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Weight Overestimation as an Indicator of Disordered Eating Behaviors Among Young Women in the United States

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Abstract

Objective—This paper examines the association between weight overestimation and symptoms of disordered eating behaviors using a nationally representative sample of young women.

Method—We use data from Wave III of the National Longitudinal Study of Adolescent Health to compare self-reported weight (in pounds) to measure weight obtained by interviewers using a scale. Focusing on normal weight women between the ages of 18 and 24 ($n = 2,805$) we compare the discrepancy in self-reported and measured weight among women with and without any disordered eating behaviors.

Results—Women who over report their weight by at least five percent are significantly more likely than those who either under report or accurately report their weights to exhibit disordered eating behaviors. These results persist despite controlling for distorted body image.

Conclusion—Our findings support both motivational and perceptual bias explanations for overestimating weight among those who exhibit disordered eating behaviors. We argue that weight over-estimation, together with other important information regarding women's nutrition, exercise, mental health, and health-related behaviors, should be treated as a potential indicator for the diagnosis of an eating disorder among young normal weight women.

Keywords

weight overestimation; eating disorders; body image; body mass index; subjective weight

Introduction

Most research on the discrepancy between self-reported and measured weight has focused on the degree to which individuals *underestimate* their current physical weight.¹ This is of primary concern to medical researchers because self-reported weight may jeopardize the reliability and validity of weight classifications such as overweight or obese.^{2–4} Although some have reported correlations between self-reported and measured physical size as high as 0.95,^{2,4,5} small differences in objective and subjective weight are important for public health and demographic research because the misclassification of overweight and obese individuals has a significant impact on prevalence estimates for the population.^{3,4}

Because it is less common, very little work has focused on the *overestimation* of physical weight. This area is important because, as with underestimation, overestimation may provide

misleading population health estimates, especially among women.⁶ But it is also important because of the implications of weight overestimation among young women.^{7,8} Specifically, body size overestimation is regularly shown to be associated with diagnosed eating disorders⁹ especially among relatively thin women.¹⁰ Despite this large body of work, there is little information about the prevalence of actual weight overestimation, particularly among normal weight young women in the United States. Likewise, very little research has examined the association between weight overestimation and symptoms of disordered eating behaviors among normal weight women, and none has been conducted on a nationally representative sample. The examination of this phenomenon is particularly relevant among normal weight women because body size overestimation may be a characteristic of women who are *at-risk* of developing anorexia nervosa rather than those who have progressed to a diagnosis of anorexia.¹⁰ Therefore, weight discrepancies may be a useful tool to identify those at risk of developing more serious eating disorders.

In a review of 52 studies on the relationship between body image disturbance and eating disorders, Farrell et al.⁹ report that 48 and 37% of the studies show a positive association between body size overestimation and anorexia nervosa and bulimia nervosa, respectively, using a variety of techniques to assess body image disturbance. The bulk of the remaining studies reported null findings in part because the preoccupation with both weight and size may lead individuals with eating disorders to more accurately estimate their weight and size than the general population.^{11–14} In one of the only studies to examine the relationship between actual *weight* overestimation (as opposed to body size overestimation) and eating disorders, McCabe et al.¹¹ found that individuals with anorexia nervosa tend to overestimate their weight slightly, while individuals with bulimia nervosa slightly underestimate their weight. Outside of this study, however, the relationship between weight *overestimation* and eating disorders has not been examined, and only in rare instances have researchers shown an association between weight *underestimation* and disordered eating behaviors.^{15,16}

As with weight underestimation¹ there are two possible explanations for the link between weight overestimation and disordered eating behaviors: (1) perceptual bias and (2) motivational distortion. Proponents of the perceptual bias perspective argue that weight overestimation among those with disordered eating behaviors is the result of a distorted body image.⁷ That is, persons with disordered eating behaviors may be more likely to overestimate their weights when compared to healthy controls simply because they believe that they are heavier than they really are. This is typically found among women with anorexia nervosa who view themselves as normal or over weight^{13,17} but this association may also exist among normal weight women, and especially among those who may be at risk of developing a serious eating disorder.

Second, it is also possible that overestimating weight represents a motivational distortion. That is, weight overestimation may be an effort among those with disordered eating behaviors to conceal their low weights, thereby avoiding drawing attention to their unhealthy eating behaviors. Walsh et al.¹⁸ suggest that individuals who engage in disordered eating behaviors or who have been diagnosed with an eating disorder may intentionally over-report their weights in an attempt to avoid treatment or hospitalization. Couturier and Lock¹⁹ found that many individuals who have been diagnosed with an eating disorder will attempt to deny or conceal their disordered eating behaviors and lower than expected weight. Despite this, a large number of eating disorder screening measures utilize self-report data. Thus, a discrepancy between reported weight and measured weight may highlight attempts to conceal unhealthy eating behaviors, particularly among normal weight women who will not be identified as at-risk based on their body mass index (BMI) status alone.

Additionally, Heilbrun and Freidberg¹⁰ suggest that body size overestimation may be more common among women who are at-risk for anorexia than among those who have actually progressed to an eating disorder diagnosis. They argue that this perceptual bias may serve as a motivation to engage in restrictive dieting, particularly among normal weight women whose actual body weight may not necessitate weight loss. If this is the case, a quantitative measure of actual weight overestimation should allow researchers and clinicians to identify normal weight women who may be at-risk for developing anorexia. Finally, Heilbrun et al.¹⁰ note that it may be difficult to identify women who might become anorexic in the future, since baseline rates of anorexia remain relatively low. As such, examining the discrepancy between self-reported and objective weight in a nationally representative sample of normal weight, young adult women should allow us to better understand the relationship between weight overestimation and the risk of developing an eating disorder.

Data and Measures

All data used in these analyses come from Wave III of the National Longitudinal Study of Adolescent Health (Add Health). Add Health is a school-based study of youth originally in grades 7 through 12. Following an in-school assessment, more detailed information was then collected from 20,745 adolescents (Wave I) during in-home interviews from April to December of 1995. Researchers returned to adolescents' homes from April to August of 1996 to collect follow up data, using the same measures for 14,738 adolescents (Wave II) and then again between July 2001 and April 2002 for Wave III of the study ($n = 15,197$).

During Wave III respondents were asked to report their weight in pounds. After the interview was complete, each respondent's weight was then measured by the researchers using a standard scale. The discrepancy between objective and subjective weight denotes the primary variable used in the analysis. After restricting the sample to normal weight women (those with a measured BMI between 20 and 25) and complete information for all variables used in the analyses including sampling weights,²⁰ a total of 2,858 respondents are used, with a mean age of 21 years. The weight overestimation variable is dummy coded 1 for those that overestimate by at least five percent of their measured body weight and 0 for all other respondents. In total, 99 respondents (3.43%) were coded as over estimating their weights. Individuals who over or underestimated their weights by more than 40 pounds were dropped from the sample. We also include information on respondent's body image in which women were asked if they considered themselves to be (1) "Very underweight" to (5) "very overweight". In total 22.31% of the normal weight women perceived themselves to be overweight. *Disordered eating behaviors* is coded 1 if respondents said that they had engaged in any of the following activities in the past week in order to lose or maintain their current weight: (a) made yourself throw up; (b) took laxatives; (c) took diuretics. Respondents were also coded 1 if they indicated that (in the past 7 days) they: (a) had eaten so much in a short period of time that they would have been embarrassed if others had seen them do it, or (b) that they had been afraid to start eating because they thought that they would not be able to stop or control their eating. We also included positive responses to previous diagnosis of anorexia nervosa or bulimia. In total, we identified 369 respondents (12.89%) who exhibited one or more disordered eating behaviors. We also control for several important characteristics that have been associated with disordered eating behaviors: (a) depression,²¹ (b) drinking behaviors,^{22–24} and (c) impulsivity²⁵ (see: http://sobek.colorado.edu/~boardman/Conley_Boardman_Methods.pdf).

Results

Table 1 presents average weight discrepancy estimates for a nationally representative sample of young women in the United States. On average, women tend to report weights that are

one and a half pounds lighter than their actual physical weight. As shown elsewhere²⁶ we find the average weight discrepancy increases with increasing measured weight but the highest rate of over-reporting is among those with a BMI between 20 and 21.

To describe the association between weight overestimation and disordered eating behaviors, we present results from two logistic regression models in which the dependent variable is the dummy variable for one or more disordered eating behaviors and the primary independent variable is weight overestimation. According to these results, weight overestimation by at least five percent significantly increases the risk of disordered eating behaviors ($OR = 1.98, p < .05$). The second model in Table 2 is designed to evaluate the meaning for the association between overestimating weight and presenting symptoms of eating disorders. As expected, perceived body weight is strongly and positively associated with eating disorder symptoms; however, the inclusion of this covariate did not change the estimated effect of overestimation. That is, weight overestimation and body image appear to act independent of one another as predictors of disordered eating behaviors.

Conclusion

Among normal weight women, a self-reported weight overestimation of at least five percent of one's body weight significantly predicts the presence of one or more disordered eating behaviors, even when other known risk factors for eating disorders are controlled for. Although distorted body image was strongly associated with symptoms of disordered eating, this link did not fully account for association between weight overestimation and disordered eating behaviors. These findings suggest that weight overestimation among those with disordered eating behaviors is a function of both distorted body image and motivational bias to report a significantly higher weight; women who are at-risk for developing an eating disorder may exhibit both a distorted body image *and* a desire to avoid detection of their unhealthy eating behaviors.

Our findings are in line with Heilbrun and Freidberg's¹⁰ work on body size overestimation as a precursor to anorexia. In particular, weight overestimation may be at a critical point prior to the emergence of anorexic behaviors since this perceptual distortion can serve as a strong motivator to engage in restrictive dieting, particularly among women who are of normal weight status who are relatively thin. One benefit of the use of weight overestimation rather than body size overestimation to screen at-risk populations is that this simple quantitative measure of objective versus self-reported weight is easy to administer to study participants, especially when using samples with a large number of participants.

One limitation of the current study is the way in which we operationalized motivational bias. That is, we considered the motivation to report higher weights to be a purposive effort on the part of women with disordered eating behaviors to conceal their weights from others. This understanding is in line with other work in this area^{18,19} but it does not acknowledge that the motivation may also be an effort to distort objective weight from one's self. For example, Heilbrun and Friedberg¹⁰ argue that the motivation for distorted body image is to "maintain dieting behavior even when a thin body is attained" (p. 383). This may also explain why we were unable to empirically separate our two hypotheses. Future work in this area should attempt to differentiate between social and personal motivations to distort one's physical weight.

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TABLE 1

Weight discrepancies in self-reported and measured weight by BMI status among young adult women in the United States

Measured BMI	Average Discrepancy Between Self-Reported and Measured Weight in Pounds	Percent Weight Discrepancy Among Those with Positive Weight Discrepancies	Percent Overestimating by at Least 5%	Sample Size
20–20.9	–0.07 (–0.73, 0.58)	3.71 (2.66, 4.74)	7.85 (4.20, 11.50)	568
21–21.9	–0.88 (–1.41, –0.34)	2.47 (1.86, 3.09)	3.39 (1.12, 5.66)	614
22–22.9	–1.74 (–2.19, –1.28)	2.18 (1.78, 2.58)	1.87 (0.56, 3.18)	597
23–23.9	–2.49 (–3.00, –1.98)	2.27 (1.86, 2.69)	1.95 (0.77, 3.12)	559
24–24.9	–2.81 (–3.59, –2.03)	2.62 (2.15, 3.09)	1.95 (0.32, 3.59)	520
Total	–1.57 (–1.89, –2.03)	2.71 (2.33, 3.09)	3.43 (2.18, 4.66)	2858

Notes: Data obtained from Wave III of the Add Health Study. Cell entries represent the average weight discrepancy in pounds and 95% confidence intervals in parentheses. All estimates obtained using the SURVEY commands in STATA 9.1 to adjust for the complex sampling design of the Add Health Study.

TABLE 2

Logistic regression estimates: weight overestimation and the risk of disordered eating behaviors

	Odds Ratio	95% CI	Odds Ratio	95% CI
Weight difference [$< +5\%$]				
Overestimate $\geq 5\%$	1.984	(1.170, 3.365)	1.904	(1.114, 3.254)
Perceived overweight			1.549	(1.045, 2.295)
Observed BMI	0.969	(0.830, 1.130)	0.907	(0.777, 1.058)
Socio-demographic Controls				
Race/Ethnicity [Non-Hispanic White]				
Hispanic	0.504	(0.271, 0.937)	0.497	(0.270, 0.914)
Non-Hispanic Black	0.768	(0.436, 1.353)	0.810	(0.460, 1.427)
Asian	1.101	(0.715, 1.696)	1.094	(0.714, 1.674)
Native American	1.492	(0.718, 3.100)	1.519	(0.752, 3.069)
Completed High School [No]				
Yes	0.820	(0.483, 1.394)	0.812	(0.478, 1.381)
Age (years)	1.061	(0.913, 1.234)	1.063	(0.916, 1.234)
Confounding Characteristics				
Recently quit Smoking [Yes]				
No	1.361	(0.875, 2.115)	1.386	(0.891, 2.155)
Depression	1.498	(1.299, 1.727)	1.464	(1.267, 1.692)
Drinking behavior	1.145	(1.015, 1.293)	1.156	(1.023, 1.306)
Impulsivity	1.202	(1.011, 1.428)	1.189	(0.997, 1.418)

Notes: Cell entries represent odds ratios for one or more disordered eating behaviors. All estimates obtained using the SURVEY commands in STATA 9.1 to adjust for the complex sampling design of the Add Health Study.