Overweight and Self-Perceptions of African American Children

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The study examines the self-perceptions of two groups of overweight African American children, in Oakland, California. There are two research questions: a) What is the self-perceived body image of overweight African American children?; and b) How do body mass index (BMI) and body dissatisfaction influence self-perceptions of these children? The study utilizes quasi-experimental design with participants divided into high-intensity and low-intensity intervention groups. Height, weight, and self-perception assessments were measured at baseline and after one year. Participants were aged 9-10 years old; had one African American parent, and had BMI < 85th percentile. The high-intensity intervention consisted of weeklong summer day camp and once-weekly activity nights stressing physical activity and nutrition education, while the low-intensity intervention consisted of nutrition information materials mailed to participants quarterly. The children in both groups underestimated their level of overweight, regardless of their degree of overweight. At one year, BMI was associated positively with self-worth for girls in high-intensity group and negatively with body satisfaction for boys in both groups. For boys in the low-intensity group, body dissatisfaction was associated negatively with self-worth.

By any measure, Americans are becoming more overweight (CDC, 2008b). Even in childhood, overweight and obesity have increased dramatically, and CDC data indicate that overweight among children aged 6-11 has more than tripled since 1980, from 6% to 18.8% (CDC, 2008a, 2008b), while Type 2 diabetes has doubled. The connection between increased rates of overweight among young people and Type 2 diabetes has resulted in earlier diagnosis of the disease, with up to 45% of new cases occurring among those under the age of 19 (ADA, 2000). Type 2 diabetes impacts the African American community disproportionately: 9.8% of non-Hispanic whites over age 20 have Type 2 diabetes, compared with 14.8% among African Americans (ADA, 2000).

The body mass index (BMI) cut points for pediatric overweight and obesity are somewhat controversial, but the 85th percentile is generally regarded as the cut point for risk of overweight or overweight, and the 95th percentile for obesity (Krebs et al., 2007). Numerous studies have identified many of the factors contributing to the obesity epidemic: poor diet and eating habits, lack of physical activity options, and the impact of high fat and sugar food and beverage marketing targeted to children and poor communities of color (Alleyne & LaPoint, 2004; Ebbeling & Ludwig, 2008; Smith, Rhodes, Naylor, & McKay, 2008; Tirodkar & Jain, 2003).

This article examines the impact of a nutrition education and physical activity intervention on the self-perceived body image, body satisfaction, academic and athletic competence, physical appearance, social acceptance and global self-worth among a group of overweight and obese 9 and 10 year-old African American children from two low-income areas of Oakland, California.

Body Satisfaction

The literature indicates that African American adults and children appear to be less concerned overall than Whites about societal emphasis on thinness. While African American girls have a higher rate of overweight than White girls (Ogden, Carroll, & Flegal, 1997; Ogden, Carroll, Curtin, Lamb, & Flegal, 2010), several studies have found they feel more satisfied with their bodies than White girls (Adams et al., 2000; Andres, 2007; Kelly, Wall, Eisenberg, Story, & Neumark-Sztainer, 2005; Lyons, Carlson, Thurm, Grant, & Gipson, 2006;

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Nishina, Ammon, Bellmore, & Graham, 2006). Although boys are less frequently studied than girls, the existing literature indicates a fairly low level of concern about overweight among African American and White preadolescent boys (Adams et al., 2000; Eisenberg, Newmark-Sztainer, & Story, 2003). Some researchers have suggested that African American males perceive larger body shapes and sizes as more desirable and attractive for themselves, as well as for those of the opposite sex (Adams et al., 2000; Jones, Fries, & Danish, 2006; Story, French, Resnick, & Blum, 1995). Across gender and race, however, children who report that they are teased or bullied about their weight report lower body satisfaction than those who are not (Eisenberg et al., 2003; Nishina et al., 2006). The immediate culture in which adolescent girls live, especially the degree of parental or peer support they experience, contributes to their body satisfaction (Kelly et al., 2005).

RESEARCH QUESTIONS AND METHODS

There are two research questions for this study:
a) What is the self-perceived body image of overweight African American children?
b) Do BMI, gender or body image dissatisfaction influence other self-perceptions of these children?

The data reported in this study are a subset of data collected for a larger study of Type 2 diabetes risk in overweight African American children (Raman et al., 2008; Raman, Ritchie, Lustig, & Fleming, 2010). African American children were recruited from schools and community-based venues in two low-income neighborhoods of Oakland, California, with high concentrations of African American residents. The part of the study reported here focuses on the psychosocial outcomes of the intervention on the participants.

Children who were eligible for participation in the study met the following criteria: *a)* they had at least one African American parent; *b)* they were 9 or 10 years old at the time of recruitment; *c)* they had BMI at or above the 85th percentile when matched for gender and age; *d)* they were free of any systemic or metabolic disorders and not taking medication known to affect energy, metabolism or body weight; and *e)* they were free of physical or emotional factors that would interfere with consistent participation in the program.

A total of 165 subjects were recruited into the study. 52 girls and 36 boys were assigned to the high-intensity intervention group, which participated in a one-week summer day camp concentrating on physical activity and nutrition education, with monthly follow-up "family nights" for the participants and their parents that focused on healthy eating and physical activity, including swimming, dancing and games. Attention was also devoted to self-esteem building activities. 42 girls and 35 boys were assigned to the low-intensity intervention group, which received educational materials on nutrition and physical activity that were mailed to their homes on a quarterly basis. Both groups participated in the periodic anthropometry (weight, height, measurement) and blood chemistry studies.

Metrics and Instruments

Several measurements were used to gather data related to body size, body image, and self-esteem. The participants' body weight, height, waist and hip measurements were collected with subjects lightly dressed and without shoes or jewelry. Height was measured with a stadiometer, and weight was measured with electronic scales. Body Mass Index (BMI) was calculated as weight (kg) divided by height squared (m2) (NCHS, 2008). Waist-to-hip ratio (WHR) was calculated using the other measurements collected.

Body image, which is a mental picture of one's own body, was measured by a widely-utilized figure-rating scale developed in a study of pre-adolescent children (Collins, 1991). The instrument consists of two identical sets of female or male silhouettes. On these two figures, participants mark their perception of their current body silhouette and the silhouette that best represents how they would *like* their body to look. The male-specific instrument used to measure body image is included as Figure 1A, and the instrument used to measure the female body image is Figure 1B.

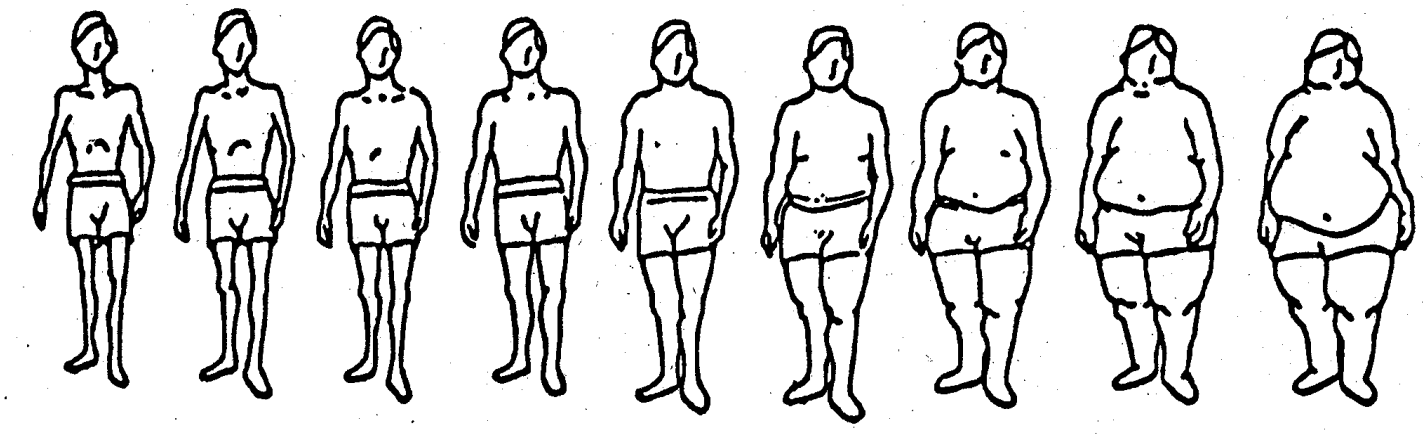
Body dissatisfaction was calculated using the difference in the numbers assigned to the two silhouettes on the body image questionnaire. Each unit of difference between the two images was scored as a unit of body dissatisfaction such that the scale

FIGURE 1A
Body Image Assessment Instrument

The drawings below show different sizes of bodies.

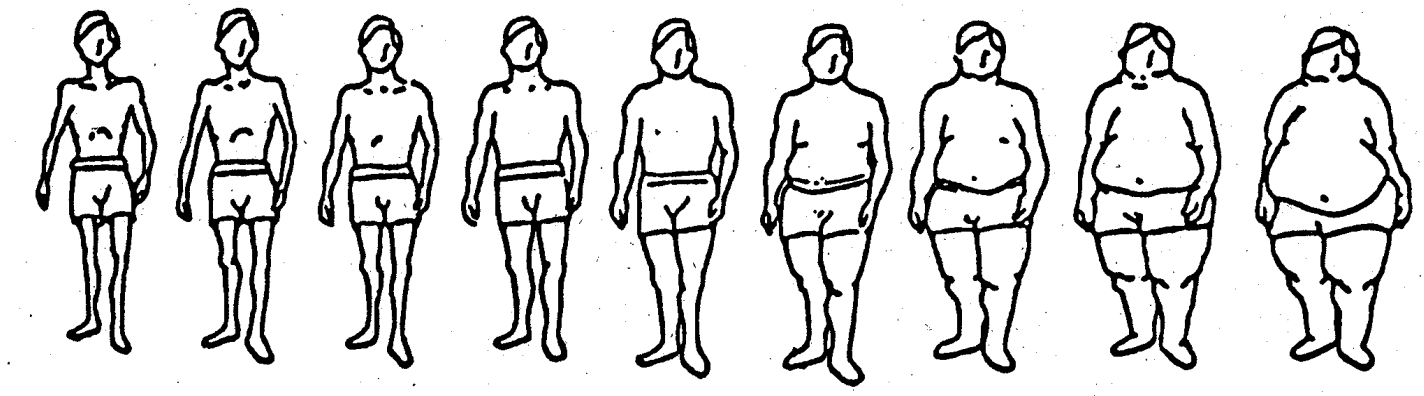
In the drawings below, put a check mark (X) on the line below the picture that is most like your body.

Your body NOW



In this second set of drawings, put a check mark (X) on the line below the picture that is how you would like your body to be.

How you would like your body to be?



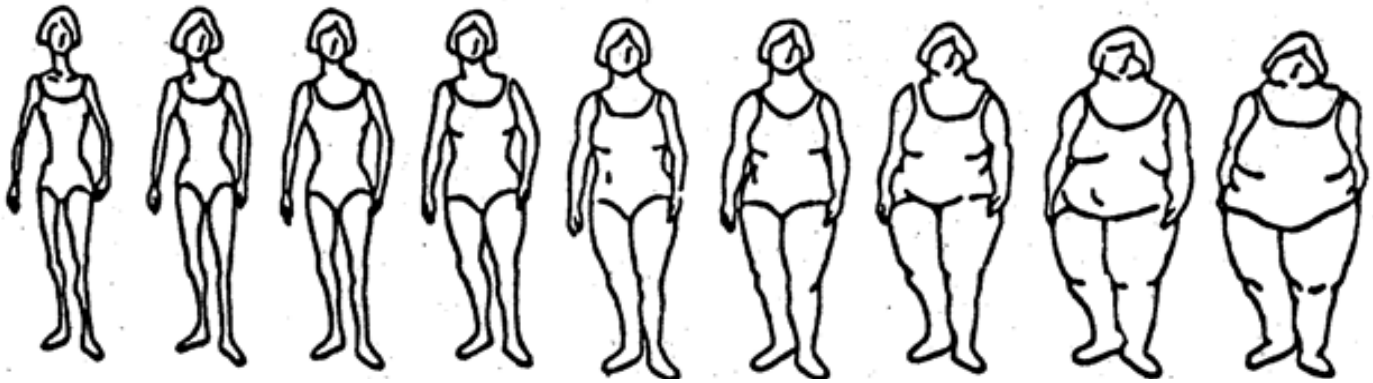
When you are finished, fold this paper and put it in the envelope.
(Source: Collins, 1991)

FIGURE 1B
Body Image Assessment Instrument

The drawings below show different sizes of bodies.

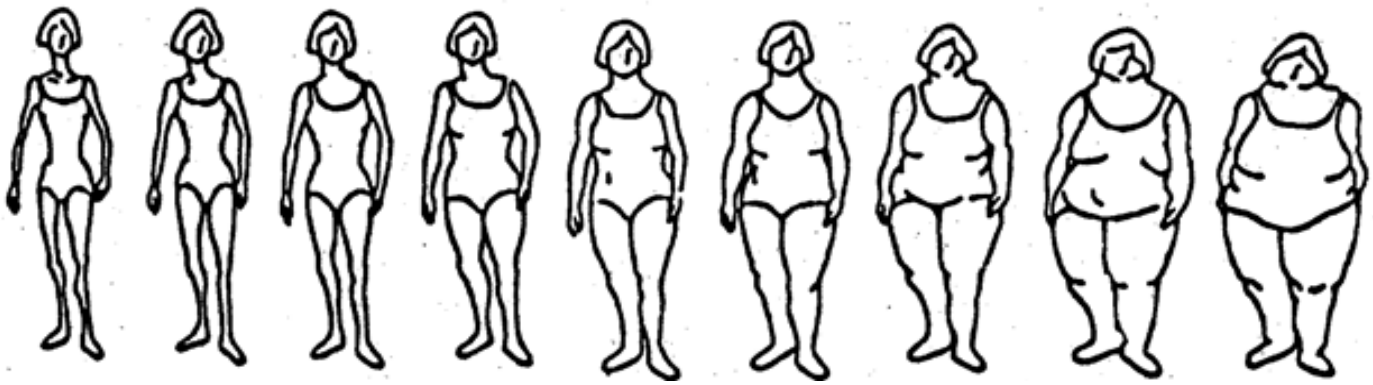
In the drawings below, put a check mark (X) on the line below the picture that is most like your body.

Your body NOW



In this second set of drawings, put a check mark (X) on the line below the picture that is how you would like your body to be.

How you would like your body to be?



When you are finished, fold this paper and put it in the envelope.
(Source: Collins, 1991)

could go from "0", representing complete body satisfaction, to "8", representing the greatest possible difference between the two body images.

The Harter Self-Perception Profile for Children (Harter, 1985) is designed to evaluate six domains or sub-scales of perceived competence and self-adequacy: global self-worth, academic competence, physical appearance, behavioral conduct, athletic competence and social acceptance. Each sub-scale contains six items, and each item is scored from 1 to 4 where 4 represents the most positive self-judgment and 1 the least. Scale scores are the average of the item scores. The internal consistency of the items within each sub-scale was assessed using Cronbach's criterion (Cronbach & Warrington, 1951).

Using SPSS (SPSS Inc.), descriptive and inferential statistics were calculated to compare girls and boys from both the high-intensity intervention and low-intensity intervention groups. Student's ***t*** statistic was used to identify any statistically significant differences between the two intervention groups at baseline, to assure the comparability of the high-intensity and low-intensity intervention groups. Pearson's correlation was used to determine the associations between body mass, body image and the self-perception variables from the Harter scale and to analyze the strength and significance of those relationships.

RESULTS

At baseline, there were no significant differences between the two intervention groups in the means of BMI, waist measurement, waist-hip ratio, body image, body dissatisfaction, athletic competence, academic competence, social acceptance, and assessment of behavior. For girls only, there were significant differences between the mean scores of the high and low-intensity groups on global self-worth (***t*** = 2.45, significant at .05 level), with girls in the high-intensity group having higher global self-worth scores.

Self-Perceived Body Image

At baseline, the participants assessed their current body image using silhouettes from 1 (very thin) to 9 (very rounded). Most of the boys and girls reported their current size as somewhere around the middle, 4 or 5, even though their group mean BMI percentile was above the 90th percentile for their age and gender (girls' BMI $\mu = 96.7$; $\sigma = 5.2$; girls' current body image $\mu = 4.77$, $\sigma = 1.16$; boys' BMI $\mu = 95.6$; $\sigma = 5.9$; boys' current body image $\mu = 5.01$, $\sigma = 1.02$). The 23 girls in the highest quartile of BMI were above the 99th percentile of BMI. Five of these girls reported that they saw their current body silhouette as "4", 10 saw their current silhouette as "5", and only 3 girls in the quartile saw their silhouettes above "6". Among boys, the highest quartile represented the 18 boys with BMIs above the 99th percentile. In comparison, 2 of the boys saw their body image silhouette as "4", 3 saw their body image as "5", and 8 saw their body image as "6". Five of them saw their body image silhouette as above "6". This suggests that as a group, boys had a somewhat more realistic assessment of their body's silhouette than did girls, but that the majority of the participants had self-perceived body silhouettes inconsistent with their BMI.

The Relationship Between BMI, Body Image, Gender and other Psychosocial Variables

The variables used to measure the participants' psychosocial status were body dissatisfaction, academic competence, athletic competence, self-appraisal of physical appearance, social acceptance, and global self-worth. In addition, the measure of body dissatisfaction was also used as a psychosocial measure. Correlation coefficients were calculated between these variables and the participants' BMI percentile for age and gender, which proved to be the most robust measures of overweight. The results of this analysis are presented in Table 1.

TABLE 1
Pearson's Correlation Between BMI Percentile and Perception Variables at Baseline

Perception Variable	*Female (94)*	*Male (72)*
Academic Competence	.172*	.137
Athletic Competence	-.062	-.342**
Physical Appearance	-.022	-.320**
Social Acceptance	.150	-.220*
Self-Worth	.148	-.257**

* $p < .05$ level
** $p < .01$ level
*** $p < .001$ level

BMI percentile was correlated with body dissatisfaction for boys and girls, although the relationship for boys was more significant than for girls at baseline, as Table 1 illustrates. BMI percentile was associated with reports of stronger academic competence for girls. BMI was also negatively associated with athletic competence for boys. As boys' BMI percentile increased, they also reported significantly more negative views of their physical appearance, social acceptance and self-worth. None of these variables was significantly associated with increased BMI for girls.

Using body dissatisfaction as an independent variable and examining its relationship with the other perception variables resulted in significant negative correlations for girls between body dissatisfaction and their assessment of physical appearance (R=-.295, $p < .05$) and global self-worth (R=-.294, $p < .05$).

During the year between the baseline measures and the post-intervention measures, 19 girls (20% of the sample) and 13 boys (18% of the sample) dropped out of the study. There were no substantive differences on any of the measured variables between the dropouts and those who were retained in the study.

After a year in the program, both the high-intensity and low-intensity intervention groups had increased their BMI. In addition, both groups had significantly increased their average waist measurements ($p < .01$). Table 2 presents the results of the correlations between body dissatisfaction and the perception variables after one year of the intervention.

While among boys, body dissatisfaction was highly correlated with BMI percentiles (R=.632 and .523 for high-intensity and low-intensity intervention boys respectively, $p < .05$), there was no such correlation for girls. Body dissatisfaction was associated with low self-perceptions of most of the variables for boys in the low-intensity intervention group, significantly for self-worth, social acceptance, physical appearance and athletic competence. For boys in the high-intensity intervention group, body dissatisfaction was negatively associated with social acceptance. Even though BMI was positively correlated with body dissatisfaction for boys, the correlates of body dissatisfaction are not the same as those for BMI. Thus, even when BMI increases, boys in the low-intensity intervention group did not experience negative self-perceptions unless they also have high levels of body dissatisfaction. For girls, body dissatisfaction was associated negatively with perceptions of physical appearance.

TABLE 2
Correlation Between Participants' Body Dissatisfaction and Perception Variables at Year 1

Perception	*High Intervention*		*Low Intervention*	
Variable	*Female*	*Male*	*Female*	*Male*
Academic Competence	-.140	.053	-.201	-.316
Athletic Competence	.098	-.205	-.176	-.539*
Physical Appearance	-.292	.026	-.394*	-.482*
Social Acceptance	.121	-.503*	-.300	-.415*
Self-Worth	-.083	.095	-.158	-.535*

* $p < .05$ level
** $p < .01$ level

DISCUSSION

One year of participating in this intervention did not result in reduced BMI for these African American children whose overweight puts them at risk of developing Type 2 diabetes, but the participants' perceptions of themselves, and especially the very different responses of girls and boys, raise several questions that need further discussion and study. First, the participants mostly saw themselves as having an average or slightly below average silhouette, even though they were selected because they were at risk of overweight by the currently-accepted standards of the CDC. This underestimation of their weight might be explained by two circumstances: *1)* the tolerance for higher degrees of overweight in African American communities, and *2)* the tendency of low-income African American mothers to underestimate the weight of their children.

As mentioned earlier, overweight and obesity among children has significantly increased since

1980 (ADA, 2000; Ebbeling & Ludwig, 2008; Ogden, Carroll, & Flegal, 2008). Recent estimates place 34% of African American children aged 9-12 at or above the 85th percentile (Ogden et al., 2008). Research consistently indicates that the African American community is more tolerant of higher weight than some other ethnic communities (Andres, 2007; Bailey, 2006; Baughcum, Chamberlin, Deeks, Powers, & Whitaker, 2000; Dietz, 1998). No recent analyses have been conducted of low-income African American communities in particular, but overweight and obesity are more prevalent in low-income than in middle and upper income communities (Ahn, Juon, & Gittelsohn, 2008). This sample was drawn from low-income communities where overweight is likely more prevalent; because of this higher prevalence, overweight children may be regarded as normative. If this is so, it is understandable why they might view themselves as "average" in body size. Other studies of pediatric and adolescent obesity support this possibility (Collins, 1991; Frisby, 2004; Sisson, Franco, Carlin, & Mitchell, 1997; Thomas, 2006).

The participants' views of themselves as "average" may also be reinforced by their parents' perceptions. Research indicates that African American and Hispanic mothers, especially if they are low-income or have low education, underestimate their children's body weight (Baughcum et al., 2000; Jain et al., 2001; Killion et al., 2006). Given that children's first images of themselves reflect the views of the adults around them, it is possible that these young participants' body images have been influenced by their parents' attitudes about their body weight. If this is the case, interventions designed to reduce childhood obesity among African American children need to address parental perceptions if they expect to change the self-perceptions of the children.

The analysis of data from this study reveals an association between BMI and increased self-worth in the high-intensity intervention girls, and decreased self-worth in low-intensity intervention boys. The results for girls are consistent with other research demonstrating that the self-esteem of African American girls is less influenced by overweight than is the case in Asians and Caucasians (Andres, 2007; Lyons et al., 2006; Nishina et al., 2006). It is possible that the high-intensity intervention girls had their self-worth bolstered by the activities and interactions of the intervention, which were targeted to improving self-esteem. This supports research (Alleyne & LaPoint, 2004; Ward, 1996) that concludes African American girls' self-concepts are more related to other values, such as competence, resourcefulness, and relationships with family and community than by externally-established standards of beauty.

Among boys in both groups, body dissatisfaction was strongly associated with increased BMI. These results are also consistent with two studies of the limited number that include dissatisfaction with body weight for African American boys (Nishina et al., 2006; Paxton, Eisenberg, & Neumark-Sztainer, 2006). Other studies have either included so few African American boys that no distinct conclusions could be drawn for them (Wood, Becker, & Thompson, 1996); concentrated solely on the boys' views of acceptable weights for *females* (Thompson, Sargent, & Kemper, 1996); or concluded that boys' worries about their weight were only concerned with lack of muscle development.

Although it is possible that the intervention may have buffered the negative consequences of high BMI on self-worth for boys in the high-intervention group, the relationship between increased BMI and low self-worth among boys in the low-intensity intervention group is worrisome. While overweight has not been studied as a risk factor in the study of ecological factors associated with developmental outcomes for African American males, it is possible that it is an important contextual factor over time. This is especially important because overweight is associated with increased height and bone age, and may result in African American boys being seen as older and more mature than they actually are (Dietz, 1998). This has potentially negative consequences for their treatment in schools, by social service personnel, and for their interactions with law enforcement. If further research confirms these relationships, overweight can be especially important in further specifying models that "unpack" poverty as an explanatory variable in understanding the high proportion of negative life cycle outcomes that occur for African American males in US society. Such models include Spencer & Swanson's Phenomenological Variant of

Ecological Systems Theory [PVEST] (Spencer, Dupree, Cunningham, Harpalani, & Miller, 2003; Swanson, Cunningham, & Spencer, 2003) and studies of positive youth development (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 1998; Lerner & Castellino, 2002; Prelow, Weaver, & Swenson, 2006).

CONCLUSION

Although this study analyzes relationships between BMI and a series of psychosocial outcome variables, including body dissatisfaction, academic competence, athletic competence, global self-esteem, behavior, physical appearance, and social acceptance, the realities are much more complex than can be described by a linear model. Ecological systems theories suggest that input variables, such as health, interact with contextual variables in children's lives, and the choices these individuals make to produce outcomes throughout the developmental cycle (Bronfenbrenner, 2000; Swanson, Spencer, Dell'Angello, Harpalani, & Spencer, 2002). Those choices, which include long-term food selection and physical activity habits, will determine whether these youth develop Type 2 diabetes, other negative health consequences associated with overweight, or other poor life cycle outcomes that African Americans experience disproportionately.

The numbers in this study are small in the subgroups and the data only reflect one year of intervention. Longer-term study of culturally-sensitive interventions is needed to understand what works in helping African American children to reduce their BMI and avoid the negative health outcomes associated with overweight and obesity. In addition, there is a need to understand how these interventions provide buffering influences on the negative psychosocial impact of overweight, especially for boys. Currently, there are few studies of childhood or adolescent overweight that focus on its psychosocial impact on boys. The impact of long-term body dissatisfaction and low self-esteem on African American boys with high BMI deserves more study.

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