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SEX AND RACE/ETHNIC DIFFERENCES IN INACCURATE WEIGHT PERCEPTIONS AMONG U.S. ADOLESCENTS

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Abstract

Purpose—Inaccurate weight perceptions may lead to unhealthy weight control practices among normal weight adolescents and to a greater risk of adult obesity and related morbidities for overweight adolescents. To examine which U.S. adolescents are at risk of these outcomes, we examine sex and racial/ethnic differences in weight perception inaccuracy. This is the first study of weight perception inaccuracy to include Latino/a and Asian American adolescents.

Methods—Among the 12,789 Wave II participants of the National Longitudinal Study of Adolescent Health, we estimate multivariate models that reveal how sex, race/ethnicity, and clinical weight categories predict weight perception inaccuracy.

Results—Relative to boys, girls have lower odds of underestimating their weight and greater odds of overestimating their weight. In particular, among overweight and obese adolescents, girls are more accurate than boys, but among normal weight adolescents, boys are more accurate. Compared to Whites, African Americans are more likely to underestimate their weight, particularly among overweight girls and obese boys. Overall and particularly among girls and normal weight adolescents, African Americans are less likely to overestimate their weight than their White counterparts. Finally, Asian American girls are more likely to underestimate their weight than White girls.

Conclusion—These findings have important implications for identifying and intervening with adolescents at the greatest risk of long-term weight problems, weight-related morbidity, and unhealthy weight control practices.

Keywords

body mass index; weight perceptions; sex; race/ethnicity; health disparities

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INTRODUCTION AND BACKGROUND

Messages about weight are discordant: billion-dollar industries market weight-loss products, grassroots movements advocate fat acceptance, and public health campaigns encourage healthy weight control behaviors. In this context, it is not surprising that adolescents often develop inaccurate weight perceptions, which can take two problematic forms. Clinically overweight adolescents may underestimate their weight and, thus, be less likely to take steps to reduce their weight and risk of additional complications (Rosenstock, Strecher, & Becker, 1988; Strauss, 1999; Wardle, Haase, & Steptoe, 2005). Clinically normal weight or underweight adolescents may overestimate their weight and adopt unhealthy weight control behaviors and eating disorders (Felts, Parrillo, Chenier, & Dunn, 1996; Field, et al., 1999; Strauss, 1999; Talamayan, Springer, Kelder, Gorospe, & Joye, 2006).

Many adolescents have inaccurate weight perceptions, with more underestimating than overestimating their weight (Pritchard, King, & Czajka-Narins, 1997). The current study examines sex and racial/ethnic differences in these inaccuracies using a nationally representative sample. It predicts differences between adolescents' weight perceptions and the clinical classification of their interviewer-measured weight after including a set of important confounders. The analysis builds upon prior research that has examined differences in adolescent weight perception accuracy between boys and girls (Goodman, Hinden, & Khandelwal, 2000) and between African Americans and Whites (Brener, Eaton, Lowry, & McManus, 2004; Strauss, 1999). Similar to recent research based on data from Minnesota (Himes, Hannan, Wall, & Neumark-Sztainer, 2005), we expand our racial/ethnic categories to include Latino/as and Asian Americans. These are the two fastest growing racial/ethnic minority groups in the U.S (Day, 1996) and rates of obesity are as high among Latino/as as they are among African Americans (Ogden, et al., 2006). We also refine estimates of sex and racial/ethnic differences in weight perception inaccuracy by adjusting for several confounders, such as socioeconomic background (Jain, et al., 2001; O'Dea & Caputi, 2001) immigrant status (Kandula, Kersey, & Lurie, 2004), athleticism (Desmond, Price, Gray, & O'Connell, 1986) and parents' weight (Strauss, 1999; Tienboon, Rutishauser, & Wahlqvist, 1994). Two previous studies adjust for confounders but neither includes immigrant status, parents' weight or athleticism (Himes, et al., 2005; Strauss, 1999). Finally, our analyses predict not only if perceptions are inaccurate, but also whether adolescents under- or overestimate their weight. The two prior studies that have examined this do not rely on nationally-representative samples (Brener, et al., 2004; Himes, et al., 2005). Thus, findings are not generalizable to the national population of adolescents. In sum, our analysis expands upon previous research on sex and racial/ethnic differences in weight perception accuracy and brings together several prior innovations into a single study.

There are also two unique features of our study. It is the first to examine accuracy within weight categories. This is critical for understanding who is at risk for the two problems stemming from inaccurate perceptions noted above. We also examine only moderate to large inaccuracies in perceptions by granting leeway to adolescents whose objective weight places them near the boundary between two clinical weight categories (e.g., if an adolescent's weight is at the 84th percentile, technically one percentile point below the cutoff for being overweight, we classify them as accurate if they report being either “about the right weight” or “slightly overweight”). This acknowledges adolescents' limited familiarity with clinical weight categories.

Our study's innovations allow us to produce quality estimates of which adolescents (defined by their sex, race/ethnicity, and weight) are most likely to underestimate and overestimate their weight. Given that the weight-related messages adolescents receive frequently clash, these analyses suggest which adolescents may develop body image issues or remain overweight and at risk of weight-related co-morbidities due to weight misperceptions.

METHODS

Data

Our analyses rely on data from Waves 1 and 2 of the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative, stratified, school-based sample of adolescents in grades 7-12 in 1994 (Harris, et al., 2003). A sample of Add Health respondents and their parents, including oversamples of Cubans, Puerto Ricans, Chinese, and high socioeconomic status African-Americans, were interviewed at home in 1994 or 1995 (Wave 1) and all adolescents, except Wave 1 12th graders, were re-interviewed in 1995 or 1996 (Wave 2), when height and weight were first objectively measured by a trained interviewer. To arrive at our final sample of Wave 2 respondents (N = 12,789), we exclude those without Wave 2 sample weights (n=1,170) and young women who were ever pregnant between 1994 and 1996 (n=779).

Our sample would be reduced further if we relied only on cases without missing data (i.e., used listwise deletion; N = 7, 484). Most variables have very little missing data. For example, less than 1.5% of respondents are missing data on objective weight, weight perceptions, sex, race/ethnicity, age or nativity. Yet several family background characteristics have relatively high proportions of missing data: family income = 9.0%, parental obesity = 16.3% and parents' education = 24.4%.[1] To address missing data due to item nonresponse, we utilize multiple imputation. This procedure entails iteratively replacing missing values with predictions based on associations observed amongst the rich set of variables, creating multiple complete data sets (Rubin, 1987). Data are imputed using the "ICE" application within Stata 9.0 (Royston, 2005b). Empirical results are averaged across the five imputation samples and we appropriately account for the variation across imputation samples to calculate standard errors (Acock, 2005;Royston, 2005a). The results presented here based on multiply imputed data are more conservative than results obtained from a sample relying on listwise deletion.

Measures

Accuracy of weight perceptions—Perception accuracy is defined according to the simultaneous intersection of adolescents' objective weight and their weight perceptions. Objective weight is based on adolescents' interviewer-measured weight and height at Wave 2. We calculate their body mass index (BMI) and classify it into age- and sex-specific categories established by the Centers for Disease Control and Prevention that indicate underweight (BMI < 5th percentile), normal weight (5th percentile ≤ BMI < 85th percentile), overweight (85th percentile ≤ BMI < 95th percentile), and obesity (BMI ≤ 95th percentile) (Ogden, et al., 2002).

Adolescent weight perceptions derive from the following Wave 2 question: "How do you think of yourself in terms of weight?" where 1= "very underweight," 2= "slightly underweight," 3= "about the right weight," 4= "slightly overweight" and 5= "very overweight." We collapse perceptions into three categories: "underweight," "about the right weight" (to imply normal weight), and "overweight."

We use the mismatch of an adolescent's weight category and weight perceptions to create two indicators of weight perception inaccuracy. The first is dichotomous, indicating whether adolescents' weight perceptions are accurate (= 1) or not (= 0). The second is a multinomial variable that compares accurate perceptions versus overestimates and underestimates.

[1]Parental obesity and parents' education have the highest percent missing because they require data from both parents and shifts in family structure make reports about both parents less likely.

As noted previously, our operationalization of accuracy allows for a realistic margin of error to account for adolescents' lack of familiarity with clinical weight definitions. Adolescents are classified as accurate if their weight is within two percentiles of the cutoff between two weight categories and their perceptions align with either category. Specifically, respondents are classified as accurate if (1) their perception equals underweight and their BMI is less than or equal to the 7th percentile for their age and sex, (2) their perception equals "about the right weight" and their BMI is equal to or falls between the 3rd and 87th percentile, or (3) their perception equals overweight and their BMI is greater than or equal to the 83rd percentile. Our accuracy measure produces more conservative estimates of sex and racial/ethnic differences in accuracy than a stricter operationalization (results not shown, but available upon request).

Sex—Sex indicates whether the adolescent is male (= 1) or female.

Race and ethnicity—Adolescents identified their race and ethnicity in Wave 1 in response to predetermined categories, but could select more than one. We use Add Health guidelines for classifying individuals as non-Latino White (the reference category), non-Latino African-American, non-Latino Asian, non-Latino Native American, and Latino (Udry, 2003). We further classify Latino respondents into two categories, Mexican-American or other Latino. The Native American sample is relatively small (n = 536), but we include them to create mutually exclusive racial/ethnic categories.

Control variables—We control for important confounders of weight and weight perceptions measured at Wave 1, specifically adolescents' age, immigrant status, parental obesity, parents' education, and family income. Parental obesity is based on the parent respondent's report of whether the adolescent's biological mother and/or biological father is "obese." These items are combined to create the following three dichotomous variables relative to the reference category for those without any obese parents: (1) both biological parents are obese, (2) only the biological mother is obese, and (3) only the biological father is obese. Parents' education is measured in years, averaged in two-parent families, and obtained from the parent survey, but supplemented with the adolescent's report when parents' data are missing. Finally, income is based on the parent respondent's report of yearly family income in thousands of U.S. dollars for 1994-1995. It is recoded into six categories reflecting income percentiles. Our final confounder, athletic involvement, is based on Wave 1 and 2 data. Adolescents are classified as athletic if they participated in an organized school sport or reported playing an active sport or exercising five or more times a week during the past week in either survey wave.

Statistical analysis

We estimate a sequence of models to examine sex and racial/ethnic differences in weight perception accuracy. Our simplest model predicts whether adolescents are accurate using logistic regression methods. We then predict weight under- or overestimation (versus accuracy) using multinomial logistic regression. Finally, we predict accuracy within each clinical weight category using logistic regression. We estimate all models for the full sample and separately for boys and girls to examine how sex and race/ethnicity individually and jointly predict weight perception accuracy. To ensure that estimates are generalizable to the national population and are not biased due to attrition or survey design, we utilize STATA's survey design applications (SVY; version 9; Stata, College Station, TX) to weight and correct all statistical models for design effects as suggested by Chantala and Tabor (1999).

RESULTS

Descriptive statistics

We begin by describing adolescents' weight perceptions, objective weight, and weight perception accuracy. Fifty-four percent of adolescents perceive their weight as “about the right weight,” while almost 16% perceive being underweight and 30% perceive being overweight (Table 1). Objectively, 4% are underweight, 68% are normal weight, 15% are overweight, and 13.5% are obese (Table 1). When the intersection of the two is considered, 70.5% of adolescents have accurate weight perceptions, whereas 18.0% underestimate and 11.5% overestimate their weight after allowing for a reasonable margin of error.

As noted in Table 2, obese adolescents are more accurate than those in all other objective weight categories ($P< .01$). Eighty-two percent of obese adolescents are accurate, while 65% of overweight, 69% of normal weight and 74% of underweight adolescents are accurate. But these general patterns hide important sex differences. Among obese, overweight and underweight adolescents, girls are more likely to have accurate weight perceptions relative to boys. Conversely, normal weight boys are more accurate than normal weight girls.

Basic differences in inaccuracy

We next present results from weighted logistic regression models predicting differences in the odds of having accurate weight perceptions net of confounders among the full sample and among female and male adolescents (Table 3). Among the full sample, boys have roughly 10% lower odds of being accurate than girls. Asian Americans' odds of accuracy are 33% lower than their White counterparts (Odds Ratio (OR) = 0.67; $P< .01$). Separate analyses of girls and boys suggest that the significant difference in accuracy between Asian Americans and Whites is evident among girls, but not boys (Table 3).

Differences in underestimating and overestimating weight

The preceding analyses, while revealing, could concomitantly hide other important differences because underestimating and overestimating weight are grouped together as “inaccurate.” Thus, we estimate models that predict whether sex and racial/ethnic groups differ in their likelihood of under- and overestimating their weight (Table 4) and find additional differences. Among the full sample, boys (versus girls) and African Americans (versus Whites) are more likely to underestimate their weight and less likely to overestimate their weight. Asians are more likely to underestimate their weight than are Whites.

These racial/ethnic patterns differ by sex. Among girls (Table 4, panel 2), African Americans are more likely to underestimate their weight and less likely to overestimate their weight than Whites. But among boys (Table 4, panel 3), African Americans are only less likely to overestimate their weight relative to Whites. They do not significantly differ in their odds of underestimating their weight. In addition, only Asian and White girls differ in their odds of underestimating their weight. Asian girls have higher odds of weight underestimation. There is no significant difference between Asian and White boys.

Differences in accuracy within clinical weight categories

Our final analyses investigate sex and race/ethnic differences in accuracy among adolescents in different clinical weight categories. First we provide baseline estimates from a model that examines how sex, race/ethnicity and objective weight each predict weight perception accuracy (results available upon request). Similar to the bivariate results reported previously, these models find that obese adolescents are more accurate than normal weight adolescents net of confounders (OR=2.39; $P<.001$). In contrast, underweight and overweight adolescents do not

differ from normal weight adolescents in their likelihood of being accurate in the multivariate models (Underweight: OR 1.03, *P*=0.88; Overweight: OR 1.00, *P*=0.98).

We next tested for significant sex and racial/ethnic differences in weight perception accuracy among adolescents in different weight categories (Table 5). No significant sex or race/ethnic differences in accuracy emerge among underweight adolescents, even in models further stratified by sex (results available upon request). These null finding may reflect the relatively small number of adolescents who are objectively underweight (*n*=442).

Among normal weight adolescents, boys have higher odds than girls of being accurate (OR=1.22; *P*< .01). Relative to Whites, African Americans have higher odds of being accurate (OR=1.24; *P*< .05) and Asians have lower odds of being accurate (OR=0.68; *P*< .05). These racial differences were not further moderated by sex (results available upon request).

Among both overweight and obese adolescents, boys are less likely than girls to accurately see themselves as overweight (OR=0.33; *P*< .01 among overweight adolescents; OR=0.24; *P*< .00 among obese adolescents). Similarly, African Americans are less likely than Whites to accurately see themselves as overweight (OR=0.52; *P*< .01 among overweight adolescents; (OR=0.41; *P*< .00 among obese adolescents). When we further stratify these models by sex, results suggest that the patterns differ by sex and by weight category. The Black-White differences among overweight adolescents are significant for girls (OR=0.30; *P*<.01), but not boys. In contrast, the Black-White differences among obese adolescents are significant for boys (OR=0.33; *P*< .01), but not girls.

In sum, the results demonstrate that weight perception accuracy depends on adolescents' sex, race, and clinical weight category. Repeated differences are found by sex, between African Americans and Whites, between Asians and Whites (particularly for girls), and between normal weight, overweight, and obese adolescents.

CONCLUSIONS AND DISCUSSION

We find significant differences in adolescents' weight perception accuracy by sex and race/ethnicity, but the complexity of these disparities is masked in the simplest models that do not account for how adolescents' perceptions are inaccurate or adolescents' actual weight. Simple models indicate statistically significant differences in accuracy between boys and girls and Asians and Whites, but additional models clarify these patterns and suggest which adolescents are at risk for particular negative consequences of inaccurate weight perceptions.

Although boys are more likely than girls to have inaccurate perceptions, when inaccurate, boys' and girls' are at risk of very different health problems. Boys' are less accurate overall because they have more than twice the odds of girls of underestimating their weight. Furthermore, overweight and obese boys have lower odds than girls of being accurate. As such, boys are less likely than girls to recognize that they are overweight and are at higher risk than girls of lifetime overweight, obesity and weight-related morbidity and mortality. Conversely, girls are at higher risk of unhealthy weight control practices given that they are more likely to overestimate their weight and, among normal weight adolescents, girls are less likely than boys to accurately perceive their weight.

Important racial/ethnic differences are also illuminated with more detailed models. Our simplest model does not find a difference between Whites and African Americans. This is contrary to prior research that does not adjust findings for confounders (Brener, et al., 2004) or that focus only on accurately perceiving oneself as overweight (Strauss, 1999). Our results are congruent, however, with prior research regarding Black-White differences (Brener, et al., 2004; Strauss, 1999) once we examine how African Americans and Whites are inaccurate.

African American boys and girls have lower odds of overestimating their weight relative to their White counterparts. In addition, African American girls have greater odds of underestimating their weight. These findings suggest that African Americans are at a lower risk of unhealthy weight control practices than Whites, but they may also be at greater risk of lifetime obesity and weight-related morbidity and mortality because African Americans who are overweight or obese have lower odds of accurately perceiving their weight. This is particularly true for African American boys who are more likely to be obese (Ogden, et al., 2006) than White boys, but less likely to accurately perceive themselves as overweight.

Our study is also the first to reveal differences in weight perception accuracy between White and Asian adolescents in a nationally representative study.[2] Given that census projections suggest a doubling of the Asian American population during the next few decades (Day, 1996), our analysis helps gauge the possible health risks of this growing U.S. minority group if they do not accurately assess their weight. Our simplest model suggests that Asian Americans are less accurate than Whites, but additional analyses demonstrate that this is due to a difference among girls. Asian girls are more likely to underestimate their weight, and in supplementary bivariate analyses, we see that this tendency is driven by overweight Asian girls. Twenty nine percent of overweight Asian American girls underestimate their weight relative to 12% of obese Asian American girls and 14% of normal weight Asian girls. Overweight Asian girls, thus, may face the same weight-related health risks as boys and African American adolescents.

Interestingly, we find no differences in perception accuracy between Mexican Americans and Whites, despite Mexican Americans' high prevalence rates of overweight and obesity (Ogden, et al., 2006). Thus, their high prevalence of obesity may place them in danger of a range of weight-related health risks, but they do not face the double disadvantage by inaccurately perceiving their weight. We also do not find differences in accuracy among other Latino/as.

Our final contribution is showing how weight perception accuracy varies by clinical weight status. Obese adolescents' odds of being accurate are more than double that of their normal weight counterparts. The implications of this finding are quite positive. If obese adolescents accurately perceive being overweight, they may be more likely to take steps that will reduce their risk of obesity-related morbidity and mortality.

Our findings are robust, but this study is not without limitations. First, our accuracy measure is conservative because adolescents are not expected to have detailed knowledge of clinical weight categories, but it could also be too crude, especially for capturing accuracy differences among overweight adolescents. In fact, collapsing the perceptions “slightly overweight” and “very overweight” may explain why obese adolescents are significantly more likely to be accurate. Additional research could utilize more detailed perception categories to investigate the degree of inaccuracy. Second, differences in accuracy could reflect the fact that BMI conflates fat mass with fat-free mass. Although we control for athleticism, differences in musculature and bone density across groups could contribute to the observed patterns. Therefore, other measures of body composition, such as the waist-to-hip ratio or subscapular skinfold, were they available in our data, could provide different assessments of adolescents' objective weight and, therefore, their accuracy. Third, the data are over 10 years old, but to our knowledge, this is the only nationally representative dataset that includes important confounders of weight perceptions and large enough subsamples of Latino/a and Asian American adolescents to expand racial/ethnic comparisons beyond African Americans and Whites. To confirm the applicability of our findings to adolescents today, we conducted

[2]Himes et al.(2005) also examined Asian-White differences with data from Minnesota, but with a slightly different focus. They examined linear differences between adolescents' self-reported BMI and objectively-measured BMI, but did not find a significant difference between Asians and Whites for either sex.

supplementary analyses with the Youth Risk Behavior Survey (YRBS) of 2007 and find that the general patterns regarding weight perception accuracy have not changed significantly over the last decade.[3] This provides us with greater confidence about the relevance of our findings. Finally, the results are based on one question about weight perceptions and racial/ethnic groups may attach different meanings to specific terms. Focus groups conducted with African American, Mexican American and White youth suggest that African Americans and Mexican Americans use different descriptors for healthy weight, including having “meat” or “curves” (Center for Disease Control and Prevention, 2000). Future research can build from these findings to explore normative evaluations of weight and how they differ across racial/ethnic groups.

Despite these limitations, the current analyses shed new light on sex and racial/ethnic differences in weight perception accuracy with the goal of identifying which adolescents may be at greatest risk of the problematic consequences of perception inaccuracy. This information is critical for targeted interventions aimed at preventing unhealthy weight control practices and obesity-related morbidity and mortality. Findings may be particularly useful for physicians to better identify which patients are most in need of education and advice regarding their weight.

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REFERENCES

Acock AC. Working With Missing Values. Journal of Marriage and Family 2005;67(4):1012–1028.

Brener ND, Eaton DK, Lowry R, McManus T. The association between weight perception and BMI among high school students. Obesity Research 2004;12(11):1866–1874. [PubMed: 15601984]

Center for Disease Control and Prevention. Healthy Weight, Physical Activity, and Nutrition: Focus Group Research with African American, Mexican American, and White Youth: Executive Summary. Centers for Disease Control; Atlanta, GA: 2000.

Chantala, K.; Tabor, J. Strategies to perform a design-based analysis using the Add Health data. 1999. Retrieved June 7, 2002, from http://www.cpc.unc.edu/projects/addhealth/files/weight1.pdf

Day, JC. Population Projections of the United States by Age, Sex, Race, and Hispanic Origin: 1995 to 2050. U.S. Bureau of the Census; Washington, D.C.: 1996. No. P25-1130

Desmond SM, Price JH, Gray N, O'Connell JK. The Etiology of Adolescents' Perceptions of Their Weight. Journal of Youth and Adolescence 1986;15:461–474.

Felts WM, Parrillo AV, Chenier T, Dunn P. Adolescents' perceptions of relative weight and self-reported weight-loss activities: analysis of 1990 YRBS (Youth Risk Behavior Survey) national data. Journal of Adolescent Health 1996;18(1):20–26. [PubMed: 8750424]

Field AE, Camargo CA, Taylor BC, Berkey CS, Frazier L, Gillman MW, et al. Overweight, weight concerns, and bulimic behaviors among girls and boys. Journal of the Academy of Child and Adolescent Psychiatry 1999;38(6):754–760.

Goodman E, Hinden BR, Khandelwal S. Accuracy of teen and parental reports of obesity and body mass index. Pediatrics 2000;106(1 Pt 1):52–58. [PubMed: 10878149]

Harris, KM.; Florey, F.; Tabor, J.; Bearman, PS.; Jones, J.; Udry, JR. The National Longitudinal Study of Adolescent Health: Research Design. 2003. Retrieved January 22, 2004, from http://www.cpc.unc.edu/projects/addhealth/design

[3]The YRBS asks the same question to ascertain weight perceptions, but relies on adolescents' self-reported weight and height to calculate BMI. Using the same decision rules, we find 71.6% of adolescents are accurate, 18.9% underestimate and 9.5% overestimate their weight in the 2007 YRBS. This is remarkably comparable to Add Health estimates (70.5%, 18.0%, and 11.5%, respectively). Any discrepancy across data sources could be due to the fact that self-reported weight is confounded with weight perceptions (Brener, et al., 2004), especially for girls (Ge, Elder, Regnerus, & Cox, 2001), and would give the appearance of greater accuracy.

Himes JH, Hannan P, Wall M, Neumark-Sztainer D. Factors Associated with Errors in Self-reports of Stature, Weight, and Body Mass Index in Minnesota Adolescents. Annals of Epidemiology 2005;15 (4):272–278. [PubMed: 15780774]

Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't low-income mothers worry about their preschoolers being overweight? Pediatrics 2001;107(5):1138–1146. [PubMed: 11331699]

Kandula NR, Kersey M, Lurie N. Assuring the Health of Immigrants: What the Leading Health Indicators Tell Us. Annual Review of Public Health 2004;25:357–376.

O'Dea JA, Caputi P. Association Between Socioeconomic Status, Weight, Age and Gender, and the Body Image and Weight Control Practices of 6- to 19-year-old Children and Adolescents. Health Education Research 2001;16:521–532. [PubMed: 11675800]

Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of Overweight and Obesity in the United States, 1999-2004. JAMA 2006;295(13):1549–1555. [PubMed: 16595758]

Ogden CL, Kuczmarski RJ, Flegal KM, Mei Z, Guo S, Wei R, et al. Centers for Disease Control and Prevention 2000 growth charts for the United States: Improvements to the 1977 National Center for Health Statistics version. Pediatrics 2002;109(1):45–60. [PubMed: 11773541]

Pritchard ME, King SL, Czajka-Narins DM. Adolescent Body Mass Indices and Self-Perception. Adolescence 1997;32(128):863–880. [PubMed: 9426809]

Rosenstock IM, Strecher VJ, Becker MH. Social Learning Theory and the Health Belief Model. Health Education & Behavior 1988;15(2):175–183.

Royston P. Multiple imputation of missing values: update. Stata Journal 2005a;5(2):1–14.

Royston P. Multiple imputation of missing values: Update of ice. Stata Journal 2005b;5(4):527–536.

Rubin, D. Multiple imputation for nonresponse in surveys. Wiley; New York: 1987.

Strauss RS. Self-reported weight status and dieting in a cross-sectional sample of young adolescents: National Health and Nutrition Examination Survey III. Archives of Pediatrics & Adolescent Medicine 1999;153(7):741–747. [PubMed: 10401809]

Talamayan KS, Springer AE, Kelder SH, Gorospe EC, Joye KA. Prevalence of overweight misperception and weight control behaviors among normal weight adolescents in the United States. [Article]. TheScientificWorldJournal 2006;6:365–373.

Tienboon P, Rutishauser IHE, Wahlqvist ML. Adolescents' perception of body weight and parents' weight for height status. Journal of Adolescent Health 1994;15(3):263–268. [PubMed: 8075099]

Udry JR. The National Longitudinal Study of Adolescent Health (Add Health), Waves I & II, 1994–1996; Wave III, 2001–2002 [MRDF]. 2003

Wardle J, Haase AM, Steptoe A. Body image and weight control in young adults: international comparisons in university students from 22 countries. International Journal of Obesity 2005;30(4): 644–651. [PubMed: 16151414]

Table 1

Weighted Descriptive Statistics for the Study Sample (N = 12,789)

	Mean or %	Std. Err.
Weight Perception		
Underweight	15.7%	-
About the Right Weight	54.3%	-
Overweight	30.1%	-
Objective Weight		
Underweight	3.6%	-
Normal	67.8%	-
Overweight	15.1%	-
Obese	13.5%	-
Perception Accuracy, with Allowable Margin of Error		
Underestimate	18.0%	-
Accurate	70.5%	-
Overestimate	11.5%	-
Sex = Male	47.0%	
Race/Ethnicity		
White	68.3%	-
Black	14.9%	-
Mexican	7.1%	-
Other Latino	5.0%	-
Asian American	3.9%	-
Native American	0.1%	-
Age	15.95	0.11
Parent Obesity		
Two Obese Parents	5.4%	-
Only Mom Obese	13.0%	-
Only Dad Obese	4.8%	-
Neither Parent Obese	76.8%	-
Any Athletic Involvement = 1	69%	-
Parents' Education	13.18	0.12
Family Income	2.14	0.06
US born = 1	93.4%	-

Table 2

Percentage of Adolescents with Accurate Weight Perceptions and the Direction of Inaccurate Perceptions by Sex and Objective Weight Category

	Underestimate	Accurate	Overestimate	Total	N^a
Full Sample					
Underweight	-	**73.5%**	26.5%	100.0%	559
Normal weight	16.4%	**68.8%**	14.9%	100.0%	8,959
Overweight	35.1%	**64.9%**	-	100.0%	1,681
Obese	15.1%	**81.9%**	-	97.0%	1,590
Girls					
Underweight	-	**78.0%**	22.0%	100.0%	247
Normal weight	9.9%	**66.9%** *	23.2%	100.0%	4,405
Overweight	20.4%	**79.6%** *	-	100.0%	836
Obese	7.5%	**92.5%** *	-	100.0%	689
Boys					
Underweight	-	**70.6%**	29.4%	100.0%	312
Normal weight	22.4%	**70.5%**	7.0%	100.0%	4,554
Overweight	49.0%	**51.0%**	-	100.0%	845
Obese	20.4%	**79.6%**	-	100.0%	901

Source: National Longitudinal Study of Adolescent Health (Add Health), Waves 1 and 2.

Note: The definition of accuracy allows for a margin of error for adolescents' with objective weights near the clinical cut-points between weight categories.

[a] Given the data is multiply imputed the N's are not consistent across imputations. The reporte N's are the average N's across the five imputed data sets.

* Girls are significantly different (P <.01) in their likeilhood of being accurate relative to boys in the same weight category.

Table 3

Results from Multivariate Logistic Regression Models Predicting Weight Perception Accuracy for the Full Sample and for Male and Female Adolescents (N = 12,789)

	Full Sample (n = 12,789)			Girls (n = 6, 177)			Boys (n = 6,612)		
	OR	**(95% CI)**	***P* Value**	**OR**	**(95% CI)**	***P* Value**	**OR**	**(95% CI)**	***P* Value**
Male	0.90	(0.83-1.00)	0.050	--			--		
Race/Ethnicity (ref: non-Latino White)									
Black	0.98	(0.86-1.13)	0.805	1.03	(0.85-1.27)	0.738	0.95	(0.79-1.14)	0.565
Mexican	0.87	(0.73-1.13)	0.154	0.84	(0.62-1.13)	0.244	0.90	(0.69-1.18)	0.441
Other Latino	1.08	(0.75-1.14)	0.445	1.01	(0.67-1.51)	0.974	1.16	(0.68-1.09)	0.217
Asian	0.67	(0.47-0.94)	0.019	0.56	(0.36-0.88)	0.012	0.76	(0.48-1.21)	0.246
Native American	0.74	(0.40-1.35)	0.321	0.80	(0.32-1.99)	0.627	0.74	(0.36-1.51)	0.403
Age	0.95	(0.91-0.98)	0.001	0.94	(0.90-0.99)	0.015	1.05	(0.91-0.99)	0.021
Parental Obesity (ref: Neither Parent Obese)									
Two Obese Parents	1.28	(0.98-1.67)	0.067	1.46	(1.01-2.12)	0.046	1.16	(0.83-1.62)	0.395
Only Mom Obese	1.17	(0.96-1.43)	0.122	1.05	(0.83-1.33)	0.670	1.28	(0.96-1.71)	0.086
Only Dad Obese	0.96	(0.71-1.28)	0.761	1.14	(0.80-1.63)	0.468	0.85	(0.57-1.26)	0.419
Any Athletic Involvement	0.92	(0.82-1.03)	0.150	0.96	(0.82-1.13)	0.635	0.87	(0.73-1.04)	0.137
Parents' Education	1.00	(0.98-1.03)	0.800	1.01	(0.97-1.05)	0.665	1.00	(0.96-1.04)	0.974
Family Income	1.00	(0.96-1.04)	0.991	0.98	(0.92-1.04)	0.535	1.17	(0.96-1.07)	0.578
U.S. Born	0.92	(0.72-1.18)	0.504	1.12	(0.81-1.53)	0.494	0.75	(0.52-1.08)	0.120

Source: National Longitudinal Study of Adolescent Health (Add Health), Waves 1 and 2.

Abbreviations: OR, odds ratio; CI, confidence interval.

Table 4

Results from Multivariate Multinomial Logistic Regression Models Predicting Whether Adolescents' Underestimate or Overestimate Their Weight (Versus Have Accurate Weight Perceptions) for the Full Sample and for Male and Female Adolescents (N = 12,789)[a]

	Underest			Overest		
	OR	**(95% CI)**	***P* Value**	**OR**	**(95% CI)**	***P* Value**
Full Sample						
Male	2.33	(2.00-2.72)	0.000	0.36	(0.30-0.43)	0.000
Race/Ethnicity (ref: non-Latino White)						
African American	1.31	(1.13-1.52)	0.000	0.61	(0.47-0.80)	0.000
Mexican	1.20	(0.98-1.47)	0.076	1.06	(0.80-1.41)	0.678
Other Latino	1.20	(0.90-1.60)	0.213	0.93	(0.69-1.27)	0.649
Asian	1.64	(1.09-2.46)	0.017	1.30	(0.90-1.88)	0.165
Native American	1.56	(0.81-3.03)	0.185	0.92	(.45-1.86)	0.811
Girls						
Race/Ethnicity (ref: non-Latino White)						
African American	1.55	(1.22-1.96)	0.000	0.65	(0.48-0.89)	0.006
Mexican	1.43	(0.89-2.32)	0.139	1.06	(0.73-1.53)	0.772
Other Latino	1.28	(0.78-2.11)	0.333	0.83	(0.53-1.30)	0.411
Asian	2.49	(1.32-4.70)	0.005	1.37	(0.88-2.16)	0.166
Native American	2.32	(0.76-7.09)	0.140	0.68	(0.25-1.89)	0.461
Boys						
Race/Ethnicity (ref: non-Latino White)						
African American	1.19	(0.99-1.43)	0.065	0.55	(0.33-0.94)	0.028
Mexican	1.12	(0.84-1.48)	0.444	1.09	(0.69-1.72)	0.725
Other Latino	1.16	(0.83-1.61)	0.387	1.16	(0.68-1.87)	0.577
Asian	1.33	(0.80-2.23)	0.271	1.26	(0.70-2.27)	0.445
Native American	1.40	(0.67-2.94)	0.368	1.20	(0.41-3.50)	0.738

Source: National Longitudinal Study of Adolescent Health (Add Health), Waves 1 and 2.

Abbreviations: OR, odds ratio; CI, confidence interval.

[a] Adjusted for age, parental obesity, any athletic involvement, parents' education, family income and nativity.

Table 5

Multivariate Models Predicting Whether Weight Perceptions Are Accurate among Adolescents in Different Objective Weight Categories (N = 12,789) [a]

	Underweight (n = 442)			Normal Weight (n = 8,779)			Overweight (n = 1,857)			Obese (n = 1,711)		
	OR	**(95% CI)**	***P* Value**	**OR**	**(95% CI)**	***P* Value**	**OR**	**(95% CI)**	***P* Value**	**OR**	**(95% CI)**	***P* Value**
Male	0.70	(0.38-1.29)	0.253	1.22	(1.07-1.40)	0.005	0.32	(0.24-0.45)	0.000	0.24	(0.15-0.37)	0.000
Race/Ethnicity (ref: non-Latino White)												
African American	0.65	(0.27-1.60)	0.351	1.24	(1.02-1.52)	0.035	0.52	(0.38-0.72)	0.000	0.41	(0.26-0.66)	0.000
Mexican	1.19	(0.49-2.89)	0.690	0.81	(0.65-1.01)	0.060	0.89	(0.49-1.60)	0.688	0.99	(0.51-1.90)	0.967
Other Latino	0.68	(0.33-1.40)	0.287	0.95	(0.73-1.23)	0.682	0.65	(0.35-1.18)	0.153	1.07	(0.56-2.02)	0.837
Asian	1.08	(0.32-3.73)	0.897	0.68	(0.48-0.95)	0.025	0.71	(0.20-2.58)	0.603	0.60	(0.22-1.68)	0.331
Native American	2.17	(0.14-33.02)	0.574	0.72	(0.30-1.72)	0.454	0.66	(0.17-2.48)	0.534	0.65	(0.31-138)	0.257

Note: Analyses of Add Health data, Waves 1 and 2; Standard errors in parentheses

Two-tailed signficance tests: * significant at 5%; ** significant at 1%

[a] Adjusted for age, parental obesity, any athletic involvement, parents' education, family income and nativity.