Title: Weight misperception among young adults with overweight/obesity associated disordered eating behaviors

Running Head: Weight misperception among young adults with obesity

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WEIGHT MISPERCEPTION AMONG YOUNG ADULTS WITH OBESITY

ABSTRACT

Objective: The purpose of this study was to examine the cross-sectional association between weight misperception among young adults with overweight/obesity and disordered eating behaviors.

Method: In a subsample young adults with overweight or obesity participating in Wave III (2001-2002) of The National Longitudinal Study of Adolescent to Adult Health (n=5,184), we examined the cross-sectional association between weight under-perception (i.e., perceiving oneself to be at a healthy body weight or underweight) and disordered eating (fasting/meal skipping for weight control, purging/pills for weight control, overeating/loss of control eating, and use of performance-enhancing products/substances).

Results: About 20% of young adult females inaccurately perceived their body weight to be in the healthy range compared to 48% of males. Individuals who misperceived their weight as healthy were significantly less likely to report fasting/meal skipping (Females: OR:0.25, 95% CI:0.14-0.43; Males: OR:0.31, 95% CI:0.20-0.48) and vomiting or taking diet pills/laxatives/diuretics (Females: OR:0.10, 95% CI:0.04-0.25; Males: OR:0.10, 95% CI:0.04-0.25) for weight control. Among females, those who misperceived their weight status as healthy were also less likely to report overeating or loss of control eating (OR;0.41, 95% CI:0.24-0.71). Greater use of performance-enhancing products/substances was seen among males who under-perceived their weight as healthy (OR:2.06, 95% CI:1.57-2.72) and among both females (OR:2.29, 95% CI:1.40-20.0) and males (OR:2.27, 95% CI:1.13-4.55) who perceived themselves to be underweight.

Discussion: Weight under-perception among young adults with overweight/obesity may convey some benefit related to disordered eating behaviors, but could be a risk factor for the use of performance-enhancing products/substances.

Weight misperception occurs when an individual's perceived weight status differs from their true weight status. The direction of weight misperception (i.e., under- versus over-perception) can differ by weight status. For example, a female adolescent with a healthy weight who thinks she is overweight is over-perceiving her weight, while a female adolescent with obesity who believes she has a healthy weight is under-perceiving her weight. While the majority of adolescents with a healthy body weight accurately perceive their weight status (87%), most overweight adolescents (77%) and many adolescents with obesity (43%) under-perceive their weight.[1] The prevalence of weight under-perception among individuals with overweight and obesity has increased over time[2,3] and the prevalence varies considerably by sex, race/ethnicity, and socioeconomic status.[1,4,5] Males, racial/ethnic minorities, and those from low-income households are more likely than their respective counterparts to misperceive their weight status.[1,4,5]

To date, most research examining the relationship between weight misperception and disordered eating or disordered weight control behaviors (referred to henceforth as disordered eating behaviors) has focused on youth with a healthy weight who over-perceive their weight. Over-perception of weight among these youth is cross-sectionally associated with lower self-esteem,[6] dieting and breakfast skipping,[7] and a range of disordered eating behaviors including fasting,[8-10] taking diet pills,[8,9,11] taking laxatives, [8-11] and self-induced vomiting after meals.[8,10,11] Perceived overweight status among youth, irrespective of actual weight, is associated with dieting,[2,12] fasting,[13] taking diet pills[14], taking laxatives,[13,14] self-induced vomiting,[13,14] and binge eating.[15] Such studies suggest that perceiving oneself as overweight/obese may increase risk of disordered eating behaviors among all individuals, including those who are accurately perceiving themselves to be overweight/obese. It is not known whether the risks associated with weight

misperception differ according to the direction of the misperception, however, because, few studies have looked explicitly at the relationship between weight under-perception and disordered eating among individuals with overweight/obesity.

Weight under-perception among individuals with overweight/obesity has gained attention as a possible threat to the success of strategies to address obesity and potential barrier to the adoption of healthful behaviors among individuals with overweight/obesity.[16] Believing that knowledge of weight status is imperative to generate action, weight misperception among individuals with overweight/obesity is generally regarded as an obstacle that should be addressed in public health interventions and targeted weight loss efforts.[1,17] Indeed, the belief that weight misperception is harmful has been bolstered by studies showing that individuals with overweight/obesity who accurately perceive their weight are more apt to self-report engaging in healthy behaviors.[17-21] However, two recent studies, somewhat counterintuitively, found that individuals with overweight/obesity who misperceive their weight as healthy gained less weight over time than their accurately perceiving peers.[22,23]

More research is needed to better understand the understudied phenomenon of weight misperception among individuals with overweight/obesity. Accordingly, we sought to examine the cross-sectional association between weight under-perception among young adults with overweight/obesity and disordered eating behaviors. Given the observed association between perceived overweight status and dieting and disordered eating among individuals all of weights, we hypothesized that weight under-perception among young adults with overweight/obesity would be associated with less disordered eating.

METHODS

Participants

Data for this study come from Wave III of The National Longitudinal Study of Adolescent to Adult Health (Add Health). Add Health is a nationally representative school-based study of adolescents in the United States initially enrolled in 1994-1995. Participants were enrolled in grades 7-12 (Wave I) and came from a sample of 80 high schools and 52 middle schools. Systematic sampling methods and implicit stratification were incorporated into the Add Health study design to ensure the sample was representative of US schools with respect to region of country, urbanicity, school size, school type, and ethnicity. Wave III data were collected in 2001 and 2002 when the participants were 18 to 26 years. Add Health participants who were overweight/obese at Wave III according to the BMI-for-age cut-offs recommended by the Centers for Disease Control in the United States[24] were eligible for the present study.

Of the 20,745 participants in Add Health, 6,423 were excluded due to missing sampling weights at Wave III, 717 were excluded because of missing BMI at Wave III, 6,636 were excluded because they were not overweight/obese at Wave III, 8 were excluded for missing weight perception at Wave III and 1,777 were excluded due to missing covariates. Of the remaining 2,552 girls and 2,632 boys, up to an additional 32 for girls and 27 for boys were dropped for a given behavior because of missing disordered eating behaviors at Wave III, but were included for other analyses where data were present. Among females, 2,551 participants were included in the fasting/meal skipping and purging/pills analyses, 2,546 participants were included in the overeating/loss of control analysis, and 2,520 participants were included in the performance-enhancing products/substances analysis. Among males, 2,631 participants were included in the

fasting/meal skipping and purging/pills analyses, 2,628 participants were included in the overeating/loss of control analysis, and 2,605 participants were included in the performance-enhancing products/substances analysis.

Informed consent was obtained at Wave I and the study was approved by the institutional review board at the University of North Carolina Chapel Hill.[25]

Assessment of exposure

Weight perception in Wave III was the primary predictor in all analyses. Wave III data were selected because of the availability of both objective height/weight data and disordered eating data. Weight perception was constructed from responses to a single question (How do you perceive your weight? Response options: very overweight, overweight, normal weight, underweight, very underweight?). Young adults who perceived themselves to be very overweight or overweight were considered accurate perceivers (referent group). Young adults who perceived themselves as normal weight were considered under-perceivers and those who perceive themselves to be underweight or extremely underweight are considered extreme under-perceivers.

Assessment of outcomes

Purging/pills

Self-induced vomiting and/or use of pills, such as laxatives or diet pills, for weight control were assessed in Wave III with the question: During the past seven days, which of the following things did you do in order to lose weight or to keep from gaining weight? A positive response to

this dichotomous variable was assigned to participants who responded yes to any of the following: 1) made yourself vomit, 2) took weight-loss pills, 3) took laxatives, or 4) took diuretics.

Performance-enhancing products/substances

Use of performance-enhancing products or substances was assessed in Wave III with two separate questions: 1) In the past year, have you used a legal performance-enhancing substance for athletes (such as Creatine, Monohydrate, or Andro)?; 2) Since June 1995, have you taken any of the following drugs without a doctor's permission (response option: steroids or anabolic steroids)? A positive response to the dichotomous variable for performance-enhancing product or substance use was assigned to participants who responded yes to either question.

Fasting/skipping meals

Fasting or skipping meals for weight control was assessed in Wave III with the following question: During the past seven days, which of the following things did you do in order to lose weight or to keep from gaining weight? A positive response to the dichotomous variable for fasting and/or skipping meals for weight control was assigned to participants who selected this option.

Overeating/loss of control eating

Overeating and/or loss of control eating was assessed in Wave III. A positive response to the dichotomous variable for overeating or loss of control eating was assigned to participants who provided a yes response to a Wave III question about overeating (In the past seven days, have

you eaten so much in a short period that you would have been embarrassed if others had seen you do it?) or a question about loss of control eating (In the past seven days, have you been afraid to start eating because you thought you wouldn't be able to stop or control your eating?).

Analysis

We examined frequencies and chi-square statistics of all the disordered eating behaviors according to weight perception category and by gender. Among individuals with fully-observed exposure and outcome data, we conducted gender-stratified logistic regression analyses examining whether weight misperception was cross-sectionally associated with disordered eating behaviors (purging/pills, performance-enhancing products/substances, fasting/skipping meals, and overeating/loss of control eating). Model 1 was an age- and BMI- adjusted model and included weight perception category at Wave III, in addition to Wave III BMI (continuous) and age (continuous). Model 2 was a fully-adjusted model that additionally adjusted for confounders: (1) Race/ethnicity: Asian/Pacific Islander, Native American/American Indian, Hispanic, non-Hispanic Black, non-Hispanic White; (2) Percent poverty level (imputed; continuous); and (3) Highest level of education achieved by either parent (in 4 categories, less than high school, high school graduate, some college, college and beyond). We ran models for each disorder eating behavior separately.

RESULTS

Descriptive statistics for females and males in our analytic sample are found in Tables 1 and 2. Weight misperception was less common among females compared to males in our sample with about 20% of females under-perceiving their body weight compared to 48% of males. Mean

BMI differed significantly according to perceived weight status ($p<0.001$). Among females, the highest mean (SE) BMI was seen among accurate perceivers (33.9 [0.37]), followed by extreme under-perceivers (32.9 [1.90]), and then under-perceivers (27.7 [0.17]). Among males, a higher mean (SE) BMI was seen in accurate perceivers (34.5 [0.60]) compared to under-perceivers (27.9 [0.14]) and extreme under-perceivers (27.9 [0.37]). Weight perception category also differed according to race/ethnicity with non-Hispanic Black individuals most likely to under-perceive their weight status.

Findings from cross-sectional analyses are found in Table 3. Among females, those who misperceived their weight as healthy were significantly less likely to report fasting/meal skipping (OR:0.25, 95% CI:0.14-0.43) and vomiting or taking diet pills/laxatives/diuretics (OR:0.10, 95% CI:0.04-0.25) for weight control in fully-adjusted models. Results from the fully-adjusted models also indicated that females who misperceived their weight status as healthy were also about half as likely to report overeating or loss of control eating (OR;0.41, 95% CI:0.24-0.71). Extreme under-percievers (i.e. females who perceived themselves to be underweight), were also less likely to report fasting/meal skipping for weight control (OR:0.32, 95% CI:0.10-0.99), but were more than twice as likely to report the use of performance-enhancing products/substances (OR:2.29, 95% CI:1.40-20.0) compared to their accurately perceiving counterparts. Among males, those who misperceived their weight as healthy were also significantly less likely to report fasting/meal skipping (OR:0.31, 95% CI:0.20-0.48) and vomiting or taking diet pills/laxatives/diuretics (OR:0.10, 95% CI:0.04-0.25) for weight control in fully-adjusted models. Among males, no significant relationship was seen between weight perception category and overeating/loss of control eating, however, both under-perceivers (OR:2.06, 95% CI:1.57-2.72)

and extreme under-perceivers (OR:2.27, 95% CI:1.13-4.55) were more likely to report the use of performance-enhancing products/substances.

DISCUSSION

We found an association between weight misperception and disordered eating behaviors during young adulthood. Specifically, males and females with overweight/obesity who misperceived their weight to be healthy were less likely to fast or skip meals or to vomit or take diet pills, laxatives, or diuretics for weight control. Females who misperceived their weight to be healthy were also less likely to engage in overweight and/or loss of control eating, while perceiving oneself to be underweight was associated with greater use of performance-enhancing products/substances among both males and females.

The finding from the present study adds to the literature in several ways. Most studies of weight misperception include only females and few examine weight misperception specifically among individuals with overweight/obesity. Findings from our study are supported by other cross-sectional studies which find an association between perceived overweight among individuals of all weights and disordered eating behaviors. In a cross-sectional study of secondary school students from Hong Kong, Cheung et al. found that weight control behaviors are motivated by perceived weight rather than actual weight, particularly among females.[14] Specifically, they found that females who perceived themselves as overweight were more likely to restrict caloric intake, purge, and take diet pills and laxatives.[14] In a cross-sectional study of high school girls in Nova Scotia, Cook et al. found that girls who perceived themselves as overweight were at risk for engaging in disordered eating behaviors such as fasting and vomiting/taking laxatives.[13]

While these two studies were conducted among a younger population and among females only, we found a similar association between weight perception and taking diet pill or laxatives or vomiting for weight control among both males and females. In a large sample of male and female college students, Saules et al. showed that students who accurately perceived themselves to be overweight/obese were significantly more likely to report binge eating.[15] In this study, perceiving oneself as overweight contributed significantly to the prediction of binge eating, beyond the risk conferred by established correlates of binge eating such as gender, mood, and cigarette smoking.[15] We found an association between weight perception and overeating and/or loss of control eating among the females in our sample, but were not able to compare our-sex specific findings with the Saules et al. study[15] because sex-stratified models were not reported. To our knowledge, the association weight perception among induvial with overweight/obesity and the use of performance-enhancing products/substances has not been studied previously. Although a desire to gain weight among a sub-set of males with obesity has been observed previously,[26] the use of products performance-enhancing products/substances among individuals with obesity, especially those who under-perceive their weight, is understudied and warrants further exploration.

While weight misperception among individuals with overweight/obesity is typically viewed as problematic, our findings call this assumption into question. Our findings, when compared to studies of weight misperception among individuals with a healthy body weight, suggest the implications of weight misperception differ substantially by weight status. While weight over-perception among individuals with a healthy body weight appears to increase risk of disordered eating beahviors,[9-11,27] weight under-perception among individuals with overweight/obesity is

associated with decreased risk of disordered eating behaviors, but higher risk for the use of performance-enhancing products/substances. In addition to being at lower risk for some disordered eating behaviors, individuals with overweight/obesity who perceive their weight to be healthy have lower risk for depression[28] and gain less weight over time.[22,23] More research is needed to examine why weight misperception among individuals with overweight/obesity may be protective against some disordered eating behaviors, but several plausible explanations exist. First, obesity is a highly stigmatized condition, and it is possible that individuals who associate themselves with this stereotyped group of people may be more vulnerable to the countless negative effects of weight stigma.[29] Second, although an individual's perception of risk susceptibility to a threat is thought to be a critical determinant of health behavior,[30] it is possible that obesity represents a unique example of the application of health behavior theories. Specifically, while individuals who are aware of their weight status may be more likely to plan or attempt weight loss,[17] those looking for immediate results may adopt dangerous strategies such as fasting, vomiting, or taking diet pills, laxatives, or diuretics or may adopt overly restrictive practices that cannot be sustained long-term and could increase risk of later binge eating. Moreover, these behaviors may explain the excess weight gain seen in adolescents with overweight/obesity who accurately perceive their weight.[22,23] It is also possible that changes made to dietary intake and physical activity for the purpose of weight control may be less effective or sustainable than those made for other reasons such as improving health, feeling better, or having more energy. In the case of obesity, awareness/acknowledgement or weight status may not be a necessary step in the healthy behavior change process. In support of this hypothesis, an analysis of NHANES data of adolescents showed that both the perception of being overweight and actual overweight status were both strongly associated with weight control

behaviors, such as exercising to lose weight, suggesting that inaccurate weight perception may not hinder the adoption of healthful habits entirely.[31]

While weight misperception is not a newly described phenomenon, our study is the first to look exclusively at weight under-perception among young adults with overweight/obesity and its relationship with disordered eating behaviors. Notable strengths of our study are its large size and our ability to adjust for measured BMI and other sociodemographic characteristics known to be associated with weight misperception. This study was conducted among a nationally-representative sample of young adults in the United States; however, the generalizability of these associations among young adults in other counties is unknown. In addition, weight perception in the present study was assessed in 1996. The prevalence of weight misperception among young adults with overweight/obesity in our study was lower than recent estimates among a slightly younger adolescent sample;[1] however, other studies have found that body size underestimation in overweight individuals has increased over time.[2,3] We were unable to estimate the extent to which observed relationships were driven by unmeasured likely confounders, such as weight/shape concern and body dissatisfaction. Disordered eating behaviors in Add Health were assessed based on the past 7 days, which we expect underestimates the true prevalence of disordered eating in the study sample. As such, we had small sample sizes for some of the disordered eating behaviors, particularly among the males. Our sample sizes for disordered eating behaviors were also limited because we included only young adults with overweight or obesity in the analyses. To address sample size concerns, we combined purging (vomiting and laxatives) and diet pill use into a single variable rather than report them separately as has been done in other studies.[32,33] Because of the nature of assessment of weight perception in Add

Health, weight misperception had to be crudely categorized as accurate perception, under-perception, and extreme under perception. This type of categorization lacks precision because it does not fully capture the degree to which someone may be under-perceiving their weight (i.e. individuals who were near the overweight cutoff were classified in the same way as those who had a BMI that far exceeded this cutoff). This type of imprecision is further demonstrated by observed differences in mean BMI by weight misperception category. We adjusted for BMI in all models to account for these differences, but acknowledge that the differences in BMI among weight perception category is a limitation of our study which may explain some of the disordered eating risk. Further, extreme under-perception was uncommon in our sample (n=67 among females; n=101 among males) and thus our power to detect association in this group was limited. Finally, because we relied on crude measures of disordered eating behaviors rather than comprehensive scales that provide more robust information, the clinical signficance of these behaviors is unknown and requires further examination.

Obesity is a major public health concern,[34] putting young adults at risk for a number of physical health complications as they develop into adulthood, such as elevated cholesterol, high blood pressure, insulin resistance, stroke, and heart disease.[35] While this risk of physical health complications is used to defend widespread strategies to address obesity, equal attention is not paid to the fact that individuals with obesity are at risk for a number of psychological consequences, such as depression, body dissatisfaction, binge eating, and the use of unhealthy weight control behaviors.[36-40] While some have argued that the high prevalence of weight misperception among individuals with obesity represents a public health challenge, it is premature to assume that correcting weight misperception is a necessary or effective component

of strategies aimed at addressing obesity. In fact, our findings indicate that weight misperception in young adults with overweight/obesity could protect them from negative psychological consequences such as some disordered eating behaviors that may, in turn, exacerbate their weight problems. Given the critical need to integrate prevention efforts for all weight-related disorders,[41,42] understanding the relationship between weight misperception among individuals with overweight/obesity and disordered eating will help inform the development of more comprehensive approaches to preventing all weight-related disorders, obesity and eating disorders alike.

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Table 1: Descriptive statistics **among females** by weight perception category

Participant Characteristics	All females (n=2,552)		Weight Perception Category at Wave III						p-value
			Extreme Under-Perceivers (Perceived Underweight) (n=67)		Under-Perceivers (Perceived Healthy Weight) (n=442)		Accurate Perceivers (Perceived Overweight) (n=2,043)		
	Sampled Frequency	Weighted Percent (SE) or Mean (SE)	Sampled Frequency	Weighted Percent (SE) or Mean (SE)	Sampled Frequency	Weighted Percent (SE) or Mean (SE)	Sampled Frequency	Weighted Percent (SE) or Mean (SE)	
Age (years; Wave III)	2,552	21.4 (0.12)	67	21.8 (0.30)	442	21.2 (0.17)	2,043	21.4 (0.13)	0.12
BMI (kg/m^2)	2,552	32.9 (0.32)	67	32.9 (1.9)	442	27.7 (0.17)	2,043	33.9 (0.37)	<0.001
Highest Parental Education									0.048
Less than High School	332	12.3% (1.5)	13	5.4% (2.2)	55	13.9% (2.3)	264	80.7% (3.4)	
High School Grad or Equivalent	746	31.3% (1.6)	22	2.6% (0.7)	114	13.3% (1.6)	610	84.0% (1.8)	
Some College/Trade School Post High School	867	34.1% (1.5)	22	1.7% (0.5)	161	17.7% (1.8)	684	80.5% (1.9)	
Graduated College or Above	607	22.3% (1.5)	10	1.6% (0.6)	112	17.1% (2.1)	485	81.3% (2.2)	
Parental Income as Percent of Federal Poverty Level	2,552	2.53 (0.1)	67	1.79 (0.28)	442	2.53 (0.18)	2,043	2.56 (0.10)	0.018
Race/Ethnicity									<0.001
Non-Hispanic White	1,215	60.6% (3.3)	26	1.8% (0.4)	177	13.8% (1.4)	1,012	84.4% (1.4)	
Non-Hispanic Black	646	19.7% (2.6)	20	3.3% (1.2)	158	23.6% (2.6)	468	73.2% (3.0)	
Asian/Pacific Islander	92	1.9% (0.5)	6	8.7% (3.7)	13	12.5% (5.7)	73	78.8% (5.6)	
Hispanic	415	12.1% (1.9)	14	4.3% (1.4)	62	11.1% (1.9)	339	84.6% (2.2)	
Other/Multiracial	184	5.7% (0.8)	1	0.07% (0.07)	32	19.9% (3.9)	151	80.0% (3.9)	
Disordered Eating/Weight Control-Wave III									
Fasting/Meal Skipping (n=2,551)	429	17.0% (0.8)	6	7.5% (3.7)	29	5.8% (1.4)	394	19.5% (1.0)	<0.001
Purging/Pills (n=2,551)	217	8.0% (0.7)	5	7.0% (3.1)	8	1.0% (0.5)	204	9.4% (0.8)	<0.001
Overeating/Loss of Control Eating (n=2,546)	241	10.0% (0.7)	7	9.7% (4.1)	25	4.8% (1.1)	209	11.1% (0.8)	0.003
Performance Enhancing Products/Substances (n=2,520)	55	1.9% (0.3)	5	8.7% (4.5)	7	1.3% (0.6)	43	1.9% (0.4)	0.005

Table 2: Descriptive statistics **among males** by weight perception category

Participant Characteristics	All males (n=2,632)		Weight Perception Category at Wave III						p-value
			Extreme Under-Perceivers (Perceived Underweight) (n=101)		Under-Perceivers (Perceived Healthy Weight) (n=1,161)		Accurate Perceivers (Perceived Overweight) (n=1,370)		
	Sampled Frequency	Weighted Percent (SE) or Mean (SE)	Sampled Frequency	Weighted Percent (SE) or Mean (SE)	Sampled Frequency	Weighted Percent (SE) or Mean (SE)	Sampled Frequency	Weighted Percent (SE) or Mean (SE)	
Age (years; Wave III)	2,632	21.7 (0.12)	101	22.1 (0.31)	1,161	21.6 (0.13)	1,370	21.7 (0.13)	0.24
BMI (kg/m^2)	2,632	31.3 (0.34)	101	27.9 (0.37)	1,161	27.9 (0.14)	1,370	34.5 (0.60)	<0.001
Highest Parental Education									0.42
Less than High School	269	9.1% (1.3)	11	4.4% (1.7)	111	44.8% (5.0)	147	50.7% (4.7)	
High School Grad or Equivalent	700	27.3% (1.7)	36	4.5% (1.0)	291	42.9% (2.3)	373	52.6% (2.4)	
Some College/Trade School Post High School	912	35.4% (1.6)	30	2.7% (0.8)	432	48.6% (2.0)	450	48.8% (2.0)	
Graduated College or Above	751	28.2% (1.9)	24	3.0% (0.8)	327	43.9% (2.4)	400	53.1% (2.5)	
Parental Income as Percent of Federal Poverty Level	2,632	2.73 (0.10)	101	2.22 (0.22)	1,161	2.81 (0.14)	1,370	2.70 (0.10)	0.06
Race/Ethnicity									<0.001
Non-Hispanic White	1,342	65.0% (3.2)	35	2.5% (0.5)	607	45.0% (1.6)	700	52.5% (1.6)	
Non-Hispanic Black	433	13.3% (2.0)	30	7.0% (1.7)	226	53.5% (3.1)	177	39.5% (3.4)	
Asian/Pacific Islander	192	3.5% (0.9)	6	1.7% (1.3)	67	35.9% (5.9)	119	62.4% (6.0)	
Hispanic	481	12.1% (2.1)	21	5.0% (1.5)	185	42.6% (3.7)	275	52.4% (3.7)	
Other/Multiracial	184	6.2% (0.9)	9	3.2% (1.4)	76	42.6% (5.1)	99	54.2% (5.3)	
Disordered Eating/Weight Control-Wave III									
Fasting/Meal Skipping (n=2,631)	235	8.7% (0.70)	8	6.4% (3.4)	45	4.2% (0.7)	182	12.9% (1.2)	<0.001
Purging/Pills (n=2,631)	82	3.0% (0.47)	3	4.8% (2.8)	10	0.6% (0.2)	69	2.0% (0.8)	<0.001
Overeating/Loss of Control Eating (n=2,628)	176	6.2% (0.7)	10	13.3% (4.8)	67	5.2% (0.8)	99	6.6% (1.1)	0.06
Performance Enhancing Products/Substances (n=2,605)	498	20.1% (1.3)	21	24.5% (6.7)	280	25.7% (1.9)	197	14.8% (1.4)	<0.001

Table 3: Cross-sectional association of weight perception category and unhealthy weight control behaviors/disordered eating

	Odds Ratio (95% Confidence Interval)							
	Females							
	Fasting/Meal skipping		**Purging/Pills**		**Overeating/ Loss of control eating**		**Performance Enhancing Substances/Drugs**	
	(N=2,551)		**(N=2,551)**		**(N=2,546)**		**(N=2,520)**	
	M1	**M2**	**M1**	**M2**	**M1**	**M2**	**M1**	**M2**
Weight Perception Category								
Perceived Overweight	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
Perceived About the Right Weight	**0.26 (0.15, 0.45)**	**0.25 (0.14, 0.43)**	**0.10 (0.04, 0.26)**	**0.10 (0.04, 0.25)**	**0.40 (0.23, 0.68)**	**0.41 (0.24, 0.71)**	0.62 (0.20, 1.89)	0.63 (0.19, 2.07)
Perceived Underweight	**0.35 (0.12, 0.98)**	**0.32 (0.10, 0.99)**	0.75 (0.28, 1.98)	0.72 (0.26, 1.99)	0.87 (0.35, 2.19)	0.77 (0.31, 1.92)	**5.05 (1.46, 17.5)**	**2.29 (1.40, 20.0)**
	Males							
	Fasting/Meal skipping		**Purging/Pills**		**Overeating/ Loss of control eating**		**Performance Enhancing Substances/Drugs**	
	(N=2,631)		**(N=2,631)**		**(N=2,628)**		**(N=2,605)**	
	M1	**M2**	**M1**	**M2**	**M1**	**M2**	**M1**	**M2**
Weight Perception Category								
Perceived Overweight	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)	1.0 (Ref.)
Perceived About the Right Weight	**0.31 (0.20, 0.48)**	**0.31 (0.20, 0.48)**	**0.10 (0.04, 0.25)**	**0.10 (0.04, 0.25)**	0.71 (0.44, 1.15)	0.72 (0.44, 1.16)	**1.99 (1.51, 2.63)**	**2.06 (1.57, 2.72)**
Perceived Underweight	0.49 (0.16, 1.52)	0.49 (0.16, 1.49)	0.81 (0.25, 2.64)	0.94 (0.29, 3.07)	1.92 (0.72, 5.09)	1.92 (0.73, 5.09)	1.88 (0.93, 3.81)	**2.27 (1.13, 4.55)**

Bolded estimates indicate p<0.05
M1: Adjusted for age and BMI at Wave III
M2: Adjusted for age and BMI at Wave III, race/ethnicity, percent poverty, and parental education.