LOC eating in the past month. Two girls met criteria for DSM-5⁴⁰ binge eating disorder. Greater general and eating self-efficacy were associated with fewer episodes of LOC (all p 's < 0.01; Table 3). Self-efficacy scores were unrelated to fat mass or BMI z-scores.

Total intake during the laboratory test meal ranged from 158.5 kcal to 2,403.5 kcal ($M \pm SD$: $1,158.0 \pm 445.4$; Table 2). GSES was inversely related to total intake at the laboratory test meal (Figure 1a; $\beta = -0.26$, $p < 0.01$). Moreover, lower GSES scores were associated with lower percent protein selected at the meal ($\beta = 0.28$, $p < 0.01$). However, GSES was unrelated to snack ($\beta = -0.13$, $p = 0.12$) or dessert intake ($\beta = -0.14$, $p = 0.10$). Further, there was no relationship between general self-efficacy and percent fat or carbohydrate consumed or vegetable or fruit intake.

WEL availability subscale score, but not other indices of eating-related self-efficacy, was inversely related to total energy (Figure 1b; $\beta = -0.19$, $p = 0.04$), snack ($\beta = -0.20$, $p = 0.02$), and dessert intake ($\beta = -0.25$, $p < 0.01$). Lower WEL positive activities scores and negative emotion scores were associated with lower percent protein eaten in the laboratory meal ($\beta_s = 0.25$, p 's < 0.01). The remaining WEL subscales were unrelated to percent protein consumed. There was no relationship between eating-related self-efficacy and percent fat or carbohydrate consumed or vegetable or fruit intake.

Discussion

The current study supports the link between self-related agency beliefs and behavior. Notably, in our sample, BMI was positively correlated with severity of LOC eating but unrelated to self-efficacy. The mixed results may be reflection of the limited weight range of study participants or a byproduct of a *prevention*-intervention seeking sample falling somewhere between traditional treatment and non-treatment seeking groups. A connection between BMI and LOC episodes^{12,13} and BMI and self-efficacy^{19,20} has only been reported in non-treatment seeking youth samples. Consistent with our hypotheses, general and eating self-efficacy were negatively associated with self-reports of disinhibited eating behavior (i.e., less frequent LOC eating in the past month) and some, but not all, aspects of eating behavior measured objectively in a controlled environment.

Total intake at the meal averaged 1,158 kcal. This represents over 50% of the estimated daily energy requirement for normal weight 14 to 15 year old girls with either sedentary (14y: 1693 kcal, 15y: 1706 kcal) or low (14y: 2011 kcal, 15y: 2032 kcal) activity levels⁴¹, and exceeds the percentage (25%) of daily calories typically eaten at lunch by adolescent girls.⁴² It is possible that excessive intake was due to the overnight fast and timing of the laboratory meal. However, a recent study of meal patterns in youth with and without LOC eating determined that breakfast was the least commonly eaten meal⁴³ suggesting that consuming the first meal of the day at 11:00 AM likely did not disrupt participants' typical eating patterns. Moreover, the amount consumed in the laboratory in this study was consistent with averages reported in other buffet meal studies in youth.^{6, 38} Thus, excessive overall intake at the buffet meal may support a central component of the toxic environment hypothesis that leads to high obesity rates; individuals may be consuming too much overall in part because of the high availability of foods.²

The current study provides some evidence that not only are adolescent girls with LOC susceptible to the toxic environment, they are aware of their vulnerability to it. The domain-specific belief in one's ability to refrain from eating just because food is available emerged as the most salient variable in relation to eating behavior. It was inversely related with total intake, as well as snack and dessert consumption, at a large meal featuring a wide variety of foods. Thus, consistent with Bandura's social-cognitive theory outlining the role self-efficacy beliefs in behavioral decision-making processes,¹⁷ in our study, those least likely to believe in their ability to affect outcomes appear to be most vulnerable to the toxic food environment.

As anticipated, lesser belief in one's own general agency was associated with more frequent LOC eating reported in the month prior to assessment and greater energy intake at a laboratory meal. Whether or not there is a temporal relationship between self-efficacy and eating behavior remains unclear. There are some data to suggest that low self-efficacy is a prospective predictor of binge eating in non-overweight, non-treatment seeking women.⁴⁴ In addition, high self-efficacy is prospective predictor of long-term weight loss in obese treatment-seeking adults.⁴⁵ If a similar temporal relationship exists in adolescent girls, with self-efficacy beliefs predicting eating behavior, then promoting the enhancement of self-efficacy beliefs could help reduce the occurrence of LOC eating and the accompanying adverse outcome.^{10, 14–16, 46}

Overall macronutrient distribution at the meal in this study was consistent with the daily distribution of energy intake reported by girls ages 12 to 19 in the U.S.⁴⁷ However, adolescents' endorsing greater general and eating self-efficacy chose to eat a higher percentage of protein. Although moderate intake of a variety of low-fat foods is associated with maintaining a healthy body weight, popular culture promotes high protein diets.⁴⁸ Those who consume more protein may be considered more health- or weight-conscious.⁴⁹ Opting to consume more protein, especially in the presence of highly palatable fats and carbohydrates, might reflect an adolescent's focus on controlling body weight, which could also be correlated with eating self-efficacy beliefs.

Strengths of this study included the relatively large and racially diverse sample and the use of an objective measurement of eating behavior. Notably, race did not significantly contribute to any of the statistical models. The sample consisted only of adolescent girls and thus results may not be generalizable to adolescent boys or to younger children. Due to the design of the prevention study for which these adolescents were recruited, all participants endorsed LOC eating and we therefore lacked a unique comparison group. Youth with and without LOC eating are known to differ on a variety of psychological and behavioral dimensions. Those with LOC are heavier, report more eating-related and psychological distress,^{36, 50} describe different meal patterns,⁴³ and choose more high-calorie snacks and desserts in a laboratory meal setting³⁸ compared to their peers without LOC eating. Therefore, future studies are warranted to determine how general and eating self-efficacy beliefs relate to eating behavior in a standardized setting compare among those with and without self-reported disinhibited eating behavior. Additionally, our sample characterizes the self-efficacy profile of adolescent girls *seeking* a preventative intervention for weight gain. It would be useful to empirically explore the possibility that this group was more self-efficacious than those who declined to enter an intervention program to appreciate whether or not recruitment impacted the findings of the current study. Finally, findings from this investigation are limited by its cross-sectional design. Given existing literature that suggests self-efficacy beliefs might be predictive of health behaviors over brief time-spans,^{21–23} future prospective studies to assess the predictive validity of these beliefs on objective measures of eating behavior in the long-term could offer valuable information in reducing the high rates of pediatric obesity.

In conclusion, general and eating self-efficacy beliefs appear to predict eating behavior, as measured by subjective and objective assessments, in adolescent girls with LOC eating. Future longitudinal research is needed to determine the impact of self-efficacy beliefs on eating and weight related outcomes so that targeted prevention efforts may be developed.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

References

1. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999–2010. *JAMA*. 2012; 307:483–90. [PubMed: 22253364]
2. Brownell, K.; Horgen, K. *Food Fight: The Inside Story of the Food Industry, America's Obesity Crisis, and What We Can Do About It*. New York: McGraw-Hill; 2004.
3. Tordoff MG. Obesity by choice: the powerful influence of nutrient availability on nutrient intake. *Am J Physiol Regul Integr Comp Physiol*. 2002; 282:R1536–39. [PubMed: 11959698]
4. Ackroff K, Bonacchi K, Magee M, Yiin YM, Graves JV, Sclafani A. Obesity by choice revisited: effects of food availability, flavor variety and nutrient composition on energy intake. *Physiol Behav*. 2007; 92:468–78. [PubMed: 17524435]
5. Birch LL, Fisher JO. Mothers' child-feeding practices influence daughters' eating and weight. *Am J Clin Nutr*. 2000; 71:1054–61. [PubMed: 10799366]
6. Shomaker LB, Tanofsky-Kraff M, Zocca JM, et al. Eating in the absence of hunger in adolescents: intake after a large-array meal compared with that after a standardized meal. *Am J Clin Nutr*. 2010; 92:697–703. [PubMed: 20720255]
7. Bhatnagar D, Anand IS, Durrington PN, et al. Coronary risk factors in people from the Indian subcontinent living in west London and their siblings in India. *Lancet*. 1995; 345:405–9. [PubMed: 7853948]
8. Schulz LO, Bennett PH, Ravussin E, et al. Effects of traditional and western environments on prevalence of type 2 diabetes in Pima Indians in Mexico and the U.S. *Diabetes Care*. 2006; 29:1866–71. [PubMed: 16873794]
9. Stice E, Cameron RP, Killen JD, Hayward C, Taylor CB. Naturalistic weight-reduction efforts prospectively predict growth in relative weight and onset of obesity among female adolescents. *J Consult Clin Psychol*. 1999; 67:967–74. [PubMed: 10596518]
10. Field AE, Sonneville KR, Micali N, et al. Prospective association of common eating disorders and adverse outcomes. *Pediatrics*. 2012; 130:e289–95. [PubMed: 22802602]
11. Tanofsky-Kraff M, Cohen ML, Yanovski SZ, et al. A prospective study of psychological predictors of body fat gain among children at high risk for adult obesity. *Pediatrics*. 2006; 117:1203–09. [PubMed: 16585316]
12. Tanofsky-Kraff M, Yanovski SZ, Wilfley DE, Marmarosh C, Morgan CM, Yanovski JA. Eating-disordered behaviors, body fat, and psychopathology in overweight and normal-weight children. *J Consult Clin Psychol*. 2004; 72:53–61. [PubMed: 14756614]
13. Morgan CM, Yanovski SZ, Nguyen TT, et al. Loss of control over eating, adiposity, and psychopathology in overweight children. *Int J Eat Disord*. 2002; 31:430–41. [PubMed: 11948648]
14. Tanofsky-Kraff M, Yanovski SZ, Schvey NA, Olsen CH, Gustafson J, Yanovski JA. A prospective study of loss of control eating for body weight gain in children at high risk for adult obesity. *Int J Eat Disord*. 2009; 42:26–30. [PubMed: 18720473]
15. Sonneville KR, Horton NJ, Micali N, et al. Longitudinal associations between binge eating and overeating and adverse outcomes among adolescents and young adults: does loss of control matter? *JAMA Pediatr*. 2013; 167:149–55. [PubMed: 23229786]
16. Tanofsky-Kraff M, Shomaker LB, Olsen C, et al. A prospective study of pediatric loss of control eating and psychological outcomes. *J Abnorm Psychol*. 2011; 120:108–118. [PubMed: 21114355]
17. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychology Rev*. 1977; 84:191–215.
18. Gillis A. Determinants of health-promoting lifestyles in adolescent females. *Can J Nurs Res*. 1994; 26:13–28. [PubMed: 7882193]
19. Steele MM, Daratha KB, Bindler RC, Power TG. The relationship between self-efficacy for behaviors that promote healthy weight and clinical indicators of adiposity in a sample of early adolescents. *Health Educ Behav*. 2011; 38:596–602. [PubMed: 21474635]
20. Losekam S, Goetzky B, Kraeling S, Rief W, Hilbert A. Physical activity in normal-weight and overweight youth: associations with weight teasing and self-efficacy. *Obes Facts*. 2010; 3:239–44. [PubMed: 20823687]

21. AbuSabbah R, Achterberg C. Review of self-efficacy and locus of control for nutrition- and health-related behavior. *J Am Diet Assoc.* 1997; 97:1122–32. [PubMed: 9336559]
22. Story M, Neumark-Sztainer D, French S. Individual and environmental influences on adolescent eating behaviors. *J Am Diet Assoc.* 2002; 102:S40–51. [PubMed: 11902388]
23. Baker CW, Little TD, Brownell KD. Predicting adolescent eating and activity behaviors: the role of social norms and personal agency. *Health Psychol.* 2003; 22:189–98. [PubMed: 12683739]
24. Wolkoff LE, Tanofsky-Kraff M, Shomaker LB, et al. Self-reported vs. actual energy intake in youth with and without loss of control eating. *Eat Behav.* 2011; 12:15–20. [PubMed: 21184968]
25. Ranzenhofer LM, Hannallah L, Field SE, et al. Pre-meal affective state and laboratory test meal intake in adolescent girls with loss of control eating. *Appetite.* Apr 18. in press.
26. Field AE, Cook NR, Gillman MW. Weight status in childhood as a predictor of becoming overweight or hypertensive in early adulthood. *Obes Res.* 2005; 13:163–69. [PubMed: 15761176]
27. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, et al. CDC growth charts: United States. *Adv Data.* 2000; 314:1–28. [PubMed: 11183293]
28. Sherer M, Maddux J, Mercandante B, Prentice-Dunn S, Jacobs B, Rogers R. The self-efficacy scale: construction and validation. *Psychol Rep.* 1982; 51:663–71.
29. Woodruff S, Cashman J. Task, domain, and general self-efficacy: a reexamination of the self-efficacy scale. *Psychol Rep.* 1993; 72:423–32.
30. Walker LO, Sandor MK, Sands D. Competence-building in adolescents, Part I: A self-help nursing intervention. *Issues Comp Ped Nurs.* 1994; 17:179–95.
31. Clark MM, Abrams DB, Niaura RS, Eaton CA, Rossi JS. Self-efficacy in weight management. *J Consult Clin Psychol.* 1991; 59:739–44. [PubMed: 1955608]
32. King TK, Clark MM, Pera V. History of sexual abuse and obesity treatment outcome. *Addictive Beh.* 1996; 21:283–90.
33. Fairburn, C.; Cooper, Z. The Eating Disorder Examination. In: Fairburn, CG.; Wilson, GT., editors. *Binge eating, nature, assessment and treatment.* 12. New York: Guilford; 1993. p. 317–60.
34. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders DSM-IV-TR.* Washington, DC: American Psychiatric Association; 2000.
35. Rizvi SL, Peterson CB, Crow SJ, Agras WS. Test-retest reliability of the eating disorder examination. *Int J Eat Disord.* 2000; 28:311–16. [PubMed: 10942917]
36. Glasofer DR, Tanofsky-Kraff M, Eddy KT, et al. Binge eating in overweight treatment-seeking adolescents. *J Pediatr Psychol.* 2007; 32:95–105. [PubMed: 16801323]
37. Kuczmarski RJ, Ogden CL, Guo SS, et al. 2000 CDC Growth Charts for the United States: methods and development. *Vital Health Stat 11.* 2002;1–190. [PubMed: 12043359]
38. Tanofsky-Kraff M, McDuffie JR, Yanovski SZ, et al. Laboratory assessment of the food intake of children and adolescents with loss of control eating. *Am J Clin Nutr.* 2009; 89:738–45. [PubMed: 19144730]
39. SPSS. Version 18. Chicago, IL: SPSS, Inc; 2009.
40. American Psychiatric Association. <http://www.dsm5.org/>
41. Institute of Medicine of the National Academies. *Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids.* Washington, D.C: The National Academies Press; 2005.
42. U.S. Department of Agriculture, Agricultural Research Service. *Lunch: Percentages of selected nutrients contributed by foods eaten at lunch. What we eat in America.* 2012. www.ars.usda.gov/ba/bhnrc/fsrg
43. Matheson BE, Tanofsky-Kraff M, Shafer-Berger S, et al. Eating patterns in youth with and without loss of control eating. *Int J Eat Disord.* 2012; 45:957–61. [PubMed: 23015352]
44. Bardone-Cone AM, Abramson LY, Vohs KD, Heatherton TF, Joiner TE Jr. Predicting bulimic symptoms: an interactive model of self-efficacy, perfectionism, and perceived weight status. *Behav Res Ther.* 2006; 44:27–42. [PubMed: 16301012]
45. Wiltink J, Dippel A, Szczepanski M, Thiede R, Alt C, Beutel ME. Long-term weight loss maintenance after inpatient psychotherapy of severely obese patients based on a randomized study:

- predictors and maintaining factors of health behavior. *J Psychosom Res.* 2007; 62:691–98. [PubMed: 17540227]
46. Tanofsky-Kraff M, Shomaker LB, Stern EA, et al. Children's binge eating and development of metabolic syndrome. *Int J Obes.* 2012; 36:956–62.
47. U.S. Department of Agriculture, Agricultural Research Service. Energy intakes: Percentages of energy from protein, carbohydrate, fat, and alcohol, by gender and age. What we eat in America. 2012. www.ars.usda.gov/ba/bhnrc/fsrg
48. Freedman MR, King J, Kennedy E. Popular diets: a scientific review. *Obes Res.* 2001; 9:1S–40S. [PubMed: 11374180]
49. Kim MJ, Lim YR, Kwak HK. Dietary behaviors and body image recognition of college students according to the self-rated health condition. *Nutr Res Pract.* 2008; 2:107–13. [PubMed: 20126374]
50. Tanofsky-Kraff M, Faden D, Yanovski SZ, Wilfley DE, Yanovski JA. The perceived onset of dieting and loss of control eating behaviors in overweight children. *Int J Eat Disord.* 2005; 38:112–22. [PubMed: 16134103]

Figure 1.

(a) General self-efficacy scale rating was significantly related to measured energy intake (kcal) at the standardized laboratory meal ($p < 0.01$). (b) Weight Efficacy Lifestyle Questionnaire (WEL) availability subscale score was significantly related to measured energy intake ($p = 0.04$).