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THE RELATIONSHIP BETWEEN PARENT PERCEPTION OF CHILD WEIGHT, PARENT FEEDING STYLE AND CHILD BMI AMONG LOW-INCOME, AFRICAN AMERICAN PRESCHOOLERS

Jhazmin Taylor

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ABSTRACT

In February 2011, First Lady Michelle Obama revealed her plan to end the childhood obesity epidemic in America. With childhood obesity considered a health crisis, it is crucial to begin serious prevention efforts. Shaping healthy eating habits and the physical activity of children at the preschool age is a great step toward life-long prevention. The U.S. populations most affected by and at-risk for childhood obesity are African Americans and Hispanic Americans. Overweight and obesity rates are also particularly on the rise among preschool children. The purpose of the current study is to examine the relationship between parents' perception of their child's weight status, parent feeding style and child body mass index (BMI). A total of 82 primary caregivers of preschool-age children participated in the study. Participants were low-income and primarily African American. Primary caregivers completed surveys that included a demographic questionnaire, caregiver feeding style questionnaire and a parent perception measure. The children's BMI information was gathered from Head Start's nutrition coordinator. Results showed that 35% of children in the current sample had a BMI at or above the 85th percentile, which is considered overweight. Results suggest that parents perceive their child's weight status to be at a healthier level than objective BMI estimates suggest. Parent feeding style was not significantly related to child BMI in the current study.

INTRODUCTION

Childhood obesity is a health crisis in the United States. In February 2011, First Lady Michelle Obama revealed her plan to end the childhood obesity epidemic in America. Michelle Obama's "Let's Move" campaign is aimed at fighting the obesity epidemic by providing schools, families and communities with simple tools to help children become more active. National childhood obesity rates highlight the need for such programs. Data from 2003 to 2006 showed increases in obesity from 10.5% to 17.6% in adolescents' ages 12 to 19, from 11.3% to 17% in children ages 6 to 11 and from 7.2% to 12.4% in two-to-five year old children. Overweight and obesity rates are of particular concern among preschool children. A study conducted by Ogden showed an increase in obesity from 5% to 12.6% in preschool African American girls and from 3% to 8.7% in preschool African American boys, which also signifies gender differences. There are now 13.9% of U. S. children ages two to five years considered overweight, and 26.2% are considered at-risk of being overweight (Ogden et al., 2006). With obesity rates increasing particularly among the preschool age group, it is clear that prevention activities need to begin during the preschool years (Ogden et al., 1997; Salsberry & Reagan, 2005; Wofford, 2008). Since minorities are at high-risk, it is important to place a particular focus on this group.

Prevention may be the best method of addressing the nation's obesity crisis. Prevention of obesity may be more effective than programs that target the reduction of obesity once begun. For example, Wofford found that strategies that focus on enhancing or building healthy habits have more stable, long-term effects than strategies that focus on limiting behaviors. Children encouraged to increase their fruit/ vegetable intake were more likely to show significant decreases in body mass index when compared to children encouraged to decrease fat and sugar

intake. Habits for youth at-risk for obesity are often changed during preschool years (Ogden et al., 1997; Salsberry & Reagan, 2005).

Parents are an important influence on child development in many ways, including physical health and weight. Parents create environments for children that may foster the development of healthy eating behaviors and weight, or promote weight gain and aspects of disordered eating. Characteristics of these environments include socio-demographic factors (Strauss & Knight, 1999), parental activity (Sallis et al. & Moore et al., 2003), parental eating styles (Cutting et al. Hood et al., 1999) and parents' child-feeding styles (Johnson & Birch; Fisher & Birch, 2000). The key role parents play in the development of obesity-inducing eating habits in their offspring is a topic of increasing interest worldwide (Golan & Crow, 2004). Also, important to the effectiveness for nutrition and activity programs that influence preschool children is parental involvement (Wofford, 2008). A final, important aspect to enacting healthy habits is a positive family model.

Demanding parents use stages of control, supervision, and demands of maturity. Responsive parents display levels of warmth, acceptance and involvement. Sacco et al. describe the five feeding styles typically chosen by parents feeding children as follows: *Responsive*, in which parents are responsive to the child's hunger cues but control the quality of their child's diet by providing an assortment of high-quality foods; *Pressuring*, in which parents are not responsive to their child's hunger cues, and are intent on controlling the amount of food the child eats by increasing the amount consumed; *Restrictive*, in which parents are not responsive to their child's hunger cues and are intent on controlling the amount and quality of food the child gets by decreasing the amount consumed and/ or not allowing the child to eat lower quality foods; *Indulgent*, in which parents are responsive to hunger cues, but do not control or set limits in

terms of quantity or quality of food consumed; and *Laissez-Faire*, in which parents are not responsive to hunger cues and do not control or set limits in terms of the quantity or quality of food consumed. Restrictive Parental feeding styles, beliefs and/ or practices related to child feeding have recently received substantial attention for the potential role they may play in the rising epidemic of childhood obesity (Hedley et al., 2004; Strauss and Pollack, 2001 pg. 132).

Studies report that requiring a child to eat to get a reward has been shown to reduce a child's liking for that food (Birch, Marlin & Kramer, 1981). Using food as a reward for regulating a child's behavior has also been shown to increase the child's preferences for these products (Birch, Zimmerman & Hind, 1980). However, a few studies found contradictory results regarding the effects of instrumental feeding on a child's preferences and behavior (Horne et al., 2004; Lowe, Horne, Tapper, Bowdery, & Egerton, 2004; Moore, Tappen & Murphy, 2007).

Child Obesity Trends

The article "Childhood Obesity Paradox" claims that high levels of physical activity among youth are commonly associated with low rates of obesity. However, according to *Medicine & Science in Sports & Exercise*, scientists have discovered that overweight and obese ethnic groups are also some of the most active (Sallis, Prochaska, Taylor, 2000). Researchers found that Caucasian children are generally the least active, while black children are the most active. Scientists have suggested that the type of physical activity in which children are engaged is a factor in obesity rates. With the dramatic increase in American childhood obesity, this epidemic has caught the full attention of health care professionals, policy experts, children's advocates and parents (Anderson, Butcher 2006). During the years 1971-74, about five percent of children ages two to nineteen years were obese. By 1976-80, the obesity rates were slightly

higher, but between 1980 and 1994 the obesity rates nearly doubled. By 1999-2002, nearly 15 percent of U.S. children were considered obese. In 2000 overweight levels among children were shown to increase in 16 of 38 countries. Although the rates of obesity were higher for older children in every survey, all age groups showed an increase in obesity (Anderson, Butcher 2006). In 2010, 46 million children globally were estimated to be overweight and obese; 92 million were at risk of becoming overweight (Onis, Blossner, and Borghi, 2010).

Physical Activity

Daily physical activity is beneficial to all individuals over age two years and has been shown to protect against weight gain and other chronic diseases. Children with the greatest physical activity have the least gains in body mass index (BMI) by the time the child reaches adolescence (Moore, Gao, Bradley, 2003). According to the National Association for Sport and Physical Education, preschool children should participate in at least 60 minutes of unstructured physical activity or “free play,” at least 60 minutes of structured physical activity, and should not be sedentary for more than 60 minutes at one time, except when sleeping.

Physical activity is often limited by a number of factors. One main limiting factor is the environment. Environmental factors such as weather, neighborhood safety, and the accessibility of television and video games play a role in the amount of time children spend being physically active (Spurrier, Magarey, Golley, Curnow, Sawyer, 2008).

Role of Parents in Preventing Childhood Obesity

The essential key to a child’s behavior is parenting. Starting the child off with good habits is a great way to make those habits stay throughout adulthood. Parents shape their

children's lives in countless ways: with a focus on eating and health habits, the parents' knowledge of nutrition, influence over food selection, meal structure and home-eating patterns, modeling of healthful eating practices, levels of physical activity, and the modeling of sedentary habits, including television viewing. All of these behaviors influence children's development of lifelong habits that contribute to normal weight or to overweight and obesity (Kaplan, Liverman, and Kraak, 2004).

With parents playing such important roles in shaping child development, they are also vital to cooperative efforts to fight the nation's childhood obesity epidemic. Epstein (1996) identified three reasons to involve parents in obesity-prevention interventions. First, obesity runs in families and it may be unrealistic to intervene with one member of a family while others are modeling and supporting behaviors opposed to intervention goals. Second, parents serve as models; they reinforce and support the acquisition and maintenance of eating and exercise behaviors. Finally, to produce maximum behavioral change in children, it may be necessary to teach parents to use specific behavior-changing strategies, such as positive reinforcement. Dietz and Stern (1999) suggest parents are responsible for offering healthful, varied foods, while children themselves are responsible for deciding what and how much they want to eat from what they are offered.

Children are born with an innate liking for sweet and salty foods and a disliking for sour and bitter foods. Since children develop most of their food habits through exposure and repeated experience, research suggests that individual differences in the physiologic regulation of energy intake appear as early as the preschool years, and that parents have a large influence on these differences (Birch, 1980).

Role of Child Care Settings in Prevention

Childcare settings are a great place to initiate childhood obesity prevention programs. Of the nation's 21 million preschool children, 13 million spend a substantial part of each day in childcare facilities (Story, Kaphingst, French, 2006). As such, reaching out to childcare facilities is a great way to shape the diet and physical activity of children. Having so many mothers in the labor force puts childcare participation at an all-time high in the United States (Story, Kaphingst, French, 2006).

Story's article "The Role of Child Care Settings in Obesity Prevention" lists the different types of facilities typically chosen for daycare. These facilities include: centers, which are for groups of children in a nonresidential setting such as a business, church, or school; small family child-care homes, usually for six or fewer children in the day-care provider's home; large family or group child-care homes, which for seven to twelve children cared for by two providers in a provider's home; in-home care, provided by a non-relative in the family home; and kith and kin care by a relative, neighbor or friend for one family only.

A child can spend more time in a child-care setting than she/he spends with parents. With child care beginning as early as six weeks of age, for as long as forty hours a week, it is important to have nutrition and physical activity programs implemented in these settings as well. Forty-one percent of preschool children are in child care for thirty-five or more hours a week; twenty-five percent for fifteen to thirty-four hours a week; sixteen percent are in daycare for one to fourteen hours per week, and eighteen percent spend no time in child care. Most children in childcare are in centers, with the next most utilized childcare facility being family homes.

The Role of Built Environments in Childhood Obesity

The built environment also plays a role in the reduction and prevention of obesity. The built environment includes neighborhoods, buildings, food sources and recreational facilities with which people come in contact on a daily basis. The way the built environment is created can affect many daily decisions, such as whether people walk to work or school, eat frequently at fast-food restaurants or take their children to parks.

Studies also show the link between access to recreational facilities and the physical activity of children. Children and adolescents with access to recreational facilities and programs near their homes are more physically active than those without access (Sallis, Prochaska, Taylor, 2000). The more often young adolescents use recreational facilities, the greater their total physical activity, with parks and the neighborhoods most important for boys and commercial facilities and the neighborhood most important for girls (Hoefler, 2002). Direct observation studies of preschool children have shown that being outdoors is the biggest correlate of the children's physical activity (Sallis, Prochaska, Taylor, 2000).

Parent's Perception of Child's Weight

Parental perception of a child's weight is not always accurately related to the child's actual weight. An important step in the treatment of overweight is to help the family recognize the child's overweight status. Studies have shown that high rates of maternal obesity misrepresentation are correlated with fewer years of education (Eckstein, 2006). Eckstein's parent perception study shows that children of more highly educated parents are less likely to be overweight (Eckstein, 2006). Parents of overweight children do not think they can influence their children's physical activity as much as parents of non-overweight children. This suggests that

parents of non-overweight children encourage more physical activity, which is an important factor in fighting obesity.

Goals of the Current Study

The goals of the current study are to look at the parent's perception of the child's weight, parental feeding style and child body mass index (BMI) in a sample of low-income, African American preschoolers. Current studies have found that parental perception and the child's actual BMI are not accurately correlated (Eckstein, 2006). Parents tend to perceive their children as not overweight when, in fact, they are. Given this information, it is hypothesized that parent perception will be unrelated to the child's actual BMI.

METHODS

Participants

The main site for this project is a Head Start program in the city of Detroit. Head Start is dedicated to aiding income-eligible families of diverse cultural and ethnic backgrounds to overcome education and economic deprivation by providing comprehensive services to children three to five years of age. The sample includes parents from various Head Start centers in Detroit.

This study is a part of a larger study of Head Start mothers. The sample consists of 82 mothers or primary caregivers of children enrolled in Head Start. Participants are volunteers and are identified at monthly parent meetings or scheduled pick-up and drop-off times at Head Start. Table 1. describes the demographic characteristics of the study sample.

Mother' Age	Mother's Race	Mother's Level of Education	Marital Status	Annual Income	Number of Children	Child's Age in Months	Child's Sex
mean 30.48	98.8% African American	63.8% High School	75.3% Single	45.7% <\$5000	mean 2.31	mean 49.76	62.2% Girls
standard dev. 9.53	1.2% Multi-Racial	36.2% College of Higher	14.8% Married	16% \$5000-9999	standard dev. 1.319	standard dev. 8.91	37.8% Boys
range 18-72			3.7% Divorced	17.3% \$10,000-14999	range 1-8		
			2.5% Widowed	3.7% \$15,000-19,999			
			3.7% Single w/ Partner	8.6% \$20,000-29,999			
				8.6% \$30,000-49,999			

Table 1. Demographic Characteristics

Procedure

All surveys are collected on site at Detroit Head Start Centers, either by the larger study's principal investigator or by a trained graduate or undergraduate student. Participants signed an informed consent form prior to beginning the study and were paid \$5 to complete the study questionnaires.

Measures

Measures in the survey distributed to participants included: a demographic questionnaire, the parent perception measure and the caregiver feeding style measure.

Demographic Questionnaire

This measure was used to gather background information on the primary caregiver and the child, including age, race and sex. The caregiver's level of education is also evaluated.

Child BMI

Child height and weight were measured by the nutrition coordinator at Head Start locations. These measures were taken during the school day and represent an objective measure. BMI was calculated using the following formula: $(\text{weight}/(\text{height squared})) \times 703$. Current growth charts established by the Center for Disease Control and Prevention were used to obtain BMI percentiles for each child.

Parent Perception Measure

The parent perception measure was used to determine how the mother perceives her child's weight status (Eckstein et al., 2006). Four items were used from this scale. The first asks how the mother feels about her child's weight on a scale of 1 to 5, with "1" being "*I feel my child is underweight*" and "5" being "*I feel my child is overweight.*" The second item asks whether the parent has ever been told by a doctor that the child was overweight or gaining weight too quickly. The third item asks how much the parent agrees with the statement "*I am worried about my child's weight*" on a scale of 1 to 5, with "1" being "*strongly disagree*" and "5" being "*strongly agree.*" Also included in this measure is a series of sketches that show seven pictures of a boy and seven pictures of a girl. The pictures represent children with increasing BMI, where picture "1" is the lowest BMI, picture "7" is the highest and the 4th picture represents a child at the 50th percentile for BMI. Each mother was asked to choose which picture best corresponded with her child's weight. This measure was scored on a scale of 1 to 7 with "1" being the lightest and "7" the heaviest; "4" represented the 50th percentile.

Caregiver Feeding Style Questionnaire

The caregiver feeding style questionnaire (Hughes et al., 2005) was used to evaluate the mother's interactions with their child during mealtime. The questionnaire consists of 19 items describing strategies that may be used by parents to get their child to eat (e.g., "Beg the child to eat dinner," "Ask the child questions about the food during dinner"). The scoring for this measure is on a scale of 1 to 5, with "1" being "*never*" and "5" being "*always*." Two scales are derived from this measure. The first is called *demandingness*. Demandingness is the mean of all 19 items. The second scale is called *responsiveness*. This is calculated as a ratio of the mean for a subset of items that represent child-centered strategies (e.g., encourage the child to eat by arranging the food to make it more interesting), and the mean for overall demandingness.

Data Analysis

Data was analyzed through the statistical package for social science, or SPSS, data analysis software. This software will identify means with standard deviations and cross-variable correlations.

RESULTS

Descriptive Analyses

Eighty-two participants completed the survey. Based on measurements of height and weight, 35.2% of the children were overweight, meaning they were in the 85th percentile or above, 64.8% of the children were not overweight. The children's BMI information was gathered from the Head Start nutrition coordinator. The children's mean BMI was 16.43 (*S.D.* = 1.84). Figure 1. shows parents' perception of their child's weight status; 88.9% of the mothers felt their children were about the right weight while only 3.7% of the mothers thought their child was "a

little overweight.” Figure 2. shows parents’ visual perception of their children. Each mother chose, a scale of 1 to 7, which picture best corresponded with her child’s actual body image. The mean response for this item was 2.56 (*S.D.* = 1.31). Only 10% of mothers chose a body image above the 50th percentile for child BMI. Twelve percent of parents reported that a doctor had told them their child was overweight, or gaining weight too quickly. When asked how much they agreed with the statement, “I am worried about my child’s weight,” 4% of parents agreed or strongly agreed with the statement.

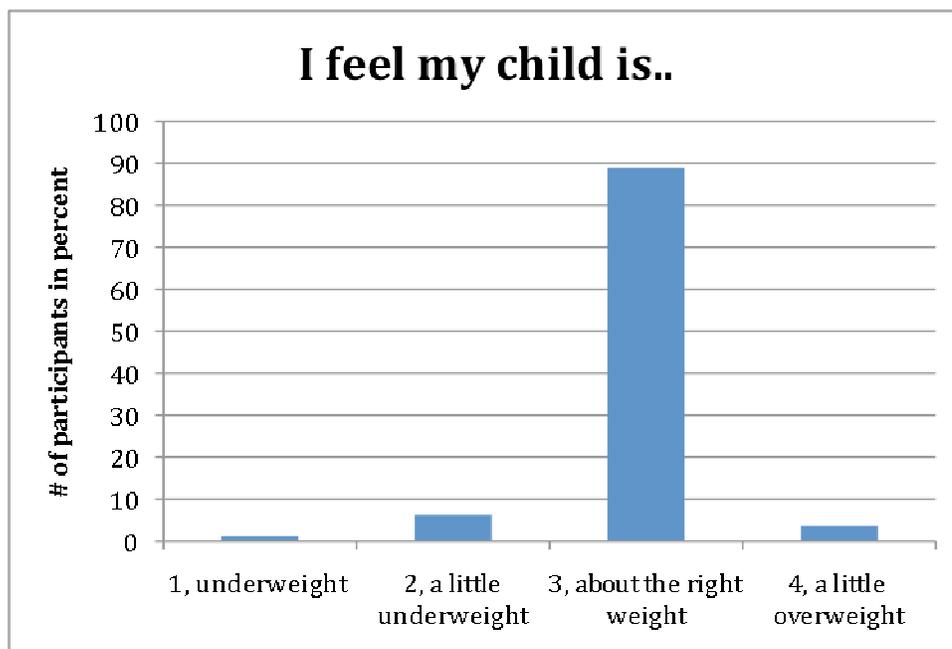


Figure 1. Parents’ verbal perception of their child’s weight status

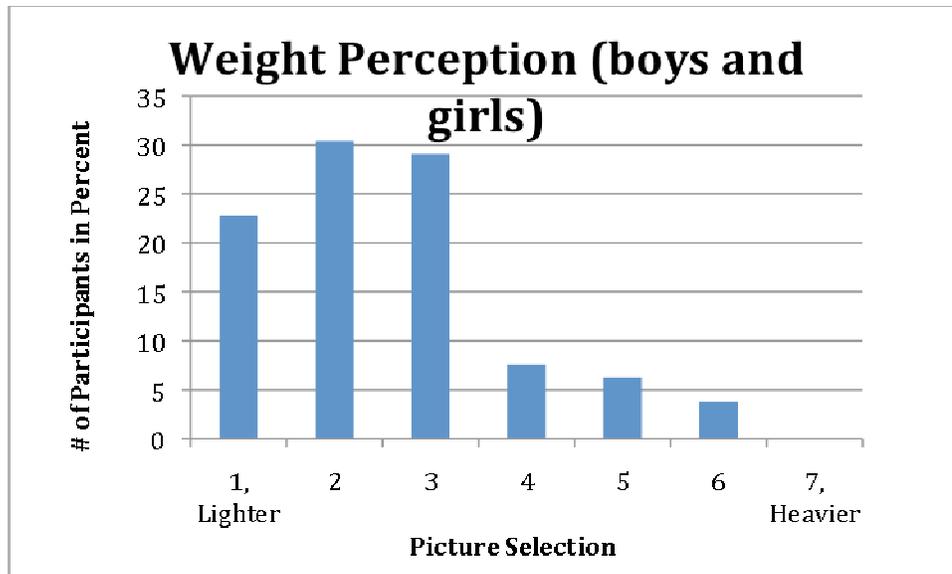


Figure 2. Parents' visual perception of their child's weight status

Bivariate Correlations

Table 2. shows the correlations between demographic characteristics and study variables. Several demographic and study variables showed significant correlations ($p < .05$), or a trend toward significance ($p < .10$). A mother's perception of her child's weight was positively related to the child's BMI. Mothers with children with higher BMIs did report higher perceptions of weight. However, as we saw from the previously mentioned descriptive statistics, mother's perceptions were not as high as their child's real status. Neither caregiver feeding style, demandingness, nor responsiveness was significantly related to child BMI. There was a correlation of $r = -.24$, $p < .05$ between demandingness on the part of the mother and how many children she has. There was also a significant correlation of $r = .25$, $p < .05$ between the doctor's concern about the child's weight and the parents' perception of their child. Those who had received a doctor's warning about their child's weight were more likely to perceive their child as heavier.

Table 2.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	1													
2. Education Level	.23*	1												
3. # of Children	.15	-.18	1											
4. Child Gender ^a	.05	.05	-.13	1										
5. Child age	.17	-.04	.15	.05	1									
6. Mom BMI	.02	.08	-.17	.06	.03	1								
7. Child BMI	-.24†	-.03	-.02	-.05	.05	.20	1							
8. BMI percentile	-.21†	-.10	.09	-.02	-.02	.24†	.76**	1						
9. I feel my child is	-.03	-.10	.13	.16	.21	.06	.27*	.11	1					
10. I am worried about my child's weight	.10	-.25*	-.27*	.01	-.05	.04	-.16	-.21	.16	1				
11. Doctor ever tell you your child was overweight? ^b	-.05	-.29**	-.004	-.01	.12	-.16	.10	.20	.25*	.07	1			
12. Weight perception Picture	-.20†	-.15	.11	-.51**	.07	-.06	.21†	.26*	.06	-.04	.30**	1		
13. Demandingness	-.11	.21	.24*	.05	-.15	.003	.06	.003	.09	-.11	-.03	.05	1	
14. Responsiveness	.01	.05	-.11	.11	.003	.20†	.10	.12	.001	.12	.15	-.02	-.04	1

14.Responsiveness														
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Correlations between Demographic and Study Variable

† $p < .10$; * $p < .05$, ** $p < .01$; a 1=female, 2=male; b 0=no, 1=yes

DISCUSSION

The goal of the current study was to examine the relationship between parent perception of child weight, parent feeding style and child BMI. One hypothesis was that parents' perception of their child's weight would not correlate significantly with their child's actual BMI. This hypothesis was partially supported. There was a significant correlation between parent perception, as indicated by the picture they chose to represent their child and their response about how they saw their child, and their child's actual BMI. Parents of children with higher BMIs chose responses that indicated a perceived higher weight status. However, based on parent reports, very few actually saw their child as overweight. Based on measured height and weight, 35.2% of the children were overweight, while only 3.7% of the mothers said they thought their child was "a little overweight." Only 10% chose a picture that represented a child over the 50th percentile. This suggests that parents are not completely aware of their children's weight status, despite the correlation.

As for the second hypothesis, there was no support for a relationship between parent feeding style and child BMI in the current study. Demandingness and responsiveness did not relate to child BMI. Results did show that the amount of demandingness from a mother was less in families where there were more children. It is possible that mothers with more children did not have the resources or time to devote to mealtime. Although we did not see this translated to higher BMIs in this study, this relationship might suggest that efforts in families with multiple children may be especially needed.

Findings showed a positive relationship between the doctor's concern and the mother's perception of her child's weight status. If a doctor said the child might have a weight issue,

parents were more likely to see it that way. Again, parents did not seem to see their child's weight as a major concern, as very few parents reported "worrying" about their child's weight. However, these results do suggest that being told about your child's weight by a health professional could be useful. If parents were more aware of the weight status of their children, it would help in the prevention of obesity.

One major limitation to this study was the use of self-report measures. Self-report measures can be less accurate because respondents might answer in a way they consider socially desirable and not reflect their true behavior or attitudes. Inaccuracies in self-reported data can influence the correlations. Another limitation to the study was the number of variables being examined. Although there were significant correlations between some of the existing variables, extending the research and looking at other variables, such as stress and family problems, may have added valuable information to our understanding of child BMI. Finally, an examination of the children's nutrition habits, not just BMI, might have yielded a relationship to parent feeding style we didn't find with BMI itself.

The results from the current study suggest that parents' perceptions of their child's weight could be a barrier to promoting healthy nutrition and activity habits in preschool-age children. If parents don't see their child as overweight when the child is overweight, they may not do the preventative behaviors necessary to get their child on the right track. This could be an important area to target for future intervention.

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