

# Associations Among Body Size, Body Image Perceptions, and Weight Loss Attempts Among African American, Latino, and White Youth: A Test of a Mediational Model

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**Objective** Little is known about influences on weight loss attempts, yet about one-half report making such attempts during adolescence. The aim was to examine the relationships among weight loss attempts, body size, and body perception in racially/ethnically diverse young adolescents. **Methods** 3954 African American, Latino, and White 5th-graders completed the Self-Perception Profile-Physical Appearance Scale and questions regarding body perceptions and past and current weight loss attempts, and had their weight and height measured. **Results** Latino youth most often and White youth least often reported weight loss attempts. Larger body size and negative body perception were related to more reported weight loss attempts in White and Latino youth. Body perception mediated the relationship between body size and weight loss attempts for White youth. **Conclusion** Motivations to lose weight appear to differ among racial/ethnic groups, suggesting that interventions for healthy weight control in youth may need to target racial/ethnic groups differently.

**Key words** body perception; body size; ethnicity; race; weight loss; youth.

Attempts to lose weight are common among youth in the United States. The 2011 Youth Risk Behavior Surveillance Survey (YRBSS) indicates that 46% of high school students, grades 9 through 12, reported presently trying to lose weight (CDC, 2012). There has also been an increase in weight loss activity among adolescents with 46% attempting to lose weight in 2011, compared with 42% in 1991 (CDC, 2012). There can be many reasons why youth might attempt to lose weight, including actually being overweight or obese. Weight loss attempts may also be attributed to concerns about the appearance of one's body size, which may be more or less independent of the person's actual size (Calzo et al., 2012; Ricciardelli, McCabe, Holt, & Finemore, 2003; Wang, Houshyar, & Prinstein, 2006).

An understanding of what motivates weight loss attempts can assist in the development of weight loss programs that are more effective over the long term. Effective safe programs are needed because even though some youth and adolescents use safe weight control behaviors, others use unhealthy practices, such as meal skipping, use of laxatives, and self-induced vomiting, which are indicators of disordered eating patterns (CDC, 2012; Neumark-Sztainer, Wall, Story, & Perry, 2003). Moreover, weight loss may be initiated without a physical health reason, as in the case of eating disorders like anorexia. These factors underscore the importance of identifying factors related to weight loss behavior in youth. The current study is one of the first attempts to identify these factors by examining the

associations of body size and body perception with weight loss attempts in a large diverse sample of youth.

### Body Size and Unhealthy Weight

About 33% of youth aged 6–19 years are overweight or obese in the United States (Ogden, Carroll, Kit, & Flegal, 2012). Overweight and obesity have become an important public health issue because they increase the risk for negative physical health outcomes. There are also psychosocial risks such as increased body dissatisfaction, decreased quality of life, and lower educational attainment in youth aged 10–19 years (Huh, Stice, Shaw, & Boutelle, 2012; Wallander et al., 2009). To achieve a healthy weight and decrease these risks, overweight and obese youth must lose weight (or not gain weight disproportionately to body growth) by using safe and healthy weight control practices such as increasing their physical activity and making healthy eating choices (Neumark-Sztainer et al., 2003).

Research on adolescents aged 8–11 and 13–18 years indicates that being classified as overweight or obese is associated with increased attempts to lose weight (McCabe & Ricciardelli, 2003; Ricciardelli et al., 2003; Yost, Krainovich-Miller, Budin, & Norman, 2010). There may also be an association of increased body mass index (BMI) with increased unhealthy weight control behaviors, such as purging, use of dietary aids such as laxatives, or excessive exercising, which can put the youth at risk for further negative health outcomes (Lynch, Heil, Wagner, & Havens, 2008; Neumark-Sztainer et al., 2003; Vander Wal, 2012). However, much of this research has been focused on older youth ~14–18 years old. Less is known about the relationship between body size and weight loss behavior at younger ages.

### Body Image Perception

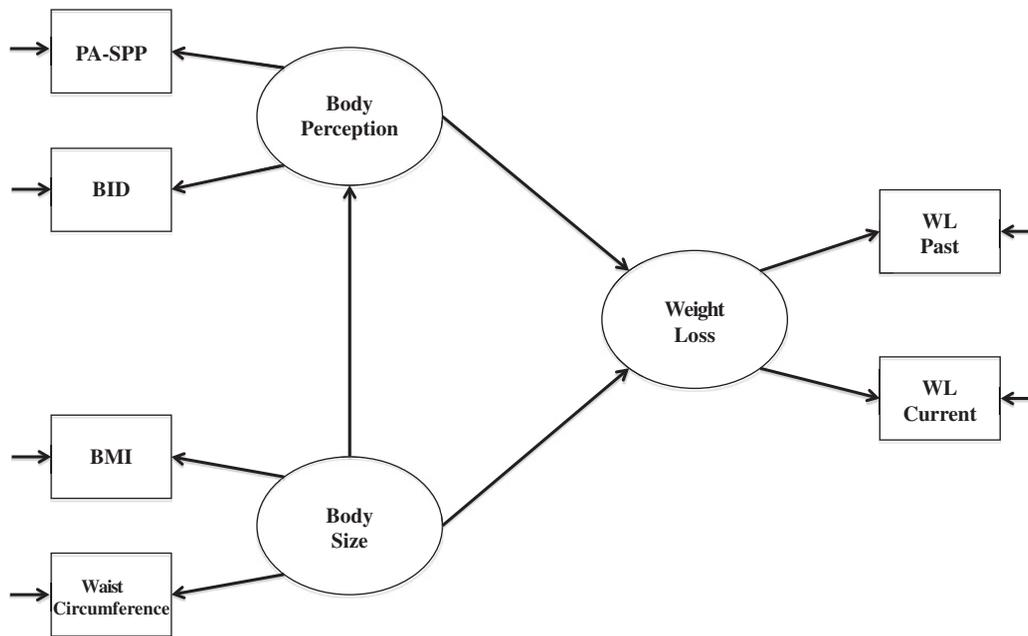
Negative perceptions about one's body can begin as early as 6 years of age (Ricciardelli et al., 2003), and have been linked to emotional distress and increased dieting, unhealthy weight control behaviors, such as binge eating, obesity, and poorer overall health in 13–15-year olds (Eisenberg, Neumark-Sztainer, & Paxton, 2006; Neumark-Sztainer, Paxton, Hannan, Haines, & Story, 2006). In addition, 8–18-year olds with a higher BMI reported significantly more negative body perceptions (Calzo et al., 2012; McCabe & Ricciardelli, 2003). Results from a longitudinal study of adolescents with a mean age of 15 years similarly indicated that as BMI increased, negative body perception increased as well (Eisenberg et al., 2006;

Neumark-Sztainer et al., 2003). Negative body perceptions or body dissatisfaction may also increase over time in youth aged 9–18 years, even in those who have healthy body weights (Calzo et al., 2012; Eisenberg et al., 2006).

### Racial/Ethnic Disparities

There are differences among racial/ethnic groups of youth in body size, body perception, and weight loss behaviors (Adams et al., 2000; Martin, May, & Frisco, 2010; Mikolajczyk, Iannotti, Farhat, & Thomas, 2012). Across childhood and adolescence, rates of overweight/obesity appear to be higher in African American and Latino compared with White youth, especially among females (Huh et al., 2012; Ogden & Carroll, 2010). Studies of youth of various ages report conflicting and inconclusive results on racial/ethnic differences in body perception (Martin et al., 2010; Mikolajczyk et al., 2012; Robinson, Chang, Haydel, & Killen, 2001; Wang et al., 2006). Differences may exist in the relationship between body size and body perception among racial/ethnic groups (Martin et al., 2010). Martin et al. (2010) found in high school students (mean age 16 years) that African Americans were less likely to perceive themselves as overweight compared with Whites and Latinos of the same body size. There is also evidence that development complicates the relationship between race/ethnicity and body perception. Thompson, Rafiroiu, & Sargent (2003) found no differences in body perceptions between African American and White students in the 3<sup>rd</sup> and 5<sup>th</sup> grade; however, significant differences emerged in the 8<sup>th</sup> and 11<sup>th</sup> grade.

The results are also mixed for weight loss behaviors. Studies conducted with youth enrolled in 4<sup>th</sup> as well as 7<sup>th</sup> through 12<sup>th</sup> grade indicate that African American adolescents report fewer weight loss attempts compared with Whites, who report the highest rates (Adams et al., 2000; Yost et al., 2010). However, one study conducted with 16–19-year old high school students did not find any differences in dieting behaviors of African American and White students (Wang et al., 2006). The results for Latinos are even less clear with some studies indicating that they report more attempts to lose weight compared with White students while other studies report the reverse (CDC, 2012; Chao et al., 2008; Robinson et al., 2001). Huh et al. (2012) concluded based on a study of 12–19-year olds that there is a serious lack of data on body perception and weight loss behavior in African American and Latino adolescents, who may be at increased risk for problems in these areas due to their higher prevalence of obesity/overweight compared with Whites.



**Figure 1.** Hypothesized Structural Equation Model. PA-SPP = physical appearance – Self Perception Profile, BID = body image difference, BMI = Body Mass Index Percentile Score, WL = weight loss.

### Limitations in Prior Research

Few studies have focused on the associations among body size, body perception, and weight loss in racially/ethnically diverse samples, yet there appears to be racial/ethnic differences in these behaviors. Existing studies have typically studied older adolescents in high school and focused on one or, at most, two racial/ethnic groups. Given that unhealthy weight, negative body perceptions, and weight loss attempts are seen already in younger youth, these associations need to be examined earlier, when eating and activity patterns are being formed (McCabe & Ricciardelli, 2003; Ricciardelli et al., 2003).

There may also be gender and socioeconomic status (SES) differences in body perceptions and weight loss attempts (Thompson et al., 2003; Wardle et al., 2004). Previous research albeit conducted with adults (18+ years) indicates that females attempt to lose weight more than males, and higher SES is associated with increased attempts to lose weight (Kruger, Galuska, Serdula, & Jones, 2004). Therefore, it is important to disentangle the role of gender and SES in understanding factors associated with weight loss attempts. Existing studies have primarily analyzed straightforward univariate associations. The current study contributes to the literature by testing a theoretical model concerning body size, perception, and weight loss, using structural equation modeling (SEM), in 5<sup>th</sup>-grade African American, Latino, and White students, while controlling for gender and SES.

Additionally, this study includes measured waist circumference, which is a more precise measure of amount of body fat and location, in combination with BMI to indicate body size.

### Current Study

This study examines the associations among body size, body perception, and weight loss attempts in 5<sup>th</sup> grade youth, at a point in development just before entry into adolescence, and how these relationships may vary among racial/ethnic groups. As depicted in Figure 1, we hypothesize a mediational model where both body size and body image perception are associated with weight loss attempts and a portion of the relationship between body size and weight loss attempts is mediated by body image perceptions. The first hypothesis is that larger body size and negative body image perception are associated with increased weight loss attempts. In addition, we hypothesize that larger body size will be associated with negative body image perception, and negative body image perceptions will mediate the relationship between larger body size and increased weight loss attempts. Finally, we hypothesize that the relationships between body size, body perception, and weight loss attempts will vary among African-American, Latino, and White youth. However, inconsistent results from the literature hinders formation of a clear directional hypothesis for the hypothesized racial/

ethnic differences (Chao et al., 2008; Martin et al., 2010; Robinson et al., 2001; Thompson et al., 2003; Wang et al., 2006).

## Methods

We used data from the Healthy Passages™ study, Wave 1, a multi-site study of health and health behaviors in youth (Schuster et al., 2012; Windle et al., 2004).

### Participants

The sample frame included 5<sup>th</sup> grade youth enrolled at public schools with  $\geq 25$  students in regular academic classrooms in and around the metropolitan areas of Birmingham, Alabama, Houston, Texas, and Los Angeles County, California. To ensure that there were adequate sample sizes of (non-Latino) African American, Latino, and (non-Latino) White students, a random sample of schools was taken, with the aim of providing a balanced overall sample across these three racial/ethnic groups (further details of the sampling procedure are provided in Schuster et al., 2012; Windle et al., 2004). Of the 6,663 parents who agreed to be contacted on receiving information about the study, 5,147 (77%) and their children completed the assessment. Exclusion criteria included not attending a regular academic classroom or a parent who could not complete interviews in English or Spanish. To focus on the three major racial/ethnic groups, 6% of participants who were not identified by their parents as being African American, Latino, and White were eliminated from the current analysis, resulting in 4,824 students. In this analysis, the unweighted distribution was 36% African American, 38% Latino, and 26% White with a youth age  $M = 11.12$  ( $SD = 0.56$ ). Additional demographic information is provided in Table I.

### Procedure

Following standard procedures approved by the institutional review boards at each research site, two trained interviewers met youths and parents at their home or another agreed on location. The parent provided informed consent and the youth provided assent. Parents were given a choice of completing the computer-assisted interviews in English or Spanish, and interviews were then conducted in private spaces with the youth and parent separately.

### Measures

#### Body Size

Body size was measured with two indicators: *BMI* and *waist circumference*. BMI calculations were based on weight and

standing height obtained according to standard anthropometric protocols (USDHHS, 1998) by trained interviewers. The participant's weight and height were measured without shoes twice. Height was measured with a stadiometer to the nearest millimeter and weight with a Tanita™ electronic digital scale to the nearest 0.1 kg. If measurements were different by  $>0.5$  cm for height or  $>0.2$  kg for weight, a third measurement was taken. The two measurements of height and weight in closest agreement were averaged and used to calculate BMI (weight in kg divided by squared height in meters). BMI was then compared with standard national charts of BMI-for-age and converted to a percentile score (USDHHS, 2002). This indicates the relative position of the child or adolescent's BMI among other youth of the same gender and age range. Waist circumference was measured in centimeters with a tape measure around the abdomen just above the hipbone.

#### Body Perception

Body perception was measured with two indicators: *Physical appearance (PA)* and *body image difference (BID)*. The PA was measured using the subscale of the Self Perception Profile (Harter, 1998) consisting of six-items in which participants were asked to identify which contrasting description fit them best (e.g., "Some kids are happy with their height and weight, other kids wish their height and weight were different") and then how true the selected statement was for them ("sort of true" or "really true"). Construct validity is supported, for example, by finding expected differences among normal weight, overweight, and obese youth (Banis et al., 1988). The range of scores on the PA was 0–24, with higher scores indicating higher body satisfaction. The internal consistency of this scale was  $\alpha = 0.66$  in this sample. BID was measured by presenting to the youth a set of drawings of seven gender-specific figures ranging from thin to overweight (Collins, 1991). Participants were first asked to choose which figure they thought a boy or girl their age should look like (ideal body) and then which figure best represented their body (self). A BID score was calculated as the absolute value of the number associated with the ideal body minus the number associated with the self (range = 0–6). Approximately 15% of participants chose an ideal body larger than their self, and 33% chose an ideal body smaller than their self. The BID score was reverse coded for the analysis so that higher scores indicated higher body satisfaction. Studies indicate that this instrument produces a valid measure of BID (Wood, Becker, & Thompson, 1996), youth estimate their body size accurately (Wallander et al., 2009), and test-retest reliability for youth as young as 8 years is high (Veron-Guidry & Williamson, 1996).

Table 1. Sample characteristics by race/ethnicity

Categorical variables	Overall (N = 3,954)		African American	Latino	White
	Raw n	Weighted %	Weighted %	Weighted %	Weighted %
Gender - Female	2,054	50	51	51	47
Race/ethnicity					
African-American	1,441	31	100	–	–
Latino	1,430	45	–	100	–
White	1,083	24	–	–	100
Highest education in household					
Less than high school graduate	748	24	10 <sup>a</sup>	45 <sup>b</sup>	2 <sup>c</sup>
High school graduate	819	22	31 <sup>a</sup>	24 <sup>b</sup>	8 <sup>c</sup>
Some college or 2 year degree	1,070	25	37 <sup>a</sup>	21 <sup>b</sup>	18 <sup>c</sup>
4 year degree or higher	1,317	29	22 <sup>a</sup>	10 <sup>b</sup>	72 <sup>c</sup>
Weight status					
Normal (BMI < 85 <sup>th</sup> %)	2,195	55	55 <sup>a</sup>	48 <sup>b</sup>	67 <sup>c</sup>
Overweight (85 <sup>th</sup> % ≤ BMI < 95 <sup>th</sup> %)	736	19	17 <sup>a</sup>	21 <sup>b</sup>	16 <sup>a</sup>
Obese (BMI ≥ 95 <sup>th</sup> %)	1,023	26	28 <sup>a</sup>	31 <sup>b</sup>	16 <sup>b</sup>
Weight loss attempts					
Previous	1,968	51	52 <sup>a</sup>	57 <sup>b</sup>	38 <sup>c</sup>
Current	1,476	39	39 <sup>a</sup>	48 <sup>b</sup>	24 <sup>c</sup>
Continuous variables		M (SD)	M (SD)	M (SD)	M (SD)
BMI percentile score		71.35 (27.35)	73.06 (26.42) <sup>a</sup>	75.60 (25.61) <sup>b</sup>	63.66 (29.13) <sup>c</sup>
CDC standardized BMI z-score <sup>d</sup>		0.81 (1.07)	0.92 (1.07)	0.98 (1.02)	0.46 (1.07)
Waist circumference (cm) - Female		72.06 (12.35)	73.56 (13.41) <sup>a</sup>	72.85 (12.00) <sup>b</sup>	68.77 (10.47) <sup>b</sup>
Waist circumference (cm) - Male		71.32 (13.00)	68.69 (12.65) <sup>a</sup>	75.64 (13.83) <sup>a</sup>	68.95 (10.69) <sup>b</sup>
Waist circumference z-score - Female <sup>e</sup>		-0.06	0.02	-0.02	-0.24
Waist circumference z-score - Male <sup>e</sup>		-0.04	-0.23	0.27	-0.21
SPP - Physical Appearance		13.99 (3.97)	14.17 (3.92) <sup>a</sup>	13.13 (4.00) <sup>b</sup>	14.73 (3.81) <sup>c</sup>
Body image difference		5.42 (0.67)	5.41 (0.69) <sup>a</sup>	5.34 (0.70) <sup>b</sup>	5.53 (0.61) <sup>c</sup>

Note. % is calculated with weights to reflect sampling. Wtd = Weighted, cm = centimeters, BMI = body mass index, SPP = Self Perception Profile.

<sup>a,b,c</sup> Different superscripts within race/ethnicity subgroups for row variable indicates statistically significant difference as per  $\chi^2$  tests ( $p < .017$ ) or analysis of variance test ( $p < .05$ ).

<sup>d</sup> BMI scores standardized using 2000 CDC growth charts (Vidmar, Carlin, Hesketh, & Cole, 2004).

<sup>e</sup> z-score calculated using national standards for males and females aged 11 years old (USDHHS, 2012).

## Weight Loss Attempts

Weight loss attempts were measured with two questions assessing *previous weight loss attempts* (“Have you ever tried to lose weight?”) and *current weight loss attempts* (“Are you trying to lose weight now?”), which were coded as “Yes” [1] or “No” [0] (Hoelscher, Day, Kelder, & Ward, 2003).

## Sociodemographic Characteristics

*Race/ethnicity* of the youth was based on a parent’s response when asked which of seven racial/ethnic categories described the youth. The youth was classified as Latino if indicated by the parent regardless of whether other categories had also been chosen. SES was measured by the highest level of education achieved by either parent. This is a stable indicator of SES (Williams & Collins, 1995) and is considered best for use with members of racial/ethnic minority groups who do not receive the same financial

gains for equivalent years of education as do Whites (Kaufman, Cooper, & McGee, 1997; Williams, 1999). Education was classified into four categories ranging from less than high school graduation (1) to completion of a 4-year college degree or higher (4).

## Data Analysis

Descriptive analysis and tests for group differences were performed using the SPSS Complex Sampling module with weighted data to adjust for the complex survey design and account for the effects of design and nonresponse weights, clustering of youth within schools, and stratification by site, as detailed elsewhere (Schuster et al., 2012). Two predictor variables had missing data, waist circumference (13%) and BMI (missing weight and/or height data, 7%), and the covariate SES (1%). Comparisons revealed only small differences between those with and without missing data.

Therefore, only participants with complete data on waist circumference, height, and weight were included in the analysis ( $n = 3,954$ ).

To address the specific research aims and hypotheses summarized by the model depicted in Figure 1, a multiple group SEM was tested using *Mplus*, version 7.11 (Muthén & Muthén, 1998–2012). Before the multiple group SEM, multiple group confirmatory factor analysis (CFA) was conducted on body size, body perception, and weight loss attempts to assess whether the measurement model differed among the three racial/ethnic groups. Factor loadings for observed variables and thresholds were freed for each racial/ethnic group, and scale parameters for the categorical factor (weight loss attempts) were fixed to 1.0 to obtain model identification. A multiple group SEM was then conducted to test model invariance across racial/ethnic groups. The model was first fit to all the data (all participants) and then separately to African-American, Latino, and White racial/ethnic groups, thus providing model fit statistics for each racial/ethnic group. The latent factor body size was formed using the measured variables waist circumference and BMI. To address issues of model convergence with regard to this latent variable, BMI percentile, and waist circumference scores were each converted into a  $z$ -score, based on this sample distribution. The latent variable body perception was formed using PA and BID scores and weight loss attempts was formed using past and current weight loss attempts. Gender and SES were included as covariates in the model. BMI, PA score, and previous weight loss attempts were fixed to 1.00 because *Mplus* 7.11 automatically fixes the first observed variable to set the metric for the latent variable and obtain model identification.

The multiple group SEM, with an invariant measurement model, was estimated to obtain the associations among latent factors and to examine the direct and indirect effects according to Figure 1. Mediation in this SEM was determined by the strength and significance of indirect versus direct effects (Cheong & MacKinnon, 2012). Values  $\geq 0.95$  for comparative fit index (CFI) and Tucker-Lewis Index (TLI) and  $\leq 0.06$  for the root mean square error of approximation (RMSEA) were considered to indicate a good fit between the model and the data (Hu & Bentler, 1999; Yu, 2002).

## Results

Descriptive information is provided in Table I. Forty-five percent could be classified as either overweight or obese based on measured BMI, and 51% reported at least one previous attempt to lose weight and 39% reported currently attempting to do so. A significantly greater

percentage of Latino youth (52%) were classified as overweight/obese compared with African American youth (45%), who in turn had a larger percentage than White youth (33%) ( $\chi^2 [2, N = 3,954] = 100.21, p < .05$ ). A higher percentage of Latino youth reported having previously (57%) and currently (48%) attempted to lose weight compared with African American youth (52 and 39%, respectively), who in turn had a larger percentage than White youth (38 and 24%, respectively) (previous:  $\chi^2 [2, N = 3,954] = 90.23, p < .05$ ; current:  $\chi^2 [2, N = 3,954] = 155.41, p < .05$ ). Moreover, Latino youth on average had the largest waist circumference and White youth the smallest [ $F(2, 4171) = 54.66, p < .05$ ], whereas White youth on average had the highest PA score, indicating a more positive perception of their body, and Latino youth had the lowest [ $F(2, 4814) = 82.81, p < .05$ ].

For the racial/ethnic groups combined (overall sample), there was not a significant association between gender and either body perception or weight loss attempts (see Figure 2). For White girls there was a positive association with body perception, but a negative association for African American girls. There was a positive association with weight loss attempts for White girls, but a negative association in Latino girls. Results also indicated that SES was significantly positively associated with body perception for all groups combined and within each racial/ethnic group. SES was also negatively associated with weight loss attempts for all groups combined but not for each racial/ethnic group separately.

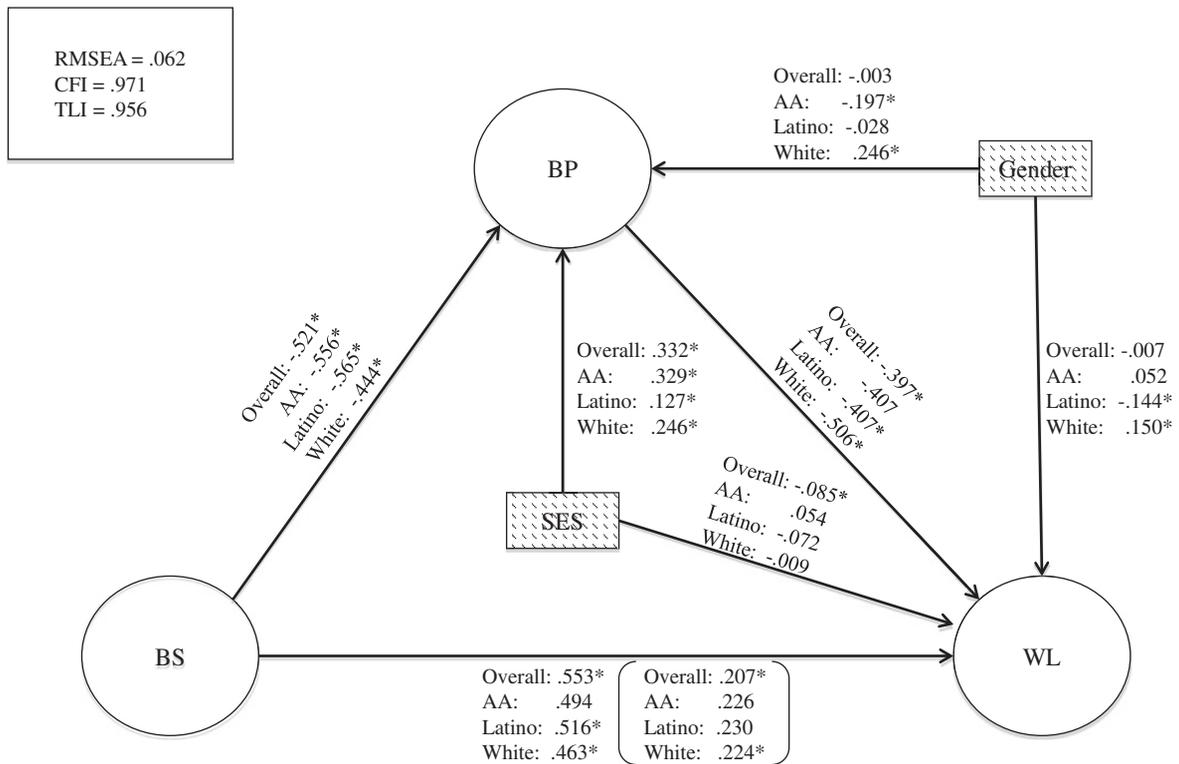
## Measurement Model

All observed variables significantly loaded onto their respective latent factors for the multiple group CFA (Table II). Whereas statistical significance was obtained for tests for measurement model invariance, further examination of results for each racial/ethnic group revealed that the models appeared to be highly similar and have comparable fit across racial/ethnic groups. As a whole, these results indicated that the fixed measurement model applies well across groups for the multiple group SEM.

## Structural Model

### Associations

The hypothesized SEM, with racial/ethnic groups combined, was a good fit for the data: CFI = 0.976, TLI = 0.953, and RMSEA = 0.065 (90% CI: [0.058, 0.073]). Body size was positively associated with weight loss attempts, and negative body perception was positively associated with weight loss attempts ( $p < .05$ ) for the sample as a whole. Body size was also positively associated with negative body perception ( $p < .05$ ). Higher SES was



**Figure 2.** Multiple Group Structural Model. AA = African American, BP = body perception, BS = body size, SES = socioeconomic status, WL = weight loss. All coefficients are standardized. Indirect estimates are reported in parentheses. \* $p < .05$ .

**Table II.** Multiple Group Confirmatory Factor Analysis Model Standardized ( $\beta$ ) Coefficients by Race/Ethnicity

Latent factors and observed variables	African American (n = 1,441)		Latino (n = 1,430)		White (n = 1,083)	
	$\beta$	SE	$\beta$	SE	$\beta$	SE
Body size						
Body mass index	0.805*	0.013	0.835*	0.013	0.826*	0.014
Waist circumference	1.000	0.000	1.000	0.000	1.000	0.000
Body perception						
Physical appearance	0.328*	0.045	0.398*	0.036	0.547*	0.049
Body image difference	0.373*	0.056	0.499*	0.043	0.435*	0.047
Weight loss attempts						
Past	0.907*	0.016	0.923*	0.013	0.942*	0.021
Current	0.974*	0.017	0.961*	0.012	0.958*	0.019

\* $p < .05$ .

significantly associated with fewer weight loss attempts and positive body perception ( $p < .05$ ). There were no significant gender differences in body perceptions or weight loss attempts.

**Mediation**

The hypothesized mediational model was supported for the whole sample and for White youth in the multiple group SEM, but not for Latino and African American youth. For White youth, body perception partially mediated the relationship between body size and weight loss

attempts ( $\beta = 0.224, p < .05$ ). The direct effect between body size and weight loss attempts was  $\beta = 0.463, p < .05$ , but when combined with the indirect effect via body perception, the total effect between body size and weight loss attempts was  $\beta = 0.687, p < .05$ .

**Racial/Ethnic Group Differences**

Although the multiple group model, testing for invariance across racial/ethnic groups, fit the data well {CFI = 0.971, TLI = 0.956, and RMSEA = 0.062 (90% CI: [0.055, 0.069])}, further examination of path coefficients for

each racial/ethnic group revealed some differences. As shown in Figure 2, body size was associated similarly positively with weight loss attempts for Latino and White youth, but not for African American youth. In addition, a positive body perception was associated with fewer weight loss attempts in Latino and White, but not in African American youth. However, body size was positively associated with negative body perception in all three groups.

## Discussion

More than half of youth reported having attempted to lose weight by 5<sup>th</sup> grade, and this was more common in Latino than African American youth, who reported more attempts than White youth. For all racial/ethnic groups, results supported the hypothesis that larger body size was associated with negative body perception. The model proposing associations of body size and body perceptions with weight loss attempts was a good fit for the overall sample; however, as hypothesized, it did not apply universally across racial/ethnic groups. The association of body size and body perception with weight loss attempts was found only for White and Latino youth. In contrast, body size and body perceptions were not associated with weight loss attempts in African American youth. Support for the mediated path in this model also varied by race/ethnicity, indicating that about one-third of the relationship between body size and weight loss attempts was mediated by body perception, but only in White and not African American or Latino youth. For White youth, those with larger bodies were more likely to experience a negative body perception, which in turn related to attempts to lose weight.

Our finding that larger body size was associated with a more negative body perception is in line with previous findings of youth in early and late adolescence and was confirmed here for all three racial/ethnic groups (Eisenberg et al., 2006; McCabe & Ricciardelli, 2003; Neumark-Sztainer et al., 2003). Previous research in youth has indicated that larger body size is associated with reported attempts to lose weight (McCabe & Ricciardelli, 2003; Ricciardelli et al., 2003; Yost et al., 2010). However, in the current study, larger body size was associated with more reported attempts to lose weight among Latinos and Whites, but not African American youth. Previous research had also indicated that having a more negative body perception is associated with increased dieting in high school students (Eisenberg et al., 2006; Neumark-Sztainer et al., 2006). The current study confirmed that same relationship between negative body perception and attempts to lose weight only in Latino and White, but not African

American youth. These accumulated findings suggest that weight loss attempts are likely influenced by how youth perceive their body, over and beyond their body size, even at young ages, including before puberty for many, although this differs to some extent among racial/ethnic groups.

An important focus of this study was to examine racial/ethnic variation in the associations among body size, body image perception, and weight loss attempts. We found that Latino youth were significantly more likely to be overweight or obese, have a negative perception of their body, and report more attempts to lose weight compared with African American youth who in turn had higher rates of all three compared with White youth. This does not fully support previous research where some studies have indicated that in middle and high school (grades 6 through 12), African American rather than White youth have the most positive body perception (Martin et al., 2010; Mikolajczyk et al., 2012). However, a study by Robinson et al. (2001) examining 3rd-grade youth reported findings similar to ours, with White youth on average having less negative perception of their bodies than African American and Latino youth.

The hypothesized mediation relationship where body perception mediated the relationship between body size and weight loss attempts was found only for White youth and not for African American or Latino youth. Taken together with the previous results, this would seem to suggest that the influences on attempts to lose weight may be different across these three racial/ethnic groups. Previous studies have suggested that for African American youth, attempts to lose weight may be more influenced by social-contextual factors such as body size and weight loss behaviors of peers and family members when compared with White youth (Chandler-Laney et al., 2009; Neff, Sargent, McKeown, Jackson, & Valois, 1997). Previous studies have also indicated that African American youth are more likely to report a more positive body image at larger body sizes compared with Whites (Wang, Liang, & Chen, 2009). However, this was not supported in this study of 5<sup>th</sup> grade youth, where larger body size was similarly associated with negative body perception for all three racial/ethnic groups. These results may suggest the possibility of differential developmental trends in body perceptions among racial/ethnic groups.

## Limitations

Among the limitations of this study are that data were drawn from a sample of youth in three specific communities making results not generalizable to the national youth population. Latinos in this study were mainly recruited in Houston and Los Angeles, therefore

representing a heritage primarily from Mexico, which may limit generalizability to Latinos in other communities with different origins. All measures except for BMI and waist circumference were obtained by self-report, including weight loss attempts. It is unclear how actual efforts to lose weight at varying intensity and duration correspond to reports of attempts to lose weight. More detailed questions on weight loss attempts in future studies could be helpful. Pubertal status was not included as a covariate in this study. Given the differences in age of the onset of puberty, which can vary by race/ethnicity, this may also limit results. The use of a fixed measurement model in the multiple group SEM despite findings of significant differences across racial/ethnic group testing may limit findings from this type of statistical analyses.

### Conclusions and Clinical Implications

This study is one of the first to examine weight loss attempts in racially/ethnically diverse youth in pre- or early adolescence. While attempts to lose weight appear to be common among youth, a clear understanding of what motivates weight loss attempts is lacking. Body size and body image perception appear to play an important role, but not universally across different racial/ethnic groups and they do not by themselves fully explain weight loss attempts. Further, research is needed into naturally occurring weight loss attempts in youth. Although findings must therefore be considered preliminary, they may have implications for the treatment of overweight and obesity.

The main implication is that weight loss attempts appear motivated differently in different racial/ethnic groups. Whereas weight loss interventions with White youth should address issues of body perception and size, based on our results, these strategies may not be effective for African American youth, for whom body perception and size do not appear related to weight loss attempts. Rather as suggested by other research, African American youth may benefit from weight loss interventions that incorporate family and/or peer support and increasing physical activity in a culturally competent manner (Chandler-Laney et al., 2009; Neff et al., 1997; Robinson et al., 2003). Implications are less clear for Latino youth, reflecting that little research has targeted them in this vein. By the same token, our findings suggest the need to develop more racially/ethnically relevant interventions to address unhealthy weight loss behaviors, such as use of diet pills or purging.

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