Published in final edited form as:

J Nutr Educ Behav. 2015 ; 47(6): 506–515.e1. doi:10.1016/j.jneb.2015.08.008.

Self-weighing throughout adolescence and young adulthood: implications for well-being

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Abstract

Objective—This paper describes the prevalence of self-weighing in the transition period from adolescence to young adulthood and examines cross-sectional and longitudinal associations between self-weighing and weight status, psychological, and behavioral outcomes.

Design—Project EAT (Eating and Activity in Teens and Young Adults), a longitudinal cohort study that assessed variables 3 times over 10 years.

Participants—1,868 adolescents and young adults.

Main Outcome Measures—weight, BMI, weight disparity, body satisfaction, weight concern, self-esteem, depression and unhealthy weight control behaviors.

Analysis—cross-sectional and longitudinal.

Results—Significant positive correlations were found at each time point between self-weighing and weight concern for both genders. Self-weighing was significantly inversely related to self-esteem at each time point in female participants. Increases in endorsement of self-weighing were significantly related to decreases in body satisfaction and self-esteem and increases in weight concern and depression in female participants; and increases in weight concern in male participants.

Conclusions and Implications—Findings suggest that self-weighing may not be an innocuous behavior for young people, particularly women. Interventions should assess potential harmful consequences of self-weighing in addition to any potential benefits. It may be appropriate for clinicians to ask about self-weighing, and if frequent, explore motivations, perceived benefits, and potential adverse correlates or consequences.

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Introduction

Obesity in adolescents is a public health concern and because obesity tracks from adolescence into adulthood (1), cost-effective ways to prevent excessive weight gain during this critical life transition are needed. Body dissatisfaction and weight concerns, two predictors of disordered eating behaviors, are also elevated among adolescents (2), making it crucial that interventions aimed at obesity prevention among adolescents also take care to not exacerbate predictors of disordered eating behaviors. There is some evidence that suggests that self-weighing may facilitate weight control in some adults and not be psychologically detrimental (3,4). However, there is reason to believe that self-weighing may not be advisable for certain adults (5) or other age groups, such as adolescents and young adults (4,6). Thus, it is important to determine if self-weighing can be helpful for weight management in adolescents, while simultaneously not contributing to poor well-being, by developing a better understanding of the long-term outcomes of self-weighing for both weight management and behavioral or psychosocial outcomes.

The literature exploring self-weighing in adolescents and young adults is scarce, and findings are inconsistent. Two cross-sectional studies found associations between self-weighing and less chance of weight regain in adolescents (7,8), but for current weight, findings have been mixed. In one study, self-weighing was positively associated with body mass index (BMI) (9), while two others found no relationship (10,11), and one study found an inverse association (8). Two longitudinal studies also reported inconsistent results: self-weighing frequency was positively associated with prospective weight gain in one study (12), but in another study, no association was found (10). Regarding well-being, self-weighing has been found to be associated with higher depressive symptomology, lower self-esteem, and lower body satisfaction, with some differences across gender (9,11,13). Considering behaviors, self-weighing has been found to be associated with both healthy (e.g. eating less junk food) and unhealthy (e.g. skipping meals) weight control behaviors in three studies (10,11,13). However, one study found no association between frequency of self-weighing and unhealthy weight control behaviors (8).

These disparate and inconsistent findings call for further investigation, notably more research studies with long-term follow-up. Project EAT, a longitudinal cohort study in a population-based sample of female and male adolescents and young adults, presents an opportunity to further explore self-weighing and its relationship with body weight and other psychosocial outcomes while investigating how these variables changed over a 10-year period. This study expands on previous analyses from Project EAT (11–13) by assessing self-weighing and outcomes indicative of well-being at three time points over 10 years. The current paper has three objectives: (1) to describe prevalence of self-weighing during the transition from adolescence to young adulthood, (2) to examine cross-sectional associations between self-weighing and selected outcomes, and (3) to investigate contemporaneous changes in self-weighing with changes in weight status, psychological, and behavioral outcomes over 10 years. Based on previous work, we hypothesized that more frequent self-weighing would be associated with poorer psychological status (greater body dissatisfaction and depressive symptoms, and lower self-esteem) and greater likelihood of engaging in unhealthy weight control behaviors.

Methods

Study Design, Participants and Recruitment

Data for these analyses were drawn from Project EAT (Eating and Activity in Teens and Young Adults)-I, II, and III, three waves of a 10-year longitudinal study designed to examine dietary intake, physical activity, weight control behaviors, weight status, and factors associated with these outcomes among young people. In Project EAT-I (1998-1999), middle school and senior high school students at 31 public schools in the XXXX metropolitan area completed surveys and anthropometric measures (14,15). In Project EAT-II (2003-2004), original participants were mailed follow-up surveys (16,17). Project EAT-III (2008-2009) followed participants as they progressed from adolescence to young adulthood. The XXXX Institutional Review Board Human Subjects Committee approved all protocols.

The analytic sample used in this paper to address objectives 1 and 2 includes the 1,902 young adults who responded at all three time points. There were 819 male participants (43.0%) and 1,083 female participants (57.0%) who completed surveys for EAT-I (Time 1), EAT-II (Time 2), and EAT-III (Time 3). To address objective 3, participants had to respond to the self-weighting item at all 3 time points, slightly decreasing the analytic sample to 1,868 (female participant $n = 1058$, male participant $n = 810$).

Because attrition from the Time 1 sample did not occur at random, data were weighted using the response propensity method (18). Response propensities (i.e., the probability of responding to the Project EAT-III survey) were estimated using a logistic regression of response at Time 3 on a large number of predictor variables from EAT-I. Weights were calibrated so that the weighted total sample sizes used in analyses for each gender cohort accurately reflect the actual observed sample sizes in those groups. The weighting method resulted in estimates representative of the demographic make-up of the original school-based sample, thereby allowing results to be more generalizable to the population of young people in the XXXX metropolitan area.

Measures

Self-weighting—Engagement in self-weighting was assessed by asking participants to respond to the statement, “I weigh myself often”. Participants responded at each survey time point using a four point Likert scale: 1-strongly disagree to 4- strongly agree (test-retest agreement [agree versus disagree] = 85% (19)). A small study comparing the assessment of self-weighting used in the current paper with a more objective assessment (yielded a correlation of $r = 0.60$ (12)).

Weight status variables: Weight and BMI—At time 1, trained research assistants following standardized procedures measured height and weight, from which BMI was calculated. BMI at later time points was calculated from self-reported height and weight; validation of self-reports is described elsewhere (20). Age and gender were assessed via self-report.

Psychological variables: Weight disparity, body satisfaction, weight concern, depression, and self-esteem—Weight disparity was calculated by comparing self-

assessed “ideal” weight and self-reported current weight. Participants responded to the question, “At what weight do you think you would look best?” (2,15) This value was divided by self-reported weight and multiplied by 100 to make a percent (repeat correlation at EAT-III = 0.95). Body satisfaction was assessed using items based on the Body Shape Satisfaction Scale (21). Participants described level of satisfaction related to 10 different body parts using a 5-point Likert scale (Cronbach's $\alpha = .92$). Weight concern was assessed with two items: “I think a lot about being thinner,” “I am worried about gaining weight” (4-point Likert scale, strongly disagree to strongly agree) (Cronbach's $\alpha = .87$) (2,14). Depressive symptoms were assessed using six items from the Kandel and Davies Depressive Mood Scale (22) (Cronbach's $\alpha = .82$). Self-esteem was assessed using six items from the Rosenberg Self-Esteem scale (23) (Cronbach's $\alpha = .79$).

Behavioral variables: less extreme and extreme unhealthy weight control behaviors

—Participants were asked to indicate if they had engaged in each of nine behaviors for reducing weight in the past year (yes/no) (2,15). Five of these behaviors constituted less extreme unhealthy weight control behaviors: fasted, ate very little food, used a food substitute, skipped meals, or smoked more cigarettes (test-retest agreement = 83%). The remaining four behaviors constituted extreme unhealthy weight control behaviors: used laxatives, pills, diuretics, or vomited (test-retest agreement = 96%). Both less extreme and extreme unhealthy weight control behavior variables were dichotomized into individuals reporting any of the behaviors versus none.

Data Analysis

The percentage of male and female participants choosing each response option for the self-weighing variable was calculated at EAT-I, EAT-II, and EAT-III. To explore relationships between self-weighing and outcomes at EAT-I, EAT-II, and EAT-III, cross-sectional Spearman rank-order correlations were used.

To examine contemporaneous changes in self-weighing and outcomes, models were developed according to the type of outcome (continuous or dichotomous). Compound symmetry of variance components was included in the models to account for the correlation between repeated measures on the same person. A decomposition of the repeated self-weighing into an average level and deviation from that average at the three surveys was employed. This decomposes the repeated measures into orthogonal dimensions between-person associations, and within-person contemporaneous change. A contemporaneous change in outcome and in self-weighing, although not allowing an inference of causality, is stronger evidence of possible causalities (of ambiguous directionality) than the cross-sectional relationship. Contemporaneous change does not address directionality, but repetitions (over persons) uses all the available data and strengthens the association. The model included a linear time effect (slope) modeled as a random slope per person. Effect size (24) is presented, which is the change in the outcome as a fraction of the standard deviation of the outcome associated with a unit change in the independent variable.

For dichotomous outcomes, a similar model was used, but with logit link function and binomial error distribution. Expected logits were inverted to yield an estimate (in each

gender) of the change in the probability of using any extreme weight control behavior associated with a contemporaneous change of 1 unit in the scale of self-weighing (e.g. moving from 'disagree' to 'agree'). Odds ratios are presented.

All analyses were weighted as described earlier. Attention is drawn to statistical p-values 0.001 since multiple tests were run. Younger and older cohorts appeared to follow the same pattern of self-weighing frequency reporting over time; a statistical interaction between age-cohort (two categories) and survey (three time points) was tested and found to be nonsignificant. Consequently, the age cohorts were combined. Analyses were not controlled for covariates to portray the true prevalence of the outcomes assessed; while associations may differ across potential covariates, this paper is descriptive in nature and presents prevalence numbers free of additional adjustments.

Results

Table 1 outlines participant characteristics for the Project EAT study at Time 1. At EAT-I, more than two-thirds of both female participants and male participants were of non-overweight status. In the overall sample, about one third of participants were in middle school and two thirds were in high school. The sample was both ethnically and socioeconomically diverse, as displayed by Table 1. Socioeconomic status was determined using the highest parental level of education, described in detail elsewhere (14).

Objective 1: Prevalence of endorsement of self-weighing over time

In both female and male participants, endorsement of self-weighing, henceforth referred to simply as self-weighing, remained fairly stable over the 10-year period (Figures 1 and 2). At EAT-I and EAT-II, most female participants disagreed that they weighed themselves often. At EAT-III, most still disagreed, but the proportion of females who strongly disagreed that they weighed themselves often was higher than at previous time points. For male participants, a similar pattern is seen, with the majority of males disagreeing that they weigh themselves often at the first two time points, and a larger proportion of males strongly disagreeing that they weighed themselves often at EAT-III as compared with previous time points.

Objective 2: Cross-sectional relationships between self-weighing and outcome variables

For female participants, no significant associations were found between self-weighing and either weight or BMI at any of the three time points (Table 2). Self-weighing was inversely, but very weakly related to weight disparity, a measure of how ideal weight compares to actual weight, at EAT-II ($r = -0.14$; $p < 0.001$). Self-weighing was associated with lower body satisfaction at EAT-I and EAT-III ($r = -0.17, -0.17$, respectively; $p < 0.001$). A consistently positive correlation was found between self-weighing and weight concern at the three time points ($r = 0.30, 0.34$, and 0.34 ; $p < 0.001$). More frequent self-weighing was associated with more depressive symptoms at EAT-I ($r = 0.14$, $p < 0.001$). More frequent self-weighing was consistently inversely related to self-esteem ($r = -0.18, -0.19, -0.15$; $p < 0.001$). For behavioral variables, the percentage of female participants showing agreement with the self-weighing question and engaging in less extreme and extreme unhealthy weight

control behaviors at each time point is displayed in Table 3. At EAT-I, of the female participants who strongly agreed with weighing themselves often, 80.9% reported engaging in at least one less extreme unhealthy weight control behavior, and 20.8% reported engaging in at least one extreme unhealthy weight control behavior. At EAT-II, of the female participants who strongly agreed with weighing themselves often, 81.3% reported engaging in at least one less extreme unhealthy weight control behavior and 39.7% reported engaging in at least one extreme unhealthy weight control behavior. At EAT-III, these values were 74.8% and 39.1%, respectively.

In male participants, fewer significant relationships were found between self-weighing and selected variables (Tables 2 and 3). Self-weighing and weight status variables (weight and BMI) were not significantly associated any time point. No relationship between self-weighing and weight disparity or body satisfaction was found. Self-weighing and weight concern showed a positive and significant relationship at all time points (at EAT-I, $r=0.24$; EAT-II, $r=0.27$; and EAT-III, $r=0.28$; $p < 0.001$). Self-weighing was not associated with depression or self-esteem at any time point. For behavioral variables, the percentage of male participants engaging in less extreme and extreme unhealthy weight control behaviors is shown in Table 3. At EAT-I, of the male participants who strongly agreed with weighing themselves often, 44.5% reported engaging in at least one less extreme unhealthy weight control behavior (e.g. fasted), and 7.9% reported engaging in at least one extreme unhealthy weight control behavior (e.g. vomited). At EAT-II, of the male participants who strongly agreed with weighing themselves often, 47.5% reported engaging in at least one less extreme unhealthy weight control behavior and 6.4% reported engaging in at least one extreme unhealthy weight control behavior. At EAT-III, these values were 42.8% and 6.9%, respectively.

Objective 3: Contemporaneous change in self-weighing and outcome variables over 10 years

To further investigate the relationship between change in self-weighing and change in outcome variables, beta coefficients and odds ratios from random coefficient models are presented (Table 4). In female participants, no significant relationships were found between change in self-weighing and change in weight status variables. Significant relationships were found between change in self-weighing and change in psychological variables. A one-unit increase in response to “I weigh myself often” was significantly ($p = 0.001$) associated with an almost one-unit (-0.97) decrease in body satisfaction, an increase in weight concern (0.55) and depression (0.41), and a decrease in self-esteem (-0.34). These findings indicate that, on average, a female who changed her response to “I weigh myself often” from ‘agree’ at EAT-I to ‘strongly agree’ at EAT-II would have reported a corresponding 0.97 point decrease in body satisfaction, 0.34 point decrease in self-esteem, 0.55 point increase in weight concern and a 0.41 point increase in depression over the 5-year interval. Corresponding effect sizes ranged from 0.09 to 0.21 in magnitude, indicating small effects (24). If endorsement of self-weighing changed by one unit, the corresponding change in probability of engaging in less extreme or extreme unhealthy weight control behaviors was not significant.

In male participants, no significant relationships were found between change in self-weighing and change in weight status variables or psychological variables, except for weight concern. A one-unit increase in response to “I weigh myself often” corresponded to a significant ($p = 0.001$) change of about a half unit (0.53) increase in weight concern. This indicates that a male increasing endorsement of self-weighing between EAT-I and EAT-II, for example, would have a 0.53 increase in weight concern over this 5-year period. The effect size for this association, 0.24, was small (24). Like in females, change in frequency of self-weighing was not significantly associated with a change in the probability of engaging in unhealthy weight control behaviors.

Discussion

This study examined the percentage of adolescents endorsing self-weighing and relationships between self-weighing and weight status, psychological, and behavioral variables in a longitudinal cohort during the transition from adolescence to young adulthood. In female participants, significant positive correlations were found at each time point between self-weighing and weight concern and self-esteem. In male participants, significant positive correlations were found at each time point between self-weighing and weight concern. Contemporaneous change analyses revealed that increases in self-weighing were significantly related to decreases in body satisfaction and self-esteem in female participants (thus showing a negative correlation); increases in weight concern and depression in female participants; and increases in weight concern in male participants.

The first aim of this paper was to describe the prevalence of self-weighing during the transition from adolescence to young adulthood. No marked trend over time in the percentage of adolescents/young adults expressing agreement with the statement, “I weigh myself often” was observed. That said, the percentage of both female participants and male participants selecting ‘strongly disagree’ increased between time 2 and time 3, while the percentage selecting ‘disagree’ decreased. Participants aged from about 15 to 25 throughout this 10-year period.

The second aim was to examine cross-sectional associations between self-weighing and various measures. In female participants, cross-sectional relationships were found between endorsing more frequent self-weighing and higher discrepancy between desired and ideal weight (significant at EAT-II), lower body satisfaction (significant at EAT-I and EAT-III), greater weight concern (significant at all time points), greater depressive symptomology (significant at EAT-I), and lower self-esteem (significant at all time points). These constructs have been found to be related to self-weighing by other researchers as well (11,13). The only consistent relationship across gender was between self-weighing and weight concern. Similarly, Klos and colleagues (2012) found a cross-sectional relationship between self-weighing and the weight concern subscale of the Eating Disorder Examination Questionnaire in both female participants and male participants; however, this relationship was no longer significant when controlling for BMI (9).

This paper's third aim was to investigate contemporaneous changes in self-weighing and changes in weight status, psychological, and behavioral outcomes over 10 years. An increase

in endorsement of frequent self-weighing was associated with a decrease in self-esteem and body satisfaction, and an increase in weight concern and depression in female participants and an increase in weight concern in male participants. Corroborating these findings, studies using different nonclinical samples of adolescents/young adults have found a relationship between self-weighing and lower self-esteem (6), body satisfaction/weight concern (9), and higher depression (6) and disordered eating score (25). However, others have not found evidence for the aforementioned relationships (26,27). In the previously mentioned longitudinal study assessing self-weighing at EAT-I and change in outcomes between EAT-I and EAT-II (16), greater self-weighing at EAT-I significantly predicted larger increases in BMI 5 years later in the younger cohort of female adolescents, and predicted more binge eating and unhealthy weight control behaviors in both the younger and older cohort of female adolescents 5 years later. The most likely reason for an association between self-weighing and BMI not being replicated here is that in the 2006 study, greater self-weighing frequency predicted greater changes in BMI in the younger cohort of females who were in middle school at EAT-I (results for the older cohort were not statistically significant), and for the present analyses, cohorts were combined because there was no reason to believe self-weighing frequency changed differently by cohort. It is possible that engaging at self-weighing at a younger age (during middle school) contributes to larger BMI gains as compared to self-weighing in the teenage years (during high school). Additionally, the 2006 study controlled for covariates and the present paper did not, in order to allow for the true prevalence of the outcomes assessed. Concerning unhealthy weight control behaviors, the present study found increasing odds of unhealthy weight control behaviors with greater endorsement of self-weighing, however, due to the stringent significance level ($p = .001$) set to control for multiple comparisons, the result was not significant. The findings presented here are in alignment with previous Project EAT studies, though statistical significance being met may vary due to sample size, strength of relationship, or a priori p -value.

The current study builds upon previous analyses from Project EAT in which associations were examined between self-weighing and various measures (11–13). Specifically, the current study utilizes measures of self-weighing collected at three separate time points, at five-year intervals. In addition to describing cross-sectional relationships between self-weighing and outcomes at each of three project EAT time points, assessing self-weighing at multiple time points allowed for the examination of contemporaneous changes in self-weighing and measures of well-being. Examining change in self-weighing and change in outcomes provides stronger evidence of possible causalities than cross-sectional relationships.

Strengths of this study include a large sample size, which allowed for adequate power to detect relationships, and weighting to adjust for nonresponse in a sample followed for a decade, enhancing generalizability of the final sample. The primary limitation of this study concerns the operationalization of the independent variable. Asking participants the degree to which they agree with the statement “I weigh myself often” on a four point Likert response scale may not equate to a measure asking participants to rate self-weighing in terms of frequency per unit of time, as used in other studies (e.g. (11)). However, as mentioned, a small study comparing the assessment of self-weighing used in the current paper with a more objective assessment yielded a moderate correlation. It is possible that

over this 10-year period, cultural shifts in body image and the media's impact on the outcome variables assessed in this cohort. A meta-analysis found the media's conception of thinness to be inversely related to self-esteem and positively associated with worsening depression, with small but significant effect sizes (28). However, researchers have found little difference between Caucasian and Chinese students, and no difference in BMI of African or Caucasian models, bringing into question the role of the media on body image and associated constructs (29,30). Despite these limitations, the strong external validity of this study makes it an important contribution to the literature and directs attention to key psychological factors – self-esteem, depression, and body satisfaction. Future studies could address limitations of internal validity by using more detailed measures of weighing frequency.

This study builds upon the extant literature examining links between self-weighing and adverse outcomes. In one study, female participants self-reported that the number on the scale impacted their mood (31). Mercurio and Rima (2011) suggested that Objectification Theory might help to conceptually link self-weighing and body dissatisfaction, positing that this relationship was mediated by body surveillance. They found empirical support for this idea (32). Objectification Theory asserts that a focus on one's physical attributes and the importance of this self-evaluation imposed by society, breeds self-consciousness and unduly focusing on appearance and imagining other's evaluation of physical looks, making self-monitoring this appearance important (33). Future research examining interrelationships between self-weighing and weight status, psychological, and behavioral outcomes over time are warranted, especially those using a more objective assessment of self-weighing frequency. Given the suggestion of changes in self-weighing frequency and adverse changes in body dissatisfaction, weight concern, depressive symptoms, and self-esteem, caution is advised in recommending this behavior to adolescents and young adults. At the same time, self-weighing is a frequently used behavior among young adults (31), has been found to be associated with improvements in binge eating and depression as part of weight loss treatment (27), and can serve as inexpensive objective feedback about weight control in a population with high rates of overweight/obesity (34), which can also be associated with adverse psychological outcomes (35). Future experimental research in healthy, young adult participants should be designed carefully to exclude participants for whom self-weighing might not be advisable (e.g. female individuals with low body satisfaction, self-esteem, or high depressive symptoms); and monitor and address weight status, psychological, and behavioral outcomes. This would allow for evidence of potential causality, direction of that causality, and further information about for whom specifically self-weighing behavior is or is not beneficial.

Implications For Research and Practice

Because self-weighing is a behavior that carries relatively little social stigmatization, an adolescent or young adult may feel more comfortable reporting to their primary care provider information about how often they weigh themselves, as compared to discussing how depressed they feel or responding to questions about self-esteem. Because the current study results suggest that self-weighing and changes in self-weighing frequency are associated with adverse psychological changes, especially in female participants, it may be

advisable for clinicians to ask about self-weighing at office visits, noting change over time, as a proxy for investigating other more concerning changes in well-being.

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Female Participants: response to "I weigh myself often" in 1999, 2005, and 2010

Figure 1.

Percent of female participants strongly disagreeing, disagreeing, agreeing and strongly agreeing with the statement "I weigh myself often" in 1999, 2005, and 2010. Note. Only those with completed data are included. Data are weighted for nonresponse

**Male Participants: responses to "I weigh myself often"
in 1999, 2005, and 2010**

Figure 2.

Percent of male participants strongly disagreeing, disagreeing, agreeing and strongly agreeing with the statement "I weigh myself often" in 1999, 2005, and 2010. Note. Only those with complete data are included. Data are weighted for nonresponse.

Table 1
Project EAT-I study participant characteristics

	Female participants (n)	Male participants (n)
Weight status		
% Normal weight	67.2 (700)	68.8 (555)
% Overweight	18.7 (195)	13.1 (105)
% Obese	14.1 (147)	18.1 (147)
School level		
% In middle school	28.2 (291)	30.3 (244)
% In high school	71.8 (742)	69.7 (561)
Race		
% White	46.9 (484)	51.1 (410)
% Asian	5.2 (54)	5.8 (46)
% African American	20.9 (215)	14.6 (117)
% Hawaiian/Pacific Islander	0.5 (5)	0.6 (5)
% Hispanic	19.0 (196)	20.6 (164.9)
% Native American	3.2 (33)	3.8 (31)
% Mixed race	4.3 (44)	3.5 (28)
Socioeconomic status		
% Low SES *	18.1 (183)	16.1 (124)
% Low-middle SES	18.2 (184)	20.8 (160)
% Middle SES	27.4 (277)	24.6 (190)
% High-middle SES	22.6 (229)	25.3 (195)
% High SES	13.7 (139)	13.2 (102)

* SES = Socioeconomic Status. SES was determined by parent's education level.

Note: These values are weighted for nonresponse.

Table 2

Cross-sectional Pearson correlations between response to “I weigh myself often” (SD) – Disagree (D) – Agree (A) – Strongly Agree (SA)) and continuous variables. Means appear below the correlation at each time point.

Females													
	EAT-I				EAT-II				EAT-III				
Weight Status Variables													
Weight	-0.01				0.07				0.10				
"I weigh myself often"	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA	
Mean	129.0	125.7	128.9	125.5	137.4	139.0	146.1	139.3	149.9	148.7	160.9	156.8	
BMI (kg/m ²)	-0.02				0.07				0.09				
	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA	
	22.5	22.2	22.5	21.9	23.4	23.7	24.9	23.7	25.6	25.7	27.3	26.6	
Psychological Variables													
Weight disparity (%)	-0.01				-0.14*				-0.09				
	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA	
	91.6	92.7	91.2	92.0	93.5	92.3	88.5	90.1	89.2	88.7	86.7	86.6	
Body satisfaction	-0.17*				-0.24				-0.17*				
	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA	
	33.9	32.1	30.9	27.9	34.3	32.3	28.4	28.0	31.8	28.1	28.5	26.8	
Weight concern	0.30*				0.34*				0.34*				
	SD	D	A	SA	SD	D	A	SAS	DD	A	S	A	
	6.6	7.5	8.3	9.3	6.5	7.5	8.6	9.1	6.9	8.1	8.3	9.7	
Depression	0.14*				0.10				0.11				
	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA	
	17.7	18.2	19.2	19.6	19.2	19.2	19.9	21.1	18.8	19.3	19.0	21.5	
Self-esteem	-0.18*				-0.19*				-0.15*				
	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA	
	17.9	17.6	16.9	15.4	18.5	18.2	17.0	16.6	18.6	17.6	17.8	16.9	
Males													

* correlation significant at $p < 0.001$

“Weight disparity % = self-assessed “ideal” weight divided by actual weight, multiplied by 100 Body satisfaction: Body Shape Satisfaction Scale – scores range from 5 (dissatisfied) – 50 (satisfied)

Weight concern: assessed with items “I think a lot about being thinner,” “I am worried about gaining weight”; scores range from 3 (low weight concern) – 12 (high weight concern)

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Depression: six items from the Kandel and Davies Depressive Mood Scale, scores range from 10 (low depressive symptoms) – 50 (high depressive symptoms) **
Self-esteem: six items from the Rosenberg Self-Esteem scale, scores range from 6 (low) – 24 (high)."

Table 3
Percentage of female and male participants choosing response category for “I weigh myself often” (Strongly Disagree (SD) – Disagree (D) – Agree (A) - Strongly Agree (SA)) who reported engaging in less extreme and extreme UWCBs

Females												
	EAT-I			EAT-II			EAT-III					
Behavioral Variables												
Less extreme UWCB												
"I weigh myself often"	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA
Prevalence	43.3	54.1	66.3	80.9	43.6	60.7	71.1	81.3	54.9	62.0	66.9	74.8
Extreme UWCB												
	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA
	11.5	6.9	13.4	20.8	12.1	17.2	26.5	39.7	14.7	15.3	25.7	39.1
Males												
	EAT-I			EAT-II			EAT-III					
Behavioral Variables												
Less extreme UWCB												
"I weigh myself often"	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA
Prevalence	27.7	30.3	34.2	44.5	17.7	35.9	43.7	47.5	24.3	40.2	38.0	42.8
Extreme UWCB												
	SD	D	A	SA	SD	D	A	SA	SD	D	A	SA
	3.7	1.3	2.7	7.9	5.9	8.0	6.6	6.4	1.7	10.1	8.0	6.9

Note. Models are weighted for nonresponse, but not otherwise adjusted for covariates.

Ns differ based on variable.

UWCB = Unhealthy Weight Control Behaviors

Table 4

Longitudinal contemporaneous change beta coefficients or odds ratios corresponding to a 1 unit change in response to “I weigh myself often” (Strongly Disagree – Strongly Agree) over 10 years.

	Females n = 1058				Males n = 810			
Continuous Outcomes								
	Beta	SD	ES	p-value	Beta	SD	ES	p-value
Weight Status Variables								
Weight	-0.15	28.47	-0.01	0.704	-0.08	35.99	0.00	0.882
BMI	-0.08	4.64	-0.02	0.278	-0.07	4.46	-0.02	0.322
Cognitive Variables								
Weight disparity (%)	0.39	12.36	0.03	0.185	0.18	15.47	0.01	0.383
Body satisfaction	-0.97	9.16	-0.11	<0.001	-0.29	8.52	-0.03	0.201
Weight concern	0.55	2.60	0.21	<0.001	0.53	2.21	0.24	<0.001
Psychological Variables								
Depression	0.41	4.41	0.09	<0.001	0.08	4.39	0.02	0.515
Self-esteem	-0.34	3.43	-0.10	<0.001	-0.12	3.38	-0.04	0.163
	Female n = 1058				Males n = 810			
Dichotomous Outcomes								
	OR	Mean %	Change %	p-value	OR	Mean %	Change %	p-value
Behavioral Variables								
Less extreme UWCB	1.15	60.2	~ 3.3	0.045	1.22	32.2	~ 4.5	0.025
Extreme UWCB	1.21	17.1	~ 2.8	0.013	1.16	5.2	~ 0.8	0.314

SD = standard deviation; ES = effect size = change as fraction of standard deviation; UWCB = Unhealthy weight control behavior; For less extreme and extreme UWCB, table entries are from the logistic model; OR = Odds Ratio of the probability of the behavior for a one step change within an individual in reporting agreement (Strongly Disagree, Disagree, Agree, Strongly Agree) with the statement “I weigh myself often”. Models are weighted for nonresponse.

Statistically significant beta coefficients ($p < .001$) are shown in **bold** type.

Weight disparity % = self-assessed “ideal” weight divided by actual weight, multiplied by 100 Body satisfaction: Body Shape Satisfaction Scale – scores range from 5 (dissatisfied) - 50 (satisfied)

Weight concern: assessed with items “I think a lot about being thinner,” “I am worried about gaining weight”; scores range from 3 (low weight concern) - 12 (high weight concern)

Depression: six items from the *Kandel and Davies Depressive Mood Scale*, scores range from 10 (low depressive symptoms) – 50 (high depressive symptoms)**

Self-esteem: six items from the Rosenberg Self-Esteem scale, scores range from 6 (low)– 24 (high)