



## The impact of weight, sex, and race/ethnicity on body dissatisfaction among urban children

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### ABSTRACT

The purpose of the current study was to examine the relative contributions of weight status, race/ethnicity, sex, and age on body dissatisfaction in a large group of diverse children. Participants were 4th–6th graders ( $N=1212$ ) in ten inner-city schools who participated in an obesity prevention study previously published. Children completed the body dissatisfaction subscale of the Eating Disorder Inventory-2 (EDI-2), and weight status was assessed by measured weights and heights. Multiple regression analyses were conducted. Relative weight status was the strongest predictor of body dissatisfaction, followed by race/ethnicity, and sex. Body dissatisfaction was greatest in obese, Asian, and female children. Overall, results indicated that children's body dissatisfaction varies based on relative weight status, as well as race/ethnicity and sex among urban children. Results highlight the strong need for additional research so that more definitive conclusions may be drawn regarding the development of body image among diverse groups of children.

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### Introduction

Approximately one-third of children are overweight or obese (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). These children experience more body dissatisfaction than their healthy weight peers (Banitt, Kaur, Pulvers, Nollen, Ireland, & Fitzgibbon, 2008; Clark & Tiggemann, 2008; Crow, Eisenberg, Story, & Neumark-Sztainer, 2006; Goldfield, Moore, Henderson, Buchholz, Obeid, & Flament, 2010). Despite the disproportionately high rates of obesity among Black and Hispanic children, as well as among children from lower socioeconomic status (SES) households (Franko & Edwards George,

2009; HEALTHY Study Group, 2010; Ogden et al., 2010), the experiences of body dissatisfaction among diverse groups of children remains relatively unclear (Smolak, 2004). Given the efficacy of eating disorder prevention programs for children and adolescents that target body dissatisfaction (Stice, Ng, & Shaw, 2010), there is a need to better understand children's experiences body dissatisfaction and identify potential differences that might call for more tailored content of obesity prevention programs.

To date, relatively few studies have examined body image or dissatisfaction among diverse groups of children using similar methods and samples, and the lack of replication has resulted in a heterogeneous body of literature (Edwards George & Franko, 2010). For example, some studies have combined all non-Caucasian groups due to discrepant sample sizes (e.g., DeLeel, Hughes, Miller, Hipwell, & Theodore, 2009), and others have sampled across regional settings (i.e., urban vs. rural or suburban) (Welch, Gross, Bronner, Dewberry-Moore, & Paige, 2004). In studies comparing two different groups (usually one group vs. Caucasians), racial differences are not reported consistently (Edwards George & Franko, 2010). However, despite discrepant methods, evidence from studies that have examined a single non-Caucasian racial group suggests body dissatisfaction is related to body mass index (BMI) similar to studies examining Caucasian samples (e.g., Li, Hu, Ma, Wu, & Ma, 2005; Mirza, Davis, & Yanovski, 2005; Stockton

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et al., 2009). To the best of our knowledge, only one study has examined the relationship between body dissatisfaction (using an ideal-current size discrepancy score) and BMI with a large, racially diverse group of children (Robinson, Chang, Haydel, & Killen, 2001). Results of that study supported a positive association between body dissatisfaction and BMI across groups, with no significant differences in body dissatisfaction between racial groups after controlling for BMI (Robinson et al., 2001). In contrast, weight concerns continued to vary among girls after controlling for BMI, with Latinas reporting greater concern than Caucasian and Asian girls and a trend suggesting African American girls experienced greater concern than Caucasian girls. Despite the strengths of that study, findings involving African American children were overshadowed by a very small sample size ( $n = 23$  girls).

The purpose of the current study was to examine the independent and joint relationships between body dissatisfaction and weight status, race/ethnicity, sex, and age among children who participated in a larger previously published study focused on obesity prevention (Foster et al., 2008). To date, there remains a need to examine body dissatisfaction in understudied children from low SES areas who are at-risk for obesity. The pediatric body dissatisfaction literature remains limited by the use of small sample sizes and lack of concurrent examination of multiple racial/ethnic groups from a single region. Additionally, the available literature has produced mixed findings; thus, limiting our understanding of how demographic variables affects body dissatisfaction among diverse groups of children. The current study addresses these limitations by examining the relationship between weight status and body dissatisfaction in a large sample ( $N > 1000$ ) of children at-risk for obesity.

## Method

### Participants

Children in grades 4–6 ( $N = 1212$ ) enrolled in ten inner-city Philadelphia schools participated in a study that assessed school-based prevention strategies for obesity in low SES samples (Foster et al., 2008). Participating schools were required to have at least 50% of the student body eligible for free/reduced lunch. The majority of children were eligible for free/reduced lunch ( $80.8 \pm 12.7\%$ ). The racial composition of the sample is comparable to that of the larger Philadelphia School District ( $N =$  elementary, middle, and high schools); however, Asian students appear to be over-represented with 21.6% in the current sample (range: 1.5–48.5%) vs. 7.0% enrolled across all schools in Philadelphia (Philadelphia School District, 2011). This difference is a result of the 10 schools eligible to participate in the larger parent study described in greater detail elsewhere (Foster et al., 2008). Researchers obtained parental consent and child assent, and the average consent rate was  $69.5 \pm 15.4\%$ . The researchers obtained appropriate IRB approval to conduct this research.

### Assessments

Children were assessed prior to the implementation of the intervention, which is described in detail elsewhere (Foster et al., 2008).

**Weight status.** Weight was measured in schools with a digital scale to the nearest 0.1 kg and height was measured twice using a wall-mounted stadiometer to the nearest 0.1 cm by trained research assistants using a standardized protocol (Westat Inc., 1996). Body mass index (BMI), a ratio of weight (kilograms) to height squared (meters), was calculated for each child. Age- and sex-normed BMI z-scores were calculated using CDC software Epi Info™ Version 3.3.2 (Dean et al., 1996). Children were assigned

to weight categories based on BMI-for age and -sex percentiles (Kuczmarski et al., 2000): underweight, <5th percentile; healthy weight, 5–84.9th percentile; overweight, 85–94.9th percentile; and obese,  $\geq 95$ th percentile.

**Body image.** Body image was measured with the Body Dissatisfaction subscale of the EDI-2, a 9-item questionnaire that assesses the frequency of time spent thinking about various parts of the body. This scale has been determined to be reliable for use with children as young as 8 years old (Yanover & Thompson, 2009). Higher scores indicate higher levels of body dissatisfaction. Since the EDI-2 is highly correlated with the EDI-3 ( $r = .97$ ) (Garner, 2004), the EDI-3 manual and scoring was used as suggested by the author of the measure. Thus, a range of 0–36 (rather than 0–27) was created. Scores  $\leq 7$  indicate “low” dissatisfaction, whereas scores 8–30 suggest “moderate” dissatisfaction and those  $> 30$  suggest “high” dissatisfaction (Garner, 2004).

Scale reliability was assessed using Cronbach’s coefficient alpha, which was calculated for the entire sample as well as for sex and race/ethnicity subgroups. The overall Cronbach coefficient alpha for the 9-item body dissatisfaction subscale was .79. The internal consistency was comparable between girls ( $\alpha = .81$ ) and boys ( $\alpha = .76$ ) as well as between racial/ethnic groups: Asian ( $\alpha = .79$ ), African American ( $\alpha = .77$ ), Hispanic ( $\alpha = .80$ ), Caucasian ( $\alpha = .84$ ), and other ( $\alpha = .74$ ), indicating that the instrument was reliable and behaved similarly across sex and racial/ethnic groups.

### Analyses

The first set of regression analyses investigated the independent relationships between body dissatisfaction and relative weight status, race/ethnicity, sex, and age. In the second set of regression analyses, relative weight status, race/ethnicity, sex, and age were entered into a hierarchical setwise multiple regression to identify each variable’s unique relationship to body dissatisfaction, after controlling for the remaining variables. We also explored sex and race/ethnicity as potential moderators of the relationship between relative weight status and body satisfaction.

All analyses were conducted using SAS 9.2 (Cary, NC). School was included as a fixed effect to account for the clustering of students within schools. By treating schools as a fixed effect, it allowed each school to have its own intercept, which accounts for any differences across schools (i.e., school type, average body dissatisfaction, obesity prevalence, school lunch program, and health education management). To account for the clustered nature of the data, fixed effects versus random effects were used because the small number of schools in the sample ( $N = 10$ ) would violate the assumption of normality required for random effect modeling (Raudenbush & Bryk, 2002). Body dissatisfaction scores resembled a Poisson distribution; scores had only non-negative integer values (Allison, 1999) so all models were run with both a normal distribution and a Poisson distribution. Results from these two error distributions were similar, so results from the normal distribution are reported.

## Results

### Participant Characteristics

Participant characteristics are listed in Table 1. Over 40% were either overweight or obese, nearly a quarter were obese and over 85% were non-Caucasian. Asian children’s BMI ( $M = 19.90$ ,  $SD = 4.98$ ) was significantly lower than BMIs of African American ( $M = 21.13$ ,  $SD = 5.04$ ), Caucasian ( $M = 21.68$ ,  $SD = 5.98$ ), and Hispanic children ( $M = 21.59$ ,  $SD = 5.01$ ),  $F(4, 1207) = 4.91$ ,  $p = .001$ , but not children of “other” races.

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