DIFFERENCES AMONG PARENTS WHOSE CONCERNS ABOUT CHILD OVERWEIGHT ARE REALISTIC OR NOT

By

NICOLE LEE MOORE

Bachelor of Science in Human Environmental Sciences

Oklahoma State University

Stillwater, OK

2007

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
May, 2008

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Thesis Approved:

Dr. Laura Hubbs-Tait

Thesis Adviser

Dr. Tay Kennedy

Dr. Glade Topham

Dr. A. Gordon Emslie

Dean of the Graduate College

ACKNOWLEDGEMENTS

I would like to thank my committee, Dr. Laura Hubbs-Tait, Dr. Tay Kennedy, and Dr. Glade Topham for all of their support and encouragement during this process. Dr. Hubbs-Tait has been a continual support throughout my undergraduate and graduate career and I am forever grateful to her. Dr. Hubbs-Tait first employed me as an undergraduate student and then as a graduate research assistant, as well as graciously allowing me to use her data for my thesis. These experiences provided me with invaluable experience in the field, as well as allowing me to grow personally and professionally. I could never have completed my thesis without her countless hours of help, motivation, and laughter.

Dr. Kennedy and Dr. Topham provided immense knowledge and insight on this topic. Their understanding of the material and their willingness to assist me was astounding. Their flexibility throughout this process has been amazing and definitely reduced my anxiety level! Thank you for your support and guidance.

Lastly, I would like to thank my friends and family, especially my parents, for putting up with the long hours of writing and rewriting. Their support prior to, and during, graduate school has been incredible.

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CHAPTER I

INTRODUCTION

Purpose and Justification

This study seeks to examine the links between child overweight, parental concern about child overweight, and parental feeding practices. The first purpose of the study is to examine how child overweight is related to both parenting styles and feeding practices. Secondly, this study looks to examine how parental concern about child overweight influences parenting style and feeding practices. A brief introduction is provided in order to set up the research questions and hypotheses of the study. Definitions of constructs will be provided, as well as a description of the need for the study.

Body Mass Index (BMI) is used as a tool for assessing overweight, at risk for overweight, and underweight. The Center for Disease Control (2007) uses a formula in which child height and weight is used to place children in a weight status category based on 0their BMI percentile. The CDC has 4 weight status categories: underweight, healthy weight, at risk for overweight, and overweight. A child in the underweight category has a BMI less than the 5^{th} percentile, while a child with a BMI from the 5^{th} percentile to less than the 85^{th} percentile is considered to be healthy weight. The two categories of importance in this study are at risk for overweight and overweight. Children at risk for overweight have a BMI that is greater than the 85^{th} percentile and less than the 95^{th} percentile, while a child is considered overweight if their BMI is greater than or equal to

the 95th percentile. The number of overweight children and adults has dramatically increased over the past few decades, with the Center for Disease Control (2007) estimating that child overweight in 2-5 year olds increased almost 9% between the 1970s and early 2003-2004. Additionally, estimates of overweight in children 6-11 years old have increased approximately 12% in the same years. Research has shown that child overweight is likely to carry into adulthood, resulting in adult overweight and the onset of weight-related conditions (Birch, 1998; Lobstein, Baur, & Uauy, 2004) making child overweight an increasingly important issue. The increase in overweight has been attributed to multiple social changes, such as,a decrease in physical activity, increased use of restaurants and fast food establishments, and larger portion sizes, among other things (Lobstein et al., 2004).

Although all children will not be affected by overweight in the same way, studies have shown that overweight children have an increased risk for a variety of psychological issues, such as low self-esteem, depression, and anxiety (Warschburger, 2005). Using the Self-Perception Profile for Children, overweight children aged 9-13 years have been found to score lower on physical appearance, athletic competence, and global self-worth. In addition, girls have been found to score lower on social acceptance (Franklin, Denyer, Steinbeck, Caterson, & Hill, 2006). Overweight has also been linked with girls' early maturation in adolescence. Such maturation may lead to a variety of psychological issues, including depression and eating disorders (Lobstein et al., 2004).

Research has shown that overweight children face stigmatization and discrimination from other children throughout childhood. As early as preschool age, 4-year-old children have been found to favor 'normal' sized dolls rather than 'fatter' dolls

(Turnbull, Heaslip, & McLeod, 2000). This trend continues into elementary school, where Kraig and Keel (2001) found that 7-9 year old children preferred pictures of thin children rather than pictures of 'average' or 'chubby' children. A similar study of 5th and 6th grade children found similar results, with children liking the obese child least (Latner & Stunkard, 2003).

Child overweight leads to a variety of health issues in both childhood and adulthood, including hypertension, sleep apnea, asthma, increased risk of fractures, insulin resistance, abnormal menstruation, and fatty liver (Kaur, Hyder, & Poston, 2003; Lobstein et al., 2004; Must & Strauss, 1999). Particularly as children enter puberty, overweight influences both boys and girls. For girls, overweight has been found to be linked with early menarche; however, the opposite has been found in boys, with overweight linked to later maturation (Lobstein et al., 2004).

Child overweight also results in economic costs, both direct and indirect. Lobstein et al. (2004) states that direct costs are those costs to the health care system, including resources that are used to manage obesity and conditions or diseases that are related to obesity, while indirect costs are those that result from decreased productivity and economic activity resulting from obesity. Direct costs of overweight may not be seen in early childhood, due to the fact that there are fewer treatments and conditions may be underreported. In addition, many of the conditions linked with overweight in children may not be seen until adolescence or adulthood. Although not all direct costs may be easily examined, hospital costs have been found to be on the rise. From 1997-1999, the annual obesity-related hospital costs of children and adolescents was $127 million; however, from 1979-1981 this figure was only $35 million (CDC, 2007).

Indirect costs of overweight are also difficult to assess in childhood since children do not contribute directly to the economy through employment. However, the role of other social organizations may be examined in this area. For families with overweight children, parents may be forced to take time off of work to care for them when they are ill. Additionally, children who are ill and repeatedly absent from school are likely to experience the same educational difficulties as other children with lower school attendance (Lamdin, 1996).

Although the economic impact of childhood overweight may not be overtly present, such costs exist, both in the short- and long-term. Children who are overweight are likely to continue to be overweight into adulthood, increasing the overt presentation of economic costs, both for individuals and the nation (Lobstein et al., 2004). In response to the previously mentioned research and social and economic costs, this study examines overweight children and those at risk for overweight, particularly in terms of parental concerns about their weight. This study will address the following research questions and hypotheses:

Research Questions:

1. Which parenting practices are related to child overweight?
2. Do parenting practices differ for those who are concerned with their child's weight versus those who are not concerned?
3. Will changes in parental concern over time be paralleled by changes in parenting practices?

Hypotheses:

1. There will be mismatch between the number of children who are overweight and

the number of parents concerned about them as being overweight, with more children being overweight than parents showing concern.

2. Parents who are concerned with their child's weight will be more likely to be authoritarian in their parenting, while parents who are not concerned are more likely to be permissive.
3. With child weight statistically controlled, parenting and parental concern will be related.
4. With parental concern about child overweight controlled, parenting practices and child weight will be related.

This research will help to address the mismatch between child overweight and parental concern. As a result, practitioners working with mothers of young children will be able to provide insight regarding children's diet. Because early food habits carry into adulthood, interventions for families should be developed that begin in early childhood. If parents are better able to correctly classify their child's weight status and develop appropriate concern, they will be better able to work towards a reduction in their child's weight.

CHAPTER II

REVIEW OF LITERATURE

Child overweight is an important and pressing issue in the United States, with overweight in children ages 2-5 increasing from 5% in the late 1970s to 13.9% from 2003-2004, while overweight in children ages 6-11 increasing from 6.5% to 18.8% in the same years (Center for Disease Control, 2007). Being overweight affects not only the physical health of children, but also their psychological and social well-being. The likelihood of child overweight carrying over into adulthood is also high, making obesity a lifelong struggle for many. Overweight children are likely to suffer from a variety of health issues, such as sleep apnea, insulin resistance, increased blood pressure, hypertension, and type-2 diabetes (Kaur, Hyder, & Poston, 2003; Must & Strauss, 1999).

Body Mass Index

Body mass index (BMI) is figured using the formula weight (kg)/height squared (m^2) (Sweeting, 2007). Children with a body mass index from the 85^{th} to less than the 95^{th} percentile are considered to be at risk for overweight. Those with a BMI equal to or greater than the 95^{th} percentile are considered overweight (Center for Disease Control, 2007).

Defining Overweight

Many researchers define at risk for overweight and overweight according to the standards of the Center for Disease Control (He & Evans, 2007; May et al., 2007,

Hirschler, Gonzalez, Talgham, & Jadzinsky, 2006; Maynard, Galuska, Blanck, & Serdula, 2003;); however, other standards are also used in child obesity research (Baughcum, Chamberlin, Deeks, Powers, &Whitaker, 2000; Campbell, Williams, Hampton, & Wake, 2006; Carnell, Edwards, Croker, Boniface, & Wardle, 2005; Crawford, Timperio, Telford, & Salmon, 2006; Eto, Komiya, Nakao, & Kikkawa, 2004). Many of those studies which use standards other than the CDC are from countries other than the United States (Baughcum et al.; Campbell et al.; Carnell et al.; Crawford et al.; Eto et al.). BMI uses height and weight to determine child overweight and does not directly measure fat. As a result, researchers often use various cut-off points to define overweight in children (Sweeting, 2007). Those studies which did not follow the Center for Disease Control standards varied in the standards used. Eto et al. defined obesity as ≥ 90th percentile, Baughcum et al. defined overweight as a gender-specific weight-for-height percentile at or above the 90th percentile, while Campbell et al., Carnell et al., and Crawford et al. used the International Obesity Task Force (IOTF) standards. The IOTF standards are based on the cut-off points of BMI in adulthood (≥25 is considered overweight, while BMI ≥30 is considered obese) and produce centile curves which link child overweight to the prevalence of adult overweight (Cole, Bellizzi, Flegal, & Dietz, 2000; Lobstein et al., 2004); however, these standards have been found to assess fewer children as at risk for overweight or overweight than the standards of the Center for Disease Control (Lobstein et al., 2004).

Family Influence

Obesity is also a family issue, with many overweight parents having overweight children, continuing the cycle of obesity. A child of obese parents is more likely also to

be obese, as parents not only provide genetics, but also a food environment that increases a child's likelihood of being obese (Birch, 1998). Some parents believe that child weight cannot be changed by external factors. The belief that children are predestined to be a certain size influences the food environment. Rather than recognizing the problem of their child's overweight status, parents may assume that children will grow into their weight (Jain et al., 2001).

Although environmental factors influence child obesity, the role of the parent may buffer their impact. Parents are able to influence children's weight through parenting and feeding practices, modeling behaviors, and interactions with family members. The control that parents have over the home environment allows them to have a large influence over the development of their child's eating habits. These influences occur on three levels: parenting practices specific to feeding; parent behaviors not specific to the child, but still influencing their behaviors; and global influences, such as family functioning (Rhee, 2008). Specifically, parents influence children through control of food availability, modeling food behaviors, food socialization, and parenting style (Nicklas et al., 2001).

At birth, children show preference for foods that are sweet and reject foods which are bitter and sour, while preference for salt occurs at 4 months of age. Although infants show initial food preferences, they are modified by parenting behaviors such as exposure to certain foods, which influence individual differences (Birch, 1999). Preferences for foods are learned through repeated experiences. Parents provide food choices in childhood, resulting in the development of preferences based on both social and physiological effects. Children who are exposed to foods that are high in fat and energy

dense are likely to develop preferences for such foods, increasing their chance of becoming overweight or obese compared to children who are exposed to fruits, vegetables, and complex carbohydrates (Birch, 1998; Birch and Fisher, 1995; Birch and Fisher, 1998).

Parental Perception of Overweight

Mothers are often the primary caregiver, and differences in maternal perception of overweight influence the food environment of children. A qualitative study by Jain et al. (2001) found that mothers' worries about child weight are not influenced by their child's position on a growth chart, but rather by their child's inactivity or being teased. In addition, many mothers believe that overweight in children caused their inactivity, as opposed to inactivity causing overweight. The presentation of different foods is affected by these perceptions. Mothers were found not to worry about child weight if the child ate healthy foods and had a good appetite. In other words, if the child ate healthy foods, mothers believed they were compensating for the junk food they ate, rather than worrying about the unhealthy increase in calories.

Multiple studies have shown the mismatch between child overweight and parental perception of overweight. In a nationally representative sample of 5,500 children (aged 2-11 years) and mothers, nearly one-third (32.1%) of mothers incorrectly identified their overweight child ($\geq 95^{th}$ percentile) as "about the right weight" (Maynard et al., 2003, p. 1227). Hirschler, Gonzalez, Talghman, and Jadzinsky (2006) found that mothers of 2-6 year old children had distorted perception, with distorted perception occurring for 87.5% of mothers of those children at risk for overweight and overweight versus 17% of mothers of normal weight children. In addition, 23.7% of mothers of overweight children

considered them overweight, while only 1.6% of mothers of children at risk for overweight considered their children “fat” or “very fat”

Parental Concern About Weight

Parental perception of overweight is compounded by concern about child weight. An examination of 5- and 6-year olds showed that only 3% of mothers perceived their child as overweight, although 23% of children in the sample were actually overweight. Of the 62 overweight children in the sample, 71% of their parents were not concerned about their child’s weight, while 27% of parents were a little concerned, and only 2% of parents were very concerned (Crawford et al., 2006). Campbell et al. (2006) found that although 19% of 4-year-old children in their sample were overweight or obese, only 5% of mothers expressed concern about their child’s weight. In a similar study, 79% of mothers of overweight children (aged 2-5 years) did not perceive them as overweight. Of the 21 mothers having an accurate perception of their child’s overweight, 17 reported being concerned about such weight (Baughcum et al., 2000). A sample of 564 children ages 3- to 5- years old showed that only 1.9% of mothers with overweight children perceived them as such, while only 17.1% of mothers with obese children perceived them as such. However, 62.5% of mothers with overweight children and 75.6% of mothers with obese children were concerned about their child’s weight (Carnell et al., 2004). Finally, He and Evans (2007) found that parents are likely to misclassify their children as thinner than they are. Their study showed that 22% of parents of normal weight children classified them as underweight, while 63% of mothers of overweight children classified them as normal weight, and 63% of mothers of obese children classified their children as overweight. In addition, there was no parental concern about weight for 26% of

overweight children and 15% of obese children.

Parental Perception, Concern, and Parenting Practices

Perception and concern about child weight also influence parental feeding practices, such as restriction or pressure to eat; however, perception and concern may result in no changes in feeding practices (May et al., 2007; Hirschler et al., 2006). May et al. found that mothers who were concerned with child weight were more likely to restrict foods and pressure their children to eat. Restriction specifically applied to junk food, sweets, and the child's favorite foods. Although not statistically significant, the mothers who restricted their child's intake were more likely to have overweight children than those mothers who did not restrict. Restriction includes "attempts to restrict children's intake of foods, specifically foods high in fat, sugar, and salt" (Francis and Birch, 2005, p. 548). Restricting certain foods does not reduce children's interest in them; rather it often increases their desire for them (Cullen et al., 2000). Some researchers argue that parents who restrict their child's intake will have children who are less overweight; however, restriction actually decreases children's ability to regulate energy intake, resulting in increased body weight (Robinson et al, 2001). Parents who do not have an accurate perception of their child's weight are likely to make few changes to their feeding practices. The distortion between child weight and perception of eating habits is extremely high, with mothers of 84% of at risk for overweight children and 96.7% of mothers of overweight children believing they ate appropriately or little (Hirschler et al., 2006).

Parenting Style

Parenting style has also been linked with child eating and obesity. Baumrind's

(1971) parenting styles can be used in relation to child nutrition to explain the different approaches parents may take when dealing with child weight issues. The three parenting styles of authoritarian, authoritative, and permissive influence the food environment of children through food presentation and restriction. Authoritarian parents embrace more forceful measures to shape the behavior of their children. These parents are likely to be less rational, more punitive, and more controlling of their children. Related to feeding practices, those parents who are more restrictive of food will have children who have less ability to regulate their food intake, leading to increased weight in the child. The restrictiveness increases children's desire to have the foods that are normally prohibited by the parent (Birch & Fisher, 2000).

Authoritative parents are more rational and use explanation for their actions. As opposed to the authoritarian parent, authoritative parents do not exert large amounts of restriction on the child. Related to feeding practices, this parenting style promotes a child's ability to control his/her own intake, contributing to a decreased likelihood of obesity (Birch & Fisher, 1995).

The permissive parent is nonpunitive and less demanding of the child (Birch & Fisher, 1995). Although explanation is given for decisions, the permissive parent is not active in the child's choices or behavior. These parents are likely to have trouble structuring their child's eating patterns. Such parents are likely to attach their own emotions to child feeding, viewing feeding their child as emotionally rewarding for them (Jain et al., 2001). Similar to authoritarian parents, permissive parents are likely to have children who are less able to regulate their intake of food.

Methodological Issues

Although BMI is a widely accepted method for assessing childhood overweight and obesity, it does present some methodological issues. BMI has been widely validated in adulthood, yet there have been fewer validity assessments in the child and adolescent populations (Dietz & Bellizzi, 1999). Due to growth, BMI measurement is more complicated in children than adults, which may result in some error. Specifically, body type and build also may influence BMI measurement, with children who have a naturally large frame more likely to have a higher BMI (Dietz & Bellizzi, 1999; Guillaume, 1999). Further, BMI measurement does not take into account the composition of body mass, which includes fat-free mass and fat mass (Eto et al., 2004; Sweeting, 2007). BMI has been found to correctly classify children who are not obese while incorrectly classifying those children who are obese, showing that BMI should be used cautiously when assessing children (Eto et al.; Sweeting, 2007). In addition, because various methods are used in countries other than the United States, comparison between groups may be difficult (Guillaume, 1999).

Other methods are available for assessing overweight in children, including density-based methods, bioelectrical impedance methods, and other anthropometric methods. Sweeting (2007) reviewed specific examples of these methods. One example of the density-based methods is hydrodensitometry, which involves weighing the participant outside of and submerged in a large tank. Although considered to be ‘the gold standard’, this procedure is time consuming and not easily used with children. The bioelectrical impedance method requires that electrodes be attached to the participant’s ankle and wrist, allowing a current to be sent through the body. This type of assessment is less

accurate; however, analysers are portable and simple, which allows this method to be used in larger samples. Finally, the anthropometric method of waist circumference may be used. This measure is taken using a flexible measuring tape and referring to anatomic landmarks specifies the site of measurement. Many countries have waist circumference centiles and it can be done quickly; however, incorrect positioning of the measuring tape allows for error. Despite the many valid concerns about BMI as the measure of child overweight and at risk for overweight status, BMI will be the method used in the current study as it is currently the most prevalent method in the United States.

CHAPTER III

METHODOLOGY

Participants

Participants were enrolled in one of four Head Start centers in four rural or micropolitan communities in Oklahoma. Parents or legal guardians provided informed consent for children to participate in the project, resulting in an enrollment of 208 children aged three, four, and five years. Child assent was obtained from each child prior to measurement and assessment. Of the children enrolled, those who had completed data from parent questionnaires and anthropometric measurements in both fall and spring (n = 152) were included.

Procedure

In early Fall 2006, parents completed informed consent, demographic, and food socialization questionnaires. Results of descriptive analyses of demographic data are presented in Table 1. Child anthropometric measurements were completed by a team of researchers at each Head Start center. All fall anthropometric measurements were completed by December 13, 2006. The same set of anthropometric measurements were obtained by the same researchers from April 4-27, 2007.

Measures

Anthropometric Assessment

The height (cm) of each child was obtained using a stadiometer and weight (kg)

was measured using a scale. For both measurements, children were wearing light clothing and no shoes. Measurements for triceps skin-fold were obtained using calibrated skin fold calipers. Mid-upper arm circumference was measured using a measuring tape. The same researcher obtained all measurements after training with both adult and child participants and reliability assessments of over .80 on measurements separated by two weeks. Child height was measured and recorded two times to the nearest hundredth centimeter. If the measurements were within .15 centimeters, the two numbers were averaged to produce the final height measurement. If height measurements differed by more than .15 centimeters a third measurement was taken, and the two measurements within .15 centimeters were averaged to produce the final measurement. If the third measurement was identical to either of the first two measurements, the repeated measurement was identified as the final height.

The acquired measurements were used to obtain BMI, BMI z-scores, and upper arm circumference using Epi-Info software (release 3.4.3, 2007, CDC Atlanta, GA). Participants with a BMI score greater than or equal to the 85^{th} percentile but less than the 95^{th} percentile are considered to be at risk for overweight. Those with a BMI equal to or greater than the 95^{th} percentile are considered overweight (CDC, 2007).

Behavior Assessment

Parents completed a Demographic Information Questionnaire (DIQ) which included information regarding age of the child, parental education, household income, and federal assistance. Demographic information from the DIQ is presented in Table 1.

Questions were taken from the Child Feeding Questionnaire (Birch et al., 2001) regarding parents' concern about their child's weight, food restriction, pressure to eat,

and parental responsibility. To assess parental concern about child overweight, mothers were asked to respond to the question "How concerned are you about your child becoming overweight?" Responses of "very concerned," "fairly concerned," and "concerned" were classified as "concerned". Parents who did not answer the question regarding concern about child overweight were deleted from the final sample, leaving a final sample of 129 participants. For all alphas reported, the sample size of 129 was used. Cullen et al. (2000) developed questions related to parent planning expectancy, consequences, discouragement, and offering healthy foods. Adapted questions from a measure developed by Cullen et al. (2001) were used to assess parents' modeling of food behavior practices. The three specific feeding practices of eat anyway (If my child says "I'm not hungry," I try to get them to eat anyway), control by favorite foods (I offer my child her favorite food in exchange for good behavior), and control junk food (If I did not control my child's eating, they would eat too many junk foods) were also included. Finally, parenting styles were assessed using the Parent Behavior Questionnaire-Head Start (PBQ-HS) (Coolahan, McWayne, Fantuzzo, & Grim, 2002). The three general parenting styles identified were: Active-Restrictive, Passive-Permissive and Active-Responsive, operationalizing authoritarian, permissive, and authoritative parenting styles, respectively. The reader is cautioned that Active-Restrictive is the term used by Coolahan et al. regarding authoritarian parenting style. This is particularly important because Birch et al (2001) use a similar term "restriction" to refer to a controlling feeding practice. Measures, subscales, and Cronbach's alphas are presented in Table 2. Questionnaires are presented in Appendix A and Appendix B. For the current study, all questions on the Parent and Child Eating Questionnaire were used, while questions 11-32 on the Home

Practices Questionnaire were used.

Analyses

The data from parenting questionnaires and anthropometric measurements were entered into Microsoft Excel 2000. The information necessary for BMI percentiles and z-scores was entered into the Epi-Info program produced by the Center for Disease Control and BMI scores were obtained. The Statistical Package for Social Sciences (SPSS version 14.2) was used to analyze BMI z-scores along with parenting data.

For children to be classified as overweight, their BMI z-score had to be greater than the 85th percentile. Mothers' concern was determined by their response to the question "How concerned are you about your child becoming overweight?" Responses of "very concerned," "fairly concerned," and "concerned" were classified as "concerned".

Hypotheses and analyses:

1. There will be mismatch between the number of children who are overweight and the number of parents concerned about them as being overweight, with more children being overweight than parents showing concern.
    a. Several criteria will be used to determine children's overweight and risk for overweight: (1) CDC criteria and (2) the 90th percentile proposed by Eto et al (2004).
    b. The congruence between overweight and concern will be evaluated with chi-square tests (for exact measures).
2. Parents who are concerned with their child's weight will be more likely to be authoritarian in their parenting, while parents who are not concerned are more likely to be permissive.

a. One-way ANOVA will be used to compare the association of authoritarian parenting, as measured by the Active-Restrictive subscale of the PBQ-HS measure and permissive parenting, as measured by the Passive-Permissive subscale of the PBQ-HS measure, with scores of parents who are versus are not concerned about their child's weight.

3. With child weight statistically controlled, parenting and parental concern will be related.
    a. Hierarchical regression analysis with BMI controlled in the first block will be used to test this hypothesis using (1) the entire sample and (2) the 70th percentile.
4. With parental concern about child overweight controlled, parenting practices and child weight will be related.
    a. Hierarchical regression analysis with concern controlled in the first block will be used to test this hypothesis using (1) the entire sample and (2) the 70th percentile.

CHAPTER IV

FINDINGS

Overview

In the following chapter, results are organized according to the five hypotheses proposed in Chapter 2. Analyses correspond to those proposed in Chapter 3 as well as additional analyses conducted to clarify findings.

Preliminary Analyses

Preliminary analyses were conducted. First, Pearson product-moment correlations were computed for the relations among general parenting styles (Active-Restrictive, Passive-Permissive, and Active-Responsive) and feeding practices. The results of the correlation analyses are presented in Table 3. Second, means and standard deviations were computed for parents who were concerned versus not concerned about their child's being overweight. These descriptive statistics are presented in Table 4.

Hypothesis 1:

Please recall that the first hypothesis stated that there would be mismatch between the number of children who are overweight and the number of parents concerned about them as being overweight, with more children being overweight than parents showing concern.

This hypothesis was tested using chi square tests (see Table 5). Parental concern was determined by response to the question "How concerned are you about your child

becoming overweight?" Responses of "very concerned," "fairly concerned," and "concerned" were classified as "concerned". According to the CDC standards, children with a total BMI centile less than 85 are healthy weight, children with a total BMI centile greater than or equal to 85 and less than 95 are at risk for overweight, and children with a total BMI centile greater than or equal to 95 are overweight. Prior to examining associations of parental concern with the CDC standards, children's BMI centiles for Fall and Spring were summed. Thus, a total BMI centile "score" less than 170 for the year indicated a child of healthy weight, a total greater than or equal to 170 but less than 190 indicated risk for overweight, and a total greater than or equal to 190 indicated overweight.

For children whose BMI centile was less than 170, only 15.5% of parents were concerned, while 34.8% of parents of children with BMI centiles greater than or equal to 170 but less than 190 (at risk for overweight) were concerned. Finally, 63.6% of parents of children with BMI centiles greater than or equal to 190 (overweight) were concerned with their child's weight. Thus, as child weight increased so did parental concern ($p < .001$). A large discrepancy remains between children who are at risk for overweight and parents who are concerned, with only one-third showing concern. In addition, although the number of parents concerned increases as child weight increases, mismatch still remains. Although almost two-thirds of parents with children who are considered overweight (according to CDC standards) were concerned, 36.4% of parents remained unconcerned (see Table 5).

The standards proposed by Eto et al. (2004) differ slightly from the CDC standards and involve only two groups. The first is children with a total BMI less than the

90th percentile and the second is children with a total BMI greater than or equal to the 90th percentile. Using these standards, mismatch remains. Of the children with yearly total BMI centiles less than 180, 17.5% of parents were concerned. For those children with yearly total BMI centiles greater than or equal to 180, 56.3% of parents were concerned (Table 6; $p<.001$).

Hypothesis 2:

The second hypothesis stated that parents who are concerned with their child's weight will be more likely to be authoritarian in their parenting, while parents who are not concerned are more likely to be permissive. This hypothesis was tested using one-way ANOVA to compare general authoritarian and permissive parenting scores of parents who are versus are not concerned about their child's weight (see Table 4). Please recall that general authoritarian parenting was measured by the Active-Restrictive subscale of the PBQ-HS and general permissive parenting was measured by the Passive-Permissive subscale of the PBQ-HS. Authoritarian feeding practices were measured by questions from the Cullen et al. (2000) questionnaire. In addition, the relation of modeling and offering healthy food choices were examined in relation to parental concern about child weight.

Results showed that significant differences exist between parents who are versus are not concerned about their child's weight, with concerned parents more active-restrictive ($p<.01$) in general. Additionally, parents who were concerned were more likely to discourage their children from eating foods ($p<.05$), provide consequences ($p<.05$), and plan ($p<.05$).

Contrary to the hypothesis, no significant difference was found between parents

who were concerned versus those who were not concerned for permissive parenting. In addition, no significant differences were found for modeling healthy eating behaviors, offering healthy foods to their children, and expecting their child to eat healthy foods.

Hypothesis 3:

The third hypothesis explored the relationship between parenting and parental concern when statistically controlling for child weight and was tested using hierarchical regression analysis with BMI controlled in the first block. For this particular hypothesis, average BMI z-scores for the year were used, making it a more reliable indicator of weight throughout the year. This analysis was run using two separate criteria for child weight: (1) the entire sample and (2) children whose BMI was greater than or equal to the 70^{th} percentile.

Using the entire sample and controlling for child weight, a significant relationship was found between active-restrictive parenting style and parental concern ($p<.01$). In addition, discourage ($p<.01$), planning ($p<.01$), and consequences ($p<.001$) each had significant positive relationships with parental concern. However, non-significant relationships were found between parental concern and general permissive parenting, as well as the specific feeding practices of 'eat anyway' (If my child says "I'm not hungry,", I try to get them to eat anyway), 'control by favorite foods' (I offer my child her favorite foods in exchange for good behavior), and 'control junk food' (If I did not control my child's eating, they would eat too many junk foods). Results are shown in Table 7.

When using weight as a continuous variable beginning with the 70^{th} percentile, results (see Table 8) showed significant relationships between the active-restrictive parenting style and parental concern ($p<.01$). In addition, discourage ($p< .05$), planning

($p<.05$), and consequences ($p<.001$) all had significant relationships with parental concern. Non-significant relationships were found between general permissive parenting and parental concern, as well as the specific feeding practices of 'eat anyway,' 'control by favorite foods', and 'control junk food'. Results are presented in Table 8. The results show that when controlling for child weight, for parents of children with BMI above the 70th percentile, as parental concern about overweight increased so also did the active-restrictive parenting style, discouraging, planning, and mentioning negative consequences.

Hypothesis 4:

The fourth and final hypothesis predicted that parenting practices and child weight would be related when controlling for parental concern. Hierarchical regression analysis was used to control for concern in the fall to predict child weight in the spring from parenting practices in the Fall. The analysis was run using (1) the entire sample and (2) children whose BMI was greater than or equal to the 70th percentile.

Using the entire sample, results (Table 9) showed no significant relationships between general parenting style (active-restrictive and permissive) in the Fall and child weight in the Spring. Results also showed no significant relationships between child weight in the spring and the specific feeding practices of planning, consequences, discourage, urging children to eat when not hungry, control by favorite foods, and controlling junk food.

The 70th percentile was used as a cut-off point for child BMI in the spring, resulting in an analysis of 74 children. Results (Table 10) showed only two significant relationships: discourage ($p<.05$) and control junk food ($p<.05$). These results show that even when

parental concern is controlled, parents who were more discouraging in the fall had children with higher weight in the spring and vice versa. Further, parents who were more controlling of junk food intake in the fall had children with higher weight in the spring and vice versa. Relationships between child weight and the general parenting styles of active-restrictive and permissive were non-significant, as were the specific feeding practices, of planning, consequences, urging children to eat when not hungry, and using favorite foods to reward the child for engaging in good behavior

CHAPTER V

CONCLUSION

The sample for the study originally included 152 parent-child dyads, but 23 had to be omitted for not answering the question regarding concern about child overweight, leaving a final sample of 129 parents and their children. Multiple analyses were run to examine a variety of relationships between child overweight, parental concern about overweight, and parenting practices.

Hypothesis 1:

The initial hypothesis was that there would be a mismatch between the number of overweight children and the number of parents perceiving them as such, with more children being overweight than parents showing concern. Although the percentages clearly demonstrated this mismatch, chi-square tests also showed increasing parental concern as child degree of overweight increased for both CDC standards and the standards proposed by Eto et al. (2004). For the CDC standards, slightly more than one-third of parents with children at risk for overweight were concerned about their child's overweight, while almost two-thirds of parents with overweight children were concerned. Although one would expect child overweight and parental concern to match (i.e., all parents with at-risk-for-overweight children showing concern and all parents with overweight children showing concern), this is not the case. Interestingly, 15.5% of parents of healthy weight children are concerned about the weight of their child, which

poses the question of what is fueling these parents' concern. Although mismatch exists for both groups, the amount of concern does increase as child weight increases.

Hypothesis 2:

The second hypothesis stated that parents who are concerned with their child's weight would be more likely to be authoritarian in their parenting, while parents who are not concerned would be more likely to be permissive. This hypothesis was partially supported, with parents who reported concern over their child's weight being more authoritarian in general, as well as participating in more authoritarian feeding practices, such as discouraging their child from eating particular foods, stating negative consequences related to food, and being more planful.

Contrary to the hypothesis, parents who were concerned and parents who were not concerned showed no significant difference for permissive parenting. Further, the feeding practices of modeling healthy eating behaviors, offering healthy foods to their children, and expecting their child to eat healthy foods showed no significant differences for the two groups of parents.

Parents who were concerned were more likely to participate in the feeding practices of discouraging children from eating certain foods and stating negative consequences related to food. Although these practices may be thought to help children regulate their own eating, these results support previous findings from researchers (e.g., Francis and Birch, 2005; Robinson et al, 2001) who have found that restricting foods actually increases children's desire and intake. As a result, parents who are concerned about their child's weight are actually participating in behaviors that are counterintuitive. Although concerned parents are more likely to plan, it is difficult to distinguish whether

this behavior will have positive or negative results on the child. It is encouraging that concerned parents are taking an interest in the foods they are purchasing; however, this practice is not an interaction between parent and child, but rather an action of the parent alone, making it difficult to know the intent behind such planning.

The fact that no significant differences exist for the feeding practices of modeling, offering, and expectations related to healthy foods is discouraging. One would expect that concerned parents would be making great effort to increase their child's intake of healthy foods through modeling and offering such foods; however, this is not the case.

Hypothesis 3:

Tests of the third hypothesis used hierarchical regression, controlling for child weight, to explore the relationship between parenting and parental concern. Using both the entire sample and children with BMI scores above the 70th percentile, analyses showed similar results.

For the entire sample, results showed a significant relationship between active-restrictive parenting style, discourage, planning, and consequences and parental concern. However, non-significant relationships were found between parental concern and general permissive parenting, as well as the specific feeding practices of 'eat anyway' (If my child says "I'm not hungry," I try to get them to eat anyway), 'control by favorite foods' (I offer my child her favorite foods in exchange for good behavior), and 'control junk food' (If I did not control my child's eating, they would eat too many junk foods).

For parents of children with BMI above the 70th percentile, significant relationships existed between active-restrictive parenting style and parental concern. Results also showed significant relationships between discourage, planning,

consequences and parental concern. Non-significant relationships were found between general permissive parenting and parental concern. Further, non-significant relationships were found between the specific feeding practices of 'eat anyway,' 'control by favorite foods,' and 'control junk food'.

These results show that regardless of child weight, some parenting styles and feeding practices are predictive of parental concern. For example, parents who are more active-restrictive are more likely to be concerned about child weight and vice versa. In addition, parents who discourage their children from eating certain foods, plan when shopping, and have consequences related to food are likely to be concerned about their child's weight. Similar to hypothesis 2, these behaviors may actually be counterintuitive, showing that parents may be concerned without reason. As a result, children who may not be at risk for overweight or overweight may later develop or maintain weight issues as they may not learn to regulate their food intake (Francis and Birch, 2005; Robinson et al, 2001).

Hypothesis 4:

The fourth hypothesis used hierarchical regression to predict that when controlling for parental concern, parenting practices and child weight would be related. Analyses were run using both the entire sample and the cut-off of BMI greater than or equal to the 70^{th} percentile.

For the entire sample, no significant relationships were found for the general parenting styles of active-restrictive and permissive. In addition, the specific feeding practices of planning, consequences, discourage, eat anyway, control by favorite foods, and control by junk food in the Fall did not have significant relationships with child

weight in the Spring. Because using the entire sample includes children with weight in the 'healthy' category, the lack of significant relationships is to be expected, because relationships between parenting and weight should not occur until weight problems begin to be apparent. Note that these relationships do not indicate whether parenting is a response to the weight problems or one component of the complex of variables that contribute to them.

For the 70th percentile cut-off, results showed that two feeding practices in the fall (discourage and control junk food) were found to predict child weight in the spring. Similar to previous findings in this study and others (Francis and Birch, 2005; Robinson et al, 2001), parents who discouraged and controlled their child's eating had children with higher weight. Contrary to the hypothesis, both active-restrictive and permissive parenting were non-significant, as were the specific feeding practices of planning, consequences, eat anyway, and control by favorite foods. These results show that although some parenting practices predicted overweight, most did not.

Using different cut-off points or weight groups may result in different results. However, the 75th percentile has already been shown to be a meaningful cut-off point with children at or above this weight during the preschool years being overweight by early adolescence (Nader et al., 2006), making it appropriate for the current study.

Implications

The current study shows the mismatch between child weight and parental concern; however, the link between concern and parenting style and feeding practices provided mixed results. The relationship of concern and the general parenting styles of authoritarian and permissive was only somewhat supported; while concerned parents

were likely to be authoritarian, unconcerned parents were not more likely to be permissive. In addition, only some of the specific feeding practices were linked to parental concern.

Although the results of this study support previous research on parenting practices and child weight, there are additional questions that arise. The first being, what may cause parents of healthy weight children to show concern about their weight? Further, what causes the mismatch between parental concern and child overweight? Gaining a better understanding of what causes parents to be concerned or unconcerned may help to decrease this mismatch.

The second question is related to the second hypothesis. Why are concerned parents not more likely than unconcerned parents to model healthy eating behaviors, offer healthy foods to their children, and expect their child to eat healthy foods? It would be expected that a concerned parent would be much more likely to participate in these behaviors, causing one to wonder what is preventing them from doing so.

Limitations and Future Research

The current study has a variety of limitations. The first is the low alphas for consequences and offer (.57 and .58 respectively). The short time frame of the study is also a limitation. An increase in time between child measurements would change BMI scores and provide a longer time frame for feeding practices to change. In addition, the study does not take into account changes in the family system, such as changes in marital status, federal assistance, and employment that may influence parenting.

The study also does not take into account the weight status of the parents, which may influence concern. Parents who are overweight themselves may have a different

amount of concern than parents who are not overweight. Including the weight status of the parent or other family members may give better insight into differing degrees of parental concern.

The current study required that children be measured at two separate time points, causing a reduction in sample size of 23 children. Additional studies should use larger samples in an effort to gain a greater understanding of how child weight, concern, and feeding practices are linked.

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TABLES

TABLE 1. Means, medians, percentages, and variability of demographic measures, n = 152

Variable	Mean, Median, %[a]	± SD or interquartile range[a]	N
Child age in years	4.06, 4.04	± 0.53	152
Household income per	Median=$1000-	$100-$499 to $2000 to $2499	152
$0-$499	10.53%		16
$500 - $1499	40.79%		62
$1500 - $2499	19.08%		29
$2500 - $3499	9.87%		15
$3500 – 3999	1.97%		3
$4000 plus	1.32%		2
Not stated	16.45%		25
Parental ethnicity			
White	52.0%		79
Native American	4.6%		7
African-American	8.6%		13
Hispanic	17.1%		26
Asian	1.3%		2
Multiethnic	3.9%		6
Other minority	0.0%		0
Not stated	12.5%		19
Paternal Ethnicity			
White	39.5%		60
Native American	6.0%		9
African-American	13.8%		21

Hispanic	17.8%		27
Asian	2.6%		4
Multiethnic	1.3%		2
Other minority	1.3%		2
Not stated	17.8%		27
Parental Education	Median=some vo-	11th grade to vo-tech graduate	
Less than 12th grade	17.7%		27
High school diploma	17.1%		26
Some vo-tech	9.2%		14
Some college courses	19.7%		30
Vo-tech graduate	5.9%		9
College graduate	15.8%		24
Not stated	14.5%		22
Paternal Education	Median=12th grade	11th grade to vo-tech graduate	
Less than 12th grade	19.1%		29
High school diploma	21.7%		33
Some vo-tech	5.3%		8
Some college courses	16.4%		25
Vo-tech graduate	2.6%		4
College graduate	5.9%		9
Not stated	28.9%		44

[a]Values are mean ± SD, median with interquartile range in parentheses, or percent.

Table 2: Composition and Cronbach's alphas for subscale of measures

Measure and Subscale	N of Items	Cronbach's Alpha (original study)	Cronbach's Alpha (current study)
Parent Behavior Questionnaire-Head Start Active-Restrictive 1. I spank when my child is disobedient 2. When my child and I disagree, I tell my child to keep quiet 3. When my child misbehaves, I say things I regret 4. When my child acts up, I get visibly upset 5. I scold or criticize my child when they don't do what they are told	5	.77	.61
Parent Behavior Questionnaire-Head Start Active-Responsive 1. I tell my child I'm proud when they try to be good 2. I respond to my child's feelings or needs 3. I encourage my child to think about the consequences of their behavior 4. I express affection to my child by hugging, kissing, and holding them 5. I give praise when my child is good. 6. I tell my child reasons to obey rules 7. I show sympathy when my child is hurt 8. I apologize to my child when I make a mistake involving them 9. I explain the consequences of my child's behavior to them	9	.77	.77
Parent Behavior Questionnaire-Head Start Passive-Permissive 1. I tell my child I'll punish them, but don't do it 2. I have a hard time saying "no" to my child 3. When my child doesn't do what I ask, I let it go or do it myself 4. I find it difficult to discipline my child 5. My family says I spoil my child 6. When I want my child to stop doing something, I ask many times 7. If my child resists going to bed, I let them stay up	7	.77	.76

Model 1. I eat vegetables when I am with my child 2. I eat fruit when I am with my child 3. I eat lean meat when I am with my child 4. I eat low-fat snack foods when I am with my child 5. I drink milk when I am with my child 6. I eat whole grain breads when I am with my child	6	.89	.86
Offer 1. How often do you include vegetables in your child's meals or snacks? 2. How often do you include fruits in your child's meals or snacks? 3. How often do you include lean meat in your child's meals or snacks? 4. How often do you include low fat milk and dairy foods in your child's meals or snacks? 5. How often do you include whole grain breads or cereals in your child's meals or snacks?	5	.73	.58
Discourage 1. How often do you tell your child a food is not healthy? 2. How often do you tell your child a food will make them sick? 3. How often do you say "don't eat it"? 4. How often do you give your child a small portion? 5. How often do you tell your child a food will make him/her fat? 6. How often do you just don't buy a food? 7. How often do you just don't give a food to your child?	7	.84	.72
Expectancies 1. I tell my child to eat this food because it is good for him/her 2. I tell my child to eat this food because it will make him/her strong 3. I tell my child to eat this food because it tastes good 4. I tell my child to eat this food because it will make him/her grow	5	.79	.88

5. I let my child see me eat this food			
Planning 1. I check food labels for ingredients before purchasing a product for the first time 2. I read nutrition information provided on food packages before purchasing a product for the first time 3. I make a list before doing the shopping	3	.68	.69
Consequences 1. How often do you tell your child you will take them somewhere if they eat a food? 2. How often do you take away a privilege from your child (for example: watching TV, going outside) if a food is not eaten? 3. How often do you make something else for them to eat? 4. How often do you tell your child if they eat a food you will give them dessert? 5. How often do you force your child to eat a food?	5	.79	.57
Eat anyway (individual item) 1. If my child says "I'm not hungry," I try to get them to eat anyway	1	NA	NA
Control junk food (individual item) 1. If I did not control my child's eating, they would eat too many junk food	1	NA	NA
Clean plate (individual item) 1. My child should always eat all of the food on her plate	1	NA	NA
Control by favorite foods (individual item) 1. I offer my child her favorite foods in exchange for good behavior	1	NA	NA

TABLE 3. Correlation matrix of feeding practices and general parenting styles[a]

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Active Restrictive										
(2) Passive-Permissive	-.014									
(3) Active-Responsive	.003	-.072								
(4) Discourage	.162	-.089	-.008							
(5) Planning	-.037	-.128	.000	.232**						
(6) Consequences	.272**	.200*	-.028	.276**	.029					
(7) Model	-.052	-.203	.225*	.217*	.299***	-.042				
(8) Offer	-.074	-.147	.148	.000	.127	.011	.465***			
(9) Eat anyway	-.043	.011	-.065	-.036	-.146	.166	-.097	-.036		
(10) Control by favorite foods	.093	.149	-.234**	.058	-.071	.522***	-.064	.010	.163	
(11) Control junk food	.079	.052	-.009	.155	-.106	.165	.004	.030	.049	.064

[a]Sample size (n) for correlations ranges from 122 to 129.

*$p < 0.05$; **$p < 0.01$; ***$p < .001$.

TABLE 4. Means and standard deviations for parenting measures as a function of concern

Parenting	Concerned	Not concerned	N
Active-Restrictive	1.836(.526)**	1.604(.399)	127
Active-Responsive	3.555(.392)	3.590(.419)	127
Passive-Permissive	1.776(.490)	1.703(.476)	129
Model	3.088(.701)	3.072(.614)	128
Offer	2.887(.444)	2.883(.366)	129
Discourage	2.012(.540)*	1.784(.410)	128
Expectancies	3.186(.670)	3.058(.675)	129
Planning	2.667(.750)*	2.305(.749)	129
Consequences	1.707(.507)*	1.527(.316)	129
Eat Anyway	2.570(1.441)	2.940(1.342)	128
Control junk food	3.480(1.661)	3.380(1.459)	125
Control by favorite foods	2.130(1.362)	2.17(1.210)	124

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

TABLE 5. Match and mismatch between child overweight and parental concern (CDC Standards) n=129

	Amount of Concern		
Weight Group	Not Concerned	Concerned	Total
Healthy	84.5%	15.5%	n=84
At risk for overweight	65.2%	34.8%	n=23
Overweight	36.4%	63.6%	n=22

TABLE 6. Match and mismatch between child overweight and parental concern (Eto et al, 2004 standards) n=129

	Amount of Concern		
Weight Group	Not Concerned	Concerned	Total
<90th percentile	82.5%	17.5%	n=97
≥90th percentile	43.8%	56.3%	n=32

TABLE 7. Hierarchical Regressions predicting overweight concern from parenting (entire sample).

Outcome[a]	Change statistics[b]			Coefficients[c]			
Block and Predictors	ΔR^2	df	*P*	β	B	SE	*P*
Overweight Concern (N = 129)							
1 – Average BMI z score	.128	1, 125	.001	.358	.484	.113	.001
2 – Active-Restrictive parenting	.060	1, 124	.003	.246	.723	.238	.003
Overweight Concern (N = 129)							
1 – Average BMI z score	.130	1,127	.001	.360	.506	.116	.001
2 – Passive-Permissive parenting	.004	1,126	.451	.063	.177	.234	.451
Overweight Concern (N = 129)							
1 – Average BMI z score	.134	1,126	.001	.366	.504	.083	.001
2 – Discourage	.048	1,125	.008	.222	.646	.082	.008
Overweight Concern (N = 129)							
1 – Average BMI z score	.130	1,127	.001	.360	.506	.116	.001
2 – Planning	.044	1,126	.010	.211	.373	.143	.010
Overweight Concern (N = 129)							
1 – Average BMI z score	.130	1,127	.001	.360	.506	.116	.001
2 – Consequences	.119	1,126	.001	.346	1.218	.272	.001
Overweight Concern (N = 129)							
1 – Average BMI z score	.132	1,126	.001	.363	.509	.116	.001
2 – Eat Anyway	.002	1,125	.594	-.045	-.044	.083	.594
Overweight Concern (N = 129)							
1 – Average BMI z score	.134	1,122	.001	.366	.491	.113	.001
2 – Control by favorite foods	.007	1,121	.313	.086	.090	.088	.313
Overweight Concern (N = 129)							
1 – Average BMI z score	.130	1,123	.001	.361	.486	.113	.001
2 – Control junk food	.002	1,122	.622	-.042	-.037	.074	.622

[a]Abbreviations: BMI, Body Mass Index

[b]ΔR^2 is the change in R^2, the unique variance explained by each block in the regression.

[c]β is the standardized and B is the non-standardized regression coefficient. SE is the standard error of B.

TABLE 8. Hierarchical Regressions predicting overweight concern from parenting (70th percentile).

Outcome[a]	Change statistics[b]			Coefficients[c]			
Block and Predictors	ΔR^2	df	*P*	β	B	SE	*P*
Overweight Concern (N = 74)							
1 – Average BMI z score	.122	1,73	.002	.350	.727	.228	.002
2 – Active-Restrictive parenting	.462	1,72	.005	.302	.922	.319	.005
Overweight Concern (N = 74)							
1 – Average BMI z score	.124	1,74	.002	.352	.748	.232	.002
2 – Passive-Permissive parenting	.001	1,73	.828	.024	.066	.304	.828
Overweight Concern (N = 74)							
1 – Average BMI z score	.124	1,74	.002	.352	.748	.232	.002
2 – Discourage	.061	1,73	.022	.263	.747	.318	.022
Overweight Concern (N = 74)							
1 – Average BMI z score	.124	1,74	.002	.352	.748	.232	.002
2 – Planning	.075	1,73	.011	.277	.504	.193	.011
Overweight Concern (N = 74)							
1 – Average BMI z score	.124	1,74	.002	.352	.748	.232	.002
2 – Consequences	.128	1,73	.001	.358	1.411	.399	.001
Overweight Concern (N = 74)							
1 – Average BMI z score	.121	1,73	.002	.348	.739	.233	.002
2 – Eat Anyway	.007	1,72	.442	-.086	-.089	.115	.442
Overweight Concern (N = 74)							
1 – Average BMI z score	.125	1,70	.002	.353	.715	.227	.002
2 – Control by favorite foods	.010	1,69	.367	.102	.113	.125	.367
Overweight Concern (N = 74)							
1 – Average BMI z score	.114	1,71	.003	.338	.702	.232	.003
2 – Control junk food	.002	1,70	.720	-.042	-.040	.111	.720

[a]Abbreviations: BMI, Body Mass Index

[b]ΔR^2 is the change in R^2, the unique variance explained by each block in the regression.

[c]β is the standardized and B is the non-standardized regression coefficient. SE is the standard error of B.

TABLE 9. Hierarchical Regressions Predicting Spring Weight from Parenting with Fall Concern Controlled. (entire sample)

Outcome	Change statistics[a]			Coefficients[b]			
Block and Predictors	ΔR^2	df	*P*	β	B	SE	*P*
Spring Weight (N = 129)							
1 – Overweight Concern	.109	1,125	.000	.330	.241	.061	.000
2 – Active-Restrictive parenting	.000	1,124	.926	-.008	-.018	.189	.926
Spring Weight (N = 129)							
1 – Overweight Concern	.109	1,127	.000	.329	.231	.059	.000
2 – Passive-Permissive parenting	.007	1,126	.309	-.086	-.170	.166	.309
Spring Weight (N = 129)							
1 – Overweight Concern	.117	1,126	.000	.342	.245	.060	.000
2 – Discourage	.008	1,125	.284	.094	.196	.182	.284
Spring Weight (N = 129)							
1 – Overweight Concern	.109	1,127	.000	.329	.231	.059	.000
2 – Planning	.000	1,126	.849	-.016	-.020	.107	.849
Spring Weight (N = 129)							
1 – Overweight Concern	.109	1,127	.000	.329	.231	.059	.000
2 – Consequences	.008	1,126	.295	-.095	-.234	.223	.295
Spring Weight (N = 129)							
1 – Overweight Concern	.111	1,126	.000	.333	.235	.059	.000
2 – Eat anyway	.006	1,125	.343	-.080	-.056	.058	.343
Spring Weight (N = 129)							
1 – Overweight Concern	.116	1,122	.000	.341	.250	.062	.000
2 – Control by favorite foods	.009	1,121	.265	-.095	-.073	.066	.265
Spring Weight (N = 129)							
1 – Overweight Concern	.114	1,123	.000	.337	.246	.062	.000
2 – Control junk food	.012	1,122	.203	.108	.069	.054	.203

[a]ΔR^2 is the change in R^2, the unique variance explained by each block in the regression.

[b]β is the standardized and B is the non-standardized regression coefficient. SE is the standard error of B.

TABLE 10. Hierarchical Regressions Predicting Spring Weight from Parenting with Fall Concern Controlled (70th percentile)

Outcome	Change statistics[a]			Coefficients[b]			
Block and Predictors	ΔR^2	df	*P*	β	B	SE	*P*
Spring Weight (N = 74)							
1 – Overweight Concern	.094	1,73	.008	.306	.134	.049	.008
2 – Active-Restrictive parenting	.019	1,72	.213	-.146	-.195	.155	.213
Spring Weight (N = 74)							
1 – Overweight Concern	.099	1,74	.006	.315	.134	.047	.006
2 – Passive-Permissive parenting	.025	1,73	.156	.158	.158	.128	.156
Spring Weight (N = 74)							
1 – Overweight Concern	.099	1,74	.006	.315	.134	.047	.006
2 – Discourage	.050	1,73	.043	.238	.289	.140	.043
Spring Weight (N = 74)							
1 – Overweight Concern	.099	1,74	.006	.315	.134	.047	.006
2 – Planning	.009	1,73	.387	.102	.079	.091	.387
Spring Weight (N = 74)							
1 – Overweight Concern	.099	1,74	.006	.315	.134	.047	.006
2 – Consequences	.006	1,73	.493	-.082	-.138	.201	.493
Spring Weight (N = 74)							
1 – Overweight Concern	.098	1,73	.006	.314	.135	.048	.006
2 – Eat anyway	.016	1,72	.258	-.128	-.056	.049	.258
Spring Weight (N = 74)							
1 – Overweight Concern	.103	1,70	.006	.320	.144	.051	.006
2 – Control by favorite food	.012	1,69	.336	-.110	-.055	.057	.336
Spring Weight (N = 74)							
1 – Overweight Concern	.090	1,71	.010	.301	.133	.050	.010
2 – Control junk food	.051	1,70	.044	.227	.096	.047	.044

[a] ΔR^2 is the change in R^2, the unique variance explained by each block in the regression.

[b] β is the standardized and B is the non-standardized regression coefficient. SE is the standard error of B.

APPENDIXES

APPENDIX A

PARENT AND CHILD EATING QUESTIONNAIRE

1. When your child is at home, how often are you responsible for feeding them? ___never ___seldom ___half of the time ___most of the time ___always
2. How often are you responsible for deciding what your child's portion sizes are? ___never ___seldom ___half of the time ___most of the time ___always
3. How often are you responsible for deciding if your child has eaten the right kind of foods? ___never ___seldom ___half of the time ___most of the time ___always
4. How concerned are you about your child becoming overweight? __unconcerned __a little concerned __concerned __fairly concerned __very concerned
5. I offer my child her favorite foods in exchange for good behavior. ___disagree ___slightly disagree ___neutral ___slightly agree ___agree
6. If I did not control my child's eating, they would eat too many junk foods. ___disagree ___slightly disagree ___neutral ___slightly agree ___agree
7. My child should always eat all of the food on her plate. ___disagree ___slightly disagree ___neutral ___slightly agree ___agree
8. If my child says "I'm not hungry," I try to get them to eat anyway. ___disagree ___slightly disagree ___neutral ___slightly agree ___agree

HOW OFTEN DO YOU DO THE FOLLOWING TO ENCOURAGE YOUR CHILD TO EAT CERTAIN FOODS?

9. I tell my child to eat this food, because it is good for him/her. _____never _____sometimes _____often _____always
10. I tell my child to eat this food, because it will make him/her strong. _____never _____sometimes _____often _____always
11. I tell my child to eat this food, because it tastes good. _____never _____sometimes _____often _____always
12. I tell my child to eat this food, because it will make him/her grow. _____never _____sometimes _____often _____always
13. I let my child see me eat this food. _____never _____sometimes _____often _____always
14. How often do you tell your child you will take them somewhere if they eat a food? _____never _____sometimes _____often _____always
15. How often do you take away a privilege from your child (for example: watching TV, going outside) if a food is not eaten? _____never _____sometimes _____often _____always
16. How often do you make something else for them to eat? _____never _____sometimes _____often _____always
17. How often do you tell your child if they eat a food you will give them dessert? _____never _____sometimes _____often _____always
18. How often do you force your child to eat a food? _____never _____sometimes _____often _____always

WHEN YOU ARE SHOPPING OR COOKING HOW LIKELY ARE YOU TO DO EACH OF THE FOLLOWING:

19. I check food labels for ingredients before purchasing a product for the first time. _____never _____sometimes _____often _____always
20. I read the nutrition information provided on food packages before purchasing a product for the first time. _____never _____sometimes _____often _____always

21. I make out a list before doing the shopping. _____never _____sometimes _____often _____always

WHEN YOU ARE SHOPPING OR COOKING HOW LIKELY ARE YOU TO DO EACH OF THE FOLLOWING:

22. I compare prices on several food products when I go food shopping. _____never _____sometimes _____often _____always
23. How often do you include vegetables in your child's meals or snacks? _____never _____sometimes _____often _____always
24. How often do you include fruits in your child's meals or snacks? _____never _____sometimes _____often _____always
25. How often do you include lean meat in your child's meals or snacks? _____never _____sometimes _____often _____always
26. How often do you include low fat milk and dairy foods in your child's meals or snacks? _____never _____sometimes _____often _____always
27. How often do you include whole grain breads or cereals in your child's meals or snacks? _____never _____sometimes _____often _____always
28. How often do you include fried foods in your child's meals or snacks? _____never _____sometimes _____often _____always
29. Before you handle foods how often do you wash your hands? _____never _____sometimes _____often _____always
30. How often do you tell your child to wash their hands before they eat? _____never _____sometimes _____often _____always

EACH OF THE FOLLOWING APPLIES TO EATING IN YOUR FAMILY:

31. I eat vegetables when I am with my child. _____never _____sometimes _____often _____always
32. I eat fruit when I am with my child. _____never _____sometimes _____often _____always
33. I eat lean meat when I am with my child. _____never _____sometimes _____often _____always
34. I eat low-fat snack foods when I am with my child. _____never _____sometimes _____often _____always
35. I drink milk when I am with my child. _____never _____sometimes _____often _____always
36. I eat whole grain breads or cereals when I am with my child. _____never _____sometimes _____often _____always

TO DISCOURAGE YOUR CHILD FROM EATING A PARTICULAR FOOD, HOW OFTEN DO YOU DO THE FOLLOWING?

37. How often do you tell your child a food is not healthy? _____never _____sometimes _____often _____always
38. How often do you tell your child a food will make them sick? _____never _____sometimes _____often _____always
39. How often do you say "don't eat it"? _____never _____sometimes _____often _____always
40. How often do you give your child a small portion? _____never _____sometimes _____often _____always
41. How often do you tell your child a food will make him/her fat? _____never _____sometimes _____often _____always
42. How often do you just don't buy a food? _____never _____sometimes _____often _____always
43. How often do you just don't give a food to your child? _____never _____sometimes _____often _____always

APPENDIX B

Home Practices Questionnaire

11. I find it difficult to discipline my child.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
12. I give praise when my child is good.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
13. I spank when my child is disobedient.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
14. I have a hard time saying "no" to my child.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
15. I show sympathy when my child is hurt.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
16. My family says I spoil my child .	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
17. When my child doesn't do what I ask, I let it go or do it myself.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
18. I tell my child I'll punish them but don't do it.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
19. I respond to my child's feelings or needs	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
20. I tell my child reasons to obey rules.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
21. I tell my child I'm proud when they try to be good	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
22. I encourage my child to think about the consequences of their behavior.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
23. When my child misbehaves, I say things I regret.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
24. I express affection to my child by hugging, kissing, and holding them.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
25. If my child resists going to bed, I let them stay up.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
26. I apologize to my child when I make a mistake involving them.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
27. When my child and I disagree, I tell my child to keep quiet.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always
28. When my child acts up, I get visibly upset.	_____Almost Never	_____Sometimes	_____Often	_____Almost Always

29. When I want child to stop doing something, I ask many times. _____Almost Never _____Sometimes _____Often _____Almost Always

30. I scold or criticize my child, when they don't do what they are told. _____Almost Never _____Sometimes _____Often _____Almost Always

31. When my child asks why they must do something, I say, "I said so." _____Almost Never _____Sometimes _____Often _____Almost Always

32. I explain the consequences of my child's behavior to them. _____Almost Never _____Sometimes _____Often _____Almost Always

Oklahoma State University Institutional Review Board

Date:	Thursday, September 07, 2006
IRB Application No	HE0689
Proposal Title:	Parenting Practices for Cognitive, Emotional, and Nutritional health: Effects on Child Nutrient Status, Overweight, and Behavior - "Head Start on Health-II"
Reviewed and Processed as:	Expedited (Spec Pop)

Status Recommended by Reviewer(s): Approved Protocol Expires: 9/6/2007

Principal Investigator(s

Laura Hubbs-Tait
341 HES
Stillwater, OK 74078

Tay Seacord Kennedy
312 HES
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Sue C. Jacobs, Chair
Institutional Review Board

VITA

Nicole Lee Moore

Candidate for the Degree of

Master of Science

Thesis: DIFFERENCES AMONG PARENTS WHOSE CONCERNS ABOUT CHILD OVERWEIGHT ARE REALISTIC OR NOT

Major Field: Human Development and Family Science

Biographical:

Personal Data: Born in Stillwater, Oklahoma, on July 12, 1984, the daughter of Jack and Jana Moore.

Education: Graduated from Stillwater High School, Stillwater, Oklahoma in May 2003; received Bachelor of Science degree in Human Development and Family Science from Oklahoma State University in Stillwater, Oklahoma in May 2007. Completed the requirements for the Master of Science in Human Development and Family Science at Oklahoma State University, Stillwater, Oklahoma in May, 2008.

Experience: Born and raised in Stillwater, OK. Employed as both an undergraduate student and graduate research assistant, Oklahoma State University Department of Human Development and Family Science, 2006 to present.

Name: Nicole Lee Moore Date of Degree: May, 2008

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: DIFFERENCES AMONG PARENTS WHOSE CONCERNS ABOUT CHILD OVERWEIGHT ARE REALISTIC OR NOT

Pages in Study: 56 Candidate for the Degree of Master of Science

Major Field: Human Development and Family Science

Scope and Method of Study: The purpose of the study was to examine the relationships among parental concern about child overweight, general parenting style, and specific feeding practices. Participants in the study were 129 children aged three, four, and five years enrolled in one of four rural or micropolitan Oklahoma Head Start Centers. Parents of the participants completed a demographic questionnaire and other questionnaires examining parenting practices. Anthropometric measurements, including height, weight, and triceps skin fold, were measured in fall and again in spring.

Findings and Conclusions: Mismatch between actual child weight and parental concern existed. Although 63.6% of parents with children who are considered overweight according to CDC standards were concerned, only 34.8% of parents of children at risk for overweight were concerned. Parents who were concerned about their child's weight were significantly more likely to be active-restrictive in parenting style and were more likely to discourage their children from eating foods ($p<.05$), provide negative consequences for eating ($p<.05$), and plan meals and read labels ($p<.05$).. As BMI increased above the 70th percentile, increasing weight was related to increasing parental use of discouraging practices $p<.05$) and attempts to control junk food ($p<.05$). Results are interpreted as both showing increasing parental concern with increasing child weight and a mismatch between concern and at-risk-for-overweight status among preschool children. Parenting style and feeding practices are related to parental concern about children being overweight.

ADVISER'S APPROVAL: Dr. Laura Hubbs-Tait