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Psychological Status and Weight-Related Distress in Overweight or At-Risk-for-Overweight Children

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Abstract

Objective—To associate psychological status, weight-related distress, and weight status during childhood in overweight or at-risk-for-overweight children.

Research Methods and Procedures—We associated self-report of depression, trait anxiety, and weight-related distress (body size dissatisfaction and weight-related peer teasing after controlling for the effects of weight) in 164 children (black 35%; age 11.9 ± 2.5 years; girls 51%) who were overweight or at-high-risk-for-overweight and were not seeking weight loss.

Results—Overall, heavier children reported more psychological and weight-related distress. Black children reported more anxiety and body size dissatisfaction than white children, despite equivalent weights. However, psychological distress was not significantly associated with weight in white children. Girls reported more weight-related distress than boys. Depression was associated with weight-related teasing in all predictive models, except in the model using only black subjects. Trait anxiety was associated with report of peer teasing when using all subjects. Depression was also significantly associated with children's report of body size dissatisfaction in models using all subjects, only girls, or white subjects, but not in analyses using only boys or black subjects. For boys peer teasing was associated with body size dissatisfaction. In models including only black children, depression and trait anxiety were not significantly associated with either report of peer teasing or body size dissatisfaction.

Discussion—Regardless of race or sex, increasing weight is associated with emotional and weight-related distress in children. However, associations of psychological status, weight, and weight-related distress differ for girls and boys, and for black and white children.

Keywords

psychological status; weight-related distress; children; gender; ethnicity

Introduction

Studies of overweight adults and teens have shown differences associated with sex and race in weight-related and psychological measures of adjustment (1–4). The presumed relationship is that overweight contributes to psychological distress (5), although the converse cannot be

excluded. Outcomes have included depression, self-esteem, social adjustment, body size dissatisfaction, and weight-related teasing (WT)/ostracism by parents and peers (6,7). Results have, however, been inconsistent depending on the characteristics of the sample, such as race and sex, and whether the subjects are seeking treatment or population-based (8–10).

Race is emerging as a factor influencing how overweight is experienced by children and adolescents (11–14). In a review of the literature, French et al. (15) found that only half of the available studies showed lower self-esteem in obese children and adolescents, but found that white children had more evidence of lower self- and body-esteem associated with overweight than black children. Young-Hyman et al. (14) found that young black children did not manifest lowered self-esteem despite increasing body size dissatisfaction associated with weight. Wilson et al. (12) also found that black adolescent girls did not have lower self- or body-esteem associated with overweight.

Differences in the association of weight with psychological adjustment have also been found based on children's gender. In studies by Erickson et al. (16) and Goodman and Whitaker (17), a modest association was found between BMI and depressive symptoms for girls but not for boys. Steen et al. (18) compared normal-weight and obese boys and girls and found that boys were happier with their looks and perceived themselves to be less overweight even if they were actually obese. Sheslow et al. (19) evaluated depression in children across a wide age and weight range who were seeking weight loss treatment and found slightly more than one-half of the children to be either borderline or clinically depressed as assessed by self-report. Depression scores were not correlated with gender, race, or BMI. Finally, Wadden et al. (20) did not find an association between weight and clinical depression or trait anxiety in his mixed gender and ethnic sample. These results suggest that other factors may mediate the effect of weight on weight-related distress.

Studies of children and adolescents have also assumed that there is a direct relationship between weight and psychological distress and have not evaluated the contributions of psychological symptoms and individual traits to weight-related distress independently of weight. Assessing psychological status (depression and trait anxiety) as correlates of weight-related distress in a young, multiracial, non-treatment-seeking cohort of children across a wide range of weight provides the opportunity to examine the associations between psychological characteristics and weight-related distress.

We evaluated the associations between psychological status and weight-related distress (body size dissatisfaction and weight-related peer teasing) in young black and white children whose weight ranged from normal to severely obese. Based on the extant literature, we hypothesized that weight-related distress (body size dissatisfaction and peer teasing) and poorer psychological adjustment would be associated with increasing weight, that girls would report more teasing and body size dissatisfaction than boys, and that whites would report more psychological and weight distress than blacks. We also hypothesized that after accounting for the contribution of weight, depression and trait anxiety would be associated with reports of teasing and body size dissatisfaction independently of race or gender. We also predicted that WT by peers, regardless of gender or race, would contribute to body size dissatisfaction. This final prediction was based on the assumption that body size dissatisfaction is an internalized concept, but peer teasing is an outward manifestation of social ostracism based on weight.

Research Methods and Procedures

Procedures

Participants were recruited through two waves of notices mailed to first through fifth grade children in the Montgomery County and Prince George's County, MD, school districts and

two mailings to local family physicians and pediatricians. Mailings to families and physicians requested participation of children willing to undergo phlebotomy (blood draw) and x-rays for longitudinal studies investigating hormones in children. All mailings specified that no treatment would be offered, but participants would be compensated for their time and inconvenience. Children were eligible if they were either > 85th percentile weight for height or had two parents who were overweight but were otherwise healthy. Approximately 7% of families responded to these school mailings. By definition, if the population sample we queried was representative of the general population in the United States, then ~15% of the children would be expected to be overweight or at-risk-for-overweight (21). Likewise, ~30% of parent pairs might have been eligible based on the population prevalence of adults with BMIs ≥ 25 (Centers for Disease Control and Prevention/National Center for Health Statistics, NHANES IV). However, it is not known what percentage of potentially eligible children would be ineligible due to health reasons. Therefore, the exact number of eligible participants was unknown. Given that the mailing specified that this study would require phlebotomy (blood draw) and x-rays, the response rate of 7% indicated a one in four response among those potentially eligible.

Informed consent was obtained from parents and assent from children before all assessments, and the study was approved by the National Institute of Child Health and Human Development Institutional Review Board. Parents and children independently completed questionnaires within 3 months of a clinic or inpatient visit at which height and weight were obtained so that age- and sex-specific BMI standard deviation score (BMI-SD) could be calculated for each child.

Measurements

Socioeconomic status (SES) was established using the Hollingshead Two-Factor Scale (21) determined from the parent respondent. Weight was obtained to the nearest 0.1 kg using a calibrated digital scale (Scale-Tronix, Wheaton, IL). Height was measured three times to the nearest 1 mm using a stadiometer calibrated before each measurement (Holtain Ltd., Crymych, Wales, United Kingdom). BMI was determined by dividing weight in kilograms by height in meters, squared, and a z score (BMI-SD) was determined based on the Centers for Disease Control and Prevention age- and sex-specific standards (22). Pubertal status was established by physician or nurse practitioner examination of breast and testicle development. Pubertal developmental level was assigned according to Tanner staging (23,24).

The Children's Depression Inventory (CDI) (25) was used to assess cognitive, affective, and behavioral signs of depression in children and adolescents (age, 7 to 17 years). The CDI self-report questionnaire generates five subscales, including negative mood, interpersonal problems, ineffectiveness, anhedonia, and negative self-esteem. For the purposes of these analyses, the total score was used.

The State-Trait Anxiety Inventory for Children (STAIC) (26) is a self-administered measure of state and trait anxiety. Participants completed both the state and trait scales, describing how respondents feel "right now, at this very moment" (state anxiety) and how adolescents "usually feel" (trait anxiety). For analyses in the present study, we utilized only the trait scale. The STAIC has been shown to have high internal consistency, stability for trait anxiety, and adequate validity (27).

The Perception of Teasing Scale (POTS) (28) is self-administered and asks respondents to report whether they have been teased about physical appearance related to their weight. Two scales are generated: teasing about abilities/competencies and WT. Cronbach α s were 0.82 and 0.88, respectively, in late-adolescent college students. The scales have shown stable factor structures, acceptable internal consistencies, and convergent validity with measures of trait

anxiety and self-esteem. We replicated the factor structure using a sample of non-treatment-seeking children with ages and weights similar to our current sample. We used the WT scale score for this study.

The Collins Silhouettes (29) is a figure rating scale, containing eight male and eight female childlike figure outlines ranging from very thin to very heavy. This scale was used to measure body size dissatisfaction. Participants were asked to “circle the drawing that most looks like you now” (actual) and to “circle the drawing that you would most like to look like” (ideal). An absolute measure of body size dissatisfaction was obtained by subtracting the ideal from the actual figure rating.

Data Analysis

Pearson correlations were used to test the strength and directionality of univariate associations between weight and measures of psychological status and weight-related distress. Independent Student's *t* test comparisons between sexes and ethnicities were conducted on all predictor and outcome variables: age, SES, BMI-SD, CDI, STAIC, body size dissatisfaction, and POTS score. General linear models were created to predict body size dissatisfaction and POTS score with the entire sample, black children only, white children only, girls only, and boys only. All models controlled for age, ethnicity and gender (when applicable), SES, and BMI-SD before psychological variables were entered. Report of peer teasing was added to all models predicting body size dissatisfaction. Because the association between body size dissatisfaction and the POTS score was significant ($r = 0.404$, $p < 0.001$), and the relationship was presumed to be that weight-related peer teasing contributes to body size dissatisfaction, body size dissatisfaction was not used in the analyses predicting the POTS score.

Differences between groups and contributions of variables to models were considered significant when p values were ≤ 0.05 and trending toward significance when $p \leq 0.10$. All statistical tests were two-tailed. For measures where age- or gender-based normative data were available (CDI, STAIC), whether means reached clinical significance is indicated. Data analyses were conducted using the SPSS/PC statistical program (version 13.0 for Windows; SPSS, Inc., Chicago, IL) (30).

Results

One hundred sixty-four children (girls, 83; black, 58) served as participants. Children were an average of 11.9 ± 2.5 years old with a median pubertal status of Tanner 2. Mean BMI-SD was 1.3 ± 1.1 (range, -1.2 to 2.9). Forty percent of the children were of normal weight, 17% were at-risk-for-overweight, and 43% were overweight. The median and average SES of the sample was 3 ± 1.2 (range: 1, highest to 5, lowest SES). Fifteen percent of the children were of the highest SES, and 7% of the lowest. All other children were fairly evenly distributed in the middle three levels of SES, suggesting that this sample had a somewhat greater representation of children from higher SES families. This would be consistent with the general population from which the study sample was derived (for sample characteristics, see Table 1). Black children had lower SES ($p < 0.003$), were more anxious ($p < 0.03$), and reported more body size dissatisfaction ($p < 0.001$) compared with white children. Although similar in age and weight, black girls had more advanced breast development ($p < 0.03$). Girls reported more body size dissatisfaction and POTS scores ($p < 0.03$) than boys.

Body size dissatisfaction in our sample of children ranged from those who were dissatisfied because they wanted to be up to three silhouette figures larger to those who were dissatisfied with their body size and wanted to be as many as four figures smaller. Sixty-two percent of the sample had an absolute body size dissatisfaction difference score of 0 or 1, 31% expressed moderate body size dissatisfaction (absolute difference score of 2 to 3), and only 4% expressed

significant body size dissatisfaction (absolute difference score of ≥ 4), suggesting relatively low overall levels of body size dissatisfaction.

The results of univariate associations between weight and the variables of interest are presented in Table 2. CDI total score, representing depressive symptoms, was significantly correlated with BMI-SD in the entire sample and in analyses using black children and girls only. Trait anxiety (STAIC) was also associated with BMI-SD in analyses using the entire sample, black children, and girls. Teasing scores and body size dissatisfaction were significantly correlated with BMI-SD for all children, regardless of ethnicity or gender. As would be expected, as BMI-SD increased, depressive symptoms, trait anxiety, and reports of body size dissatisfaction and weight-related peer teasing increased. However, the relationships between weight status and psychological distress (depression and anxiety) were not found when only white children and boys were used in subgroup analyses. Because there were differences in the associations among psychological predictor variables in univariate associations between both ethnicity and weight and gender and weight, post hoc subgroup analyses were undertaken to better understand the relationships of these factors (ethnicity and gender, with weight-related distress) and report of peer teasing and body size dissatisfaction.

Regression models predicting weight-related peer teasing for all subjects, black and white samples, and girl and boy samples are presented in Table 3. Only variables that remained in the final models are presented. Increasing weight was associated with a higher report rate of peer teasing in all models using the entire sample and subgroups. Gender was associated with report of teasing when all subjects and white subjects only were used in the analyses. Older white boys were more likely to report weight-related peer teasing. Depression was significantly associated with report of teasing in all analyses except when using only black subjects. Trait anxiety was significantly associated with report of WT after taking into account ethnicity and gender in the model using all subjects. No psychological variables were significantly associated with teasing using only black children to generate the model.

Regression models of body size dissatisfaction for all subjects, black and white children, and girls and boys are presented in Table 4. Increasing weight was significantly associated with prediction of body size dissatisfaction in all models using the full sample and using subgroups. SES was associated with report of body size dissatisfaction for the boys-only analysis. Lower SES boys reported more WT. Gender was associated with the prediction of body size dissatisfaction when all children were used in the analysis but in no other subgroup models. Girls were more likely to report body size dissatisfaction, independently of weight status. In models using all subjects and only girls, black children reported more body size dissatisfaction after accounting for weight status, confirming univariate associations. Depression was significantly associated with body size dissatisfaction in the models using all subjects, whites, and girls; however, this association was not found when using either black subjects or boys only. No psychological variables predicted boys' reports of body size dissatisfaction. However, peer teasing predicted body size dissatisfaction in boys. Peer teasing was not associated with predictions of body size dissatisfaction in analyses regardless of ethnicity or gender because this association was not found in any other model using the entire sample or subgroup. Trait anxiety was not associated with report of body size dissatisfaction in any model generated. Finally, as in the models predicting report of weight-related peer teasing, no psychological variables predicted black children's reports of weight-related distress in the form of body size dissatisfaction.

Discussion

The associations between depression and anxiety and weight, in a sample of children who were either already overweight or at high risk for becoming overweight but who were not seeking

weight loss treatment, were different depending on ethnicity, gender, and the outcome assessed. Our models associating psychological variables with weight-related distress after controlling for the effects of age, gender, SES, race, and weight varied by race and gender. Examination of the amount of variance explained by weight in each of our predictive models suggests that weight status was robustly associated with weight-related distress, depending on the form of the distress (body size dissatisfaction or report of peer teasing) that was measured. Higher weight appears to be a stronger contributor to children's sense of body size dissatisfaction than to their report of peer teasing in this cohort of children who are either already overweight or at high risk for becoming overweight in the future. Additionally, heavier children experienced greater psychological distress, as well as weight-related distress, confirming our original hypothesis.

The relationships between psychological distress and weight-related distress were, however, found to be inconsistent. Although the more the children weighed, the more they experienced weight-related distress, children experienced psychological distress and its association with weight differentially depending on gender and ethnicity. Boys were more affected by their weight status if teased by peers, but this was unrelated to depression or anxiety. White and girl subjects expressed more weight-related distress associated with more psychological distress in the form of depressive symptoms. Blacks and boys were less affected by their weight status in general, and blacks, although expressing more anxiety and body size dissatisfaction in general, did not have any association between their psychological distress and the prediction of their report of weight-related distress. Thus, it appears that our hypotheses that weight-related distress would be associated with poorer psychological status, regardless of race or gender, were not confirmed. In black children, no studied variables other than weight influenced their reports of weight-related distress.

Weight-related peer teasing and body size dissatisfaction during adolescence are quite prevalent regardless of weight status, ethnicity, or gender of the sample (7,31). Stigmatization of overweight children has become worse in recent years (32), whereas the percentage of overweight children has increased (33). Peer teasing may be another aspect of the social ostracism and stigmatization that overweight children experience. Overweight children have been found to be half as likely to be named as a friend by another child (13). Our results suggest that weight concerns, although perhaps becoming more gender neutral, may still be handled differentially by girls and boys and by different ethnic groups depending on their psychological vulnerability. Boys may be more vulnerable to peer group teasing, and this may be moderated by their SES.

Our findings help to elucidate the relationships between psychosocial adjustment and weight status and the differences in weight-related distress between girls and boys and between black and white children. Psychological status, experiencing depression or anxiety, may contribute to whether a child experiences weight-related distress, irrespective of weight status. Whether a child feels distressed about his or her weight may also be affected by the child's gender or race. Sixty percent of the children studied were either at-risk-for-overweight or already overweight; however, overweight status alone did not predict whether children were experiencing weight-related distress. Children who are depressed or anxious, i.e., who are more psychologically vulnerable, are more likely to be obese (34). Our results suggest that psychological vulnerability may not lead to them to experience weight-related distress depending on their ethnicity and gender. Being a boy or black may be protective, as evident by the fact that these two groups reported less psychological distress associated with weight-related distress.

Despite recruiting a sample enriched for being overweight or at risk for becoming overweight, this sample of children was, overall, psychologically healthy. Less than 7% reported clinically

significant depression or trait anxiety based on normative data. These factors were not consistently associated with weight-related distress in all groups studied. This is not an unexpected finding, as these children and their families, despite an average BMI-SD that placed the children above the 95th percentile for age and gender, were not seeking weight reduction treatment. It is possible that a treatment-seeking population might have higher rates of self-reported depression and trait anxiety and, concurrently, a stronger connection between these factors and weight-related distress (35).

The possibility of self-selection bias must also be entertained. That only 7% of those families queried by mail elected to participate in the study is a limitation of this investigation. It may be that responding families were not only more concerned about health, but also attuned to the potential for their children to experience weight-related distress. Thus, non-responders may have been families with greater tolerance for weight-related health risk and/or distress or were unaware of the risks. We have shown previously that in minority families, in particular, overweight status in children was not perceived as a health risk by their parents (36) and that low levels of psychological distress were reported by the children (14).

Body size dissatisfaction in our sample of children varied a great deal, ranging from those who were dissatisfied because they wanted to be much bigger to those children who were dissatisfied with their body size and wanted to be much smaller. Overall, however, this cohort reported relatively low levels of body size dissatisfaction. Besides weight, only depression was associated with body size dissatisfaction. However, this association was not found for blacks and boys, whereas peer teasing contributed to body size dissatisfaction for the boys. These results suggest that boys might need to experience social ostracism to feel bad about the way they look, whereas girls may respond to a more internalized standard of what they should look like. The lack of relationship between depression and body size dissatisfaction in our black sample may be due to the very low rate of clinically significant scores in this group (two children, 3%) compared with whites (nine children, 9%).

Although the black children in this sample reported more anxiety and body size dissatisfaction than our white sample, as weight increased, despite equivalent BMI-SD score overall, psychological state was not significantly associated with weight-related distress among black children. Black women and teens experience less body size dissatisfaction than their white counterparts (3,12,37,38) regardless of weight status (39). Similar to other child cohorts (36), these findings suggest that cultural standards for blacks are more inclusive of larger body habitus, regardless of age, and this may be a protective factor against weight concerns. Although, overall, our sample of black children expressed more body size dissatisfaction than our white subjects, only four black children expressed significant or extreme body size dissatisfaction, wanting to be four silhouette sizes smaller than their current body size. The idea that black American cultural standards moderate weight concerns would be consistent with the findings in the adult and adolescent literature regarding psychosocial adjustment in relation to overweight status (12,14).

Whether because of cultural acceptance of larger body habitus or lack of psychological vulnerability, men and black American women experience fewer weight-specific psychosocial disturbances than white women. Our findings reflect these same patterns. Boys who reported depressive symptoms were more likely to report weight-related peer teasing. Weight-related peer teasing, but not depression, contributed to body size dissatisfaction. In adult men, lower BMI has been found to be associated with major depression (40). Other studies have shown that, for adult men, abdominal adiposity, rather than BMI, is associated with depressive symptomatology and anxiety disorders (41,42). Overall, adult men have been shown to experience less body size dissatisfaction related to their weight (6). However, there is evidence that adolescent boys share the same weight and size concerns experienced by girls,

independently of actual weight status (43). Mainstream cultural stereotypes may be operative here. Even in young boys, larger size, regardless of whether it is fat or muscle weight, is preferable; being in shape is more important than actual weight, and rejection from the peer group is a potent factor affecting how distressed a male is about his weight (16). Thus, it may be that weight per se does not cause boys distress, but depression sensitizes boys to peer teasing. This may explain the lack of direct association between depression and body size dissatisfaction in our boys. Mediational analyses of the relationships among weight, depression, and peer teasing were not undertaken as part of this study; however, these relationships bear further examination.

The lack of findings regarding psychological predictors in our black American children may be due to a number of factors not previously discussed. The measures used do not have independent norms for minority populations and, thus, might not be equivalent for white and black children. Feeling sad or anxious did not predict weight-related distress in our black children, although they expressed higher levels of anxiety and body size dissatisfaction when compared with whites in this study. In a prior study, we found that reports of aggressive behavior in overweight black American children were associated with higher self-esteem independently of weight (14). Thus, it is possible that the psychological constructs assessed were not those most relevant to weight-related distress in this minority population. It is notable, however, that weight status was associated with weight-related distress in this sample of black children. This might be due to the fact that parents had enrolled their child in a study tracking the associated health risks of overweight. It could be that parental health concerns about weight had been transmitted to their child. However, parental weight-related concerns were not evaluated as part of this study.

We conclude that gender and ethnicity seem to be important factors in how overweight is experienced among children. To our knowledge, there are no population-based data associating actual weight or body size with weight-related distress. To fully understand our results, this information would be needed for comparison. Our subjects (although overweight or at high risk for being overweight adults) were not seeking treatment, reported low levels of psychological distress, and were physically healthy. Because many of them were either overweight or at-risk-for-overweight, however, sensitivity to weight-related issues might have been present when compared with the general population of children encompassing the entire weight range with normal-weight parents. This speculation would be supported by their parents enrolling them in the larger prospective study of health risk related to weight status in children.

Despite these limitations, our findings suggest that understanding gender- and race-based psychological correlates of obesity in children may help to inform prevention and treatment strategies for pediatric obesity. We further suggest that psychological vulnerability may predispose children to weight-related distress depending on ethnicity and gender.

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Nonstandard abbreviations

WT	weight-related teasing
BMI-SD	body mass index standard deviation score
SES	socioeconomic status
CDI	Children's Depression Inventory

STAIC

State-Trait Anxiety Inventory for Children

POTS

Perception of Teasing Scale

Table 1

Characteristics for the entire sample ($N = 164$) by subgroup: mean $\pm$ SD for age, SES, BMI-SD, pubertal status, CDI total score, STAIC trait scale, body size dissatisfaction, and POTS appearance scale

	Blacks ($N = 58$)	Whites ($N = 106$)	Girls ($N = 83$)	Boys ($N = 81$)
Age (years)	11.7 $\pm$ 2.5	11.9 $\pm$ 2.6	11.7 $\pm$ 2.2	11.7 $\pm$ 2.7
SES	3.2 $\pm$ 1.2 [*]	2.6 $\pm$ 1.1	2.8 $\pm$ 1.2	2.9 $\pm$ 1.2
BMI-SD	2.8 $\pm$ 1.3 [†]	2.2 $\pm$ 1.2	1.3 $\pm$ 1.1	1.2 $\pm$ 1.1
Tanner stage	4.0 $\pm$ 3.8	5.0 $\pm$ 5.5	2.5 $\pm$ 1.3	2.4 $\pm$ 1.3
CDI total score ^{††}	32.4 $\pm$ 8.1 [‡]	29.7 $\pm$ 6.8	4.4 $\pm$ 4.5	4.9 $\pm$ 5.4
STAIC trait ^{‡‡}	1.6 $\pm$ 1.2 [§]	1.0 $\pm$ 1.2	31.4 $\pm$ 7.6	39.8 $\pm$ 7.2
Body size dissatisfaction	1.6 $\pm$ 1.2 [§]	.95 $\pm$ 1.2	1.4 $\pm$ 1.4 [¶]	0.99 $\pm$ 1.1
POTS	19.3 $\pm$ 4.7	18.8 $\pm$ 5.4	19.8 $\pm$ 5.9 ^{**}	18.1 $\pm$ 4.1

SD, standard deviation; SES, socioeconomic status; CDI, Children's Depressive Inventory; STAIC, State-Trait Anxiety Inventory for Children; POTS, Perception of Teasing Scale.

* Black children have lower SES, $p < 0.00$.

† Black children have more breast development, $p < 0.03$.

‡ Black children are more anxious, $p < 0.03$.

§ Black children report more body size dissatisfaction, $p < 0.01$, than white children.

¶ Girls report more body size dissatisfaction than boys, $p < 0.00$.

** Girls report more peer teasing, $p < 0.00$.

†† CDI total score ≥ 13 ; 11 children reported clinically significant depression, seven boys and four girls.

‡‡ STAIC trait scale score; 10 children had scores > 1 SD above the norms for grade level, three boys and seven girls.

Table 2

Univariate associations among BMI-SD, predictor, and outcome variables for all subjects and subgroups

Subject characteristics	All subjects (N = 164)	All blacks (N = 58)	All whites (N = 106)	All girls (N = 83)	All boys (N = 81)
Age (years)	0.066	0.017	0.107	−0.037	0.144
SES	0.071	0.116	0.004	−0.043	−0.102
Breast stage/testicle stage	0.248**	0.184	0.272**	0.164	0.798***
CDI total score	0.199*	0.307*	0.175	0.253*	0.160
STAIC trait	0.187*	0.305*	0.072	0.268*	0.081
Body size dissatisfaction	0.528***	0.569***	0.497***	0.534**	0.496***
POTS	0.440***	0.410***	0.459***	0.448***	0.405***

SD, standard deviation; SES, socioeconomic status; CDI, Children's Depressive Inventory; STAIC, State-Trait Anxiety Inventory for Children; POTS, Perception of Teasing Scale.

Pearson *r* significance values:

*
 $p < 0.05$;

**
 $p < 0.01$; and

 $p < 0.001$.

Table 3
Summary models: predictors of weight-related peer teasing (POTS)

Predictor variable	All subjects: total $R^2 = 0.38, p < 0.001$	All blacks: total $R^2 = 0.17, p < 0.001$	All whites: total $R^2 = 0.51, p < 0.001$	All girls: total $R^2 = 0.31, p < 0.001$	All boys: total $R^2 = 0.48, p < 0.001$
Age					
β^*				0.42 [†]	
SE				0.24	
Partial R^2				0.04	
Significance				0.08	
Gender					
β^*	1.4		-7.76		
SE	0.68		3.80		
Partial R^2	0.03		0.04	N/A	N/A
Significance	0.05		0.04		
Age $\times$ gender					
β^*			0.74		
SE			0.31		
Partial R^2			0.06		
Significance			0.02		
Race					
β^*					
SE					
Partial R^2		N/A	N/A		
Significance					
BMI-SD					
β^*	1.7	1.7	2.0	2.2	1.2
SE	0.33	0.50	0.40	0.56	0.32
Partial R^2	0.15	0.17	0.20	0.16	0.16
Significance	0.001	0.001	0.001	0.001	0.001
CDI total					
β^*	0.33		0.51	0.43	0.43
SE	0.08		0.07	0.13	0.06
Partial R^2	0.10		0.34	0.12	0.38
Significance	0.001		0.001	0.01	0.001
Trait anxiety					
β^*	0.11				
SE	0.06				
Partial R^2	0.03				
Significance	0.05				

POTS, Perception of Teasing Scale; β^* , unstandardized coefficient; R^2 , total variance explained in model; SE, standard error; SD, standard deviation; CDI, Children's Depression Inventory.

[†] p trending towards significance.

Table 4

Summary models: predictors of weight-related distress- body size dissatisfaction

Predictor variable	All subjects: total $R^2 = 0.37, p < 0.001$	All blacks: total $R^2 = 0.36, p < 0.001$	All whites: total $R^2 = 0.34, p < 0.001$	All girls: total $R^2 = 0.42, p < 0.001$	All boys: total $R^2 = 0.36, p < 0.001$
SES					
β^*					0.19
SE					0.08
Partial R^2					0.07
Significance					0.03
Gender					
β^*	0.39	0.50 [†]			
SE	0.16	0.28			
Partial R^2	0.04	0.06		N/A	N/A
Significance	0.02	0.07			
Race					
β^*	-0.43			-0.65	
SE	0.16			0.25	
Partial R^2	0.05	N/A	N/A	0.08	
Significance	0.01			0.01	
BMI-SD					
β^*	0.57	0.59	0.57	0.65	0.33
SE	0.08	0.12	0.10	0.12	0.11
Partial R^2	0.27	0.32	0.26	0.29	0.12
Significance	0.001	0.001	0.001	0.001	0.01
CDI total					
β^*	0.04		0.05	0.06	
SE	0.02		0.02	0.03	
Partial R^2	0.04		0.08	0.06	
Significance	0.02		0.01	0.04	
Peer teasing					
β^*					0.08
SE					0.03
Partial R^2					0.11
Significance					0.01

SES, socioeconomic status; β^* , unstandardized coefficient; SE, standard error; R^2 , total variance explained in model; SD, standard deviation; CDI, Children's Depression Inventory.

[†]
p trending towards significance.