

MATERNAL FEEDING BEHAVIOR AND CHILD SELF-ESTEEM IN SERIOUSLY
OVERWEIGHT CHILDREN

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Research conducted with parents of primarily normal weight children has found that certain parental feeding practices and attitudes, including restriction of child access to food and concern about child weight, have been associated with lower levels of children's self-esteem. The nature of the association between parental feeding and child self-esteem in seriously overweight children has not been examined. The primary aim of this study was to evaluate the relationship between maternal feeding practices (including maternal restriction, monitoring, and concern) and children's global self-worth and physical appearance esteem in a sample of 110 seriously overweight boys and girls seeking family-based behavioral weight loss treatment. Children were an average of 10.11 years old ($SD=1.16$) and had BMI scores ranging from 23.78 to 55.19 ($M = 31.69$, $SD = 5.28$). Measures of maternal feeding practices, child self-esteem, and demographic information were collected prior to the beginning of treatment. Higher maternal monitoring was associated with higher global self-worth in boys and lower global self-worth in girls. Higher maternal monitoring was associated with higher physical appearance esteem in both boys and girls. Future research that explores the total family feeding environment and employs measures of parental feeding that are appropriate for seriously overweight children may offer a richer understanding of the relationship between feeding practices and self-esteem. Additionally, interventions designed to teach parents different feeding practices according to their children's gender might enhance treatment outcomes.

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1. SELF-ESTEEM	5
1.2. CHILD SELF-ESTEEM AND OVERWEIGHT	7
1.3. PARENTING AND CHILD SELF-ESTEEM	13
1.4. PARENT FEEDING BEHAVIOR AND CHILD SELF-ESTEEM	14
1.5. SUMMARY, GOALS, AND HYPOTHESES	19
2. METHOD	23
2.1. PARTICIPANTS	23
2.2. PROCEDURE	25
2.3. MEASURES	27
2.3.1. Predictor Variables.....	27
2.3.1.1. Child Feeding Questionnaire (CFQ; Birch et al., 2001)	27
2.3.1.2. Demographic and Medical Information.....	27
2.3.2. Outcome Variable	28
2.3.2.1. Self-Perception Profile for Children (SPP; Harter, 1985)	28
3. DATA ANALYTIC PROCEDURE	29
4. RESULTS	30
4.1. MATERNAL FEEDING PRACTICES AND CHILD SELF-ESTEEM	30
4.1.1. Global Self-Worth.....	30
4.1.2. Physical Appearance Esteem	31
4.2. GENDER EFFECTS.....	32
4.2.1. Global Self-Worth.....	32
4.2.2. Physical Appearance Esteem	35
4.3. ETHNICITY EFFECTS.....	36
5. DISCUSSION	40
5.1. FINDINGS	40
5.1.1. Maternal Feeding Practices, Gender, and Global Self-Worth	40
5.1.2. Physical Appearance Esteem, Maternal Feeding Practices, and Gender.....	42
5.1.3. Measurement of Maternal Feeding Practices.....	43
5.1.4. Physical Appearance Esteem, Maternal Feeding Practices, and Child Ethnicity	45
5.2. LIMITATIONS.....	46
5.3. FUTURE DIRECTIONS	47
APPENDIX A.....	50
BIVARIATE CORRELATIONS BETWEEN RELEVANT PREDICTOR AND OUTCOME VARIABLES	50
APPENDIX B	51
ITEMS INCLUDED IN CHILD FEEDING QUESTIONNAIRE SUBSCALES.....	51
BIBLIOGRAPHY.....	53

LIST OF TABLES

Table 1. Child Characteristics.....	24
Table 2. Maternal Characteristics	26
Table 3. Simultaneous Regression Predicting Global Self-Worth Using the CFQ	30
Table 4. Simultaneous Regression Predicting Physical Appearance Using the CFQ.....	31
Table 5. Means and Standard Deviations of CFQ and SPP by Gender	32
Table 6. Simultaneous Regression Predicting Global Self-Worth Using the CFQ and Gender...	33
Table 7. Backwards Elimination Regression Predicting Global Self-Worth Using the CFQ and Gender.....	34
Table 8. Simultaneous Regression Predicting Physical Appearance Esteem Using the CFQ and Gender.....	36
Table 9. Means and Standard Deviations of CFQ and SPP by Ethnicity	37
Table 10. Backwards Elimination Regression Predicting Physical Appearance Using the CFQ and Ethnicity	39

LIST OF FIGURES

Figure 1. Interaction between maternal monitoring and child gender in the prediction of global self-worth	35
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1. INTRODUCTION

The prevalence and severity of pediatric obesity have increased significantly over the last two decades. Approximately 15.3% of American children ages 6 through 11 years are overweight (\geq 95th percentile of body mass index (BMI) for children of the same age and gender; Ogden, Flegal, Carroll, & Johnson, 2002). Notably, the greatest increases in obesity prevalence have occurred among the heaviest children, and these children are facing significant medical morbidity at very young ages. Research suggests that these severely overweight children are more likely than those who are less seriously overweight to become obese adults, highlighting the importance of intervening with this population (Serdula et al., 1993).

In addition to medical morbidity, the psychological concomitants of childhood obesity have been documented. Although the degree of psychological problems in obese children has been disputed, it is clear that a considerable proportion of overweight children are experiencing significant psychological distress. Several studies have demonstrated positive associations between various measures of psychological distress and child degree of overweight, suggesting that seriously overweight children are at increased risk of experiencing psychosocial problems (Brown et al., 1998; Kimm et al., 1991; Manus & Killeen, 1995; Mendelson & White, 1985).

One particularly important index of psychological functioning is self-esteem. Low global self-esteem has been associated with decreased motivation and performance (Bandura, 1977; Coopersmith, 1967), social isolation (Connolly, White, Stevens, & Burstein, 1987), depression, anxiety, and suicidal ideation (Harter, Marold, & Whitesell, 1992; Sheslow, Hassink, Wallace, &

DeLancey, 1993). Conversely, positive self-esteem has been associated with general self-regard, social confidence, and school ability (Robinson, Shaver, & Wrightsman, 1991) and internal locus of control (Abbey, Andrews, & Halman, 1992). Thus, self-esteem appears to play an important role in overall psychological functioning.

Because of the social stigma associated with overweight, many researchers have suggested that overweight children have lower self-esteem than their normal weight counterparts. Studies examining the relationship between overweight and self-esteem have yielded equivocal results, with the majority of studies finding some evidence that overweight children have marginally lower global self-esteem than do their non-overweight peers (see French, Story, & Perry for meta-analysis, 1995). However, examinations of the relationship between BMI and specific domains of self-esteem more germane to overweight (e.g., physical appearance esteem, social acceptance esteem, body esteem) have produced more consistent findings suggesting that overweight children have lower self-esteem in these domains compared with their normal weight peers.

Self-esteem also appears to be particularly important in overweight children seeking weight loss treatment. O'Brien and colleagues (1990) found that among a group of 4th- through 6th-grade African American children, baseline self-esteem was the strongest predictor of a decrease in degree of overweight over one year, even though self-esteem was not targeted in the intervention. This suggests that higher levels of self-esteem might contribute to the ability to decrease overweight. Additionally, decreases in children's degree of overweight during weight-loss treatment predicted improvement in children's psychological functioning (Myers, Raynor, & Epstein, 1998), whereas increases in BMI over 1 year in 9-year old children were associated with negative changes in child psychological functioning, independent of degree of overweight

(Kolody & Sallis, 1995). Because of its association with weight change, self-esteem appears to be a particularly relevant construct for obese children participating in weight loss treatment.

To date, much of the research examining the relationship between pediatric overweight and self-esteem has focused on main effects, rather than possible mediators and moderators (Friedman & Brownell, 1995). In order to enhance self-esteem and increase the likelihood of weight loss, it is important to understand what factors may be contributing to the variability in self-esteem among overweight children. Because parents play a vital role in the development of their child's self-esteem (Eskilson & Wiley, 1987), researchers have examined parental behaviors and attitudes that may impact children's self-esteem. In Costanzo and Woody's (1985) domain-specific parenting model, parents who are concerned with a specific "deviant" area of their child's life (e.g., obesity proneness) are more likely than are parents without such concerns to constrain their child's behavior in that domain. They suggest that this constraint is expressed to the child via high-constraint parenting strategies (e.g., restriction of food intake, frequent monitoring, taking control) and through transmission of high levels of concern to the child (e.g., verbal warnings, anxiety). Investigators have suggested that the child may interpret this constraint as a sign of disapproval and consequently, negatively impact his or her self-esteem (Davison & Birch, 2001, 2002).

Several studies have examined the relationships between child self-concept and parental concern about child overweight, restriction of child eating, and weight-related comments, and have found evidence for an association (Davison & Birch, 2001, 2002; Pierce & Wardle, 1993; Smolak, Levine, and Schermer, 1999). However, all of these studies were conducted with White children from primarily middle- to upper-class families, and thus, it is not known whether these findings generalize to ethnic minority children or families with lower socioeconomic status. For

example, Kimm and colleagues (1997) found that the relationships between obesity, global self-worth, and physical appearance esteem differ among African American girls compared to their White counterparts and suggest that the relatively high prevalence of obesity among African American mothers confers a protective effect on their children's self-esteem. Furthermore, studies to date have focused primarily on normal weight children. Thus, the relationships found in these samples may exist because the parent's degree of concern is not consistent with the child's degree of overweight. It is conceivable that the observed relationships between parental feeding behaviors and child self-esteem may differ in children who are seriously overweight. Moreover, children seeking weight-loss treatment are likely to be more distressed than are children in community-based samples, so it is unclear if previous findings apply to a treatment-seeking population. Finally, two of the studies described above were conducted with girls aged five and seven years, respectively. At those ages, self-concept, rather than self-esteem, is measured and the importance of physical appearance to self-esteem is not as strong as in older children. Thus, it is unclear if these relationships will hold in a sample of older overweight girls and boys.

The current study will address the following objectives:

Specific Aim: Examine the relationships between maternal feeding behaviors and attitudes and child global and domain-specific self-esteem among a group of seriously overweight children seeking weight loss treatment.

Secondary Aim 1: Evaluate whether the relationship between maternal feeding behaviors and attitudes and child self-esteem is moderated by child gender.

Secondary Aim 2: Conduct a preliminary exploration to characterize the nature of the relationship between maternal feeding behaviors and attitudes, self-esteem, and ethnicity.

1.1. SELF-ESTEEM

Self-esteem and self-concept are often used interchangeably in the literature, but there are several important distinctions between the two terms. Self-concept is generally thought of as a sum of the attributes, abilities, attitudes, and values that an individual believes describe him or her. Self-esteem is the aspect of self-concept that is evaluative, involving judgments about one's own worth and is typically thought of as how much one likes oneself (Harter, 1999). Self-esteem may connote global judgments of self-respect, self-worth, or self-acceptance (often referred to as general or global self-esteem or self-worth) or domain-specific evaluations of aspects of the self in areas such as physical appearance, academics, behavioral conduct, athletics, and social acceptance (Harter, 1990a). Self-esteem may be a particularly relevant index of psychosocial distress as research indicates that low feelings of self-esteem mediate the development of psychological symptoms and academic difficulties (Harter, 1986, 1993). Moreover, self-esteem is often negatively correlated with measures of psychosocial distress, such as depressive symptomatology, behavioral problems, anxiety, low life satisfaction, and other adjustment problems such as alcohol and drug abuse, suicide, and juvenile delinquency (Blascovich & Tomaka, 1991; Harter, 1990b; Lipka & Brinthaup, 1992). Thus, improving self-esteem might enhance other aspects of psychological functioning and decrease overall distress.

Global self-esteem is generally stable during childhood, but levels tend to drop during the transition from elementary to junior high school (Alvidrez & Weinstein, 1993; Reyes,

Gillock, Kobus, & Sanchez, 2000) and the decline is particularly evident in the physical appearance domain of self-esteem (Blyth, Simmons, & Carlton-Ford, 1983). Also around this time, several gender differences in self-esteem begin to emerge. Research suggests that girls report lower general self-esteem than do boys (Block & Robins, 1993; Blyth, Simmons, & Carlton-Ford, 1983; Israel & Ivanova, 2002; Mendelson & White, 1985; Skaalvik, 1986). A meta-analysis of studies evaluating gender differences in self-esteem (Kling, Hyde, Showers, & Buswell, 1999) found that the effect size of gender differences increased each year until children reached the age of 16, when effect sizes began to decrease. Effect sizes were small between the ages of 7-10 ($d = .16$) but became slightly larger between the ages of 11-14 ($d = .23$). The effect of gender on self-esteem was the same for both African American and White children.

Gender differences are most pronounced in specific domains of self-esteem. Boys typically describe themselves more positively than do girls in the areas of physical and academic competencies (DeBacker & Nelson, 2000) and view these competencies as more important than do girls (Crystal, Chen, Fuligni, & Stevenson, 1994). Girls generally describe themselves more positively in the area of social competencies and tend to view these competencies as more important than do boys (DeBacker & Nelson, 2000). However, these gender differences did not emerge in a study of overweight children seeking weight loss treatment, suggesting that different dimensions of self-esteem may predict global self-esteem in overweight children compared to their non-overweight peers (Israel & Ivanova, 2002). The importance of physical appearance to global self-esteem increases during early adolescence, particularly for females (Harter, 1998; Jarvie et al., 1983), and global self-worth is most highly correlated with self-perceptions in physical appearance for children around age ten (Harter, 1985; Manus & Killeen, 1995). This is

a critical time for overweight children, as deficits in physical appearance self-esteem are likely to affect global self-worth.

Ethnic differences in self-esteem have also been identified, with African American children typically reporting higher global self-worth than do their White counterparts (Kling, Hyde, Showers, & Buswell, 1999). Among girls, ethnic differences appear to be more pronounced, as changes in self-esteem appear to follow different developmental trajectories. For girls participating in the National Heart, Lung, and Blood Institute (NHLBI) Growth and Health Study, average global self-worth decreased in White girls over ages 9-14, but increased slightly for African American girls (Brown et al., 1998). Mean physical appearance scores for both ethnicities declined between ages 9 and 14, and mean social acceptance scores increased for both ethnic groups during this timeframe. Average global self-worth and social acceptance scores were higher among African American girls than White girls at every age but nine years, and physical appearance scores were higher in African American girls compared to White girls at every age. Neither the significance nor direction of the ethnic differences in the trajectories changed after adjusting for maturation stage, BMI, and household income. Despite differences in average self-concept scores, the importance of physical appearance and social acceptance to global self-worth was found for both ethnicities. These results suggest that self-esteem follows a different developmental course for African American girls than it does for White girls.

1.2. CHILD SELF-ESTEEM AND OVERWEIGHT

Research exploring the relationship between self-esteem and obesity has yielded equivocal results. Many cross-sectional studies have found lower global self-esteem in obese children and adolescents compared to their normal-weight peers (Banis et al., 1988; Braet et al., 1997; Kaplan

& Wadden, 1986; Kimm, Sweeney, Janoskey, & MacMillan, 1991; Pierce & Wardle, 1993; Sallade, 1973; Strauss, Smith, Frame, & Forehand, 1985), although other studies have found no difference (Mendelson & White, 1995; Wadden, Foster, Brownell, & Finley, 1984).

Examination of multiple dimensions of self-esteem, particularly those likely to be affected by overweight, appears to offer a more precise characterization of the relationship between overweight and self-esteem. Among children and adolescents, several cross-sectional studies have found relationships between overweight and low physical appearance self-esteem (Hill, Draper, & Stack, 1994; Manus & Killeen, 1995; Mendelson, White, & Mendelson, 1996; Phillips & Hill, 1998; Pierce & Wardle, 1993). Moreover, overweight children tend to have lower body esteem, a construct closely related to physical appearance self-esteem, than do their normal weight peers (French, Story, & Perry, 1995; Mendelson & White, 1982, 1985). Physical appearance self-esteem is a significant predictor of global self-esteem among preadolescent children (Harter, 1985; Manus & Killeen, 1995), particularly among girls, suggesting low physical appearance self-esteem may impact overall self-worth. Among overweight, treatment-seeking African American children ages 8-10, girls scored lower on physical appearance self-concept than did boys; however, there was no gender difference in global self-worth scores (Young-Hyman, Schlundt, Herman-Wenderoth, & Bozylinski, 2003).

Several studies have found associations between overweight and low perceived athletic self-concept (Braet et al., 1997; Phillips & Hill, 1998). However, in a study of overweight children seeking weight loss treatment, Israel and Ivanova (2002) reported a gender by percent overweight interaction, with girls in the highly overweight group (mean overweight = 71.36% over Ideal Body Weight) reporting lower physical self-esteem (a construct similar to athletic self-esteem) than those in the moderately overweight group (mean overweight = 38.36% over

IBW). Conversely, boys in the highly overweight group (mean overweight = 66.30% over IBW) reported higher physical self-esteem than did boys in the moderately overweight group (mean overweight = 39.46% over IBW). These findings suggest that in a population of severely overweight children, a gender difference in physical self-esteem is likely, with boys reporting higher physical self-esteem than girls. This difference may be due to increased availability of opportunities for boys to participate in sports, such as football, where overweight status may actually be an advantage, rather than a detriment. Moreover, this study highlights the importance of considering the degree of overweight and its impact on self-esteem.

Additionally, social acceptance self-esteem appears to be lower among overweight children than among their normal weight peers (Banis et al., 1988; Manus & Killeen, 1995). Related research suggests that overweight children may have difficulties with peer acceptance. Latner and Stunkard (2003) found that children do not prefer overweight peers as friends, and another study documented that nine-year old children rated overweight figure drawings as having poor social functioning, impaired academic success, and low perceived health, healthy eating, and fitness (Hill & Silver, 1995). Thus examination of multiple self-esteem domains helps to better characterize the relationship between overweight and child self-esteem.

Ethnic differences in the relationship between overweight and child self-esteem have been identified. Researchers have suggested that African Americans may differ from Whites in the psychological consequences of obesity because they may have a more socially tolerant attitude due to its relatively higher prevalence in the African American community (Desmond, Price, Hallinan, & Smith, 1989; Kumanyika, Wilson, & Guilford-Davenport, 1993). In a study of African American inner-city boys and girls in grades 4-12, researchers found no relationship between obesity and self-esteem (Kaplan & Wadden, 1986). Most of the studies examining

ethnic differences have focused on ethnic differences between White and African American girls. Brown and colleagues (1998) found that self-esteem follows a different developmental course for African American girls than it does for White girls. In general, African American girls had higher and more stable self-worth than did their White counterparts. The authors theorized that these disparities were due to ethnic differences in attitudes about physical appearance and obesity (Brown et al., 1998). Another study conducted with this cohort of girls found ethnic differences in attitudes towards obesity and physical appearance. African American girls at ages 9 and 10 were more satisfied with their body build and appearance than were White girls, regardless of their BMI. Additionally, their preferred body build and expected adult body size were significantly larger than those of White girls (Ghee, 1990). Researchers have suggested that subcultural expectations and ideals regarding African American women's appearance and behavior may underlie African American girls' body build preferences (Kumanyika, Wilson, & Guilford-Davenport, 1993; Melnyk & Weinstein, 1994).

Among nine and ten year-old girls enrolled in the NHLBI study, social acceptance esteem was significantly and negatively correlated with adiposity in Whites, but not African Americans (Kimm et al., 1997). The relationship between adiposity and social acceptance esteem for Whites appeared nonlinear with the effect mostly at the higher end of adiposity. The physical appearance score for White girls declined continuously from lower levels of adiposity to higher levels; however, physical appearance scores for African American girls had a less steep decline and plateaued at the higher end of adiposity. The decline in global self-worth scores was most notable among Whites, though there was a slight increase in global self-worth at low levels of adiposity with an overall decline thereafter among African American girls. Adiposity appeared to exert its greatest influence on physical appearance scores relative to social acceptance esteem

and global self-worth. Although adiposity was the only significant predictor of physical appearance esteem for both ethnicities, adiposity accounted for twice as much variance in esteem scores for White participants than it did for African American participants. Thus, it appears that adiposity plays a more salient role in determining physical appearance self-concept for White girls than for African American girls. Adiposity affected scores on physical appearance, social acceptance, and global self-worth less for African Americans than for Whites. Physical appearance self-esteem scores declined across the range of adiposity and dropped further at the highest degree of adiposity in White girls, but there was a less steep decline among African Americans and it leveled off at the 90th percentile of adiposity. Scores declined for African American girls once they crossed the “overweight” threshold (> 80th percentile), but Kimm and colleagues (1997) suggest that the plateau at the 90th percentile may stem from the protective effect conferred by the social tolerance of obesity combined with the relatively high prevalence of severe obesity among adult African American female household members.

Although many studies have found differences in self-esteem between overweight and nonoverweight children, it is important to note that others have found few or no differences between these groups (see French, Story, & Perry, 1995 for review; Kaplan & Wadden, 1986; Wadden, Foster, Brownell, & Finley, 1984). Inconsistent findings may be due to differences in age, ethnicity, gender, and degree of overweight among participants, the instrument used to measure self-esteem, differing standards for the measurement of overweight, and the type of self-esteem examined (specific domains vs. global).

Furthermore, it is important to consider the overweight child’s clinical status when determining whether they differ from their nonoverweight peers on measures of self-esteem because psychological distress may be one of the factors prompting the child to seek treatment.

Braet, Mervielde, and Vandereycken (1997) found that a treatment-seeking group of overweight children ages 9-12 scored lower on a measure of physical self-esteem and had more parent-reported behavioral and emotional problems than a non-clinical group of overweight children. Another study by Kimm, Sweeney, Janosky, and MacMillan (1991) found that treatment-seeking nonwhite girls scored lower on self-concept measures than did their male and White female counterparts. Because the influence of peers on child self-esteem becomes more salient as children transition to adolescence and a more peer-dominated environment, the finding of lower self-esteem in African American girls may be related to their earlier pubertal onset and subsequent increased peer pressures of adolescent social life. Moreover, because parents seek treatment for their children, treatment-seeking status may confer an additional risk of lower self-esteem because it reflects parental concern, and possibly child concern, and perhaps disapproval of child weight status. For example, Pierce and Wardle (1997) found that among overweight children seeking weight loss treatment, those children who attributed their overweight status to internal causes (e.g., eating too much, not exercising enough) had lower self-esteem than children who attributed their overweight to external causes (e.g., familial predisposition, medical cause). Thus by the parent enrolling the child in treatment, the child may receive the message that he or she is overweight due to internal causes. Such differences in methodology and sample characteristics complicate attempts to draw conclusions about the effect of overweight on child self-esteem. In summary, it is clear that there is considerable heterogeneity in dimensions of self-esteem among overweight children. However, available evidence suggests the existence of an at-risk psychological profile for a subset of obese children (Braet, Mervielde, & Vandereycken, 1997). In order to best help this group, it is important to understand what factors explain the variability in self-esteem among overweight children.

1.3. PARENTING AND CHILD SELF-ESTEEM

Around the age of seven or eight, children begin to internalize the opinions and expectations of significant others, primarily parents and peers. The beliefs, expectations, and ideals of a child's parents/caregivers and peer group are central to how the child evaluates him or herself (Harter, 1998). Parental support and acceptance have been associated with the development of positive self-esteem among children and adolescents, highlighting the important role parents play in their child's healthy psychosocial development (Eskilson & Wiley, 1987; Feiring & Taska, 1996).

Current conceptualizations of the associations between parent-child interactions and child self-esteem stem from Cooley's (1902) early work that subsequently was adapted and empirically tested by Harter (1998). According to Cooley, a child learns to distinguish self from other through social interaction, and consequently, becomes aware of the opinions of others. These opinions are subsequently internalized and used as a means of social comparison. Cooley terms the result of this process the "looking glass self," a concept of self in which the attributions you make of yourself are a function of the attributions that others make of you. A considerable body of research supports the validity of this theory (see Harter, 1998, for a review). Parental opinions about the child are likely to be transmitted via comments, attitudes, and behaviors directed towards the child. If parental opinions and comments about the child are negative, the child is likely to view him or herself in a negative manner. This theoretical paradigm has heuristic value in helping us to understand how children's body size is related to parent comments and consequently, child self-concept. Given the relationship between parent comments and opinions and related parenting qualities and child self-esteem, it is potentially useful to examine this relationship in a sample of overweight children seeking family-based weight loss treatment. If such a relationship exists, it is possible that interventions could be

developed that would target parenting behaviors that affect children's self-esteem, which may lead to improved psychosocial functioning and possibly greater weight loss. Among seriously overweight children, parental opinions related to the child's weight status might be particularly influential on children's self-perceptions. These opinions may be transmitted via parenting attitudes and behaviors related to the feeding environment.

1.4. PARENT FEEDING BEHAVIOR AND CHILD SELF-ESTEEM

Parenting attitudes and behaviors related to their child's obesity status are of particular interest, rather than just general parenting attitudes and behaviors. According to Costanzo and Woody's domain-specific parenting model (1985), parents who are concerned with their child's obesity proneness are more likely to constrain their child's behavior in that domain. The impact that food and weight-related constraints have on the child's adjustment are important to assess and may reveal more about the relationship between parenting and child outcomes compared to assessments of general parenting behaviors. For example, a weight-related measure assessing parental overconcern about child weight was a better predictor of social and emotional adjustment among overweight children than a more general family functioning scale (Stradmeijer, Bosch, Koops, & Seidell, 2000).

Parenting attitudes and behaviors have been frequently examined in the context of their contribution to children's aberrant eating and maladaptive attitudes about weight and shape. These findings are likely to be relevant to overweight children's self-esteem. Both general family dysfunction and a family environment that emphasizes thinness and encourages dieting may contribute to children's maladaptive eating behaviors. In particular, parents may make critical comments about child weight or they may model aberrant eating and weight concerns.

As children get older, parents are increasingly likely to criticize their children's physical appearance (Striegel-Moore & Kearney-Cooke, 1994). Teasing and negative parental comments about weight and shape have been associated with children's disturbed eating attitudes and behavior (Levine, Smolak, & Hayden, 1994). A child's perception that his or her parents are concerned with his or her weight has been associated with the child's level of body dissatisfaction (Thelen & Cormier, 1995). Additionally, mothers who found fewer body shapes acceptable for their child reported using more restrictive feeding practices with their children (Musher-Eizenman, Holub, Edwards-Leeper, Persson, & Goldstein, 2003). These findings offer support for the notion that parent attitudes about eating and weight impact their child's attitudes and the concept of domain-specific parenting.

Because parental constraints are associated with children's problems in self-regulation of behavior, one must also consider how the parent's beliefs and attitudes affect the child's self-beliefs. Belfer (1983) proposed that parental appraisal of a child as having positive body attributes served as a basis for self-esteem; thus one can infer that parental appraisal of the child as having negative bodily attributes will also influence self-esteem. For example, in the severely overweight child with a parent who is concerned about the child's weight and restricts the child's access to food, there is a significant discrepancy between parental expectations and the child's actual weight status. Children may perceive this as a lack of acceptance and feel increasingly dissatisfied with their own weight, appearance, and self as they are unable to meet their parent's expectations. On a related note, adults and children engage in cognitive defenses to maintain their levels of self-esteem (Harter, 1998; Tesser, 1988), and research suggests that overweight children use distortion to maintain high self-esteem (Manus & Killeen, 1995). Negative parental

comments or behaviors related to child weight or eating behavior may interfere with this mechanism.

Davison and Birch (2001) proposed that the social context an overweight child experiences provides clues about the acceptability of his or her weight status, and specific environmental factors may either place the child at risk for or protect the child from self-deprecating thoughts. With the emotional and physical well being of their child in mind, parents of an overweight child may respond to their child's weight status by expressing concern and modifying the feeding environment. Concerned parents may either directly or indirectly criticize their child in an attempt to encourage behavior change. Additionally, concerned parents may impose strict regulations on the amount and type of food their child consumes in an effort to promote weight loss. This expression of control and concern may send children the message that their weight is undesirable and that they are incapable of controlling their eating behavior. Ultimately, these messages may negatively impact an overweight child's developing sense of self.

In a similar vein, Pierce and Wardle (1993) suggested that overweight children may understand from parents that their body size indicates that they eat too much and need to be more physically active. They proposed that these attitudes imply parental dissatisfaction with the child's appearance and behavior and could influence the child to form a negative self-appraisal and consequently, lower self-esteem. Pierce and Wardle tested this theory by examining the influence of body size, parental appraisal of body size, and children's beliefs about parental appraisal, on self-esteem in children ages 9- to 11-years old. They found that children were accurate predictors of parental evaluation of whether the child was "too thin," "just right," or "too fat." Additionally, child self-esteem scores were inversely associated with parental

dissatisfaction and beliefs about parental dissatisfaction. For boys, lower self-esteem was associated with thinness and being perceived as too thin. For girls, lower self-esteem was associated with heaviness. In these analyses, the associations between parental dissatisfaction with children's body size, as well as children's beliefs about parental dissatisfaction, and lower global self-concept were not independent of weight status, making it difficult to determine if parental reaction mediates the relationship between weight status and self-concept or whether parental reaction shares variance with both variables.

Smolak, Levine, and Schermer (1999) examined the contributions of mother's and father's direct comments about child's weight and expression of their own weight concerns on child's body esteem, weight-related concerns, and weight loss attempts. The sample was composed of 148 fourth grade and fifth grade boys and girls enrolled in a curriculum evaluation program for eating disorders prevention. Data were also collected from 59 mothers, 17 fathers, and 72 mother/father dyads from primarily White and working to middle class families. They found that mothers were more likely to comment on child weight to their daughters than to their sons; fathers were equally likely to make comments to daughters and sons. Maternal dieting and parental complaints concerning their own weight were related to daughters' body esteem scores, but not sons'. The investigators also found that children were more concerned about fat and made more weight loss attempts when both parents commented on child weight than when neither parent commented. Among girls in the study, mothers', but not fathers', comments about child weight were significantly correlated with daughters' body esteem scores and concern about gaining weight. Among boys in the study, mothers' comments were related to sons' body esteem score and fathers' comments were correlated with sons' concern about becoming overweight.

In conclusion, direct parental comments, particularly those made by the mother, appear to have an influence on children's weight-related beliefs and behaviors, and girls appear to be more affected by these comments than are boys, highlighting an important gender difference. Another important finding was that mother's concern about child's weight status was associated with lower child-reported body esteem. This relationship was not independent of weight status, making it difficult to tease apart the relationships among parental comments, weight status, and self-esteem. However, controlling for weight status in a sample of primarily normal weight children may mask an important consideration. These data suggest that parent comments about child weight have negative consequences, particularly in the case of mildly or moderately overweight children. The question of how to best respond to a seriously overweight child remains.

In a series of studies following a cohort of non-Hispanic White girls ages 5 and 7, Davison and Birch (2001, 2002) examined whether parental concern about child overweight or restriction of access to food was associated with negative self-evaluations among girls. They found that parents of five year-old overweight girls reported significantly higher levels of concern than did parents of nonoverweight girls. Moreover, study investigators identified an inverse relationship between father's concern about daughter's weight status and girls' body esteem, as well as an inverse relationship between maternal concern and girls' perceived physical ability and perceived cognitive ability. All of these relationships were independent of girls' weight status. Additionally, they explored whether higher weight status, combined with parental concern or restriction, was associated with lower self-concept. Results indicated a negative interaction between maternal restriction and girls' weight status in predicting girls' perceived physical and perceived cognitive ability (i.e., when maternal restriction of child access to food

was high, heavier girls reported substantially lower perceived physical and cognitive ability). Additional analyses were conducted to determine if the identified relationships between parental concern and restriction and girls' self-concept were a reflection of the association between concern/restriction and general practices of parental control. The pattern of results did not change after controlling for general parental control.

Next, the authors (Davison & Birch, 2001, 2002) tested a mediational model to determine if peer teasing and parent weight-related criticism mediated the relationship between girl's weight status and self-concept. They found that peer teasing and parent criticism mediated the relationship between weight status and self-concept at age seven, but not at age five. Additionally, the duration and timing of parent criticism across ages five and seven mediated the association between girls' weight status at age five and perceived peer acceptance at age seven. In summary, parental restriction and weight-related criticism appear to play a salient role in the relationship between girl's weight status and low self-concept. Limitations of these studies include use of a homogenous sample in terms of ethnicity, gender, SES, and family composition (all children were living with both biological parents). Moreover, due to the young age of the participants, self-concept was assessed instead of self-esteem, and the impact of parental concern and restriction on children's physical appearance self-esteem was not measured.

1.5. SUMMARY, GOALS, AND HYPOTHESES

In summary, the existing literature lends support to the notion that parental feeding behavior, concern about child weight, and comments about child weight are associated with lower self-esteem in children. These relationships exist independently of child BMI but also mediate the relationship between child weight status and self-concept. However, several questions remain.

Because much of the previous research was done with five and seven year-olds, self-concept rather than self-esteem was measured, and the status of children's physical appearance self-esteem, a construct particularly germane to overweight children, was not measured. Weight-related parental criticism increases as children get older, so it is essential to consider child age in the examination of these relationships. Moreover, these constructs have rarely been tested in boys, so gender differences in the relationships between parental feeding practices and attitudes and child self-esteem have not been examined. These relationships are likely to differ by gender because girls appear to be more concerned than boys about weight and body shape (Smolak, Levine, & Schermer, 1998; Thelen, Powell, Lawrence, & Kuhnert, 1992), parents are more critical of girls' weight status than boys' (Pierce and Wardle, 1993; Striegel-Moore & Kearney-Cooke, 1994), and girls are more influenced than boys by parental approval or criticism of their physical appearance (Baker, Whisman, & Brownell, 2000; Eskilson & Wiley, 1987). Paternal and maternal weight concerns, beliefs, and input related to child weight appear to differentially affect children's eating and weight-related attitudes and behaviors, and maternal comments about child weight appear to be more strongly associated with child body esteem than paternal comments (Davison & Birch, 2001; Smolak, Levine, & Schermer, 1999). Furthermore, a relatively small number of fathers or male guardians participated in the current study; consequently, only data collected from mothers or female guardians will be examined. It is also unclear if the identified associations will hold in a socio-economically diverse sample that includes African American participants since previous research has been conducted in predominantly middle-to upper-class White samples.

Finally, all of the aforementioned studies were conducted in non-clinical, school- or community-based samples, where most participants fell within a normal weight range and few

children were severely overweight. The previously identified relationships between self-concept and parental feeding behaviors and attitudes may mean something different for the seriously overweight child, so these relationships may not generalize to a seriously overweight population. Increased maternal restriction, monitoring, and concern about child weight may be more appropriate when parenting a seriously overweight child. The child may experience and interpret these parenting behaviors in a more ego-syntonic manner and they may not impact child self-esteem as negatively as they might for a non-overweight child. However, given the fact that some of the relationships between parental feeding behaviors and concerns and child self-esteem were independent of child weight status, it is likely that these parenting practices will be associated with lower self-esteem in overweight children as well.

Hypothesis 1. Treatment-seeking seriously overweight children whose mothers demonstrate more restrictive feeding practices, closely monitor their child's food intake, and report high levels of concern about their child's weight will have lower global self-worth and physical appearance self-esteem than will children of mothers who show less restriction, monitoring, and concern.

Hypothesis 2. Girls will report lower global self-worth and physical appearance esteem than will boys. Furthermore, girls of mothers reporting a high degree of restriction, monitoring, and concern will report lower global self-esteem and physical appearance esteem than will boys of mothers with a high level of restriction, monitoring, and concern.

Hypothesis 3. White children will report lower global self-worth and physical appearance self-esteem than African American children.

Secondary Hypothesis: Exploratory analyses will suggest that African American children whose mothers report a high degree of restriction, monitoring, and concern will have lower

global self-worth and physical appearance self-esteem than White children whose mothers demonstrate a high degree of restriction, monitoring, and concern.

2. METHOD

2.1. PARTICIPANTS

A total of 110 severely overweight (defined as $\geq 160\%$ ideal weight for age and height) children and a parent or guardian were recruited for a family-based behavioral weight control study at the University of Pittsburgh Medical Center. For study inclusion, children were required to: 1) be between 8 and 12 years of age at time of initial inquiry; 2) have at least one parent or guardian who agreed to participate in the treatment program with the child, and; 3) be $\geq 160\%$ ideal body weight for height and age based on norms of the World Health Organization (Jeliffe, 1966). Exclusion criteria included: 1) mental retardation, pervasive developmental disorder or psychosis; 2) previously identified genetic obesity syndrome; 3) current involvement in obesity treatment or participation in a weight management program; 4) psychiatric symptomatology sufficiently severe to require immediate treatment; 5) inability to engage in moderate exercise, 6) severe medical conditions that required immediate weight management intervention (e.g., diabetes, pseudotumor cerebri or hypoventilation), and; 7) initiation of medications that affect weight status in the four months prior to assessment.

Slightly more than half of the child participants were female (53%). Seventy-one percent of the children were White and 29% were African American. Children were an average of 10.11 years old ($SD=1.16$) and had BMI scores ranging from 23.78 to 55.19 ($M = 31.69$, $SD = 5.28$). Additional child characteristics are depicted in Table 1.

Table 1. Child Characteristics

	<i>Range</i>	<i>M</i>	<i>SD</i>
Age	8.08-12.21	10.11	1.16
BMI	23.78-55.19	31.69	5.28
Percent over 50 th BMI percentile	32.95-218.12	89.18	30.14
Tanner Stage	1-4	1.73	.80
Self-Perception Profile			
Global Self-Worth	1.83-4.00	3.40	0.62
Physical Appearance	1.17-4.00	2.83	0.75
Social Acceptance	1.00-4.00	3.14	0.78
Athletic Competence	1.00-4.00	2.90	0.71
Scholastic Competence	1.50-4.00	3.17	0.73
Behavioral Conduct	1.33-4.00	3.22	0.68
		<i>%</i>	<i>n</i>
Male		47.3	52
White		70.9	78
African American		29.1	32

Participating mothers and/or female guardians ranged in age from 23 to 58 years ($M=41.65$, $SD = 6.65$). Mothers/female guardians were generally obese, with a mean BMI score of 34.92 ($SD = 9.21$; range = 18.31-70.83). Slightly more than half of the women were married or living with a partner (51.8%) and 35.5% were separated or divorced. Additional maternal information is presented in Table 2.

2.2. PROCEDURE

Interested parents or guardians completed initial telephone screenings to determine potential eligibility. If it appeared that the family met study criteria, they were asked to attend an informational meeting with other interested families. At this meeting, a member of the research team explained the purpose and requirements of the study. Participants' questions and concerns were addressed. Upon agreement to participate, parents or guardians signed consent forms approved by the University of Pittsburgh Institutional Review Board, and the child provided assent. Then, families were scheduled for a pretreatment physical examination.

After completing a study physical examination, participants scheduled a time to complete the pretreatment assessment. At this assessment, the child and parent or guardian participants were weighed in their street clothes without shoes and height was measured. The child and parent or guardian then proceeded to separate rooms to complete psychosocial questionnaires. Study staff read the questionnaires to the child participants in order to control for differing levels of reading comprehension and ability. Parent or guardian participants provided demographic information and completed questionnaires. The questionnaires were administered as part of a larger assessment battery that took approximately three hours to complete. Families received \$25 following completion of study assessments.

Table 2. Maternal Characteristics

	Range	<i>M</i>	<i>SD</i>
BMI	18.31-70.83	34.92	9.21
Age	23.76-58.50	41.65	6.65
Child Feeding Questionnaire			
Restriction	1.25-4.75	3.40	0.85
Monitoring	1.00-5.00	3.57	0.83
Concern	3.00-5.00	4.59	0.50
Child Perceived Overweight	2.60-5.00	3.63	0.38
Parent Perceived Overweight	2.00-5.00	3.58	0.60
Responsibility for Feeding	2.00-5.00	3.97	0.71
Pressure to Eat	1.00-4.50	1.75	0.82
		<i>%</i>	<i>n</i>
Married		51.8	57
Divorced or Separated		35.5	39
Education beyond High School		79.1	87
More than 4 Household Members		30.0	33
Annual Income Greater than 30,000		70.4	76
Own Home		75.2	82

2.3. MEASURES

The variables measured can be divided into 2 groups: predictor variables and outcome variables. Data for all variables were collected concurrently.

2.3.1. Predictor Variables

2.3.1.1. Child Feeding Questionnaire (CFQ; Birch et al., 2001)

The CFQ is a 31-item self-report measure designed to assess parental attitudes, beliefs, and practices regarding child feeding, with a focus on obesity proneness in children. The questionnaire was created for use with parents of children between the ages of approximately 2 to 11 years. Items are scored using a 5-point Likert-type scale. Factor analysis yielded a 7-factor model, including four factors that measure parental beliefs related to their child's obesity proneness (perceived responsibility for feeding, perceived parent weight, perceived child weight, and concern about child weight); and three that measure parental control practices and attitudes regarding child feeding (restriction, pressure to eat, and monitoring). The 7-factor model demonstrated good fit in two separate non-Hispanic white samples, and with minor modifications, also fit the data from one Hispanic sample. Internal consistency was good, with Cronbach's alpha ranging from .70 to .92 across subscales (Birch et al., 2001).

2.3.1.2. Demographic and Medical Information

Background variables include demographics (e.g., child gender, ethnicity, and family socioeconomic status) and child and parent BMI, which was calculated using the equation weight (kg)/height (m)².

2.3.2. Outcome Variable

2.3.2.1. Self-Perception Profile for Children (SPP; Harter, 1985)

The SPP is a 36-item self-report instrument designed for use with children ages 8-12 to assess perceived competence in five relevant specific domains (scholastic competence, social acceptance, athletic competence, physical appearance, and behavioral conduct) and overall self-worth (global self-worth). Each subscale consists of six two-part statements, half of which are reversed with respect to whether the first part of the statement indicates low or high competence. Items are scored from 1 to 4 with 4 representing higher competency. This instrument was selected because, in contrast to other instruments (e.g., Coopersmith Self-esteem Inventory; Coopersmith, 1967), the SPP was constructed to reduce the tendency for children to produce socially desirable responses. Moreover, several of the domains are particularly salient for overweight children (physical appearance, social acceptance). Reliability data for the SPP were obtained on four samples of children. Internal consistency was good (Cronbach's alphas = .71 to .86 across samples and subscales); correlations of subscales with global self-worth ranged from .30 to .73 across samples (Harter, 1985). For the present investigation, analyses were restricted to the prediction of child global self-worth and physical appearance esteem because these aspects of self-esteem are most likely to be affected by child obesity.

3. DATA ANALYTIC PROCEDURE

Data were analyzed with SPSS version 13.0. Initially, the distributions and correlations of all variables were examined to evaluate normality and multicollinearity. Maternal feeding variables (restriction, monitoring, and concern) were centered to adjust for multicollinearity. Predictor and outcome variables were examined for both univariate and multivariate outliers. Pearson (or Spearman, where relevant) correlation coefficients between all predictor and outcome variables were examined to identify potential covariates and are illustrated in Appendix A. Child age was significantly associated with child physical appearance esteem. Thus child age was included as a covariate in all of the following analyses predicting physical appearance esteem.

To examine the relationships between maternal feeding practices and child global self-worth and physical appearance esteem, a series of simultaneous multiple regressions were conducted. This method was selected as there were no *a priori* hypotheses concerning the order of variable entry. T-tests were conducted to examine whether there were significant gender or ethnic differences in child self-esteem. For all exploratory analyses, backwards elimination regression procedures were used to identify the model that contained the most relevant variables to predict self-esteem. For all analyses conducted using backwards elimination regression, a *p*-value of $p > .10$ was selected as the variable removal criterion.

4. RESULTS

4.1. MATERNAL FEEDING PRACTICES AND CHILD SELF-ESTEEM

4.1.1. Global Self-Worth

As depicted in Table 3, a simultaneous regression analysis was conducted to examine the predictive relationship between maternal feeding practices and children's global self-worth. Maternal feeding practices (i.e., restriction, monitoring, and concern) were entered into the regression model simultaneously. Contrary to hypothesis, maternal feeding practices did not predict global self-worth in children, $F(3,105) = 1.273, p = .288$.

Table 3. Simultaneous Regression Predicting Global Self-Worth Using the CFQ

Variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Child Feeding Questionnaire				
Restriction	-.130	.080	-.180	.106
Monitoring	.088	.074	.118	.236
Concern	.151	.134	.122	.263

$F(3,105) = 1.273, p = .288, R^2 = .035$

4.1.2. Physical Appearance Esteem

Simultaneous regression was used to assess the relationship between maternal feeding practices and child physical appearance self-esteem. The model was significant, $F(4, 104) = 2.717, p = .034$, accounting for 9.5% of the variance. As shown in Table 4, the contribution of child age to the model was significant ($B = -.132, SE B = .061, p = .034$), indicating that older children reported lower physical appearance esteem. Maternal feeding practices did not predict child physical appearance self-esteem.

Table 4. Simultaneous Regression Predicting Physical Appearance Using the CFQ

Variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Age	-.132	.061	-.206*	.032
Child Feeding Questionnaire				
Restriction	-.159	.094	-.181	.094
Monitoring	.121	.088	.134	.171
Concern	.282	.159	.188	.079

$F(4,104) = 2.717, p = .034, R^2 = .095$

* $p < .05$.

4.2. GENDER EFFECTS

4.2.1. Global Self-Worth

First, t-tests were conducted to determine whether girls reported lower global self-worth and physical appearance esteem than did boys. As shown in Table 5, girls reported significantly lower global self-worth and physical appearance esteem than did boys.

Table 5. Means and Standard Deviations of CFQ and SPP by Gender

	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
	Males (<i>n</i> = 52)		Females (<i>n</i> = 58)			
Child Feeding Questionnaire						
Restriction	3.38	.85	3.43	.85	-.319	.376
Monitoring	3.53	.77	3.60	.88	-.450	.327
Concern	4.62	.51	4.56	.48	.565	.287
Self-Perception Profile						
Global Self-Worth	3.53	.55	3.29	.65	2.080*	.020
Physical Appearance Esteem	3.02	.75	2.66	.71	2.584**	.006

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

Next, gender, maternal feeding variables (e.g., restriction, monitoring, and concern), and the respective gender by feeding interaction terms were entered simultaneously to examine their association with global self-worth. As depicted in Table 6, the model was not significant in predicting global self-worth, $F(7, 101) = 1.894, p = .078$.

Table 6. Simultaneous Regression Predicting Global Self-Worth Using the CFQ and Gender

Variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Gender	-.234	.116	-.190*	.046
Child Feeding Questionnaire				
Restriction	-.042	.148	-.058	.778
Monitoring	.258	.118	.347*	.030
Concern	.015	.233	.012	.949
Restriction by Gender	-.142	.177	-.142	.424
Monitoring by Gender	-.284	.149	-.292	.060
Concern by Gender	.119	.289	.067	.682

$F(7,101) = 1.894, p = .078, R^2 = .116$

* $p < .05$.

Because the omnibus model was not significant, but suggested that certain maternal feeding practices might be associated with global self-worth, backwards elimination regression analyses were conducted to explore the predictive relationship between maternal feeding practices, child gender, degree of child overweight, and global self-worth. Child gender, percent over 50th percentile of BMI, maternal restriction, monitoring, concern, and feeding practice by gender interaction terms were entered into the initial model. As depicted in Table 7, the final regression equation included the gender, monitoring, and monitoring by gender interaction terms. The model was significant, $F(3, 105) = 3.130, p = .029$, accounting for 8.2% of the variance in global self-worth. The contribution of gender to the regression model was significant ($B = -.242, SE B = .115, p = .038$), indicating that girls reported lower global self-worth than did boys.

Furthermore, both monitoring ($B = .243$, $SE B = .109$, $p = .027$) and the interaction between monitoring and gender ($B = -.287$, $SE B = .141$, $p = .045$) contributed significantly to the model. As illustrated in Figure 1, the monitoring by gender interaction indicated that high levels of monitoring were associated with lower levels of global self-worth among girls and higher levels of global self-worth among boys.

Table 7. Backwards Elimination Regression Predicting Global Self-Worth Using the CFQ and Gender

Variable	<u>B</u>	<u>SE B</u>	β	<i>p</i>
Gender	-.242	.115	-.197*	.038
Child Feeding Questionnaire				
Monitoring	.243	.109	.327*	.027
Monitoring by Gender	-.287	.141	-.295*	.045

$F(3,105) = 3.130$, $p = .029$, $R^2 = .082$

* $p < .05$.

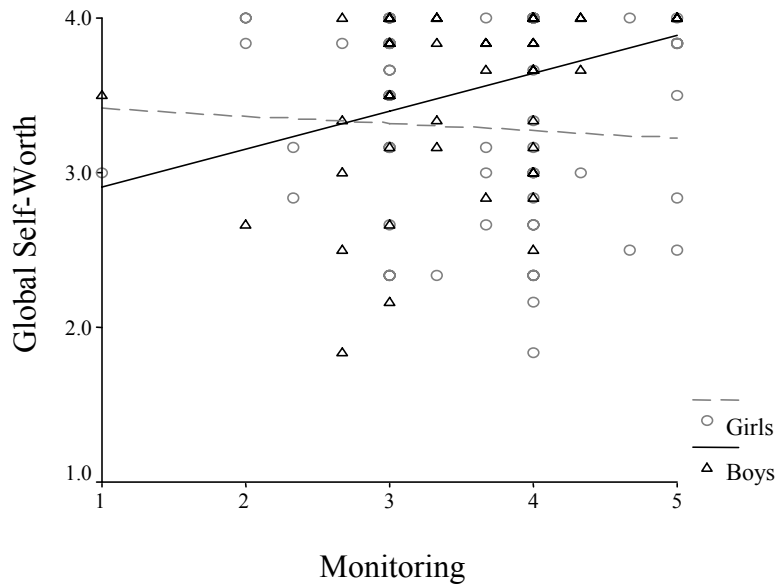


Figure 1. Interaction between maternal monitoring and child gender in the prediction of global self-worth

4.2.2. Physical Appearance Esteem

Next, gender, maternal feeding variables (e.g., restriction, monitoring, and concern), and the respective gender by feeding interaction terms were entered simultaneously to examine their prediction of physical appearance esteem. As shown in Table 8, the model was significant in predicting physical appearance esteem, $F(8, 108) = 2.844, p = .007$. Gender ($B = -.378, SE B = .136, p = .006$) and age ($B = -.138, SE B = .061, p = .026$) contributed significantly to the model, indicating that older children reported lower physical appearance esteem and that girls reported lower physical appearance esteem than did boys. Additionally, the contribution of maternal monitoring was significant ($B = .281, SE B = .137, p = .043$), indicating that higher levels of monitoring were associated with higher physical appearance esteem.

Table 8. Simultaneous Regression Predicting Physical Appearance Esteem Using the CFQ and Gender

Variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Gender	-.378	.136	-.255**	.006
Age	-.138	.061	-.215*	.026
Child Feeding Questionnaire				
Restriction	-.068	.174	-.078	.696
Monitoring	.281	.137	.312*	.043
Concern	.148	.273	.099	.588
Restriction by Gender	-.138	.209	-.115	.510
Monitoring by Gender	-.263	.174	-.225	.133
Concern by Gender	.097	.337	.045	.774

$F(8,100) = 2.844, p = .007, R^2 = .185$

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

4.3. ETHNICITY EFFECTS

T-tests were conducted to determine whether White children reported lower global self-worth and physical appearance self-esteem than did their African American peers. Results are depicted in Table 9. Mean global self-worth did not significantly differ between White children ($M = 3.37, SD = .63$) and African American children ($M = 3.49, SD = .57; t = -1.002, p=.160$). Furthermore, there were no significant differences in physical appearance esteem between White

children ($M = 2.77$, $SD = .76$) and African American children ($M = 2.97$, $SD = .72$; $t = -1.332$, $p = .093$).

Table 9. Means and Standard Deviations of CFQ and SPP by Ethnicity

	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
	White (<i>n</i> = 78)		African American (<i>n</i> = 32)			
Child Feeding Questionnaire						
Restriction	3.43	.83	3.34	.90	.463	.323
Monitoring	3.70	.84	3.26	.71	2.573**	.006
Concern	4.61	.50	4.54	.49	.615	.270
Self-Perception Profile						
Global Self-Worth	3.37	.63	3.49	.57	-1.002	.160
Physical Appearance Esteem	2.78	.76	2.97	.72	-1.332	.093

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

Analyses were conducted to explore the relationships between ethnicity, maternal feeding practices, degree of child overweight, and child global self-worth and physical appearance esteem. The following analyses were exploratory in nature, given that statistical power was insufficient to form substantive conclusions.

A backwards elimination regression analysis was conducted to examine the predictive relationship between child ethnicity, maternal feeding practices, degree of child overweight, and global self-worth. Child ethnicity, percent over 50th percentile of BMI, maternal restriction, monitoring, concern, and feeding practice by ethnicity interaction terms were entered into the

initial model. During the stepwise procedure, all of the entered variables were eliminated because they were not significantly contributing to the model (i.e., at a p -value $\leq .10$). Thus, in this small dataset, the multivariate model was not significant.

Next a backwards elimination regression analysis was conducted to examine the predictive relationship between child ethnicity, maternal feeding practices, degree of child overweight, and physical appearance esteem. Child ethnicity, age, percent over 50th percentile of BMI, maternal restriction, monitoring, concern, and feeding practice by ethnicity interaction terms were entered into the initial model. As shown in Table 10, the regression equation was significant in predicting physical appearance esteem, $F(5, 103) = 2.918, p = .017$, accounting for 12.4% of the variance. Age contributed significantly to the model ($B = -.135, SE B = .060, p = .027$), indicating that older children reported lower physical appearance esteem. The contribution of maternal concern approached significance ($B = .292, SE B = .157, p = .066$), suggesting that higher levels of concern might be associated with higher physical appearance esteem. Finally, the contribution of child ethnicity to the model also approached significance ($B = .288, SE B = .155, p = .066$), indicating a trend for African American children to report higher physical appearance esteem than their White peers.

Table 10. Backwards Elimination Regression Predicting Physical Appearance Using the CFQ and Ethnicity

Variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Age	-.135	.060	-.211*	.027
Ethnicity	.288	.155	.177	.066
Child Feeding Questionnaire				
Restriction	-.164	.093	-.187	.081
Monitoring	.158	.089	.176	.079
Concern	.292	.157	.195	.066

$F(5,103) = 2.918, p = .017, R^2 = .124$

* $p < .05$.

5. DISCUSSION

The present investigation examined the relationships between maternal feeding practices and child self-esteem in a sample of seriously overweight boys and girls seeking weight loss treatment. The major finding was that the relationship between maternal monitoring of child eating behavior and global self-worth was moderated by child gender. In addition, higher maternal monitoring was associated with higher physical appearance esteem in both boys and girls. Finally, preliminary analyses suggested potential differences in the effects of maternal feeding practices in African American versus White children. Each of these findings will be discussed in turn below.

5.1. FINDINGS

5.1.1. Maternal Feeding Practices, Gender, and Global Self-Worth

Contrary to expectation, maternal feeding practices did not predict child self-esteem. However, higher levels of maternal monitoring, defined as the degree to which the mother tracks the child's consumption of sweets, snack foods, and high fat foods, had a different relationship with self-esteem for girls and boys. Higher levels of monitoring were associated with higher global self-worth for boys and lower global self-worth for girls.

The differential relationship between maternal monitoring and self-worth for girls and boys may exist for several reasons. The act of monitoring child food intake may entail

comments about child weight, or the child may perceive high maternal monitoring as a reflection of problems regulating eating behavior. Pierce and Wardle (1993) found that parental dissatisfaction with child weight is associated with lower child self-esteem for overweight girls and underweight boys. Other research indicates that in comparison to boys, girls are more affected by parental comments about weight (Smolak, Levine, Schermer, 1999) and are more strongly influenced by parental criticism or approval of their appearance (Baker, Whisman, & Brownell, 2000; Eskilson & Wiley, 1987). Furthermore, girls are more likely to diet than are boys when encouraged by a parent to lose weight (Thelen & Cormier, 1995). Thus, the association between low self-esteem and high maternal monitoring among girls in this sample of seriously overweight children is consistent with findings in samples of normal weight girls that suggest that girls may be more vulnerable than are boys to maternal vigilance regarding eating, shape, and weight (Smolak et al., 1999).

Interestingly, higher levels of maternal monitoring were associated with better global self-worth among boys in the sample. Although to our knowledge, existing research has not examined the relationship between monitoring and self-esteem, the literature suggests that higher levels of engagement in other maternal feeding practices and attitudes (e.g., restriction, concern) are associated with lower self-esteem. However, most of the existing research has been conducted with primarily normal weight Caucasian girls from middle- to upper-class families, and it appears that the relationships identified in those studies may not generalize to seriously overweight boys. Alternatively, it may be that the combination of maternal monitoring and seeking treatment has a beneficial effect on self-esteem for boys, but not for girls. Because these gender differences in the relationship between monitoring and self-worth were found in a sample of children seeking treatment, they may have implications for the development of pediatric

obesity treatments. For example, mothers may need to implement different feeding strategies when attempting to help daughters lose weight when compared to sons.

5.1.2. Physical Appearance Esteem, Maternal Feeding Practices, and Gender

Although higher levels of maternal monitoring were associated with higher physical appearance esteem, there were no gender differences in the relationship between monitoring and physical appearance esteem. That there was an interaction between gender and monitoring when predicting global self-worth, but not physical appearance esteem, is surprising given that the majority of existing literature suggests that girls' body esteem or physical appearance esteem is lower when parents make more weight-related comments or engage in more restrictive feeding practices (Davison & Birch, 2001).

There are several possible reasons for the failure to replicate previous work documenting a negative relationship between maternal feeding practices and girls' physical appearance esteem. Research indicates that in comparison with boys, girls are more likely to derive their sense of self from their physical appearance (Harter, 1998), and they report more body image dissatisfaction and weight concerns (Rolland, Farnill, & Griffiths, 1996; Wood, Becker, & Thompson, 1996). Furthermore, available evidence suggests that adolescent girls report more peer weight-based teasing than do boys (Eisenberg, Neumark-Sztainer, & Story, 2003) and that peer weight-related teasing in childhood is concurrently associated with lower physical appearance esteem, or body satisfaction (Cattarin & Thompson, 1994; Gardner, Sorter, & Friedman, 1997; Strauss, Smith, Frame, & Forehand, 1985). Although the present study did not address this question, one might speculate that the stigma associated with being overweight in our culture has an effect on seriously overweight girls as they enter adolescence. Thus, it is quite

possible that overweight children's physical appearance esteem is influenced strongly by peers, and the impact of mothers' beliefs about children's physical appearance is less salient.

Interestingly, the majority of mothers in the sample rated their child's current weight as "overweight" rather than "markedly overweight," despite the fact that their children were on average 79% over the 50th percentile of BMI. Moreover, 65% of mothers were obese, and 20% were overweight according to their BMI. Thus, it is possible that overweight or obese mothers are more accepting of the child's body size than are the child's peers.

5.1.3. Measurement of Maternal Feeding Practices

The majority of studies that have examined parental feeding practices and child self-esteem have measured parental concern, restriction, and dissatisfaction, comments or criticism about child weight (Davison & Birch, 2001,2002; Pierce & Wardle, 1993; Smolak, Levine, & Schermer, 1999; Young-Hyman, Schlundt, Herman-Wenderoth, & Bozylinski, 2003). To our knowledge, the relationship between monitoring and child self-esteem has not been examined. The present study did not find any relationship between maternal concern (i.e., mother's concerns about her child eating too much in her absence, having to diet to maintain a desirable weight, and becoming overweight) or restriction (i.e., mother's attempts to control her child's eating by restricting access to foods, including the type and amount of food) and child self-esteem in a sample of seriously overweight children. The preponderance of research in this area has been conducted in samples of predominantly nonoverweight, middle- to upper-class Caucasian girls. Thus, it is possible that the previously identified relationships between maternal concern and restriction and child self-esteem do not apply to seriously overweight boys and girls seeking

weight loss treatment. Alternatively, several possible reasons that findings from the present study did not parallel previous research are discussed below.

One possible explanation for not finding a relationship between concern and self-esteem is that levels of concern reported in this sample were relatively high, likely reaching a ceiling. The Child Feeding Questionnaire was created based on a theory regarding parental behavior related to their beliefs and attitudes about “obesity proneness” in children, and the measure was validated in a sample of primarily normal weight children. Some of the questions that assess concern (see Appendix B) are designed to measure concern about a child becoming obese, not necessarily concern about their existing overweight status. A questionnaire designed to measure the degree of concern about a child’s current overweight status may result in greater variability in degree of concern and enhance predictive power.

Second, the level of concern, as measured by the CFQ, may be appropriate given the severity of the child’s overweight status. One might speculate that the implications of maternal concern are different for overweight and nonoverweight children. Maternal concern about child weight in a child who is not overweight may reflect a greater maternal emphasis on appearance and weight than that of an unconcerned mother. Findings of a relationship between concern and physical appearance or body esteem in previous samples may, in part, reflect the transmission of this attitude to children. In contrast, maternal concern about an overweight child may be driven largely by realistic concerns about the medical and psychosocial impact of severe obesity. Assessing the reasons for maternal concern and measuring the discrepancy between the degree of concern and the degree of the child’s weight problem would likely help discriminate between harmful and helpful concern.

Finally, it is important to consider that this sample consisted solely of treatment-seeking mother-child dyads. The act of seeking treatment may buffer the effects of concern. It may be that children perceive maternal concern differently when they are about to participate with their mother in a treatment program when compared to a mother-child pair not actively seeking treatment. Examination of maternal concern and child self-esteem in a sample of seriously overweight children not involved in weight loss treatment would help clarify the effect, if any, of seeking treatment on the relationship between concern and self-esteem.

That restriction did not emerge as a predictor suggests that the act of maternal restriction may have different implications for children who are mildly, moderately, or not overweight when compared to those who are severely overweight. Additionally, some of the questions that measure restriction may have different implications for seriously overweight children who may have difficulties regulating their energy intake, as opposed to nonoverweight children. Questions that explore the method or manner in which mothers restrict food from their children might shed additional light on the nature of the relationship between restriction and self-esteem. As discussed with respect to concern, it may be that restriction is not related to lower levels of child self-worth when combined with the mother actively seeking treatment for her child.

5.1.4. Physical Appearance Esteem, Maternal Feeding Practices, and Child Ethnicity

Exploratory analyses suggested that there may be interesting ethnic differences that will serve to enhance our understanding of potential relationships between maternal behaviors and attitudes and child self-esteem. Preliminary findings suggest that higher levels of maternal concern may be associated with higher physical appearance esteem after accounting for ethnic differences. Additionally, there was a trend for African American children to report better physical

appearance esteem when compared to their White peers. This sample did not have a sufficient number of African American boys and girls necessary to do a comprehensive analysis of the effects of ethnicity, gender, maternal feeding practices, and child self-esteem; consequently, these results should be interpreted with caution.

5.2. LIMITATIONS

There are several limitations to this study. First, the children in this study were all seriously overweight, thus findings in the present study may not generalize to children who are mildly or moderately overweight. Furthermore, study participants were all seeking weight loss treatment. Thus it is unclear whether the act of seeking external support for a child's weight management problem is associated with differences in the relationship between maternal feeding practices and child self-esteem.

Second, this study only examined maternal feeding practices and did not include a measure of paternal feeding behaviors and attitudes. Existing research suggests that maternal and paternal feeding practices are differentially associated with child self-esteem (Davison & Birch, 2001); given that there were a small number of father-child dyads, their data were excluded from the current study. However, it is likely that both mothers' and fathers' feeding behaviors and attitudes are important to consider when examining the relationships between feeding practices and self-esteem.

As discussed, this study's measure of maternal feeding practices and beliefs may not be entirely appropriate for a sample of seriously overweight children. It is likely that the measure of concern lacked specificity for detecting differences in concern among mothers in this sample. A measure of feeding practices and attitudes appropriate to a sample of seriously overweight

children seeking weight loss treatment might result in greater variability and enhance predictive power.

Finally, this study did not explore the mechanism through which maternal feeding practices are associated with child self-esteem. Because the study was cross-sectional, it was not possible to discern the direction of the relationship between maternal feeding and self-esteem. Although we hypothesize that mothers' feeding practices and attitudes affect their children's self-esteem, it may be that mothers alter their feeding practices based on how a child feels about him or herself. Furthermore, this study did not measure children's perceptions of maternal feeding practices and attitudes or examine in-depth the manner in which mothers verbally and non-verbally transmit these attitudes to their children. Further exploration of the mechanism of transmission would likely shed light on the nature of the relationships between maternal feeding and child self-esteem.

5.3. FUTURE DIRECTIONS

The present study documented gender differences in the relationship between monitoring and child self-esteem that may have important implications for the development of novel treatments for pediatric obesity. Behavioral treatments often focus on the importance of changing the child's home environment to facilitate weight loss. Maternal feeding practices are a natural target for modification, as certain practices have been associated with the promotion of children's energy intake (Fisher & Birch, 2002; Johnson & Birch, 1994). Because self-esteem is closely associated with the concept of self-efficacy (i.e., the motivation to complete a task; Bandura, 1977), treatments should also be designed to maintain or enhance child self-esteem in order to maximize weight loss outcomes. Results of the current project suggest that weight loss

interventions should teach mothers different feeding strategies according to their children's gender, and examine whether changes in these strategies over the course of treatment are associated with changes in child weight and self-esteem. The effect of employing higher levels of monitoring with boys and lower levels with girls on treatment outcomes is worthy of further study.

Certain subscales of the CFQ may not be appropriate for seriously overweight children. Parental "overconcern" about child weight is hypothesized to be an important factor in the existence of lower self-esteem among children (Stradmeijer, Bosch, Koops, & Seidell, 2000). The CFQ appears to be appropriate for measuring parental overconcern for a normal weight or mildly overweight child, but it does not appear to have the sensitivity necessary to measure overconcern for seriously overweight children. A new measure designed for use with moderately and severely overweight children would likely result in greater variability and help clarify the implications of parental feeding practices and beliefs on child outcomes.

Additionally, little is known about how children's perceptions of feeding practices are associated with self-esteem. Assessing children's beliefs about and interpretations of maternal feeding behavior might help elucidate the mechanisms linking maternal feeding and child self-esteem. For example, children who believe their mothers are monitoring their energy intake because of appearance-related concerns may feel differently about themselves than do children who interpret this behavior as a reflection of maternal concern about their health and well-being. Obtaining both mother and child reports of feeding practices, attitudes, and beliefs would help enhance our understanding of individual differences and possibly reveal mediators of the relationship between feeding and self-esteem.

In order to better understand how the feeding environment relates to child self-esteem, feeding practices need to be examined within the context of the entire family unit. The feeding behaviors and attitudes of both parents, when present, and how they interact would offer a richer understanding of the child's eating environment. Furthermore, any differences in parental feeding between siblings, particularly between overweight and non-overweight siblings, might have important implications for children's self-concept. One might speculate that parenting techniques that involve heavily monitoring and restricting an overweight child's access to certain foods, while concurrently allowing free access to a normal weight sibling might have deleterious effects on the overweight child's self-esteem. Further exploration of the total family feeding environment might help researchers better predict differences in children's self-esteem.

Finally, future work that examines the associations between maternal feeding practices and child self-esteem in a larger sample of African American and White boys and girls would afford a more comprehensive understanding of the effects of gender and ethnicity. In order to understand what influence, if any, treatment-seeking status has on the relationship between maternal feeding and child self-esteem, future studies should include a comparison group of similarly overweight children who are not seeking weight loss treatment.

APPENDIX A

BIVARIATE CORRELATIONS BETWEEN RELEVANT PREDICTOR AND OUTCOME VARIABLES

	1	2	3	4	5	6	7	8	9	10	11
1. Global Self-Worth	—	.64**	.09	-.10	.06	-.10	-.20*	.10	.08	.18	-.08
2. Physical Appearance Esteem		—	.14	-.06	.11	-.20*	-.24*	.13	.08	.09	.01
3. Monitoring			—	.25**	.16	-.15	.04	-.24*	-.20	.10	-.15
4. Restriction				—	.46*	.00	.03	-.04	-.02	-.05	.01
5. Concern					—	.09	-.06	-.06	.10	.09	-.04
6. Child Age						—	-.13	.06	.11	-.05	.01
7. Child Gender							—	-.12	-.19	.15	-.12
8. Child Ethnicity								—	.26**	-.24*	.12
9. Child % over 50 th BMI percentile									—	-.32**	.38**
10. Income										—	-.26**
11. Maternal BMI											—

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

APPENDIX B

ITEMS INCLUDED IN CHILD FEEDING QUESTIONNAIRE SUBSCALES (Birch et al., 2001)

Restriction:

Parents' attempts to control their child's eating by restricting access to foods, including the type and amount of food.

1. I have to be sure that my child does not eat too many *sweets (candy, ice cream, cake or pastries)*.
2. I have to be sure that my child does not eat too many *high fat foods*.
3. I have to be sure that my child does not eat too much of his/her *favorite foods*.
4. I intentionally keep some foods out of my child's reach.
5. I offer *sweets (candy, ice cream, cake, pastries)* to my child as a reward for good behavior.
6. I offer my child his/her *favorite foods* in exchange for good behavior.
7. If I did not guide or regulate my child's eating, he/she would eat too many *junk foods*.
8. If I did not guide or regulate my child's eating, he/she would eat too much of his/her *favorite foods*.

Response options: 1 (disagree) – 5 (agree)

Appendix B continued next page

Monitoring:

The extent to which a parent reports keeping track of children's consumption of energy dense foods.

1. How much do you keep track of the *sweets (candy, ice cream, cake, pies, pastries)* that your child eats?
2. How much do you keep track of the *snack food (potato chips, Doritos, cheese puffs)* that your child eats?
3. How much do you keep track of the *high fat foods* that your child eats?

Response options: 1 (never) – 5 (always)

Concern:

Parents' concerns about child overweight.

1. How concerned are you about your child *eating too much* when you are not around him/her?
2. How concerned are you about your child having to diet to maintain a desirable weight?
3. How concerned are you about your child becoming overweight?

Response options: 1 (unconcerned) – 5 (concerned)

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