

The Relationship among Maternal Characteristics, Maternal Dietary Self-Regulation, and the
Dietary Intake and Body Weight Status of Two to Five-Year-Old Children

By

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CHAPTER 1

Introduction

1.1 Statement of Problem

Overweight and obesity are a significant public health concern due to the physical, psychological, and secondary morbidities associated with the condition.¹ Young children do not make food choices for themselves, so understanding the factors that surround mothers' decisions regarding food choices on behalf of her child is essential. Self-regulation is a concept associated with dietary intake and physical activity²⁻⁵, but it is unclear how one person's self-regulation may affect another person's intake and physical activity. A better understanding of the relationships of maternal variables with overweight and obesity in early childhood has the potential to identify at-risk children, and undergird the development of early interventions that can, in turn, prevent poor child health outcomes.

Purpose of the Study

The study explored associations among a mother's level of dietary self-regulation, level of stress, feeding practices and body mass index (BMI) with her child's BMI and dietary intake and identified influential contextual factors in a population of mothers who had a child of preschool age.

Specific aims:

Aim 1: To assess the strength of the associations of mothers' dietary self-regulation, stress, feeding practices, and BMI with child BMI. (Phase 1 – Quantitative – survey component)

H1.1: Controlling for the contributions of the other maternal variables, maternal stress and BMI will be positively associated with child's BMI.

H1.2: Controlling for the contributions of the other maternal variables, maternal dietary self-regulation and positive feeding practices will be inversely associated with child's BMI.

Aim 2: To identify contextual factors, previously not accounted for, that impact mothers' influence on child eating habits, dietary intake, and BMI. (Phase 2 –Qualitative – interview components).

H2.1: Contextual variables not assessed in currently available measures/tools will be derived from providing mothers the opportunity to discuss their child's eating habits, dietary intake, and body weight status.

Study results lay a strong foundation for future interventional work that will a) improve maternal influence on child feeding practices for better early childhood weight outcomes and b) educate and support mothers who are at-risk for having an overweight child.

1.2 Research Questions

- 1) Are there associations of a mother's level of dietary self-regulation, level of perceived stress, feeding practices, BMI with the BMI of her child aged two to five-years?
- 2) What contextual factors do mothers report influence their decisions and actions related to their child's eating habits, dietary intake and BMI?

1.3 Significance of the Issue and the Need for Study

Approximately 30 percent of children living in the United States are overweight or obese, a trend that has been steadily increasing over the past 20 years.⁶ The World Health Organization estimates 42 million children globally are overweight or obese⁷, and according to the Center for Disease Control (CDC), approximately 17% of children aged two to 19 years are obese.⁸ The National Health and Nutrition Examination Survey (NHANES) had a promising report of a statistically significant decrease in obesity prevalence in two to five year old children between 2003-2004 and 2011-2012.⁹ From 2015 to 2016, however, there was a significant increase in obesity and severe obesity in children aged two to five years.¹⁰ The CDC has made recommendations and provided strategies for implementing healthy food alternatives and interventions for improving weight outcomes at the community level.¹¹ Despite these specific recommendations, the issue of overweight and obesity persist.

There is new momentum in recent years to focus on obesity prevention in early childhood, with more recent attention on children who attend daycare.^{12,13} A preschool aged child's experience at daycare (duration, dietary intake, physical activity) and its potential connection with obesity risk is an emerging area of research. While parent involvement in food decisions at daycare has been acknowledged as beneficial, intervention programs that include parent involvement for obesity prevention have not been sustainable.¹³

Overweight and obesity occur in children when there is an excess of energy intake with a decrease in energy output.¹⁴ Singular, direct causes of this imbalance have not been identified, but rather many factors that may contribute to this change in energy balance have emerged.¹⁴ While overweight and obesity affect all populations of children in the United

States, obesity rates are higher among Hispanic and non-Hispanic black children.¹⁵ Further, mothers who are overweight or obese are more likely to have obese children compared to mothers of normal weight.¹⁶⁻¹⁸

Related suffering from overweight/obesity includes physical, psychological, and secondary morbidities.^{1,19} Overweight and obesity in the pediatric population is not only burdensome singularly, but secondary health issues are many: there is an associated stigma that arises with childhood overweight and obesity as well as chronic health issues such as type-2 diabetes²⁰⁻²², heart disease and sleep-breathing disorders.²³ Obesity is surpassing undernutrition and infectious diseases as the most significant contributor to poor health.^{23,24} The medical cost of childhood obesity related illnesses in the United States has been estimated at \$14 billion per year; overall, obesity related illnesses cost \$190.2 billion or 21% of annual medical spending in the United States.²⁵

The family unit is crucial in the effort for childhood obesity prevention^{26,27}, but empiric evidence is lacking looking at qualities of the mother in relation to obesity proneness, especially non-demographic variables of mothers of preschool aged children. There is evidence for the relationship between self-regulation and body weight status²⁸⁻³¹ as well as feeding practices and child body weight status.³² A mother's personal qualities, including self-regulation, influences how she parents her child³³, but the relationship between maternal self-regulation and child factors such as eating habits and body weight status reveals a gap. Further, birth order and presence of siblings has been shown to impact a child's proneness to being overweight or obese, with only children and youngest sibling at greatest odds of being affected.³⁴⁻³⁷

Understanding contextual factors related to child weight is central to the nursing paradigm, which aims to improve the health of the patient with consideration of her environment. The literature points out barriers to nursing interventions for child obesity prevention including a discomfort talking to patients about the condition³⁸, parental attitudes, and lack of resources.³⁹ Nurses represent the largest sector of healthcare providers; accounting for the challenges noted, the contact nurses have with mothers and children represents an opportunity to have a positive effect on obesity prevention.

Chapter 2

Literature Review and Theoretical Framework

2.1 Theoretical Framework

There is a lack of a widely used and accepted framework to address maternal characteristics and their impact on child weight outcomes. Specifically, the literature presents a gap in theoretical direction between the concepts of maternal self-regulation and child body weight status.

Figure 1 illustrates the Bushaw Conceptual Framework, a new conceptual framework that guided this study. It is based on three existing, tested theories and models: the Social Cognitive Theory (SCT)⁴⁰, the Ecological Model of Predictors of Childhood Overweight (ECO)⁴¹, and the Temporal Self-Regulation Theory (TST)⁴², previously applied to studies aimed at improving weight outcomes and preventing obesity. The synthesis of these models addresses the gap in the current literature of a model to guide a study that includes the proposed relationships illustrated in Figure 1. Established relationships (i.e., empiric evidence) are represented with solid lines and the hypothesized relationship between maternal self-regulation and child weight are represented with dashed lines.

The relationship between mother and child is represented as well as the many contextual influences on maternal self-regulation and body weight, the focus in this study. While other parental figures could have influence on child dietary intake, physical activity, and weight outcomes, mothers have a stronger influence on a child's feeding behaviors and weight

compared to fathers.⁴³ Maternal personal characteristics [e.g. age, socioeconomic status (SES), education level, ethnicity, race] are posited as moderators between self-regulation and maternal behaviors and ultimately, child physical activity and weight. Maternal behaviors are mediators between maternal self-regulation and child weight, with a hypothesized relationship between maternal self-regulation and child body weight, dietary intake, and physical activity. Borrowing from the ECO is the inclusion of the maternal influence on child outcomes. Further, the literature supports parental influence on child dietary intake^{44,45} with a bidirectional relationship between parental feeding practices and child body weight status.^{46,47} Influence from the SCT is evidenced by the posited relationships among maternal person, behavior, and environment. From the TST is the inclusion of the concepts of decision-making, intentions, and their relationship with self-regulation. A focus on self-regulation provides a bridge between a mother's intentions and actions even when a mother has knowledge about best feeding practices for her child.⁴⁸⁻⁵⁰

Figure 1

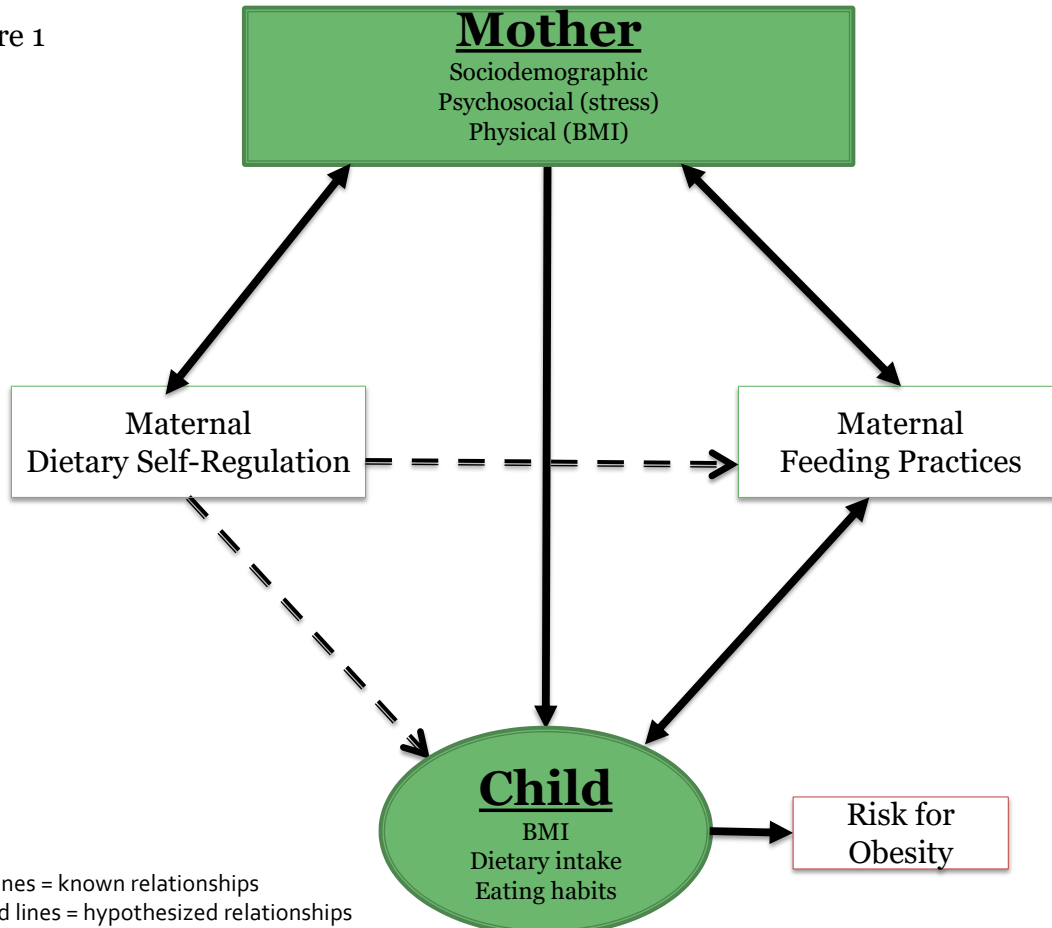


Figure 1. Bushaw Conceptual Framework. Dashed lines represent hypothesized relationships.

2.2 Critical Analysis of Relevant Literature

Self-regulation is a concept understood to be a contributing predictor of eating patterns: a person with high self-regulation is able to stop eating when sated⁵¹; and the strength and direction of the relationship between dietary self-regulation and body weight is confirmed with the effect sizes reported in this paper. Self-regulation is a concept associated with dietary intake and physical activity.²⁻⁴ How one person's self-regulation affects another person's intake and physical activity, in this context mother and child, has not been studied. Also absent from the literature are intervention studies focused on dietary self-regulation to improve body

weight status. A gap exists in measurement of dietary self-regulation, although newer measures such as the Self-Regulation Eating Behavior Questionnaire (SREBQ) and the Eating Self Control (ESC) show promise toward a more succinct way of measuring self-regulation in the context of dietary intake with a natural outcome of interest being body weight status. The ESC has confirmed internal consistency from multiple studies ($\alpha = .74-.90$)²⁸ and discriminant and convergent validity is confirmed via correlations between the ESC and General Self-Control Measure ($r > \pm .45$).²⁸ Strengths include its specific domain of eating/dietary intake, its scale is based on a widely used measure for general self-control, and it is a short measure, decreasing burden on study participants. Previous use of the ESC has been in the domain of consumer behavior. The SREBQ is also a short, 4-item measure with internal consistency measured in the original study ($\alpha = .75$).⁵² Convergent validity was confirmed with the SREBQ and avoiding tempting foods $r = .60, p < .001$.⁵² Strengths of the SREBQ include its focus on healthy eating behaviors and weight control, and its specific domain of eating and dietary intake for adults. A weakness of the measure is its lack of psychometric testing in American populations of adults. While it has been validated in a population of adults in the United Kingdom⁵², it has been used minimally in an United States. A recent study demonstrated reliability of the SREBQ in an American population⁵³ but validity was not reported.

The mother and child relationship is important to consider, especially related to dietary intake and feeding practices.⁵⁴⁻⁶⁰ Cross sectional and prospective studies of mother child pairs, ranging from infancy to adolescence, demonstrate a positive relationship between maternal and child body weight, with maternal BMI a significant predictor of child BMI z-score.⁶¹⁻⁶⁴ On the other hand, the relationships among a mother's self-regulation, her feeding practices

during infancy/young childhood, and child weight outcomes have been understudied and have not been examined inclusively. Focusing on maternal self-regulation can provide strong evidence to support future studies aimed to improve maternal influence on feeding practices and food decisions on behalf of her child. Ultimately, the mission is to improve body weight outcomes for young children.

Although previous studies have established the relationship between self-regulation and eating⁶⁵⁻⁷⁰ and self-regulation and weight⁷⁰⁻⁷³, the association between maternal dietary self-regulation and her child's weight outcome has not yet been explored in a population of young children. An intervention study focused on maternal self-regulation and child dietary intake had moderately positive results in a population of six to 11 year old girls⁴⁴, but no published studies could be found that have focused on this relationship in children under the age of six.

The primary gap identified in the review of the literature was the lack of studies testing the relationships posited in the Bushaw Framework, using a sample of mothers, particularly mothers of preschool aged children. The goal of the dissertation study was to address the gaps in the literature needed to build a case for later intervention studies. Because maternal factors and child body weight status have been understudied in populations of children under the age of five years, cross-sectional, correlational studies are needed to evaluate the association among the variables in the Bushaw Conceptual Framework. A long-term goal to address maternal self-regulation and obesity prevention in children would be to conduct a two-generation intervention and interventions across the lifespan. These types of studies would fill the gap of longitudinal studies as well as interventions that address the influencing factors from both mother and child for child weight outcomes.

2.3 Theoretical Definition of Terms/Variables

Dietary self-regulation is not frequently operationalized in isolation. Often self-regulation is a component of a measure, joined with environment and self-motivation to examine factors related to weight outcomes.^{51,74-79} As with the conceptual definition of self-regulation in the literature, self-regulation has been operationalized with measures that include related concepts, even when self-regulation was explicitly defined. Sub concepts are often assessed as a collective grouping, giving an indication of one’s self-regulation. For example, self-control^{73,80}, delays of gratification^{68,73}, problem behavior, and temperament have been used to evaluate self-regulation with observation and video-recorded sessions being common instruments used.^{68,73,81,82} Haws and colleagues²⁸ reviewed the literature for measures of self-control related to eating and found that researchers most commonly measure self-control/self-regulation in a general context, applying findings post hoc to a specific context. See Table 2.1 for theoretical definitions of the terms of interest in this study.

Table 2.1 Theoretical Definitions of Terms

Concept	Definitions
Mother	A woman who has a son or daughter ⁸³
Overweight	The result of excess energy intake resulting in fat accumulation that can have consequences on an individual’s health ^{84 14}
Obesity	Body Mass Index: weight in kilograms divided by height in meters squared [kg/m ²] >25 is overweight and >30 is obese
Child Overweight/ Child Obesity	“Overweight is weight-for-height greater than two standard deviations above WHO Child Growth Standards median; and obesity is weight-for-height greater than three standard deviations above the WHO Child Growth Standards median” ⁸⁴
Dietary intake	The consumption of chosen foods and nutrients, influencing nutritional status of an individual ^{85 86}
Self-Regulation of dietary intake	A personal process involving the ability of an individual to manage impulses independently in order to achieve a goal specific to food ^{87,88 89,90} .
Parent feeding practices	Goal directed behaviors a parent uses to influence dietary intake of a child ⁹¹
Parenting Stress	The perception of a mother or father on his/her ability as a parent and the demands of being a parent ⁹²

Chapter 3

Methodology

3.1 Research Design and Assumptions

The dissertation was a two-phase study using a sequential explanatory design. The first phase of the study was a cross-sectional, correlational design using quantitative methods. The second phase was a qualitative approach using individual interviews. The quantitative approach provided an opportunity to examine the relationships among maternal self-regulation, stress, feeding practices, and BMI and child BMI using validated measures. The qualitative approach allowed for an in-depth exploration of factors that may influence a mother's choices around feeding and choosing foods for her child that may not yet be accounted for in the current measures. Qualitative data were used to further explain and interpret quantitative results.

Assumptions for the study were that mothers of preschool aged children would be interested in participating in a study that would not directly benefit them. It was also assumed that mothers would answer the questions in the survey and interview truthfully.

3.2 Description of Research Setting

Surveys were self-completed by the participant in REDCap. The on-line BlueJeans video calling application was used for the subsample of participants completing the qualitative phase of the study. Mothers were recruited from six daycare centers located within Texas and Minnesota. Mothers were also recruited from an internet platform that matches volunteers with studies. At the onset of the study it was called TurkPrime, the name subsequently

changed to CloudResearch, powered by TurkPrime. Hereinafter the platform will be referred to as CloudResearch. The goal in recruiting from multiple sites was to reach sample size goals and provide diversity in the sample, capturing mother-child pairs from different regions in the United States and different levels of SES.

3.3 Sample

Nature and size of sample

A convenience sample of 564 mothers was recruited by the Principal Investigator (PI) from the target sites. A total of 171 participants were recruited from the four daycare centers located in Texas and Minnesota with data from 126 participants included in final data analysis. A total of 393 participants were recruited from CloudResearch with data from 293 participants included in final data analysis. The qualitative sample was 10 participants, a subset from the 171 daycare center recruited participants who volunteered to be interviewed.

Criteria for sample selection, criteria for inclusion and exclusion

Sample Selection: the multiple sites chosen for this study improved the ability to meet sample size goals, was inclusive of mothers whose children aged two to five years receive childcare outside of their home, diverse socioeconomic status, and from multiple regions of the United States. Inclusion Criteria: To be eligible for the study, a mother had to be: 1) ≥ 18 years of age with a child 2-5 years of age; a mother with more than one child age 2-5 years must choose one child to consider when completing the study, 2) able to read English, and 3) self-

identify as the primary parent caregiver. Exclusion Criteria: 1) child who had a previously diagnosed medical condition that affected their ability to eat in any capacity determined by maternal report, 2) mother who did not have access to a device to complete the electronic survey.

Methods for subject recruitment

Daycare centers: Recruitment of subjects from the daycare centers occurred via a flyer placed in the weekly folder of each child aged 2-5 years and an email with an electronic version of the flyer sent to each parent of a child aged 2-5 years via the daycare center director. The first set of flyers were sent in electronic form and paper form at the same time, with a repeat distribution of the electronic flyer occurring one month after initial recruitment to meet sample size goal. Following the survey, if the mother was interested in participating in an interview via video conferencing or telephone, she was asked to provide her name, phone number, and email address to be contacted by the PI to schedule the interview. On the day prior to the agreed meeting time for the interview, the PI sent an email message to the participant to remind her of the upcoming meeting with the video conferencing meeting link. The participant had the option to call in or join the meeting via video conferencing.

CloudResearch: CloudResearch's Prime Panels is a participant-sourcing platform with an interface that allows researchers to recruit from over 50 million participants, narrowed with the researcher's inclusion/exclusion criteria. CloudResearch assists with specific screening for eligibility; when a participant meets eligibility criteria, they can complete and submit the results. CloudResearch guarantees that a participant can only complete the survey one time, and they have quality control mechanisms which include validated attention screeners.⁹³

Participants are contacted by CloudResearch via email and dashboards based on the participant's demographic profile.⁹³ Compensation for CloudResearch participants is predetermined by the participant, so researchers are unable to specify how much each participant is paid.⁹⁴ Mothers recruited via CloudResearch were not invited to participate in the interview portion of the study, as CloudResearch does not allow participants to provide identifying information.

Flyer: A description of the study project, eligibility criteria, and information of available incentive to participate were components of the flyer to recruit interested mothers. A link to the survey was included on the flyer as well as the email address and phone number of the PI for participants who had questions or issues accessing the survey using the provided link. When mothers accessed the provided link, there was an assessment of eligibility. If a participant chose to contact the PI, a checklist parallel to the screening questions on the survey was used to screen the mother for her eligibility status for the study.

Strategies to ensure human subjects protection

Approval of the study and study protocols were obtained from the Vanderbilt Institutional Review Board (IRB) prior to the onset of any study activities. Electronic written, informed consent was obtained prior to initiating study procedures. Potential participants were informed that the data collected would be de-identified and reported in aggregate, ensuring the mother that her answers would not be linked to her identifying information. Qualitative data were de-identified, but specific quotes will be used in manuscripts and publications. The study did not include any hazardous procedures, situations, or materials. There was minimal risk to the

participants with possible emotional distress being the primary concern for the participant due to the sensitive nature of the topic of eating and body weight status.

3.4 Data Collection Methods

Procedures

Vanderbilt IRB approval was received for this study (IRB #181915). Once a participant accessed the REDCap survey, the first section explained the study purpose and study aims and screened the participant. Informed consent was electronically obtained with the participant choosing to proceed with the survey and checking a box verifying understanding of the information provided. If they agreed to participate, the survey commenced immediately. Upon completion of the survey, daycare-recruited participants were asked for their contact information for distribution of the \$25 Amazon or Target gift card. For the CloudResearch participants, their incentive was paid once the survey was completed per CloudResearch's participation agreement.⁹³ Participants are compensated according to the terms they agree upon with the platform from which they entered the survey.⁹⁴

At the end of the survey, daycare-recruited participants were asked if they were interested in participating in an interview with more in-depth questions. If interested, they were prompted to write in their email address to be contacted by the PI to schedule the interview. The PI contacted interested participants via email to schedule interviews on a first come, first serve basis. Interviews were conducted by the PI, recorded with a digital audio recorder, and took approximately 30 minutes to complete. Field notes were made immediately following the interviews to ensure details were captured that were not explicitly stated or

captured on the recordings. Digital recordings were transcribed verbatim by a professional transcription service. Interviews continued until data saturation was achieved. Ten interviews were completed. Interview participants received a \$50 Amazon or Target gift card, electronically sent. CloudResearch participants were ineligible for interviews since identifying information could not be collected from them.⁹³

Data Collection Tools

Survey: Participants completed an electronic survey in REDCap on their personal device. The survey contained between 98 and 103 questions, depending on the chosen answers provided, and took approximately 15 to 20 minutes for participants to complete.

Interview: After informed consent was obtained, ten participants completed an interview via BlueJeans video conferencing. Interviews were recorded with QuickTime Capture and BlueJeans, then stored as de-identified files in a locked folder on the PI's password protected computer. The files were uploaded to Vanderbilt Box for qualitative coding with the Vanderbilt Qualitative Core. The interview consisted of 8 questions and took approximately 30 minutes to complete. Following the interview, participants were asked a final question: "Is there anything else you would like to share about how (child's name) eats or how you make decisions about what to feed (child's name)?"

3.5 Instruments

The REDCap survey included demographic information; self-reported weight (mother and child); self-reported height (mother and child); validated measures to assess maternal self-

regulation, feeding practices, and perceived maternal stress; and maternal report of child dietary intake (fill in, short answer and interview). Following the completion of the survey, daycare recruited participants were asked to provide their name, phone number and/or email address if they were willing to participate in a short interview with the PI to discuss factors or issues that may influence her decisions about her child’s health related behaviors. The PI conducted all interviews via online video conferencing. The PI made field notes following the interviews to ensure details were captured that may not have been explicitly stated on the recordings. Table 3.1 depicts study variables and corresponding measures. Measures are described in the following section.

Table 3.1 Study Measures

Research Aim	Variable	Measure
N/A	Mother and child demographics	Demographic questionnaire
1	Maternal dietary self-regulation	Eating Self Control Self Regulation of Eating Behaviors Questionnaire
1	Maternal, self-reported body weight status	Maternal weight, height, Body Mass Index (BMI)
1	Child Feeding practices	Child Feeding Questionnaire
1,2	Maternal reported, child body weight status	BMI z-score; child weight, height, gender, age; verbal and visual scales of body image
1	Parental Stress	Perceived Stress Scale
1,2	Dietary Intake of child	Survey questions and qualitative interview guide
2	Maternal contextual factors	Qualitative interview guide

For the purposes of analysis, maternal and child ethnicity and race were collapsed to three categories: ethnicity collapsed to Hispanic/Latino, Non-Hispanic, and unknown; race collapsed to Black/African American, Caucasian, and other. Study demographics of maternal

race, maternal BMI, maternal age, and marital status had randomly missing data that was <1% of the data, so they were imputed.

The Eating Self-Control (ESC) is a 10-item measure to assess food consumption outcomes. It was self-administered and items were answered on a 7-point Likert scale; the average score of the 10 items was computed to determine an overall score.²⁸ Reliability of scores in previous research have been reported.²⁸ The validity of the measure has been established²⁸, but the measure has not yet been used exclusively in a population of American mothers. The Cronbach's alpha for the ESC scores in this sample was .90, comparable to those previously reported.²⁸

The Self-Regulation of Eating Behaviors Questionnaire (SREBQ) is a 4-item measure to assess self-management of eating behaviors.⁵² Responses were answered on a 5-point Likert scale with a total sum score averaged to indicate the individual's ability to self-regulate dietary intake as low, medium, or high.⁵² The SREBQ has been validated in a population of adults in the United Kingdom but no published studies have used the instrument in the United States. The Cronbach's alpha for the SREBQ scores in this sample was .73, comparable to the previously reported reliability of the instrument.⁵² For the SREBQ, there were 32 participants who did not qualify to complete the measure because they were identified with screening questions as having no intention of a healthy diet. After consideration from the dissertation committee, it was agreed to include the participants who had no intention of a healthy diet as having low dietary self-regulation with a score of zero.

The Child Feeding Questionnaire (CFQ) is a psychometrically validated, 31-item, self-complete measure to assess parental perceptions regarding child feeding practices with

answers on a 5 point Likert scale; sums from the 7 subscales were averaged to obtain a total score for each subscale.⁹⁵ Three of the items on this measure that ask about the child's weight during elementary school years were not included in analysis due to the sample age, reducing the measure to 28-items; per the author of the measure, the subscale containing these items could be summed and averaged for a valid score without these items included. The Cronbach's alpha for the subscales of the CFQ in this sample ranged from .70 to .92, comparable to those reported in other studies.⁹⁵⁻⁹⁷ Because of the extreme skewness, it was more useful to create categories for the following subscales of the CFQ: Perceived Feeding Responsibility, Concern about Child Overweight, and Monitoring.

The Perceived Stress Score (PSS) is a 10-item measure to assess an individual's perception of their stress. Answers were answered on a 5-point Likert scale with a total sum score revealing the mother's level of stress.⁹⁸ The Cronbach's alpha for the PSS scores in this sample was .91, comparable to those previously reported.^{99,100}

Body weight status was operationalized with BMI for the mother participant and BMI z-score and weight-for-age percentile for her child. Mother and child's height and weight were obtained via self-report.

BMI was calculated after participants were asked to report height in feet/inches and weight in pounds, both common metrics used in the United States; values were converted to kilograms for weight and meters for height in order to calculate BMI or BMI z-score. BMI z-scores cut offs are as follows: < -2 z-score is considered low weight-for-height. > +2 z-score is considered high weight-for-height/overweight in children.¹⁰¹

Parental perception of child body shape was assessed with validated tools for verbal and visual scales of age and gender specific body image.^{102,103} These scales added information about the child's body weight status by having the mother identify which age and gender specific image, choosing 1 of 7 options, most closely described her child's body.¹⁰³ The image labeled "4" for both boys and girls reflected the 50th BMI percentile, but the other images did not represent a BMI percentile.¹⁰³ Both the visual and verbal descriptions of child's body stature were collapsed from seven categories to three. For the verbal description, mothers who answered "underweight" or "a little underweight" were classified as believing their child was underweight status, those who answered "about the right weight" were classified as believing their child was normal weight status, and those who answered "a little overweight" or "overweight" were classified as believing their child was overweight status. For the visual description of child's body stature, mothers who selected images 1, 2 or 3 were classified as believing their child was heavier weight status, mothers who selected image 4 were classified as believing their child was normal weight status, and those who selected images 5, 6, or 7 were classified as believing their child was lighter weight status (see Appendix B, page 3 of survey).

Dietary intake was assessed via short answer survey and qualitative interview.

Methods for data collection and storage

REDCap, a secure database, was used to collect and store data. The participants self-completed the survey, so data values were entered directly into REDCap. Discrepancies went under full review to verify accuracy. Quantitative data were analyzed using Statistical Package for Social Sciences Software (SPSS) Version 26. Data were de-identified and stored in a

password protected computer database, managed by the PI. Qualitative data were collected with digital audio recording from the direct interviews, and field notes were made immediately following the interviews to ensure details were captured that were not explicitly stated or captured on the recordings. Qualitative data were analyzed with the assistance of the Vanderbilt Qualitative Research Core, a consultative service that supports researchers in the design, implementation and analysis of qualitative studies.

3.6 Data Analysis

Quantitative Data Analysis

Data were summarized and analyzed using SPSS (IBM SPSS Statistics, Version 26). Maternal age, maternal BMI, maternal race, marital status, and socioeconomic status variables had < 1% of randomly missing data. Those missing data were imputed using multiple imputations (SPSS). Median, interquartile range (25th to 75th percentile), minimum and maximum were used to summarize the ordinal data, as well as the continuous data distributions because several of those distributions were skewed. Chi-square tests of independence (nominal) and Mann-Whitney tests (ordinal, continuous) were used to compare the characteristics of cases included in the analysis with those of the cases excluded. These tests were also used to compare characteristics of the cases sourced from CloudResearch with those sourced from daycare centers.

Simple linear regression analyses were used to assess the unadjusted associations of maternal, child, and environmental characteristics with child BMI z-scores. Two hierarchical regression analyses were conducted to assess the effect of maternal dietary self-regulation and

positive feeding practices with the child BMI z-score (1) and with the child weight-for-age percentage (2) after controlling for other maternal characteristics. The specific order of entry was as follows: to address H1.1, step one included maternal age, maternal race, partnership status, education, SES, employment status, child age (years); step two included dietary self-regulation, child feeding practices, maternal verbal child body weight status description, maternal visual body weight status description; finally perceived stress and maternal BMI. To address H1.2 the specific order of entry was: step one included maternal age, maternal race, partnership, education, SES, employment status, maternal verbal child body weight status description, maternal visual child body weight status description, child age (years); step two included perceived stress and maternal BMI; step three included dietary self-regulation and child feeding practices.

The skewed continuous data distributions were transformed as necessary to meet the assumptions of the linear regressions. Square root transformations were sufficient for maternal age, child age starting daycare, and two subscales from the Child Feeding Questionnaire (Perceived Child Overweight and Restriction). Logarithmic transformations were used for number of days per week the child attends daycare and number of days per week the family eats in a restaurant; inverse transformations were required for child BMI and maternal BMI. Statistical significance was determined with a critical alpha of .05.

Qualitative Analysis

For the qualitative inquiry, an inductive/deductive approach was used for this study with codes generated directly from the data with the overall framework for the codes derived

from the Bushaw Conceptual Framework (Figure 1). Two coders, the PI (Coder 1) and an experienced qualitative researcher from Vanderbilt University Qualitative Research Core (Coder 2) identified and connected themes in the coded quotes. Coding discrepancies were discussed among the coders until consensus was reached. The overall approach was iterative inductive/deductive; deductively, the categories and structure of the coding system is guided by the conceptual framework, and inductively, the specific categories are identified and refined from the mothers quotes.¹⁰⁴ Qualitative data were de-identified, but specific quotes will be used in the manuscripts and publications.

The coding system was organized into five categories: dietary intake outside the home, experience with food at home, behavior related to dietary intake, strategies for physical activity, and perception of child’s growth status. Subcategories were developed during the coding process for each of these main five categories. Eighty-five codes were developed, used to code 1923 quotes from mothers. Table 3.2 shows the coding system used for this study.

Table 3.2 Coding System

Category	Label	Definition	Rules
1	Dietary intake outside the home	This category is used to describe typical meals outside the home (e.g. daycare/school/restaurants)	
1.1	Influence	Maternal perception of influence on child's dietary intake at daycare/school/restaurants (e.g., have influence on school meals, control of food at grandparents' house)	
1.2	Communication	Discuss communication between parent and daycare/school regarding food	
1.3	Dietary intake	Description of typical meals consumed by <u>child only</u>	
1.3.1	Dietary intake detailed description	V/F=vegetable/fruit; M/F=meat/fish; D= dairy; S= Starch D= dessert/sweets (include sweetened beverages); FF=fast food	
1.3.2	Dietary intake general description	General description of dietary intake (e.g., menu provided, balanced, un/healthy)	
1.4	Type of food intake		

1.4.1	Meal	Dietary intake specific to meals	
1.4.2	Snacks	Dietary intake specific to snacks	
1.4.3	Treats and desserts		
1.5	Location	Location of meal or snack	
1.5.1	Daycare	Parent's perspective about the child's dietary intake at daycare	
1.5.2	Restaurants	Parent's perspective about the child's dietary intake at restaurants or other locations outside of home/school	
1.5.3	Other		
1.6	Frequency	Frequency of child eating outside the home	exclude daycare meals
1.7	Decision making eating outside the home	Decision making around where and what to eat when not eating at home	
1.7.1	Cost	cost of food where and what	
1.7.2	Convenience	convenience of location, speed of service, etc when and what	
1.7.3	Child preference	Child preference for where and what to eat	
1.7.4	Parent preference for child	Parent preference for where and what to eat	
1.7.5	Other		Right now we are using this to catch allergy
1.8	Barriers related to dietary intake	Barriers at school/restaurant/other	
1.8.1	Picky eating	Child refuses/avoids foods that doesn't like or want to eat	
1.8.2	Family/friends influence		
2	Experience with food at home	Experience with food at home	
2.1	Mealtime	Maternal perception of mealtime with child and family	
2.1.1	Snacks	Typical snacks provided to child	
2.1.2	Weeknight meals	Describe typical weeknight routine for meals	
2.1.3	Breakfast	Description of a typical breakfast routine and intake	
2.1.4	Weekend meals	Describes typical weekend routine for meals	
2.1.5	Treats and desserts		
2.1.6	Unspecified	Unspecified mealtime	
2.2	Dietary exclusions	Maternal description of foods not provided to child and why	
2.3	Dietary intake	Description of typical meals consumed by <u>Child only</u>	
2.3.1	Dietary intake detailed description	V/F=vegetable/fruit; M/F=meat/fish; D= dairy; S= Starch D= dessert/sweets (include sweetened beverages); FF=fast food	Can also include food that is purchased for the home
2.3.2	Dietary intake general description	General description of dietary intake	Can also include food that is purchased for the home
3	Behavior related to dietary intake	Description of feeding practices and routines around food at home	
3.1	Positive interactions	Maternal reflections on child's dietary intake that felt good/satisfying	
3.2	Negative interactions	Maternal reflections on the child's dietary intake that felt bad/unsatisfying	

3.3	Other interaction	Maternal reflections on the child's dietary intake that cannot be evaluated as positive or negative	
3.4	Distractions	Maternal reflections on the distractions that happen during meal time	
3.4.1	Screens	Maternal reflections on the presence of screens during mealtime	
3.4.2	Competing obligations	Maternal reflections on distractors from mealtime togetherness or meal prep	e.g. work, siblings, time
3.4.3	Other	Maternal reflections on distractions during mealtime that cannot be evaluated as screen time or professional/work obligations	
3.5	Meal preparation	Discussion focused on who prepares meals, how food is chosen for meals	
3.5.1	Collaboration	Discuss who works together for food preparation and eating in the home	
3.5.2	Ease of preparation/convenience	e.g., make something easy	
3.5.3	Other preparations	Other discussion on who prepares meals or how chooses.	
3.6	Shopping for food	Discussion focused on routine of shopping for food and influences for food purchases	
3.6.1	Child preferences		
3.6.2	Ease of preparation/convenience		
3.6.3	Cost		
3.6.4	Other		
3.7	Strategy for dietary intake	Strategies imposed on child to encourage dietary intake of certain foods	
3.7.1	Gradual introduction		
3.7.2	Intake control	e.g., does not accommodate with separate meal, eat what is served or don't eat, sanctions	
3.7.3	Food as reward	Maternal reflection on when participant uses food as a reward for child	include maternal description of when food is used to manage a child's behavior
3.7.4	Other reward	reward other than food	
3.7.5	Accommodation/modification		
3.8	Hunger and sated cues	Description of hunger and sated cues	
3.8.1	mother	Experience of feeling hungry/sated	
3.8.2	child	Experience of feeling hungry/sated	
3.9	Barriers related to dietary intake	maternal perception of barriers to feeding at home	e.g. picky eater, maternal dietary preferences
3.9.1	Food preferences		
3.9.1.1	Child preference		
3.9.1.2	Mother's preferences		
3.9.1.3	Other people	other people in the way- husband, other children	
3.9.1.4	Other		
3.9.2	Cost	Cost of food	
3.9.3	Preparation time	Preparation time	
3.9.4	Other		
3.10	Goals	Goals related to dietary intake	

3.10.1	Increase intake		
3.10.2	Decrease intake		
3.10.3	Other		
4	Strategies for physical activity	Discussion centers on the participant's perception of physical activity	
4.1	Activity type	Any time participant talks about type of physical activity and/or benefits of physical activity	
4.2	Activity goals		
4.3	Barriers/negative feelings	Discussion around barriers to being active (e.g. neighborhood, time, screen time)	
4.4	Sleep patterns	Discussion of sleep	
5	Perception of child's growth status	Maternal perception of child's overall health r/t growth and body weight status, and discussion about how the child's healthcare provider is influencing feeding practices/overweight prevention	
5.1	Maternal perception of child's health and weight status	Maternal perception of child's body weight status and general health	
5.2	Perception of child's growth status from pediatric healthcare provider feedback/information	A discussion of maternal perception of child's body weight status based on information received from healthcare provider	
5.3	Opinions about the child's healthcare provider's attention to weight management/health feeding practices	A discussion of how the healthcare provider provides information on growth/health eating	
5.4	Ideas	Suggestions for improvement approaches for pediatric healthcare providers	

Transcripts were independently reviewed by the two coders to develop codes. Then codes were assigned to quotes, reviewed by the coders to review discrepancies, establishing inter-rater agreement. Once all transcripts were coded, one Microsoft Excel document was created organizing all quotes by code. From there the quotes were analyzed to reveal common themes and key quotes. Figure 2 provides an example of how a quote was coded.

Figure 2. Coding Example

Interview ID	Quote Order	Line Code	Speaker	Quote	Code 1	Code 2	Code 3	Code 4	Code 5	Code 6	Context
19	109	19-109	Interviewer	Okay. Is he usually eating the same food as the adults or is he eating different stuff usually?							
19	110	19-110	Mother	No, I would say most often it's different than what we're eating. I don't know, my husband's Hispanic and a lot of the food we cook is spicy, some of the things. I don't offer him some of the things because of that. Stir fried vegetables and stuff, I'll put a little portion of them on his plate but then I prep something that I know he'll eat. I'll try veggies, I'll just give him a little bit but it doesn't usually go over, because he doesn't often eat those things.	3.7.5	2.1.6	2.3.2	2.3.1	3.7.1	3.9.1.1	19-109

After all transcripts were coded and discrepancies were discussed and resolved between the coders, the quotes were organized by code. The quotes were analyzed and summarized, with emerging themes identified. Then the findings were compared to the Bushaw Conceptual Framework (Figure 1) and revisions were made to reflect the themes. The researchers from the Vanderbilt University Qualitative Core reviewed the findings and revisions to the original conceptual framework for clarity and consistency.

CHAPTER 4

RESULTS

4.1 Sample characteristics

Summaries of the characteristics of the mothers and children who were excluded from analysis and those who were included are shown in Tables 4.1 and 4.2. Participants were excluded from analysis if child height and weight was not provided or if the measures for dietary self-regulation were not completed. This decision was made because self-regulation was a primary variable of interest and child BMI was the outcome variable in the regression analyses. Mothers in the analysis were more educated (median = 13.0, IQR = 12.0-16.0 vs. median = 12.0, IQR = 12.0-16.0, $p = .014$) and more likely to be partnered (81.4% vs. 69.7%, $p = .003$) than those not included in the analysis. Children in the analysis were less likely to be an only child compared to those excluded from the analysis (23.2% vs. 55.9% $p < .001$) and therefore had a higher number of siblings (median = 0 vs. 1.0, $p < .001$). (See Tables 4.1 and 4.2)

Mothers were between 21-58 years of age (median = 34.1, IQR = 29.4-37.8) and their children ranged from 2-5 years of age (median = 3.9, IQR = 3.2- 4.8). The majority of the mothers were overweight according to the National Institute of Health body mass index (BMI) categories¹⁰⁵, with about 71% of the mothers considered to be obese (median BMI = 27.4, IQR = 22.5 - 32.3). The mothers were mostly Caucasian (79.3%), Non-Hispanic (90.5%), and partnered (81.4%). Diversity in sample was achieved with household income and region of the respondent (see Table 4.1).

Table 4.1 Summary of Maternal Characteristics

	In Analysis N	Median/IQR	Min- Max	Not in analysis N	Median/IQR	Min- Max	p- value
Maternal Age (years) ^	419	34.1/ 29.4-37.8	21.6- 58.2	142	34.3/ 29.7-38.0	20- 58	.941
Maternal BMI^	419	27.4/ 22.5-32.3	15.8- 69.4	134	25.9/ 22.3-30.6	5.9- 61.1	.290
Maternal Education (years completed)	419	13/ 12-16	2-25	138	12/12-16	8-23	.014
Hours work per week	266	40/ 32-40	2-78	84	40/32-40	10- 80	.455
		Frequency	%		Frequency	%	
Maternal Race^	419			143			.138
• Black/African American		31	7.4		18	12.6	
• Caucasian		333	79.5		104	72.7	
• Other		55	13.1		21	14.7	
Maternal Ethnicity	419			145			.206
• Hispanic/Latino		29	6.9		15	10.3	
• Non-Hispanic		379	90.5		123	84.8	
• Unknown		11	2.7		7	4.9	
Household income^	419			137			.117
• <\$45,000		150	35.8		61	44.5	
• \$45,000-\$100,000		136	32.5		39	26.9	
• > \$100,000		133	31.7		37	27.0	
Region of Respondent	417			138			.905
• Mid-West Region		173	41.5		57	41.3	
• Southern-Southwest		156	37.4		54	39.1	
• Other*		88	21.1		27	18.6	
Marital Status^	419			144			.003
• Married/living with partner		341	81.4		101	69.7	
• Divorced/separated/widowed		32	7.6		11	7.6	
• Never married		46	11.0		32	22.1	
Relationship to child	419			145			.481
• Biological mother		400	95.5		135	93.1	
• Adoptive mother		4	1.0		4	1.0	
• Step-mother		2	0.5		0	0	
• Grandmother		5	1.2		2	1.4	
• Foster mother		6	1.4		2	1.4	
• Other		2	0.5		2	1.4	
Employment status	419			145			.514
• Employed		267	63.7		88	60.7	
• Unemployed		152	36.3		57	39.3	

^ Variables imputed: randomly missing data values were < 1%

Table 4.2 Summary of Child Characteristics

	In Analysis N	Median/IQR	Min-Max	NOT in Analysis N	Median/IQR	Min-Max	p-value
Child Age (years)	419	3.9/ 3.1-4.9	2.0- 5.9	100	3.9/ 2.9-4.8	2.1-5.9	.485
		Frequency	%		Frequency	%	
Children with siblings	419	325	77.6	145	108	74.5	.449
• Birth order	413			137			<.001
Only Child		97	23.2		81	55.9	
Youngest		167	39.9		28	19.3	
Middle		43	10.3		11	7.6	
Oldest		106	25.3		17	11.7	
		Median/IQR	Min-Max		Median/IQR	Min-Max	
• Number of siblings	419	1/1-2	0-8	145	0/0-1	0-6	<.001
Gender	419	Frequency	%	145	Frequency	%	.836
• Male		201	48.0		71	49.0	
• Female		218	52.0		74	51.0	
Child Race	415			142			.092
• Black/African American		35	8.4		21	14.8	
• Caucasian		296	71.3		93	65.5	
• Other		84	20.2		28	19.7	
Child Ethnicity	419			145			.429
• Hispanic/Latino		46	11.0		20	13.8	
• Non-Hispanic		361	86.2		118	81.4	
• Unknown		12	2.9		7	4.9	
Attend daycare/school outside of the home	419			145			.733
• Yes		233	55.6		83	57.2	
• No		186	44.4		62	42.8	
		Median/IQR	Min-Max		Median/IQR	Min-max	
Days/week attends daycare	232	5/4-5	1-7	82	5/4.75-5.00	1-7	.245
Age child started daycare (months)	230	12/3-35	0-60	80	8/3.00-34.5	0.5-60.0	.428

The goal of recruiting from two disparate sources (daycare centers and CloudResearch) was to achieve diversity in the sample. As can be observed from the characteristics and

comparisons summarized in Tables 4.3 and 4.4, that goal was accomplished. Mothers recruited from the daycare centers tended to be older, more educated, more likely to be employed, worked more hours weekly, and earned more money (all statistically significant at $p < .05$, see Table 4.3). The mothers recruited from CloudResearch tended to have higher BMI, had greater ethnic diversity and were more evenly distributed in terms of region, representing regions outside of the Midwest and South/Southwest in greater frequency. Finally, the CloudResearch mothers were more likely to be the biological mother to their child, with daycare center recruited moms representing more adoptive mothers and foster mothers than the CloudResearch group. The following summaries focus on the mothers and their child who are included in the analysis.

Table 4.3 Summary of Maternal Characteristics by Source of Recruitment (N= 419)

	Cloud Research N	Median/IQR	Min-Max	Daycare Moms N	Median/IQR	Min-Max	p-value
Maternal Age (years) ^	293	32.1/ 28.2-37.2	21.6- 58.2	126	36.3/ 34.2-38.8	27.6- 44.8	.002
Maternal BMI^	293	28.3/ 23.4-33.6	18.3- 69.4	126	23.6/ 21.6-29.6	15.8- 47.5	.001
Maternal Education (years completed)	293	12/12-14	2-24	126	16/ 14-18	4-25	<.001
Hours work per week N=266	158	40/30-40	7-78	108	40/ 40.0-41.8	2-60	<.001
		Frequency	%		Frequency	%	
Maternal Race^	293			126			.213
• Black/African American		26	8.9		5	4.0	
• Caucasian		228	77.8		103	83.1	
• Other		39	13.3		16	12.9	
Maternal Ethnicity	293			126			.005
• Hispanic/Latino		26	8.9		3	2.4	
• Non-Hispanic		259	88.4		120	95.2	
• Unknown		8	2.7		3	2.4	
Household income	293			126			<.001
• <\$45,000		144	49.1		6	4.8	
• \$45,000-\$100,000		112	37.4		24	19.0	
• > \$100,000		37	12.6		96	76.2	
Region of Respondent	291			126			<.001
• Mid-West Region		94	32.3		79	62.7	
• Southern-Southwest		114	39.2		42	33.3	
• Other		83	28.5		5	4.0	
Marital Status^	293			126			.103
• Married/living with partner		231	78.8		110	87.3	
• Divorced/separated/widowed		24	8.2		8	6.3	
• Never married		38	13		8	6.3	
Relationship to child	293			126			.007
• Biological mother		282	96.2		118	93.7	
• Adoptive mother		1	0.3		3	2.4	
• Step-mother		2	0.7		0	0	
• Grandmother		5	1.7		0	0	
• Foster mother		1	0.3		5	4.0	
• Other		2	0.7		0	0	
Employment status	293			126			<.001
• Employed		159	54.3		108	85.7	
• Unemployed		134	45.7		18	14.3	

^ Variables imputed: randomly missing data values were <1%

Table 4.4 Child Characteristics by Source of Maternal Recruitment (N=419)

	Cloud Research N	Median/IQR	Min-Max	Daycare moms N	Median/IQR	Min-Max	p-value
Child Age (years)	293	4.1/ 3.2-5.0	2-5.9	126	3.67/ 3.0-4.6	2-5.9	.007
		Frequency	%		Frequency	%	
Children with siblings	293	219	74.7	126	106	84.1	.035
• Birth order	293			126			.418
Only Child		70	23.9		25	19.8	
Youngest		120	41.0		53	42.1	
Middle		29	9.9		14	11.1	
Oldest		74	25.3		34	27.0	
		Median/IQR	Min- Max		Median/IQR	Min-Max	
• Number of siblings	293	1/1-2	0-8	126	1/1-2	0-4	.831
		Frequency	%		Frequency	%	
Gender	293			126			.925
• Male		141	48.1		60	47.6	
• Female		152	51.9		66	52.4	
Child Race	291			124			.410
• Black/African American		28	9.6		7	5.6	
• Caucasian		205	70.4		91	73.4	
• Other		58	19.9		26	21.0	
Child Ethnicity	293			126			.075
• Hispanic/Latino		36	12.3		10	7.9	
• Non-Hispanic		248	84.6		113	89.7	
• Unknown		9	3.1		3	2.4	
Attend daycare/school outside of the home	293			126			<.001
• Yes		117	39.9		116	92.1	
• No		176	60.1		10	7.9	
		Median/IQR	Min-max		Median/IQR	Min-Max	
Days/week attends daycare	116	5/3.3-5.0	1-7	116	5/5-5	1-5	.009
Age child started daycare (months)	115	24/3-39	0-60	115	7/3-19	1-52	.002

Tables 4.2 and 4.5 detail the characteristics of the child referred to in the study. The children were mostly Caucasian (71.3%) and Non-Hispanic (86.2%), and fairly evenly distributed male/female. Mothers described the child’s body weight status three ways: with self-report

height and weight and visual and verbal descriptions of the child’s body stature. The median child BMI z-score was .56 (IQR = -.79 – 2.06), revealing the children were overall of normal weight status, mirrored with the mother’s verbal description of the child’s body weight status (78% described the child as “about the right weight”). Conversely, when the mothers were asked to identify the body type that most closely resembles the child’s body stature, 47.5% chose an overweight figure, while 29.8% chose a normal weight figure. Thinking about the child visits to the pediatrician, most of the mothers felt their child’s provider was not concerned about their child’s weight being too high (96.7%).

About 56% of the children described in the study attend daycare or school outside of the home, with those attending daycare typically attending five days/week (IQR = 4.0-5.0). While most of the children included in the analysis had siblings, only about 12% had more than two siblings, and about 46% had one sibling. Mothers reported that they are the person typically preparing meals in the household (74.2% of the sample) with only 2% of the children subscribing to a special diet. During mealtime, about 70% of the children sometimes or always watch TV. When shopping for food, mothers identified cost (66.6%), healthy food options (76.6%) and child preference for certain foods (78.3%) as the top influencing factors for food selection while routine (37.5%), sale items (45.3%), and selection of available foods (48.4%) were identified less often as influencing.

Table 4.5 Child Body and Diet Characteristics (N =419)

	Median/IQR	Min/Max
Child BMI	16.3/ 14.6-19.0	8.5-48.8
Child weight-for-age Z score	.56/ -.8-2.1	-20.0-6.4

Child weight-for-age percentile	71.27/ 21.5-98.1	0.0-100
Times child eats in a restaurant, weekly	1/1-2	0-8
	N	Frequency/%
Person typically preparing meals in household		
• Mother	311	74.2
• Father	16	3.8
• Grandparent	6	1.4
• Nanny/babysitter/other	5	1.2
• Child	2	0.5
Visual description of child's body stature		
• Lighter weight status	95	22.7
• Normal weight status	125	29.8
• Heavier weight status	199	47.5
Verbal description of child's body stature		
• Underweight status	63	15.0
• Normal weight status	327	78.0
• Overweight status	29	6.9
Pediatrician/healthcare provider concern about child's weight being too high		
• Yes	14	3.3
• No	405	96.7
Child subscribe to a special diet		
• Yes	9	2.1
• No	410	97.9
Child watching TV during meals		
• Always	47	11.2
• Sometimes	247	58.9
• Never	125	29.8
Influence when shopping for food for family		
• Cost of food	279	66.6
• Selection of foods available at grocer	203	48.4
• Child preferences for certain foods	328	78.3
• Parent preferences for certain foods	262	62.5
• Healthy food options	321	76.6

• Tasty food options	234	55.8
• Convenience	242	57.8
• Routine	157	37.5
• Food items on sale	190	45.3
• Other*	3	0.7
• Nothing influences me	2	0.5

Descriptive summaries of maternal perceived stress and dietary self-regulation are shown in Table 4.6 and summaries of maternal feeding practices are found in Table 4.7. In general, the mothers surveyed had moderate perceived stress. Dietary self-regulation was measured twice, using the ESC and the SREBQ. Mothers, in general, demonstrated low to moderate levels of dietary self-regulation. The median scores of the ESC reflect moderate levels of dietary self-regulation, and the median SREBQ scores showed low levels of dietary self-regulation in this sample. Assessed with the CFQ, about 60% of the mothers always felt responsible for feeding their preschooler, and exhibited low levels of pressure to eat (median 2.6, IQR = 2.0-3.5). The mothers did not have strong perceptions that they or their child were overweight (median 3.3, IQR = 3.0-3.5, median = 3.0, IQR = 2.7-3.0, respectively), and about 92% of the mothers were not concerned about their child being overweight.

Table 4.6 Maternal perceived stress and dietary self-regulation (N=419)

Instrument	Reliability (Cronbach's Alpha)	Median/ IQR	Min/Max
Perceived Stress	0.91	18/ 14-23	0-40
Eating Self Control	0.90	4.1/ 3.1-5	1-7
Self-Regulation of Eating Behaviors *	0.73	2.4/2-3	0-4.2
		Frequency/%	
Self-Regulation of Eating Behaviors Categories			

• Low self-regulation of eating		261/62.3	
• Moderate self-regulation of eating		143/34.1	
• High self-regulation of eating		15/3.6	

*Screening questions excluded 32 participants who DO NOT intend to control their consumption of foods they find tempting and DO NOT intend to have a healthy diet. Without those participants given scores of 0, N=387, Median/IQR= 2.6/2-3, Min/Max= 1-4.2.

Table 4.7 Maternal child feeding practices (N =419)

	Reliability (Cronbach's alpha)	Median/ IQR	Min/Max
Perceived Parent Overweight	0.76	3.3/ 3-3.5	1-5
Perceived Child Overweight	0.70	3/ 2.7-3.0	1.3-4.3
Restriction	0.79	3.4/ 2.8-3.9	1-5
Pressure to eat	0.75	2.8/ 2-3.5	1-5
		Frequency	%
Perceived feeding responsibility	0.88		
• ≤ 3.5 (low level of responsibility)		28	6.7
• 3.6-4.5		139	33.2
• >4.5-5 (always feel responsible)		252	60.1
Concerns about child overweight	0.82		
• ≤ 3.5 (low level of concern)		384	91.6
• 3.6-4.5		26	6.2
• >4.5-5 (high level of concern)		9	2.1
Monitoring	0.92		
• ≤ 3.5 (low level of monitoring)		161	38.4
• 3.6-4.5		138	32.9
• >4.5-5 (high level of monitoring)		120	28.6

4.2 Results from Analyses of Study Aims

All analyses were run twice, once with child BMI z-score and once with child weight-for-age percentile as the dependent variable. Because there were minimal differences between

the analyses, and BMI z-scores are more widely used in the literature to operationalize child body weight status, the following results report findings from the child BMI z-scores.

Aim 1: To assess the strength of the associations of mothers' dietary self-regulation, stress, feeding practices, and BMI with child BMI.

Unadjusted associations of maternal, child, and environmental characteristics, and maternal self-report measure scores with child BMI z-scores are detailed in Tables 4.8 and 4.9. While there were no statistically significant associations between maternal and child characteristics or environmental characteristics and child BMI z-scores, there were statistically significant associations noted for maternal self-report measures. The strongest univariate associations of maternal self-report measures with child BMI z-scores were seen for maternal perception of her child's body weight status, both verbal ($r = .42, p < .001$) and visual ($r = .31, p < .001$). Additionally, there were statistically significant univariate associations of maternal feeding practices with child BMI z-scores in the following subcategories: perceived child overweight ($r = .44, p < .001$), pressure to eat ($r = -.14, p = .005$), monitoring ($r = .13, p = .023$), and restriction ($r = .10, p = .043$) (See Table 4.9).

Table 4.8 Associations of maternal, child, and environment characteristics with Child BMI z-score (N=419)

	R (p-value)	beta	p-value
Mother's years of age *		.02	.700
Mother's race [Caucasian]	.05 (.566)		
African American		-.05	.323
Other		-.03	.611
Marital status [Married/Partnered]	.02(.927)		
Divorced/separated/widowed		-.02	.732
Never married/single		-.01	.829
Mother's BMI *		-.06	.241
Child's age [years]		< .01	.963
Education level		.01	.819
Socioeconomic status [\$45,000-\$100,00]	.03(.806)		
< \$45,000		.02	.748
> \$100,000		-.02	.742
Unemployed		.004	.936

*Variable transformed: Mom age (square root), Mom BMI (inverse), days/week attend daycare (logarithm)

[] Indicates the referent category for nominal/ordinal categories

Table 4.9 Associations of maternal self-report measure scores with Child BMI z-score (N=419)

	R (p-value)	beta	p-value
Eating Self Control		-.01	.841
Self-Regulation of Eating Behaviors		-.05	.329
Self-Regulation of Eating Behaviors [high]+	.06(.528)		
Low (<= 2.8)		.10	.431
Moderate (2.8-3.6)		.05	.673
Self-Regulation of Eating Behaviors [high] (N=387)	.05(.676)		
Low (<= 2.8)		.09	.484
Moderate (2.8-3.6)		.06	.663
Perceived stress		-.01	.882
Maternal Perception of Child Body Image [Normal weight]	.31(<.001)		
Underweight		-.20	<.001
Overweight		.16	.005
Maternal Verbal Perception of Child Body [Normal weight]	.42(<.001)		
Underweight		-.30	<.001
Overweight		.25	<.001
Child Feeding Questionnaire			
Feeding response [Moderate]	.07(.336)		
Low (<= 3.5)		.06	.288
High (>4.5)		-.03	.535
Concern for child overweight [Moderate]	.11(.070)		
Low (<= 3.5)		-.06	.307
High (>4.5)		.07	.193
Monitoring [Moderate]	.13(.023)		
Low (<= 3.5)		-.15	.008
High(>4.5)		-.04	.464
Restriction *		.10	.043
Perceived child overweight *		.44	<.001
Perceived parent overweight		.08	.088
Pressure to eat		-.14	.005

*Variable transformed: CFQ Restriction and CFQ Perceived child overweight (square root)

[] Indicates the referent category for nominal/ordinal categories

+ SREBQ categorical, with 32 “zero” scores included

H1.1 Perceived stress and maternal BMI

Results for the multivariate analysis of the associations of perceived stress and maternal BMI with child BMI z-scores are shown in Table 4.10. In the initial step, no statistically significant associations of the maternal demographic characteristics with child BMI were

observed ($R^2 = .09, p = .968$). In step 2, dietary self-regulation, child feeding practices, and maternal perception of child body weight status were entered. This addition resulted in a statistically significant increase in explained variance in child BMI (R^2 change= .27, $p < .001$), accounting for approximately 28% of the variability in child BMI z-score (Adjusted $R^2 = .23$). After controlling for the maternal demographics, self-regulation, child feeding and weight variables, maternal perceived stress and maternal BMI did not demonstrate a statistically significant increase in explained variance in child BMI (R^2 change= .01, $p = .197$) (see Table 4.10).

Table 4.10 Hierarchical Multiple Regression: H1.1: Controlling for the contributions of the other maternal variables, maternal stress and BMI will be positively associated with child's BMI. N=419; DV= Child BMI z-score

	Multiple R	p-value	Adjusted R^2	R^2 -change	p-value
Step 1: Maternal age, maternal race, partnership status, education, SES, employment status, child age (years)	.09	.968	-.02	.01	.968
Step 2 : Dietary self-regulation, child feeding practices, maternal verbal child body weight status description, maternal visual child body weight status	.53	<.001	.23	.27	<.001
Step 3: Perceived stress, Mom BMI	.54	<.001	.24	.01	.197

SES= socioeconomic status; DV = dependent variable

The individual coefficients for each variable in the final model are shown in Table 4.11. After controlling for all of the other variables in the model, child BMI z-scores for those with maternal visual perceptions of her child's body weight status as being underweight were higher than those with maternal perceptions of the child's weight being normal ($beta = -.12, p = .042$). Additionally, child BMI z-scores were higher for those with maternal verbal perception of her child being overweight ($beta = .12, p = .020$) and maternal perception of her child being

overweight, measured with the CFQ ($beta = .31, p < .001$). Furthermore, child BMI z-scores were higher for those with mothers reporting low levels of monitoring compared to those reporting moderate monitoring ($beta = -.11, p = .036$) (See Table 4.11).

Table 4.11 Final Model H1.1 with Child BMI z-score as dependent variable

	<i>beta</i>	<i>p</i> -value
Maternal age	.03	.588
Maternal race (Caucasian)		
African American	-.06	.189
Other	-.03	.494
Marital Status (married/partnered)		
Divorced/separated/widowed	-.05	.303
Never married/single	-.06	.227
Maternal BMI	-.10	.101
Education level	.02	.651
Socioeconomic status (\$45,000-\$100,000)		
< \$45,000	.03	.601
> \$100,000	-.05	.327
Unemployed	.02	.670
Eating Self Control	-.07	.215
Self-Regulation of Eating Behaviors	-.08	.086
Perceived stress	-.04	.467
Maternal Visual Perception of Child Body Image (Normal weight)		
Underweight	-.12	.042
Overweight	.03	.553
Maternal Verbal Perception of Child Body (Normal weight)		
Underweight	-.10	.074
Overweight	.12	.020
Child age (years)	-.03	.495
Child Feeding Questionnaire		
Feeding response (Moderate)		
Low (<= 3.5)	.09	.064
High (>4.5)	.04	.425
Concern for child overweight (Moderate)		
Low (<= 3.5)	.04	.491
High (>4.5)	.02	.764
Monitoring (Moderate)		
Low (<= 3.5)	-.11	.036
High (>4.5)	-.06	.215
Restriction *	.06	.208
Perceived child overweight *	.31	<.001
Perceived parent overweight	-.03	.686
Pressure to eat	-.04	.421

*Variable transformed: Mom age (square root), Mom BMI (inverse), days/week attend daycare (logarithm), dining out weekly (logarithm), CFQ Restriction and CFQ Perceived child overweight (square root).

H1.2 Dietary self-regulation and child feeding practices

Results for the multivariate analysis of the associations of dietary self-regulation and child feeding practices with child BMI z-scores are shown in Table 4.12. In the initial step, a statistically significant association of the maternal demographic characteristics and maternal perceived child body weight status with child BMI was observed ($R^2 = .45, p < .001$). In step 2, perceived stress and maternal BMI were entered. This addition did not result in a statistically significant increase in explained variance in child BMI (R^2 change = .01, $p = .252$), (Adjusted $R^2 = .18$). After controlling for the maternal demographics, perceived child weight variables, maternal perceived stress, and maternal BMI, the addition of dietary self-regulation and child feeding practices demonstrated a statistically significant increase in explained variance in child BMI (R^2 change = .08, $p < .001$) (see Table 4.12).

Table 4.12 H1.2: Controlling for the contributions of the other maternal variables, maternal dietary self-regulation and positive feeding practices will be inversely associated with child's BMI. N=419; Dependent variable: Child BMI z-score

	Multiple R	<i>p-value</i>	<i>Adjusted R²</i>	<i>R²-change</i>	<i>p-value</i>
Step 1: Maternal age, maternal race, partnership, education, SES, employment status, maternal verbal child body weight status description, maternal visual child body weight status description, child age (years)	.45	<.001	.18	.20	<.001
Step 2 : Perceived stress, Mom BMI	.46	<.001	.18	.01	.252
Step 3: dietary self-regulation, child feeding practices	.54	<.001	.24	.08	<.001

The individual coefficients for each variable in the final model are shown in Table 4.13.

After controlling for all of the other variables in the model, child BMI z-scores for those with

maternal visual perceptions of her child's body weight status as being underweight were higher than those with maternal perceptions of the weight being normal ($beta = -.12, p .042$), and maternal verbal perception of her child being overweight ($beta = .12, p = .020$). Additionally, child BMI z-scores were higher for those with mothers with the perception of her child being overweight ($beta = .31, p < .001$) as well as mothers who reported low levels of monitoring compared to those reporting moderate monitoring ($beta = -.11, p = .036$) (see Table 4.13).

Table 4.13 Final Model H1.2 with Child BMI z-score as dependent variable

	beta	p-value
Maternal age	.03	.588
Maternal race (Caucasian)		
African American	-.06	.189
Other	-.03	.494
Marital Status (married/partnered)		
Divorced/separated/widowed	-.05	.303
Never married/single	-.06	.227
Maternal BMI	-.10	.101
Education level	.02	.651
Socioeconomic status (\$45,000-\$100,000)		
< \$45,000	.03	.601
> \$100,000	-.05	.327
Unemployed	.02	.670
Eating Self Control	-.07	.215
Self-Regulation of Eating Behaviors	-.08	.086
Perceived stress	-.04	.467
Maternal Visual Perception of Child Body Image (Normal weight)		
Underweight	-.12	.042
Overweight	.03	.553
Maternal Verbal Perception of Child Body (Normal weight)		
Underweight	-.10	.074
Overweight	.12	.020
Child age (years)	-.03	.495
Child Feeding Questionnaire		
Feeding response (Moderate)		
Low (<= 3.5)	.09	.064
High (>4.5)	.04	.425
Concern for child overweight (Moderate)		
Low (<= 3.5)	.04	.491
High (>4.5)	.02	.764
Monitoring (Moderate)		
Low (<= 3.5)	-.11	.036
High (>4.5)	-.06	.215
Restriction *	.06	.208
Perceived child overweight *	.31	<.001
Perceived parent overweight	-.03	.686
Pressure to eat	-.04	.421

*Variable transformed: Mom age (square root), Mom BMI (inverse), days/week attend daycare (logarithm), dining out weekly (logarithm), CFQ Restriction and CFQ Perceived child overweight (square root)

() Indicates the referent category for nominal/ordinal categories

Aim 2: To identify contextual factors, previously not accounted for, that impact mothers' influence on child eating habits, dietary intake, and BMI. Aim 2 of the study was assessed using qualitative methods.

H2.1: Contextual variables not assessed in currently available measures/tools derived from providing mothers the opportunity to discuss their child's eating habits, dietary intake, and body weight status.

Contextual variables related to the child's dietary habits inside and outside the home environment, the child's physical activity, and the mother's perceptions of the child's weight status related to input from the child's healthcare provider were identified through semi-structured questions detailed in the interview guide in Appendix C. While the majority of the mothers in the survey sample were overweight or obese, 50% of the mothers interviewed were overweight or obese. The mothers interviewed were also slightly older (median age 36.2 years versus 34.1 years) and worked more hours per week (47.5 versus 40 hours/week) compared to the mothers in the survey sample. All of the mothers in the interview sample were employed compared to about 64% employment of the mothers in the survey sample. The interview and survey sample were similar in race, ethnicity and marital status.

Six main themes emerged from the qualitative analysis: environmental conditions, maternal dietary self-regulation, social influences, maternal feeding practices, and child. Each of these broad categories had subthemes. Each main theme and related subthemes are presented below with some illustrative quotes.

Environmental Conditions

The theme “environmental conditions” encompasses the family milieu, particularly how it affects the mother. It captures the obstacles and facilitators the mother’s environment pose, influencing her decision making in relation to her child’s dietary intake. Three subthemes emerged within the theme of environmental conditions: 1) maternal competing obligations; 2) cost of food; and 3) convenience.

Competing maternal obligations. This subtheme captures the limitations that competing obligations put on the mother’s ability to control food decisions. Competing obligations is defined in this context as maternal reflections on distractors from mealtime togetherness or meal preparation. For most of the mothers, breakfast time was noted as particularly challenging with required multitasking and competing obligations. Often described were scenes of the mother trying to feed the child and get ready to leave the house for the day. Other mothers described her need for self-care competing with the needs of her child and family, planning and executing breakfast meals to allow her time alone (i.e. self-care). Overall, this meal was not described positively. Competing maternal obligations are evidenced by the following quotes:

“ . . . usually they're doing their thing and I call them for breakfast. And they sit down and eat breakfast, and then when they're gone I usually eat my breakfast. So, I can have some peace and quiet.” Participant 81

“ . . . while they're eating, I am actually taking a shower. So I would typically leave them with iPads and go and take a quick shower . . . ” Participant 16

“Oh, that is not our good time. During the week, on a school week, I am not a morning person, 100%. So, they eat almost without fail those Jimmy Dean Delights sandwiches . . . because they can make it themselves and so they're early birds. They get up before me.” Participant 15

“ . . . I think the issue here is time. These children have, we're both working parents and thankfully for me at least, I work from home, so that helps a little bit. But still I have, you know a plate full. So I'm trying as much as possible plan ahead with feeding. You know like meals and stuff but that never, you know, it just never materializes 100% the way you wish it would. . .”
Participant 16

Cost of food. This subtheme captures how cost of food impacts a mother’s decision on what to feed her child. In this sample of mothers, cost was seen as a barrier to providing foods perceived as healthier or better for their child. Specifically, organic foods were mentioned by many mothers as healthier, better foods, but cost often prohibited their ability to provide foods in this category. Mothers influence over dietary intake of her child, impacted by cost of food is evidenced by the following quotes:

Context: The mother reports that cost influences shopping because she is unable to buy organic foods but she’d like to: *“ . . . I guess cost in the sense that I just buy regular fruits and vegetables. I don't buy organic in that sense, yeah cost would come into play. . .”* Participant 19

“ . . . I mean I would love to buy more 100% organic definitely, but I just can't afford it. So I do buy organic milk, I don't buy organic meat. But their snacks, I usually try to get the organic crackers. So everything that I can, as much as I can get organic, I try to do that. But no, not everything that I buy. So I would say yes, I'd love to buy organic.” Participant 3

Convenience The subtheme, convenience, emerged as both a facilitator and a barrier to the mother’s ability to make food decisions she viewed as positive for her child. As a facilitator, many mothers reported making bigger meals on the weekends and having the convenience of serving leftovers during the week. Many mothers described having positive feelings about the food the daycare provided the child, both for their perception of the foods being healthy for the child and the convenience of not having to prepare the foods. Other mothers described making food selections for the child that are not necessarily seen as healthy food options, but are

chosen because they are quick and easy to prepare. This last perspective shows convenience as a barrier to positive decisions for the child's dietary intake.

The following quotes illustrate convenience as a facilitator to making healthy food decisions for their child, both quotes within the context of daycare meals:

“ . . . And one of the reasons we like that school is because they provide the meals. It's one less thing that we have to do. . . ” Interview ID 21

“And it's nice not to have to worry about packing another lunch.” Interview ID 19

Conversely, the following quotes illustrate of convenience as a barrier to making healthy food decisions for their child:

“Well, during the week, it's easy and fast, Nutri-Grain bars, Pop-Tarts. I'll buy or make pancakes and freeze them, so they can reheat them, that kind of stuff for breakfast. On the weekends it's more of French toast, eggs, pancakes, that kind of stuff, cereal.” Participant 81

[When asked how she decides what to buy/prepare for meals]: *“Yeah, ease of preparation I would say. . . So for example, fish sticks and we buy sweet potato fries, they're easy to prepare. But my husband likes to make his own French fries from potatoes. So things like, so that is easy, the fish fingers or the macaroni or whatever. I don't even know how to make that macaroni and cheese . . . ”* Participant 16

“ . . . one of his snacks is his favorite, and we do it, is Uncrustables. He loves those . . . it's just easier that way. We can take them on the go. So, I would say he has Uncrustables, probably, almost every day. It's his favorite snack. When he's super hungry, he usually has it when he's at the park. So, anyway. Yeah, he has one of those almost every day . . . ” Participant 21

Maternal Dietary Self-Regulation

Mothers described their dietary self-regulation in relationship to their decisions around their own food selections and physical activity. Mothers shared weaknesses when making decisions about their own dietary intake as well as when trying to make healthy food decisions for their child. Three subthemes emerged within the concept of maternal dietary self-

regulation, all three related to goals: 1) food goals; 2) weight goals; and 3) exercise goals. Each of these subthemes is presented below.

Food goals. Food goals emerged as a subtheme within maternal dietary self-regulation. This subtheme related to the mother's expressed goals for their child's dietary intake. Many of the mothers wished their child would eat more fruits and vegetables. Others felt additional protein in the child's diet was an important goal. One mother talked about her goal of providing healthier foods for her child than she provides for herself. Specifically, she talked about how her parents rewarded her as a child with food, and she feels that has contributed to her struggle with being overweight. The mother reported being intentional about avoiding food as a reward for her child. Another mother acknowledged her own picky eating habits and her goal to have her child eat a bigger variety than the mother does. The following quotes illustrate the subtheme:

"Yes. I would love it if we all ate more vegetables, but I kind of just roll with the ones that they will eat and it's not even the same ones that I like. . . But I wish that we all ate more veggies, but I was not raised that way and I have attempted to make myself better over the years. I was definitely raised in southern, everything is fried, most things are brown, like [crosstalk 00:17:56] fried Okra, you know, kind of not a colorful food palate. Being an adult, I really have tried to make myself like as many things as possible, but that would be a good area of improvement for us." Participant 15

". . . But also I think we're getting also lazy to do it. We had a nanny before and she was Vegan so she was very big on making sure they have a lot of veggies in their meals. And I think that really helped them love vegetables and fruits. And I think now that we're on our own, we're getting a bit more, we're getting lazy, you know. Like sometimes we make like pasta and meatballs and not have the broccoli, you know. So for example, I would like to have more of the veggies in terms of portion size than the pastas and stuff, for example, things like that. But it's just sometimes not convenient when you want to just do something quick." Participant 16

". . . So I feel like I'm more conscious about her eating than I am my own. And so I feel like they eat very healthy. . . And so I try to make sure that they eat healthier, and I'm trying to get them to make healthier choices and not use ... like my parents used food as a reward for me." Participant 3

“ . . . Most kids aren't going to like anything the first time they try it unless it's something sweet. But, I think it's usually just making sure that the kids get exposed to everything even if the mom doesn't like it, I try to make sure even if it's something I'm not going to eat that he still has it. And that's why I don't have any restrictions at his school, I want to make sure he's exposed to everything.... so it's just making sure that you're encouraging even if they don't like it once, still trying to find different ways to introduce it or have them try it again. . .” Participant 87

Weight goals. Weight goals emerged as a subtheme within maternal dietary self-regulation.

This subtheme related to the mother’s expressed weight goals for herself and her child. One mother who identified herself as overweight discussed her goal to teach her child to make healthier food choices that would promote healthy weight compared to what she has done for herself. Another mother described using a food delivery service that provides healthy, portioned meals to help regulate the dietary intake for the family. The following quotes illustrate this subtheme:

“ . . . I mean I feel like I make healthier choices for her than I do myself, just because I am overweight. And so I feel like being a mom that's overweight that has a kid, I want my daughter to not be overweight.” Participant 3

“We also do meal boxes. For a whole year we did Sun Basket, which they do ... which loved the perfectly balanced, perfectly portioned ingredients, stuff like that. And then I have done Snap Kitchen, which is pre-prepared meals. They're really more of a dietary meal.” Participant 21

Exercise goals. Exercise goals emerged as a subtheme of maternal dietary self-regulation. Many of the mothers described getting active with their children, especially after school and work.

Most detailed going for walks, many included visits to a nearby park. While all of the mothers described their children as being active all the time, most of the mothers referenced physical activity for themselves as a goal, trying to find time for exercise whenever they can. One mother described her workplace as being large enough that a walk through the campus served as exercise for her. The following quote illustrates the subtheme:

“Well, I just joined a gym yesterday. So, I'm on a new task set, health and wellness. I'm turning 37, so I'm not getting any younger. With three healthy, active boys, I need to be able to keep up with them. And also, if they see me going to the gym and staying healthy, then maybe ... they'll continue and you get that ... what they need to do.” Participant 81

Social Influences

Social influences emerged as a broad theme. Mothers described how people outside the family unit affected the mother's decisions around dietary intake of her child. Two subthemes emerged within the theme of social influences: 1) perception of weight status from healthcare provider and 2) maternal peer and public perception. The following explains each subtheme and key quotes elicited from the interviews.

Perception of child's weight status from healthcare provider. The mothers consistently conveyed confidence in their child's body weight status because of reassurance from her child's healthcare provider. There was variation, however, in how the mothers received information from their healthcare provider, if at all. For example, one mother has chosen not to take her child for well child checkups, so no one is monitoring her child's body weight status. Other mothers were interested in the healthcare provider's opinion on their child's weight, but described circumstances with the healthcare provider that felt the information left room for misinterpretation. The following quotes illustrate this subtheme:

[Context: mother reports that she does not take her child to a healthcare provider]: *“... Kind of my mentality is if there's nothing that's seemingly wrong, I don't want to spend the extra time or money on a medical visit where she would just be weighed and measured. No, she's pretty average. She's pretty tall for her age and a well-built little chick.”* Participant 208

[Context: This mother is overweight and has concerns about her child's growth status]: *“I mean I always worry about seeing her on the 90th percentile for weight. I mean she's not, I mean there are some kids that are a lot skinnier than her. She's not overweight by any means, she is ... I just for me I think I worry about the weight category of it. But then I see her height being the 99th percentile, and our pediatrician is like, "Do you realize your child is bigger than my five-*

year-old?" Being taller than her five-year-old. So for me I think that's something that I do worry about, I don't want her to have to worry about weight issues. But they just say that she's right on where she should be." Participant 3

[Regarding her feelings about her child's body weight status]: *"I'm okay with it as long as they're okay with it. They said at his last visit that this is the point where he will probably start to slim down a bit, and that's kinda what we noticed with the older one. As they get a little bit older, they lose some of that baby fat. He still is in the 90s, but he is leaning out in a way for himself. . ."* Participant 19

"Yeah, I mean, it would be good because you know, he's at, like I said, he has a high percentile. I don't know if that's good or bad necessarily because he doesn't, my pediatrician doesn't really say anything." Participant 16

Maternal peer/public perception. Maternal peers and public perception emerged as a subtheme of social influences. This subtheme captures how mothers are influenced by peers or what she perceives as public perception of her child's dietary intake. Most often this theme arose in the interviews when the mothers talked about dining out in restaurants. Many mothers talked about making decisions about the child's dietary intake in restaurants to ensure others in the restaurant would perceive the child as behaving. Other mothers provided examples of peer influence, explaining when friends or family are part of mealtime, the food decisions she would typically make are not followed in favor of more leniency to unhealthy food choices. Overall, the mothers reflected they feel they have the least amount of control over her child's dietary intake when other adults, either friends or family, are around. The following quotes illustrate this subtheme:

"And when you visit grandparents, I think you can only imagine, it is my worst nightmare in terms of how much he's ingesting . . . everyone you go to wants to take him for a donut or for an ice cream or whatever. And you try to explain why we can't do that, but it's just they want to have this experience . . . he's on one step short of a sugar high, and then has a serious meltdown, so." Participant 21

"We stick to some of the same restaurants where we know that he has experience and he has eaten that same type of meal at home . . . more so, at his age and with his personality, we're just trying to keep things cool and calm out in public." Participant 136

[Regarding her child's dietary intake] *"I'll give in a little bit when we're with other friends."*
Participant 21

Maternal Feeding Practices

Mothers identified behaviors and strategies related to feeding her preschool age child.

Four subthemes emerged within the broad theme of maternal feeding practices: 1) intake control; 2) passive technology intrusion; 3) food as reward; and 4) accommodations to food selection and/or preparation. The following explains each subtheme and key quotes from the interviews that illustrate the theme.

Intake control. There was consistency in responses when the mothers were asked how they handle it when the child does not like the food being served: the mothers insist the child try a bite or take a certain number of bites of the food. Most of the mothers commented they learned a strategy they call a "no thank you bite" from daycare, so in a circumstance when the child verbalized he does not like a food item, he must take at least one bite. Additionally, most of the mothers acknowledged using dessert or treats as a strategy to control intake during mealtime. The following quotes illustrate the subtheme:

"He's supposed to eat it, so I don't offer another option. I don't make him eat it all. But he has to have... Like I'll say, "You have to at least try everything on your plate." I would say like, "You need to have three more bites," or whatever it is. Then if he doesn't eat the amount that I think is reasonable, then he doesn't get dessert." Participant 91

"Yeah, we usually have to do the little ... We have to do the setting limits, like he has to have three bites of his green beans before he gets to officially leave the table and get a toy that he wants. I mean, we have to do a lot of that, like time ... You know." Participant 136

"They have to take two no thank-you bites and usually at that point, they just kind of give in and eat it. . ." Participant 15

"If you eat dinner you get dessert. So that's how we reward that behavior. . ." Participant 21

Food as reward. Food as reward emerged as a subtheme within maternal feeding practices. Using food as a reward was closely linked to intake control, as noted in the last quote above. Many of the mothers noted providing dessert as a reward when the child finished their dinner. Conversely, some of the mothers had strong feelings against using food as a reward. For example, one mother talked about her own experience receiving food as a reward as a child and feels it has had a detrimental effect on her weight as an adult. This subtheme is split into two categories: 1) mothers who use food as a reward and 2) mothers who do not use food as a reward. The following quotes illustrate this subtheme:

Using food as reward:

"I use it as a bribe if she really doesn't want to do something and I've tried to speak with her logically about it and can't convince her and if I can't offer her something else. . . I'd say about probably about twice a month, I'm like, "Hey, if you go to preschool graduation and get on stage, we can get something afterwards. We'll go get Menchies," which is frozen yogurt. You know, "If you do this," and that totally happened." Participant 15

"The only thing, so for example, mainly on candy. Though I don't, like for the twins, I'll say, I used that even this morning, you know they didn't want to get out of the car when I dropped them off at daycare, so I said "there's candy inside the, in the school, come on and I'll give you candy". But then by the time we get into the class they've already forgotten. So I'll just use that to get them out." Participant 16

Not using food as a reward:

"Like I wouldn't say, "Oh, I'm glad you shared that toy. Do you want a piece of chocolate?" No, no, I don't think so." Participant 91

"You know, I don't think that we do that as a special treat because I'm not much for giving food as a reward system. . . I don't think that food should tie in with a behavior because then it could ... I think it could cause some negative associations with food but, again, that's all just opinion. .

. I want him to grow up not thinking of it as a reward, per se, but more of this is a part of life and it is a social gathering, family time together and maybe taking a little bit of the emotional stuff out of eating and just enjoying each other's company, rather than connecting it with food, I guess, emotions with food." Participant 136

[Reflecting on her experience as a child] "It was, "You did good in school, let's go to McDonald's." And so I'm trying to not have that transfer to them, so that they don't have to deal with what I deal with as an adult. You know? . . . I mean I feel like I make healthier choices for her than I do myself, just because I am overweight. . ." Participant 3

Passive technology intrusion leading to distracted eating. Passive technology intrusion during meal and or snack time is another subtheme under maternal feeding practices that emerged from the interviews. Mothers discussed overtly using screens during mealtime, both mobile devices and television, while some also described not having screens directly in front of the child, but often televisions were on in the background during meals. As with using food as a reward, there were mothers who intentionally avoided screens during mealtime. The following quotes illustrate this subtheme:

"We have a TV upstairs that's on, but they have no view of it." Participant 81

"More often than not, it is on in the background in the other room." Participant 15

"It's typically on, not right within sight of the table, they could turn their head and see it but it's typically on in the background." Participant 19

"Similarly we're trying to get them out of iPads too. But that's kind of a way of getting them to sit. To sit still and eat. Otherwise it's just gonna be like, we're out. Like it's just a mess. So we're trying to get them out of iPods. My husband is better with that than me. Because, you know, with me, I'm like thinking of multiple things that I need to do. So if I can just get them to focus and I can multitask on something else that's like good." Participant 16

". . . It's I think she usually, my husband will feed them so I think he usually lets them sit in the living room in front of the TV, or she'll sit at the dining room table for breakfast with my son if he's still there." Participant 3

Accommodations for child, food selection and preparation. Modifying meal choices or preparation of food to accommodate the child was commonly identified by the mothers in their

child feeding practices. Mothers talked about adapting recipes that are culturally rooted to accommodate the child's palate by making the food blander. Some members of the family would then add seasoning individually to suit their palate. Others planned meals according to the child's preferences, with the entire family eating foods that the child likes to eat. Mothers discussed the child's preferences influencing their dietary intake, very frequently when dining out, but also in food preparation and snacks at home. Most often, the mother reported indulging the child's preferences in hopes of having a more pleasant mealtime experience. The following quotes illustrate the subtheme:

"No, I would say most often it's different than what we're eating. I don't know, my husband's Hispanic and a lot of the food we cook is spicy, some of the things. I don't offer him some of the things because of that. Stir fried vegetables and stuff, I'll put a little portion of them on his plate but then I prep something that I know he'll eat. I'll try veggies, I'll just give him a little bit but it doesn't usually go over, because he doesn't often eat those things." Participant 19

". . . What I try to do is ensure that ... I basically keep our weeknight meals fairly simple because I don't want to make three meals. . . So, for the most part I try to stick to things that he likes for the main course. Which are consistently chicken, pork, pasta. So, I'll try to make something that's fairly neutral in flavor so that my husband and I can eat it and spice it up with other toppings. But it's still something that I can serve him. And then he'll just get slightly different sides, because we won't [eat] peas. . ." Participant 21

[Asked if she makes special meals for her child] *"No. That I don't do that anymore. I think I did when he was super picky, but I don't usually make anything. I try to make something that I know he'll eat a little something of."* Participant 87

"We stick to some of the same restaurants where we know that he has experience and he has eaten that same type of meal at home . . ." Participant 136

Child

This theme captures the influence of the child on the mothers feeding practices and food decisions. Four subthemes emerged within the broad theme of child: 1) dietary intake; 2)

eating habits; 3) physical activity; and 4) body weight status. The following explains each subtheme and key quotes from the interviews.

Dietary intake. Dietary intake emerged as a subtheme. This subtheme related to the mothers report of her child's dietary intake, inclusive of meals at home and outside the home, typically at daycare and restaurants. The mothers lauded their daycare centers for providing children a variety of foods and for the most part felt the meals were healthy. There was some diversity in how the mothers felt about the snacks at daycare; some mothers felt the snacks were adequate while other mothers felt they offered too many prepackaged items like crackers and cookies. All of the mothers reported they did not have much control over the dietary intake while their child was at daycare. They explained that unless the child had a food allergy, they were expected to follow the menu. When reflecting on dining in restaurants with their child, the most commonly reported food items were macaroni and cheese, chicken nuggets and French fries. Many of the mothers report going to Chick-fil-A most often when dining out with their child, with mothers reporting they dine out typically 1-2 times per week.

Meals eaten at home often include chicken, pasta, vegetable or fruit. Many mothers report trying to fix meals that they think the child will like. Breakfast meals were often reported to include foods like Cheerios and yogurt; many mothers report offering items on the go like granola bars or items that are quick to prepare (e.g. prepackaged breakfast sandwiches, frozen pancakes/waffles). The following quotes illustrate the subtheme:

Dietary intake at daycare:

"... they definitely have picky palettes, and I'm sure some of it's my fault. But that's why it's cool that the one goes to daycare where they offer a variety of things, they're offering so much stuff. So whether he tries it or not, they are definitely taking on that role for sure." Participant 19

“And then for their afternoon snack . . . it's usually something ... gosh, I hate to say always, about half the time, I guess, it's something kind of junkier than I would like her to have, like it's the crackers or something like that and then the other half of the time it's just more fruit.

Participant 15

Dietary intake at home:

“He does have breakfast at day care, but he's also hungry first thing in the morning, so he might want a granola bar. On occasion, my husband likes to give him chocolate donuts. You know, so we're guilty of that. He seems like to like the donuts a little too much.” Participant 136

“Well, during the week, it's easy and fast, Nutri-Grain bars, Pop-Tarts. I'll buy or make pancakes and freeze them, so they can reheat them, that kind of stuff for breakfast. On the weekends it's more of French toast, eggs, pancakes, that kind of stuff, cereal.” Participant 81

Eating habits. Eating habits emerged as a subtheme. This subtheme related to the mother's description of their child's daily eating patterns. Mothers described their children as picky eaters, more so than they were previously. Snacking was a common eating habit described by most mothers, both at home and at daycare. One mother described her intention to feed her child the same foods she eats, and described how she avoids foods that would be considered “kid food” in hopes of her child eating a well-rounded diet. The following quotes illustrate the subtheme:

“I can't explain children. He ate everything under the sun up until the age of two, and then he became a kid.” Participant 21

“... my kids ask a lot for snacks, but my understanding is a lot of kids ask for snacks. But I feel like they ask for snacks probably too much. So I mean that's my biggest thing with them is I'm like, “God you just ate dinner, and it's an hour later, and you already want a snack? No, get out of here. Go get some water.” Participant 3

“... one of his snacks is his favorite, and we do it, is Uncrustables. He loves those . . . it's just easier that way. We can take them on the go. So, I would say he has Uncrustables, probably, almost every day. It's his favorite snack. When he's super hungry, he usually has it when he's at the park. So, anyway. Yeah, he has one of those almost every day . . . he's definitely at this age where if he could just live on snacks he would. But we really try to keep snacks relatively,

relatively healthy. Besides the Uncrustable, which definitely has sugar in it, most of his snacks are fruit based or maybe crackers or something. . .” Participant 21

“I fed her kind of everything that I was eating as it was appropriate, so I feel like that contributed a ton to how well-rounded her diet is and how open she is to trying interesting, different foods. I never introduced like a box of macaroni or SpaghettiOs or the typical kid stuff, because I wanted her to have more of a broad palette. I think my theory is, at least, is once I would introduce that kind of thing, she'd be like, "Oh!"” Participant 208

Physical activity. Physical activity is a subtheme of the child. Overall, the mothers note the children are very active, multiple times per day. All of the mothers believed their child was a good sleeper and did not make any mention of sleep issues. Some of the children had screen time before bed, but none of the children had screens in their room, with the exception of iPads. The mothers discussed some feelings of isolation in their neighborhood and the need to monitor the child for safety reasons. Most of the mothers described positive feelings about their child’s physical activity, often joining the child for a walk or playing at the park together.

The following quotes illustrate the subtheme:

“I take the kids and the dog for a walk and also we're very lucky we have about four and a half miles of hiking trails next to our neighborhood, but there are shorter cut-outs, although I did carry that 35-pound child about two miles, because she wore out. But usually they're okay to do a mile to two miles of hiking or else we'll just walk the dog. It's about a mile, mile and a half route we take around our neighborhood. . .” Participant 15

“. . . They do two outdoor recesses while he's at school. So, he's just running like a crazy kid, and then when the nanny picks him up they usually go to the park.” Participant 21

Body weight status. Body weight status is a subtheme of the child that was operationalized in the quantitative analysis with visual and verbal maternal assessments of child body weight status as well as child BMI z-score. In the qualitative portion of the study, this subtheme related to maternal feelings about their child’s body weight status. Overall, mothers reported they were happy with their child’s body weight status, most feeling reassured by their

healthcare provider that the child was maintaining a healthy body weight. Some of the mothers, however, voiced concern about their child's body weight status because of confusing information from the child's healthcare provider. The following quotes illustrate the subtheme:

"My husband and I are very short people, but she's always, like I said, grown consistently, so she's not as big as the other kids in her class, but she grows at the same rate that they do and so I always feel happy." Participant 15

". . . he's at, like I said, he has a high percentile. I don't know if that's good or bad necessarily because he doesn't, my pediatrician doesn't really say anything." Participant 16

"I mean I always worry about seeing her on the 90th percentile for weight. I mean she's not, I mean there are some kids that are a lot skinnier than her. She's not overweight by any means, she is ... I just for me I think I worry about the weight category of it. But then I see her height being the 99th percentile, and our pediatrician is like, "Do you realize your child is bigger than my five-year-old?" Being taller than her five-year-old. So for me I think that's something that I do worry about" Participant 3

4.3 Convergence of Qualitative and Quantitative Findings

Although the primary purpose of the qualitative portion of the study was to explore contextual factors of the study purpose not explored in the quantitative portion of the study, there was some overlap. Using mixed methods resulted in a rich description of maternal factors that have a relationship with child feeding practices and child body weight status. Subthemes emerged in the qualitative portion of the study that adds depth to data collected in the quantitative portion of the study. Table 4.14 summarizes the convergence of qualitative and quantitative findings.

Table 4.14 Convergence of qualitative and quantitative findings

Theme/subthemes	Qualitative Method	Quantitative Method*
Mother		
Personal characteristics	All of the mothers reported being the primary person preparing meals and making food decisions on behalf of their child	Maternal BMI categories: Weight normal = 6.4% [BMI 18.5-24.9] Overweight = 22.7% [BMI 25-29.9] Obese = 70.9% [BMI ≥ 30] 60.1% of the mothers always feel responsible for feeding their child
Environmental Conditions		
Maternal competing obligations	Breakfast was the most common meal mentioned that has distractions and other activities limiting the mother's ability to provide a positive mealtime for the child. Mothers most often mentioned trying to get ready for work/leave the house which competes with the need to feed the child breakfast in the morning. Some mothers indicated they manage competing obligations by partnering with the spouse to provide a meal for a child.	--
Cost of food	Cost perceived as a barrier to providing food mothers felt was healthiest (e.g. organic)	66.6% of mothers reported cost as an influencing factor when food shopping for their child; 76.6% of mothers reported healthy food options as an influencing factor when food shopping for their child
Convenience	Interpreted as both a barrier and facilitator to making healthy food decisions for a child. Barrier example: Unhealthy foods are chosen due to their ease of preparation Facilitator example: Preparing meals in large quantity on weekend so have quick and easy meal preparation during the week	57.8% of mothers reported convenience as an influencing factor when choosing which foods to purchase when food shopping for their child
Maternal Dietary Self-Regulation		
Food goals	Mothers want to provide healthier foods for their child. Mothers provided examples of fruit and vegetables consistently. Some referred to an increase in protein as a goal to eating more healthfully. Mothers reflected on their own diets and have a goal of their child having better dietary intake compared to them.	Mothers report low to moderate levels of dietary self-regulation, based on median scores from the ESC and SREBQ
Weight goals	Mothers reflected on their desire to have a healthier weight for themselves and a desire for their child to maintain a healthy weight.	Mothers reported moderate to moderate/high perceived parent overweight: median = 3.3, IQR = 3-3.5
Exercise goals	Most of the mothers described exercise routines that are fit into their lifestyles whenever possible; most referred to exercise in the form of playing with their child and going for walks	--
Social influences		
Perception of child's weight status	None of the mothers reported their healthcare	91.6% of mothers reported they have

from healthcare provider	<p>provider verbalized concern over their child's weight.</p> <p>Variation in how the mother received information about dietary intake and weight from their child's healthcare provider. Some mothers reported uncertainty in interpreting the information they were given by the provider related to the child's growth status.</p>	<p>low level of concern about their child being overweight</p> <p>96.7% of mothers report their child's healthcare provider does not have a concern about their child's weight being too high</p>
Maternal peer/public perception	<p>Mothers' decision making about child dietary intake was influenced by the presence of peers or extended family members. Consistently, the mothers reported negative feelings about their decisions when peers/family were involved, where the child ate food that was perceived as less healthy compared to what they would feed them if the other people were not around.</p> <p>Mothers reported that in restaurants they often allow the child to choose the restaurant and the foods eaten so the child is not seen as misbehaving in a public place.</p>	--
Maternal Feeding Practices		
Intake Control	<p>Most of the mothers report asking the child to at least try all food being served to them.</p> <p>Reported that the daycare centers teach the children to take a "no thank you" bite of all food offered.</p> <p>Dessert was a frequently used tool to encourage the child to eat more of their meal: eat the meal and the child was given dessert.</p>	<p>Mothers reported lower levels of pressure to eat for their child [median = 2.8, IQR= 2-3.5]</p> <p>Monitoring: 38.4% of the mothers reported low levels of monitoring while 28.6% reported high levels of monitoring</p> <p>Mothers reported moderate levels of restriction: median = 3.4, IQR = 2.8-3.9</p> <p>Statistically significant univariate association between child BMI z-score and pressure to eat [$r = .14, p = .005$]; monitoring [$r = .13, p = .023$], and restriction [$r = .10, p = .043$]</p>
Food as Reward	<p>Mothers differed in perspective. Some mothers saw giving dessert if the child finished a meal as a reward.</p> <p>Some mothers had strong feelings against rewarding behavior with food. An example was a mother reported she was rewarded with food as a child and feels it has had a negative effect on her weight as an adult.</p>	--
Passive technology intrusion/ distracted eating	<p>Most of the mothers described the presence of screens with food, but many acknowledged a desire to minimize its presence during mealtime.</p> <p>Mothers reported TVs being on in the background during mealtime, the use of iPads during meals, occasionally eating meals in front of the TV.</p>	70.1% of the children in the survey sample watch TV during meals at least sometimes
Accommodations of food selection and preparation for child preferences	Mothers commonly reported adapting the preparation of foods at home to satisfy the child's preference for food. Typically this was achieved by making food blander.	--

	Mothers commonly reported choosing foods to serve the entire family that satisfy the child's preference for food.	
Child		
Dietary intake	<p>Mothers reported positive feelings about the dietary intake at daycare; most felt there was good variety and healthy options. Some mothers reflected negatively on the snacks provided at daycare as they are often cookies or crackers.</p> <p>Mothers reported having no control over the child's food intake at daycare.</p> <p>Mothers reported the most common foods the child ate when in a restaurant were macaroni and cheese, chicken nuggets, and French fries.</p> <p>Mothers reported they typically take the child to eat in a restaurant 1-2 times/week</p> <p>Intake at home often included chicken, pasta, vegetable or fruit. Breakfast mealtime was often quick, with children eating cereal, yogurt, granola bars, frozen prepared foods (e.g. pancakes, waffles, breakfast sandwiches)</p>	Times child eats in a restaurant, weekly: median = 1, IQR = 1-2, range 0-8
Eating habits	<p>Breakfast was often reported as a mealtime that was hurried with foods chosen for convenience and ease of preparation.</p> <p>Children were frequently described as picky eaters, often new onset. Mothers described the child ate a better diet as a smaller child, now in preschool years, pickiness has increased.</p> <p>The children eat high volume of snacks, both at daycare and at home.</p>	--
Physical Activity	<p>Children were described as very active, enjoying physical activity whenever possible.</p> <p>Mothers reported trying to be active with the child, going on walks, playing at the park.</p> <p>All the mothers reported positive sleep behaviors, no TVs in bedrooms. Some mothers reported the child used iPads at bedtime.</p>	--
Body weight status	<p>Overall the mothers reported not feeling concerned about their child's body weight status.</p> <p>Some mothers reported feeling unsure how they should interpret the healthcare provider's explanation of the child's body weight.</p>	<p>Perceived child overweight median= 3, IQR = 2.7-3 so in general, parents did not perceive their child as overweight</p> <p>Body weight status for children in the sample was generally within normal: child BMI z-score median = .56/ IQR = -.8 to 2.1</p> <p>47.5% of mothers visually described their child as heavier weight status;</p> <p>6.9% of mothers verbally described their</p>

*Quantitative results represent mothers included in the survey data analysis, N=419

-- Indicates the theme or concept was not explored with quantitative methods

Revised Conceptual Model

Based on the quantitative and qualitative study results, revisions to the conceptual model that was developed for this study were made. See Figure 1, page 8 for the initial model and Figure 3, page 66 for the revised model. The initial conceptual framework was revised to include those hypothesized relationships supported by quantitative study findings as established relationships. Two main themes and related subthemes that emerged from the qualitative analyses were not included in the original framework. The addition of the theme “social influences” to the Bushaw Conceptual Framework is not explicitly supported in the tested theories and models from which the new framework is based. The SCT, however, supports the posited relationships among the mother and her environment⁴⁰, in this context the environment includes the child’s healthcare provider, maternal peer relationships, and family relatives. Social influences have a direct, unidirectional relationship with maternal feeding practices. The addition of the theme “environmental conditions” to the conceptual framework is supported by the ECO⁴¹, where the environmental conditions and the parent have direct relationships. Additionally, the SCT⁴⁰ supports this addition, connecting the mother, her behavior, and her environment. In the revised conceptual model, environmental conditions has a unidirectional relationship with the mother.

The convergence of the qualitative and quantitative data support the relationship between maternal dietary self-regulation and two main constructs: child and maternal feeding

practices. The quantitative results demonstrated that after controlling for the maternal demographics, perceived child weight variables, maternal perceived stress, and maternal BMI, the addition of dietary self-regulation and child feeding practices demonstrated a statistically significant increase in explained variance in child BMI (R^2 change= .08, $p < .001$) (see Table 4.12). The qualitative data added depth to this finding, revealing maternal attempts to self-regulate through goals (exercise, weight, and food goals). The modified conceptual framework illustrates this new finding with a solid, unidirectional line between maternal self-regulation and maternal feeding practices; and a solid, unidirectional line between maternal self-regulation and child.

Depth of understanding within established relationships in the original conceptual framework resulted in the addition of subthemes added to maternal feeding practices and child. Intake control, food as reward, passive technology intrusion, and accommodations to food selection and food preparation were added to the conceptual framework to highlight subthemes of maternal feeding practices that were most pronounced in the qualitative results. The same rationale was applied when adding subthemes of physical activity, child preferences and distracted eating to the main construct of the child. The modified Bushaw Conceptual Framework (Figure 3) illustrates results from the tested hypotheses.

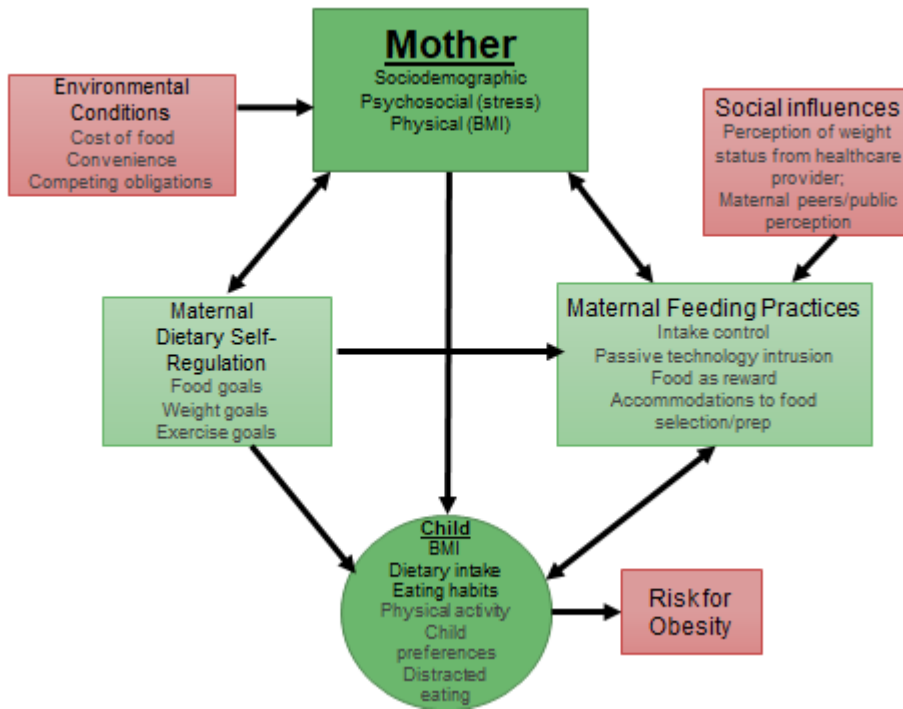


Figure 3. Revised Bushaw Conceptual Framework

CHAPTER 5

DISCUSSION

5.1 Meaning and Significance of Findings

This study successfully identified maternal factors that surround mothers' decisions regarding food choices on behalf of her child. This study provides new knowledge that fills the gap in understanding the relationships among maternal dietary self-regulation, maternal feeding practices, and child body weight status in preschool aged children. This study differs from previous studies because it examined the association between maternal dietary self-regulation and child body weight status in a population of American mothers of preschool aged children using a mixed methods approach. Self-regulation was operationalized with two instruments in the survey portion of the study, with further depth added with qualitative data. The following section discusses the meaning and significance of the findings in light of prior research findings. The content is organized by the research questions and hypotheses posed for this study.

5.1.1 Research question 1: Are there associations of a mother's level of dietary self-regulation, level of perceived stress, feeding practices, BMI with the BMI of her child aged two to five-years?

Two hypotheses were generated from this research question. The following discusses the results from testing the hypotheses and the meaning of the findings.

5.1.1.1 Controlling for the contributions of the other maternal variables, maternal stress and BMI will be positively associated with child's BMI.

The results of the multivariate analysis conducted support the null hypothesis. Controlling for the maternal demographics, self-regulation, child feeding and weight variables, maternal perceived stress and maternal BMI did not demonstrate a statistically significant increase in explained variance in child BMI. This finding differs from other studies that have looked at the association among these variables, but other studies did not control for all of the variables in this analysis, particularly dietary self-regulation. A meta-analysis¹⁰⁶ and a more recent literature review¹⁰⁷ that examined the relationship between maternal stress and child BMI found a positive effect size between maternal stress and child BMI, with higher effect sizes noted for parenting stress compared to overall stress. Longitudinal studies have demonstrated marginal significance between maternal stress and child BMI, especially in girls¹⁰⁸ and when the child also experienced stress.¹⁰⁶ The findings from this study add to a mixed body of knowledge looking at maternal characteristics such as stress and BMI and their association with child BMI.

Findings from a recent meta-analysis examining maternal BMI and childhood obesity suggest a 264% increase in odds that a child will be overweight or obese if his mother is overweight or obese pre-pregnancy.¹⁰⁹ The majority of the mothers in this study were overweight or obese, yet the univariate association between maternal BMI and child BMI z-scores was not statistically significant. Due to the cross-sectional nature of this study, it is unknown whether or not these mothers were more recently overweight or if they have maintained this body stature from pre-pregnancy. Additionally, it is unknown if the children in

this sample, despite being mostly normal weight at this point in time, will develop overweight or obesity over time.

5.1.1.2 Controlling for the contributions of the other maternal variables, maternal dietary self-regulation and positive feeding practices will be inversely associated with child's BMI.

The results of the multivariate analysis conducted support the hypothesis. Controlling for the maternal demographics perceived child weight variables, maternal perceived stress, and maternal BMI, the addition of dietary self-regulation and child feeding practices demonstrated a statistically significant increase in explained variance in child BMI. Similar to recent studies of mothers and their preschool aged children^{110,111}, this study supports the inverse relationship between positive feeding practices and child BMI. This study offers new information about the contribution of maternal dietary self-regulation with positive feeding practices to child BMI z-scores, after controlling for maternal variables such as demographics, BMI, and stress. The finding suggests an inverse relationship between maternal dietary self-regulation and child BMI z-score. Assessing a mother's dietary self-regulation could be informative to a healthcare provider, considering low maternal dietary self-regulation as a potential risk factor for an increase in child body weight status.

In this study, child BMI z-scores were higher for children of mothers who reported low levels of monitoring compared to those reporting moderate monitoring. This suggests a child could have a lower BMI z-score if the mother is with the child during mealtime, supervising the child's dietary intake. This is a unique finding compared to other studies that assessed this relationship in a population of mothers of young children, where a statistically significant

relationship was not established.^{96,112} There are important differences to note from the Nowicka, Sorjonen, Pietrobelli, Flodmark, Faith⁹⁶ sample: unlike this study sample, the majority of the mothers had BMIs within normal and they lived outside the United States (Sweden).⁹⁶ Additionally, the Farrow, Blissett¹¹² looked at children longitudinally but up to age two years. A mother's feeding practices could change at or after age two, where monitoring could increase or decrease as the child and mother experience and develop eating and food relationships.

5.1.2 Research question 2: What contextual factors mothers report influence their decisions and actions related to their child's eating habits, dietary intake and BMI?

Qualitative findings from the study revealed contextual factors not addressed in the quantitative portion of the study. This section discusses findings related to factors that influence mothers' decisions and actions related to child feeding practices, child dietary intake and child body weight status.

5.1.2.1 Mother

All of the mothers who were interviewed reported being the primary person preparing food for the child. Additionally, even when the mother was not directly preparing the food, she felt she was making food decisions on behalf of her child. In the last few decades, there appears to be a growing trend of male partners contributing to meal planning and preparation^{113,114}, but as mirrored in this study, mothers continue to have primary responsibility. The mothers interviewed in this study were balancing work and family obligations, and often competing obligations arose during breakfast meals. The mothers described scenes where they were trying to get ready for the day (e.g. shower) while providing quick breakfast foods for the child,

rarely sitting with the child for the meal. Children were offered processed breakfast foods (e.g. donuts, frozen breakfast sandwiches, frozen pancakes), granola bars, or cereal. Similar to the finding in this study, a quantitative study revealed working mother's perceived time pressure influenced confidence that she could prepare a healthy meal.¹¹⁵ Assessing a mother's perception of competing obligations around meal time, especially perceived time pressure at breakfast, could help to identify mothers who need encouragement to develop and maintain healthy meal plans in anticipation of hectic morning routines.

In addition to competing obligations impacting food decisions for her child, cost and convenience of food were identified as barriers to providing healthy foods to children. Cost of food was mostly related to the ability to buy organic foods while convenience was related to the selection of less healthy foods because they were perceived to be quicker to prepare. The desire to purchase more organic foods is consistent with shifting consumer attitudes, influenced by the desire to live healthier and avoid preventable diseases (e.g. heart disease, type 2 diabetes).¹¹⁶ Mothers reported feeling organic foods would be a healthier choice for their child's dietary intake, including processed foods labeled as organic such as macaroni and cheese, crackers, and fruit snacks. Mothers in this study echo the consumer science around organic foods, feeling positive about serving her child processed foods because of an organic package label.¹¹⁷ Competing with the desire to purchase healthy foods, convenience was reported by over half of the surveyed mothers as a priority when choosing foods to purchase for her child. This may signal a risk factor for poor child dietary intake as mothers motivated by convenience for dietary intake of their child tend to choose less nutritious, energy dense foods compared to mothers motivated by health.^{118,119} Pediatric healthcare providers should consider

providing more specific guidance to mothers of preschool aged children on best options for healthy foods that are simple to prepare and available locally. Additionally, mothers need education on food product labels, explaining that an organic label does not always equate nutritious.

Mothers revealed their dietary self-regulation through food, weight, and exercise goals. Similar to previous qualitative study¹²⁰, food related goals focused on the mothers' interest in providing healthier foods for her child, most frequently mentioning a goal of increasing fruit and vegetable intake. Interestingly, mothers reflected that their own diets do not reflect these food goals, suggesting low levels of dietary self-regulation. Their goals focused on providing healthier food for their child than they provide for themselves. The qualitative data reflects the survey data on dietary self-regulation with mothers scoring low to moderate levels of dietary self-regulation, based on median scores of the ESC and SREBQ. The mothers' goal was to encourage the children to eat "better" than they do. It is more likely, however, the child will model behavior and eating habits of the mother, resulting in child outcomes that mirror that of the mother.¹²¹ Pediatric healthcare providers should consider asking mothers about their own eating habits when assessing the child's, appreciating the importance of the child's tendency to mirror maternal habits.

Mothers also talked about weight goals for both herself and her child. Some of the mothers who acknowledged being overweight had projected goals for their child to not be overweight. Their goals were focused on the child's activity and food, to promote healthy body weight status. Other mothers described goals to improve their own weight and physical activity to set an example for their child, hoping to model behaviors that promote healthy weight and

levels of physical activity. None of the mothers felt their child needed to be more physically active than they already are; exercise goals in this sample were all self-directed. Encouraging mothers to model positive behaviors around eating and physical activity and setting goals for the family unit instead of one individual could have the highest degree of benefit in preventing obesity.

Despite having goals of healthy dietary intake and weight for their children, the mothers in the study reported changing their feeding practices when they were making food decisions in the presence of people outside the family unit. These modifications occurred typically in restaurants with peers or time with extended family. The mothers reported these experiences as being negative; allowing the child to eat food the mother felt was not healthy to meet a social norm or expectation of a maternal peer group. These behaviors reflect a desire to meet social norms, with social influences being more powerful than the mother's personal desire for the child to eat healthfully. This finding is echoed in behavioral science literature, warning that attempting to meet current social norms around eating could be contributing to obesogenic behaviors.¹²²

Many healthcare providers have difficulty talking about obesity with their patients³⁸, perhaps due to parental attitudes and lack of resources³⁹. It is not surprising, then, that 96.7% of participant mothers in this study report their child's healthcare provider did not have a concern about their child's weight being too high. Additionally, many of the mothers in the interviews reported the healthcare providers typically have them fill out a paper form about food intake or weight concerns, but beyond showing them a growth chart, there is little conversation about dietary intake and obesity prevention. It raises the question whether the

healthcare provider truly does not have a concern about the child's weight status (or weight trajectory due to reported eating/physical activity habits), or if they are too uncomfortable to raise the concern to the parent.

Typically the mothers in the study described intake control in the form of insisting the child at least try a bite of food being served to them that they are not interested in eating. Mothers reported modeling methods used at the daycare centers where they ask the children to take a "no thank you" bite of foods the child is not interested in eating. Dessert was frequently used to incentivize the child to eat their meal. In the survey results, the subtheme intake control was measured with pressure to eat, monitoring, and restriction, all of which had statistically significant univariate associations with child BMI z-score (see Table 4.9). These relationships are well established in the literature^{32,95,97}, but the qualitative results from this study add depth to existing knowledge. Particularly, this study adds information about the mothers modeling feeding practice strategies they learned from their child's daycare center caregivers, practices that are associated with child body weight status.

Mothers in the study differed in their attitudes toward using food as a reward. As mentioned above, mothers used food as a reward to establish intake control: offering dessert if the child at their meal. Some mothers reported rewarding the child with food if they follow a requested behavior (e.g. getting out of the car, staying on stage during a performance). Other mothers reported they never reward with food, with one mother reflecting that she feels her own issues with body weight status is, in part, due to her parents using food as a reward for her when she was a child. Food as reward, sometimes referred to as indulgent feeding practices, are associated with higher child body weight status.¹²³ Alternatively, verbal praise instead of

food as reward could promote healthier dietary intake.¹²⁴ Healthcare providers have an opportunity to provide guidance to mothers on rewarding preschool age children with nonfood items such as verbal praise.

Another subtheme that emerged from maternal feeding practices was passive technology intrusion. About 70% of the children in the survey sample watch TV during meals at least sometimes, and the mothers interviewed further described the presence of screens when the child is eating at least some of the time. Often mothers described the television was on in the background during a meal, other times the child was watching TV or an iPad while eating. There is growing concern about screen time and sedentary behavior in children, with the evolution of access to technology in multiple platforms increasing the amount of time young children are sedentary.¹²⁵ Whether or not technology intrusion is an important variable to focus on in obesity intervention in preschool aged children, however, remains less understood. A recent intervention study aimed to reduce obesity in a population of two to five year old children found that decreasing screen time did not have a significant effect on the child's body weight status,¹²⁶ despite the established positive relationship between screen time and body weight status in children.¹²⁵ Still, healthcare providers are discussing screen time in the context of obesity prevention in growing numbers.¹²⁷ In addition to addressing the child's time spend looking at a screen, healthcare providers should assess mother's screen habits, given the positive association between child and parent screen time habits.¹²⁸

5.1.2.2 Child

The dietary intake of the children in this study reflected both maternal food choices for the child and child preference. A recurrent theme among the mothers interviewed was picky

eating. Mothers reported the child ate a greater variety of foods as an infant/young toddler, then in later toddler/preschool years developed picky eating habits. In contrast, a recent study by Emmett, Hays, Taylor¹²⁹ found a predictor of picky eating in preschool years was picky eating at 15 months of age. The mothers in this study voiced concern about nutrition and their child's picky eating habits, noting difficulty with intake of vegetables; there was not a reported concern about the child's body weight status related to the picky eating habits. Validating the mother's lack of concern, a longitudinal study demonstrated no greater risk for overweight or obesity in children who are picky eaters.¹³⁰ A recent study that assessed maternal feeding practices related to picky eating found a direct correlation between positive encouragement in the form of praise and vegetable intake.¹³¹ Healthcare providers may be able to help mothers of picky eaters in preschool years by recommending continued introduction of foods of different flavors and variety, using praise instead of punishment to encourage intake¹³¹, and modeling healthy dietary intake (i.e. parents eating the same meal as the child, including fruits and vegetables).^{129,132}

Child preference for snacks was frequently mentioned by the mothers in the interview sample of the study. Mothers' report of dietary intake at the daycare centers also included at least two snacks per day. Some of the mothers commented that they felt the snacks at school were not healthy, mentioning crackers and cookies as typical snack items offered. Despite the negative feelings about the snacks at daycare, mothers reported similar, energy dense snack options for their children at home. Some of the mothers in the interviews justified the snacking habits of their child because they felt the child was very active. A systematic review reports similar findings in other studies, with unhealthy foods being one of the most consistent

associations with snacking in young children.¹³³ Mothers in the study seemed attentive to having goals of healthier meals but less so with snacks for the child. Healthcare providers should provide anticipatory guidance on healthy snacks in addition to healthy meals. The children in this study received multiple snacks per day, both at home and at daycare. Snack time foods are therefore an important component of the child's dietary intake and should not be negated by healthcare providers who are providing dietary guidance to mothers of preschoolers.

All of the mothers interviewed reported their child was highly physically active. Additionally, many of the mothers described making attempts to be physically active with their child, typically going for walks. There was less consistency when the mother was asked to describe her own physical activity, with some mothers reporting a high amount of physical activity on a weekly basis and others reporting little to none. A cross-sectional study of American mothers and their 2-5 year old children found a positive association between mothers modeling of physical activity and the preschooler's physical activity level.¹³⁴ Levels of physical activity were not quantified in this study, but the qualitative data differs from the Zhang, Quick, Jin, Martin-Biggers¹³⁴ findings where even the mothers who were not physically active reported having children who were very active.

5.1.3 Other findings

An overweight mother is likely to have overweight children.¹⁶⁻¹⁸ In this study, most the children were reported to have normal body weight status, but about 94% of the mothers reported being overweight or obese. Additionally, the mothers in this study have characteristics

that make them at risk for obesogenic habits, specifically low dietary self-regulation and moderate levels of perceived stress. In an effort to capture the child's body weight status, the mother was asked to report the child's height and weight, describe their child's body weight status both visually and verbally, and maternal perception of her child being overweight was also measured within the CFQ. Interestingly, children who were described as being underweight had statistically significantly higher BMI z-scores than the children described as normal weight. In a study assessing the prevalence of parental misperception of their child's body weight status at age two to five years, 95-97% of parents assessed at two time points misperceived their overweight child as being of normal body weight status.¹³⁵ This could present a challenge for healthcare providers who would like to address obesity prevention or early signs of obesity with a mother who does not perceive body weight status as an issue for her child.

5.2 Strengths and Limitations

As with all studies, this study has strengths and limitations. Study findings expand the body of knowledge related to the relationship between maternal characteristics and early childhood body weight status. Findings from this study provide support for the relationship between maternal dietary self-regulation and child feeding practices and child body weight status. The data also adds further understanding to the body of existing knowledge related to maternal characteristics (e.g. feeding practices and stress) and the child's eating habits and body weight status.

The mixed method design of the study allowed depth of understanding of maternal dietary self-regulation and child feeding practices in preschool aged children. The sample in the

quantitative portion of the study is geographically and socioeconomically diverse, representing mothers throughout the United States. The multimodal approach to recruit participants allowed for the diverse sample of mothers. It demonstrated the benefit of utilizing CloudResearch, a participant sourcing platform for academic research, a method of recruitment infrequently used in nursing research.

The cross-sectional design of this study limits the ability to determine cause and effect. The emphasis on self-report measures also limits generalizability due to potential response bias. Feasibility dictated this method, and while it introduces threats to internal validity, it provides new insight to relationships that have not been previously examined, or at least not reported in published literature. Since the concept of weight is a sensitive topic, recruitment may have been skewed towards those who are interested in maintaining a healthy weight and are comfortable talking about their weight. While the focus of the study is on the mother, an outcome of interest is the child's BMI, which may have encouraged mothers to participate since the findings could support health promotion for their child. All potential participants were informed that the data collected would be de-identified, ensuring the mother that her answers would not be linked to her identifying information. Mothers may have had time barriers to completing a survey and an in-depth interview, limiting opportunity for recruitment of mothers for the interview phase who are unable to attend a scheduled session. Allowing mothers to self-complete the quantitative portion electronically minimized this barrier for the survey phase. Recruiting at multiple sites improved the diversity of the sample by region and SES. There is risk of selection bias due to convenience sampling. Mothers who are more attentive to their child's

weight and feeding practices may have been more inclined to participate. This bias may limit generalizability, but useful information was gained to inform future studies.

Reliance on self-report of weight and height measurements may have impacted study findings. Women may have an incorrect perception of their own weight status¹³⁶ as well as the tendency for mothers to not recognize overweight in their own preschool aged children.¹⁰² Visual and verbal measurements of child body weight status were included in the survey to add depth of understanding to the child's body weight status.

There is a gap in valid and reliable instruments to measure dietary self-regulation. The instruments used to operationalize dietary self-regulation in this study have not been used extensively in published literature. Understanding of the mothers' level of dietary self-regulation was achieved in this study by using two instruments to measure dietary self-regulation in addition to maternal personal reflections on dietary self-regulation from the interviews.

Finally, there were statistically significant differences between mother-child pairs who were recruited for the study but were not included in the analysis. The mothers in the analysis were more educated and more likely to be partnered than those not included in the analysis. Children in the analysis were more likely to have siblings compared to those excluded from the analysis. The mothers who were included in the analysis may have had an easier time completing the survey due to education level or had more time to complete the survey accurately due to partnership status. Since children without siblings are at higher risk of overweight and obesity³⁴⁻³⁷, the results may have been impacted with the exclusion of some participants from the analysis who are only children. Additionally, there is growing evidence to

support a link between childhood obesity and single parent status ¹³⁷, but the evidence is not conclusive, with studies demonstrating children of single parents experiencing the same risk of childhood overweight as their counterparts living in two parent households. ^{138,139}

5.3 Implications and Recommendations for Future Research

The results of this study highlight the need for healthcare providers to consider maternal characteristics when assessing a preschool aged child for obesity risk. The study results suggest healthcare providers should consider assessing maternal body weight status, dietary self-regulation, feeding practices, and maternal understanding of healthy feeding practices when considering a preschooler's risk of obesity. The mothers in the study revealed their child's healthcare provider spends very little time discussing obesity prevention topics, especially assessment of dietary intake and maternal characteristics. Healthcare providers also need to be aware of their own personal barriers to addressing obesity risk with mothers in order to improve assessment and guidance for mothers of preschoolers.

Future studies could utilize the methods of this study but expand it to follow mother-child pairs longitudinally to see if the relationships established in this study continue to exist and have an impact on the child's body weight status as they grow and develop. The findings from this study inform future intervention studies, supporting two generation studies and the call for family based interventions. ¹⁴⁰ Targeting mothers who were recruited for this study but not included in the analysis, noted to be less educated and less likely to be partnered, is important to add depth of understanding of what those maternal characteristics have on her feeding practices and her child's body weight status compared to partnered mothers with

higher education. Future studies using self-report methods to measure height and weight status for the maternal participants should consider using a body image scale, similar to the ones used for children in this study. In a study assessing women's perception of BMI, women were overall able to identify a graphic that resembled their BMI¹³⁶, adding greater understanding of the mother's actual body weight status. Additionally, given the evidence to support the relationship between pre-pregnancy overweight and childhood obesity¹⁰⁹, depth of understanding of the child's trajectory for obesity risk could be enhanced if pre-pregnancy weight is measured in addition to current maternal body weight status.

This study reveals the need for healthcare providers to assess maternal risk factors for childhood overweight/obesity in order to provide anticipatory guidance. The majority of the mothers in this study were overweight or obese, yet almost all of them reported their healthcare provider did not have concerns about their child being or becoming overweight. Previous studies reveal these children are at risk for becoming overweight because of their mother's weight status. Based on that understanding, nearly all of the healthcare providers for the children in this sample should be addressing obesity prevention, yet nearly none of them were. Future research should focus on interventions aimed at helping healthcare providers overcome personal barriers to addressing overweight/obesity as well as developing family based interventions that address maternal risk factors for child obesity.

References

1. Ebbeling CB, Pawlak DB, Ludwig DS. Childhood obesity: public-health crisis, common sense cure. *The lancet*. 2002;360(9331):473-482.
2. Wills TA, Isasi CR, Mendoza D, Ainette MG. Self-control constructs related to measures of dietary intake and physical activity in adolescents. *J Adolesc Health*. 2007;41(6):551-558.
3. Anderson ES, Winett RA, Wojcik JR. Self-regulation, self-efficacy, outcome expectations, and social support: social cognitive theory and nutrition behavior. *Ann Behav Med*. 2007;34(3):304-312.
4. Poddar KH, Hosig KW, Anderson ES, Nickols-Richardson SM, Duncan SE. Web-based nutrition education intervention improves self-efficacy and self-regulation related to increased dairy intake in college students. *J Am Diet Assoc*. 2010;110(11):1723-1727.
5. Munt A, Partridge S, Allman-Farinelli M. The barriers and enablers of healthy eating among young adults: a missing piece of the obesity puzzle: a scoping review. *Obes Rev*. 2017;18(1):1-17.
6. Fryar CD, Carroll MD, Ogden CL. Prevalence of overweight, obesity, and severe obesity among children and adolescents aged 2–19 years: United States, 1963–1965 through 2015–2016. 2018.
7. World Health Organization. Health Promotion. 2016; http://www.who.int/topics/health_promotion/en/. Accessed January 23, 2016, 2016.
8. Centers for Disease Control and Prevention Childhood obesity facts. 2015.
9. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011-2012. *Jama*. 2014;311(8):806-814.
10. Skinner AC, Ravanbakht SN, Skelton JA, Perrin EM, Armstrong SC. Prevalence of Obesity and Severe Obesity in US Children, 1999–2016. *Pediatrics*. 2018.
11. Keener D, Goodman K, Lowry A, Zaro S, Khan LK. Recommended community strategies and measurements to prevent obesity in the United States: Implementation and measurement guide. *Centers for Disease Control and Prevention*. 2009.
12. Dev DA, Speirs KE, Williams NA, Ramsay S, McBride BA, Hatton-Bowers H. Providers perspectives on self-regulation impact their use of responsive feeding practices in child care. *Appetite*. 2017;118:66-74.
13. Matwiejczyk L, Mehta K, Scott J, Tonkin E, Coveney J. Characteristics of effective interventions promoting healthy eating for pre-schoolers in childcare settings: an umbrella review. *Nutrients*. 2018;10(3):293.
14. Anderson PM, Butcher KF. Childhood obesity: trends and potential causes. *The Future of children*. 2006:19-45.
15. Ogden CL, Carroll MD, Lawman HG, et al. Trends in obesity prevalence among children and adolescents in the United States, 1988-1994 through 2013-2014. *JAMA*. 2016;315(21):2292-2299.
16. Whitaker RC. Predicting preschooler obesity at birth: the role of maternal obesity in early pregnancy. *Pediatrics*. 2004;114(1):e29-e36.
17. Reilly JJ, Armstrong J, Dorosty AR, et al. Early life risk factors for obesity in childhood: cohort study. *Bmj*. 2005;330(7504):1357.

18. Whitaker KL, Jarvis MJ, Beeken RJ, Boniface D, Wardle J. Comparing maternal and paternal intergenerational transmission of obesity risk in a large population-based sample. *The American journal of clinical nutrition*. 2010;91(6):1560-1567.
19. Pulgarón ER. Childhood obesity: a review of increased risk for physical and psychological comorbidities. *Clin Ther*. 2013;35(1):A18-A32.
20. Freedman DS, Mei Z, Srinivasan SR, Berenson GS, Dietz WH. Cardiovascular risk factors and excess adiposity among overweight children and adolescents: the Bogalusa Heart Study. *The Journal of pediatrics*. 2007;150(1):12-17. e12.
21. Han JC, Lawlor DA, Kimm SY. Childhood obesity. *The Lancet*. 2010;375(9727):1737-1748.
22. Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychological bulletin*. 2007;133(4):557.
23. Kopelman PG. Obesity as a medical problem. *Nature*. 2000;404(6778):635-643.
24. Müller O, Jahn A. Malnutrition and maternal and child health. In: *Maternal and Child Health*. Springer; 2009:287-310.
25. Cawley J, Meyerhoefer C. The medical care costs of obesity: an instrumental variables approach. *J Health Econ*. 2012;31(1):219-230.
26. Brotman LM, Dawson-McClure S, Huang K-Y, et al. Early childhood family intervention and long-term obesity prevention among high-risk minority youth. *Pediatrics*. 2012;129(3):e621-e628.
27. Lee H, Lee S, Park E. Do family meals affect childhood overweight or obesity?: nationwide survey 2008–2012. *Pediatr Obes*. 2016;11(3):161-165.
28. Haws KL, Davis SW, Dholakia UM. Control over what? Individual differences in general versus eating and spending self-control. *Journal of Public Policy & Marketing*. 2016;35(1):37-57.
29. Gunstad J, Paul RH, Cohen RA, Tate DF, Spitznagel MB, Gordon E. Elevated body mass index is associated with executive dysfunction in otherwise healthy adults. *Compr Psychiatry*. 2007;48(1):57-61.
30. Tăut D, Băban A, Giese H, Matos MG, Schupp H, Renner B. Developmental Trends in Eating Self-Regulation and Dietary Intake in Adolescents. *Applied Psychology: Health and Well-Being*. 2015;7(1):4-21.
31. Koike S, Hardy R, Richards M. Adolescent self-control behavior predicts body weight through the life course: a prospective birth cohort study. *Int J Obes (Lond)*. 2016;40(1):71-76.
32. Hurley KM, Cross MB, Hughes SO. A systematic review of responsive feeding and child obesity in high-income countries. *The Journal of nutrition*. 2011;jn. 110.130047.
33. Anderson SE, Keim SA. Parent–Child Interaction, Self-Regulation, and Obesity Prevention in Early Childhood. *Current Obesity Reports*. 2016;5(2):192-200.
34. Mosli R, Miller A, Peterson K, et al. Birth order and sibship composition as predictors of overweight or obesity among low-income 4-to 8-year-old children. *Pediatr Obes*. 2016;11(1):40-46.
35. Ochiai H, Shirasawa T, Ohtsu T, et al. Number of siblings, birth order, and childhood overweight: a population-based cross-sectional study in Japan. *BMC Public Health*. 2012;12(1):766.

36. Hunsberger M, Formisano A, Reisch LA, et al. Overweight in singletons compared to children with siblings: the IDEFICS study. *Nutr Diabetes*. 2012;2(7):e35.
37. Park SH, Cormier E. Influence of siblings on child health behaviors and obesity: a systematic Review. *Journal of Child and Family Studies*. 2018;27(7):2069-2081.
38. Miller SK, Alpert PT, Cross CL. Overweight and obesity in nurses, advanced practice nurses, and nurse educators. *Journal of the American Association of Nurse Practitioners*. 2008;20(5):259-265.
39. Larsen L, Mandleco B, Williams M, Tiedeman M. Childhood obesity: Prevention practices of nurse practitioners. *Journal of the American Association of Nurse Practitioners*. 2006;18(2):70-79.
40. Bandura A. *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc; 1986.
41. Davison KK, Birch LL. Childhood overweight: a contextual model and recommendations for future research. *Obesity reviews*. 2001;2(3):159-171.
42. Hall PA, Fong GT. Temporal self-regulation theory: A model for individual health behavior. *Health Psychol Rev*. 2007;1(1):6-52.
43. Johannsen DL, Johannsen NM, Specker BL. Influence of parents' eating behaviors and child feeding practices on children's weight status. *Obesity (Silver Spring, Md)*. 2006;14(3):431-439.
44. Gholami M, Wiedemann A, Knoll N, Schwarzer R. Mothers improve their daughters' vegetable intake: a randomized controlled trial. *Psychol Health Med*. 2015;20(1):1-7.
45. Golan M. Parents as agents of change in childhood obesity—from research to practice. *Int J Pediatr Obes*. 2006;1(2):66-76.
46. Jansen PW, Tharner A, van der Ende J, et al. Feeding practices and child weight: is the association bidirectional in preschool children? *The American journal of clinical nutrition*. 2014;100(5):1329-1336.
47. Afonso L, Lopes C, Severo M, et al. Bidirectional association between parental child-feeding practices and body mass index at 4 and 7 y of age. *The American journal of clinical nutrition*. 2016;103(3):861-867.
48. Schwarzer R. Modeling health behavior change: How to predict and modify the adoption and maintenance of health behaviors. *Applied Psychology*. 2008;57(1):1-29.
49. Luszczynska A, Tryburcy M, Schwarzer R. Improving fruit and vegetable consumption: a self-efficacy intervention compared with a combined self-efficacy and planning intervention. *Health Educ Res*. 2006;22(5):630-638.
50. Wiedemann AU, Lippke S, Schwarzer R. Multiple plans and memory performance: Results of a randomized controlled trial targeting fruit and vegetable intake. *J Behav Med*. 2012;35(4):387-392.
51. Birch LL, Fisher JO. Development of eating behaviors among children and adolescents. *Pediatrics*. 1998;101(3 Pt 2):539-549.
52. Kliemann N, Beeken RJ, Wardle J, Johnson F. Development and validation of the Self-Regulation of Eating Behaviour Questionnaire for adults. *International Journal of Behavioral Nutrition and Physical Activity*. 2016;13(1):87.

53. Balani R, Herrington H, Bryant E, Lucas C, Kim SC. Nutrition knowledge, attitudes, and self-regulation as predictors of overweight and obesity. *Journal of the American Association of Nurse Practitioners*. 2019;31(9):502-510.
54. Gross RS, Mendelsohn AL, Fierman AH, Hauser NR, Messito MJ. Maternal infant feeding behaviors and disparities in early child obesity. *Childhood obesity (Print)*. 2014;10(2):145-152.
55. Daniels LA, Mallan KM, Nicholson JM, et al. An Early Feeding Practices Intervention for Obesity Prevention. *Pediatrics*. 2015;136(1):e40-49.
56. Kitsantas P, Gallo S, Palla H, Nguyen V, Gaffney K. Nature and nurture in the development of childhood obesity: early infant feeding practices of overweight/obese mothers differ compared to mothers of normal body mass index. *J Matern Fetal Neonatal Med*. 2015:1-4.
57. Østbye T, Krause KM, Stroo M, et al. Parent-focused change to prevent obesity in preschoolers: results from the KAN-DO study. *Prev Med*. 2012;55(3):188-195.
58. Power TG, Hughes SO, Goodell LS, et al. Feeding practices of low-income mothers: how do they compare to current recommendations? *Int J Behav Nutr Phys Act*. 2015;12:34.
59. Thompson AL. Developmental origins of obesity: early feeding environments, infant growth, and the intestinal microbiome. *Am J Hum Biol*. 2012;24(3):350-360.
60. Wehrly SE, Bonilla C, Perez M, Liew J. Controlling parental feeding practices and child body composition in ethnically and economically diverse preschool children. *Appetite*. 2014;73:163-171.
61. Gibson LY, Byrne SM, Davis EA, Blair E, Jacoby P, Zubrick SR. The role of family and maternal factors in childhood obesity. *Med J Aust*. 2007;186(11):591.
62. Hernández-Valero MA, Wilkinson AV, Forman MR, et al. Maternal BMI and country of birth as indicators of childhood obesity in children of Mexican origin. *Obesity*. 2007;15(10):2512-2519.
63. Strauss RS, Knight J. Influence of the home environment on the development of obesity in children. *Pediatrics*. 1999;103(6):e85-e85.
64. Baidal JAW, Locks LM, Cheng ER, Blake-Lamb TL, Perkins ME, Taveras EM. Risk factors for childhood obesity in the first 1,000 days: a systematic review. *American journal of preventive medicine*. 2016;50(6):761-779.
65. Vohs KD, Baumeister RF. *Handbook of self-regulation: Research, theory, and applications*. Guilford Press; 2011.
66. Hughes SO, Frankel LA, Beltran A, et al. Food parenting measurement issues: working group consensus report. *Childhood Obesity*. 2013;9(s1):S-95-S-102.
67. Bruce AS, Martin LE, Savage CR. Neural correlates of pediatric obesity. *Prev Med*. 2011;52 Suppl 1:S29-35.
68. Connell LE, Francis LA. Positive parenting mitigates the effects of poor self-regulation on body mass index trajectories from ages 4-15 years. *Health Psychol*. 2014;33(8):757-764.
69. Frankel LA, Hughes SO, O'Connor TM, Power TG, Fisher JO, Hazen NL. Parental Influences on Children's Self-Regulation of Energy Intake: Insights from Developmental Literature on Emotion Regulation. *J Obes*. 2012;2012:327259.
70. Herman CP, Polivy J. The self-regulation of eating: Theoretical and practical problems. 2004.

71. Wing RR, Tate DF, Gorin AA, Raynor HA, Fava JL. A self-regulation program for maintenance of weight loss. *N Engl J Med*. 2006;355(15):1563-1571.
72. Gokee-LaRose J, Gorin AA, Wing RR. Behavioral self-regulation for weight loss in young adults: a randomized controlled trial. *International Journal of Behavioral Nutrition and Physical Activity*. 2009;6(1):10.
73. Francis LA, Susman EJ. Self-regulation and rapid weight gain in children from age 3 to 12 years. *Arch Pediatr Adolesc Med*. 2009;163(4):297-302.
74. de Vet E, de Wit JB, Luszczynska A, et al. Access to excess: how do adolescents deal with unhealthy foods in their environment? *The European Journal of Public Health*. 2013;23(5):752-756.
75. Williams GC, Grow VM, Freedman ZR, Ryan RM, Deci EL. Motivational predictors of weight loss and weight-loss maintenance. *J Pers Soc Psychol*. 1996;70(1):115.
76. Carey KB, Henson JM, Carey MP, Maisto SA. Which heavy drinking college students benefit from a brief motivational intervention? *J Consult Clin Psychol*. 2007;75(4):663.
77. Stok FM, De Vet E, Wardle J, Chu MT, De Wit J, De Ridder DT. Navigating the obesogenic environment: How psychological sensitivity to the food environment and self-regulatory competence are associated with adolescent unhealthy snacking. *Eating behaviors*. 2015;17:19-22.
78. Zimmerman BJ. Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*. 2008;45(1):166-183.
79. Love H, Bhullar N, Schutte NS. Psychological aspects of diet: Development and validation of three measures assessing dietary goal-desire incongruence, motivation, and satisfaction with dietary behavior. *Appetite*. 2019;138:223-232.
80. Tsukayama E, Toomey SL, Faith MS, Duckworth AL. Self-control as a protective factor against overweight status in the transition from childhood to adolescence. *Arch Pediatr Adolesc Med*. 2010;164(7):631-635.
81. Seeyave DM, Coleman S, Appugliese D, et al. Ability to delay gratification at age 4 years and risk of overweight at age 11 years. *Arch Pediatr Adolesc Med*. 2009;163(4):303-308.
82. Mischel W, Ebbesen EB. Attention in delay of gratification. *J Pers Soc Psychol*. 1970;16(2):329.
83. Gabriel S, Gardner WL. Are there "his" and "hers" types of interdependence? The implications of gender differences in collective versus relational interdependence for affect, behavior, and cognition. *J Pers Soc Psychol*. 1999;77(3):642.
84. World Health Organization. Obesity and Overweight. *Fact Sheet number 311* 2016; <http://www.who.int/mediacentre/factsheets/fs311/en/>. Accessed July 2, 2017, 2017.
85. Paeratakul S, Ferdinand DP, Champagne CM, Ryan DH, Bray GA. Fast-food consumption among US adults and children: dietary and nutrient intake profile. *J Am Diet Assoc*. 2003;103(10):1332-1338.
86. Brown KH. Measurement of dietary intake. *Population and development review*. 1984;10:69-91.
87. Bandura A. Social cognitive theory of self-regulation. *Organ Behav Hum Decis Process*. 1991;50(2):248-287.

88. Maes S, Karoly P. Self-Regulation assessment and intervention in physical health and illness: A review. *Applied Psychology*. 2005;54(2):267-299.
89. De Ridder DT, De Wit JB. Self-regulation in health behavior: Concepts, theories, and central issues. *Self-regulation in health behavior*. 2006:1-23.
90. Van Damme S, Crombez G, Goubert L, Eccleston C. Current issues and new directions in psychology and health: the costs and benefits of self-regulation—a call for experimental research. In: Taylor & Francis; 2009.
91. Shloim N, Edelson LR, Martin N, Hetherington MM. Parenting styles, feeding styles, feeding practices, and weight status in 4–12 year-old children: a systematic review of the literature. *Front Psychol*. 2015;6.
92. McStay RL, Dissanayake C, Scheeren A, Koot HM, Begeer S. Parenting stress and autism: The role of age, autism severity, quality of life and problem behaviour of children and adolescents with autism. *Autism*. 2014;18(5):502-510.
93. CloudResearch. What is Prime Panels? 2019; <https://go.cloudresearch.com/knowledge/what-is-prime-panels>. Accessed October 24, 2019.
94. CloudResearch. How are Participants on Prime Panels Compensated. 2019; Explanation for how Prime Panel participants are compensated for completing a survey. Available at: <https://go.cloudresearch.com/knowledge/how-are-participants-on-prime-panels-compensated>. Accessed October 24, 2019.
95. Birch LL, Fisher J, Grimm-Thomas K, Markey C, Sawyer R, Johnson SL. Confirmatory factor analysis of the Child Feeding Questionnaire: a measure of parental attitudes, beliefs and practices about child feeding and obesity proneness. *Appetite*. 2001;36(3):201-210.
96. Nowicka P, Sorjonen K, Pietrobelli A, Flodmark C-E, Faith MS. Parental feeding practices and associations with child weight status. Swedish validation of the Child Feeding Questionnaire finds parents of 4-year-olds less restrictive. *Appetite*. 2014;81:232-241.
97. Anderson CB, Hughes SO, Fisher JO, Nicklas TA. Cross-cultural equivalence of feeding beliefs and practices: the psychometric properties of the child feeding questionnaire among Blacks and Hispanics. *Prev Med*. 2005;41(2):521-531.
98. Cohen S, Kamarck T, Mermelstein R. Perceived stress scale. *Measuring stress: A guide for health and social scientists*. 1994.
99. Roberti JW, Harrington LN, Storch EA. Further psychometric support for the 10-item version of the perceived stress scale. *Journal of College Counseling*. 2006;9(2):135-147.
100. Lee E-H. Review of the psychometric evidence of the perceived stress scale. *Asian Nurs Res (Korean Soc Nurs Sci)*. 2012;6(4):121-127.
101. World Health Organization. Cut-off points and summary statistics *Global Database on Child Growth and Malnutrition 2020*; World Health Organization Global Database on Child Growth and Malnutrition Z-score cut-off points. Available at: <https://www.who.int/nutgrowthdb/about/introduction/en/index5.html>. Accessed January 25, 2020, 2020.
102. Baughcum AE, Chamberlin LA, Deeks CM, Powers SW, Whitaker RC. Maternal perceptions of overweight preschool children. *Pediatrics*. 2000;106(6):1380-1386.

103. Eckstein KC, Mikhail LM, Ariza AJ, Thomson JS, Millard SC, Binns HJ. Parents' perceptions of their child's weight and health. *Pediatrics*. 2006;117(3):681-690.
104. Fereday J, Muir-Cochrane E. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International journal of qualitative methods*. 2006;5(1):80-92.
105. National Institute of Health BMI Categories. *Calculate Your Body Mass Index 2019*; https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm. Accessed November 1, 2019, 2019.
106. Tate EB, Wood W, Liao Y, Dunton GF. Do stressed mothers have heavier children? A meta-analysis on the relationship between maternal stress and child body mass index. *Obesity reviews*. 2015;16(5):351-361.
107. O'Connor SG, Maher JP, Belcher BR, et al. Associations of maternal stress with children's weight-related behaviours: a systematic literature review. *Obesity Reviews*. 2017;18(5):514-525.
108. Leppert B, Junge KM, Röder S, et al. Early maternal perceived stress and children's BMI: longitudinal impact and influencing factors. *BMC public health*. 2018;18(1):1211.
109. Heslehurst N, Vieira R, Akhter Z, et al. The association between maternal body mass index and child obesity: A systematic review and meta-analysis. *PLoS medicine*. 2019;16(6).
110. Russell CG, Haszard JJ, Taylor RW, Heath A-LM, Taylor B, Campbell KJ. Parental feeding practices associated with children's eating and weight: What are parents of toddlers and preschool children doing? *Appetite*. 2018;128:120-128.
111. Haszard JJ, Russell CG, Byrne RA, Taylor RW, Campbell KJ. Early maternal feeding practices: associations with overweight later in childhood. *Appetite*. 2019;132:91-96.
112. Farrow CV, Blissett J. Controlling feeding practices: cause or consequence of early child weight? *Pediatrics*. 2008;121(1):e164-e169.
113. Harnack L, Story M, Martinson B, Neumark-Sztainer D, Stang J. Guess who's cooking? The role of men in meal planning, shopping, and preparation in US families. *Journal of the American Dietetic Association*. 1998;98(9):995-1000.
114. Flag LA, Sen B, Kilgore M, Locher JL. The influence of gender, age, education and household size on meal preparation and food shopping responsibilities. *Public health nutrition*. 2014;17(9):2061-2070.
115. Beshara M, Hutchinson A, Wilson C. Preparing meals under time stress. The experience of working mothers. *Appetite*. 2010;55(3):695-700.
116. Rana J, Paul J. Consumer behavior and purchase intention for organic food: A review and research agenda. *Journal of Retailing and Consumer Services*. 2017;38:157-165.
117. Lee W-cj, Shimizu M, Kniffin KM, Wansink B. You taste what you see: Do organic labels bias taste perceptions? *Food Quality and Preference*. 2013;29(1):33-39.
118. Roos E, Lehto R, Ray C. Parental family food choice motives and children's food intake. *Food Quality and Preference*. 2012;24(1):85-91.
119. Hoffmann DA, Marx JM, Kiefner-Burmeister A, Musher-Eizenman DR. Influence of maternal feeding goals and practices on children's eating behaviors. *Appetite*. 2016;107:21-27.

120. Goulding AN, Lumeng JC, Rosenblum KL, Chen YP, Kaciroti N, Miller AL. Maternal Feeding Goals Described by Low-Income Mothers. *J Nutr Educ Behav.* 2015;47(4):331-337.e331.
121. Sonnevile KR, Rifas-Shiman SL, Kleinman KP, Gortmaker SL, Gillman MW, Taveras EM. Associations of obesogenic behaviors in mothers and obese children participating in a randomized trial. *Obesity.* 2012;20(7):1449-1454.
122. Higgs S, Thomas J. Social influences on eating. *Current Opinion in Behavioral Sciences.* 2016;9:1-6.
123. Shloim N, Edelson LR, Martin N, Hetherington MM. Parenting styles, feeding styles, feeding practices, and weight status in 4–12 year-old children: A systematic review of the literature. *Frontiers in psychology.* 2015;6:1849.
124. Yee AZ, Lwin MO, Ho SS. The influence of parental practices on child promotive and preventive food consumption behaviors: a systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity.* 2017;14(1):47.
125. Barnett TA, Kelly AS, Young DR, et al. Sedentary behaviors in today's youth: Approaches to the prevention and management of childhood obesity: A scientific statement from the American Heart Association. *Circulation.* 2018;138(11):e142-e159.
126. Tucker JM, DeFrang R, Orth J, Wakefield S, Howard K. Evaluation of a Primary Care Weight Management Program in Children Aged 2–5 years: Changes in Feeding Practices, Health Behaviors, and Body Mass Index. *Nutrients.* 2019;11(3):498.
127. Belay B, Frintner MP, Liebhart JL, et al. US Pediatrician practices and attitudes concerning childhood obesity: 2006 and 2017. *The Journal of pediatrics.* 2019;211:78-84. e72.
128. Madigan S, Racine N, Tough S. Prevalence of Preschoolers Meeting vs Exceeding Screen Time Guidelines. *JAMA pediatrics.* 2020;174(1):93-95.
129. Emmett PM, Hays NP, Taylor CM. Antecedents of picky eating behaviour in young children. *Appetite.* 2018;130:163-173.
130. Antoniou E, Roefs A, Kremers S, et al. Picky eating and child weight status development: a longitudinal study. *Journal of Human Nutrition and Dietetics.* 2016;29(3):298-307.
131. Jordan AA, Appugliese DP, Miller AL, Lumeng JC, Rosenblum KL, Pesch MH. Maternal prompting types and child vegetable intake: Exploring the moderating role of picky eating. *Appetite.* 2020;146:104518.
132. Taylor CM, Emmett PM. Picky eating in children: causes and consequences. *Proceedings of the Nutrition Society.* 2019;78(2):161-169.
133. Blaine RE, Kachurak A, Davison KK, Klabunde R, Fisher JO. Food parenting and child snacking: a systematic review. *The international journal of behavioral nutrition and physical activity.* 2017;14(1):146.
134. Zhang M, Quick V, Jin Y, Martin-Biggers J. Associations of Mother's Behaviors and Home/Neighborhood Environments with Preschool Children's Physical Activity Behaviors. *American Journal of Health Promotion.* 2019:0890117119864206.
135. Duncan DT, Hansen AR, Wang W, Yan F, Zhang J. Change in misperception of child's body weight among parents of American preschool children. *Childhood Obesity.* 2015;11(4):384-393.

136. Holliday C, Holliday N, Mulekar M. Women's perceptions of body mass index. *Clinical obesity*. 2019;9(1):e12286.
137. Duriancik DM, Goff CR. Children of single-parent households are at a higher risk of obesity: A systematic review. *Journal of Child Health Care*. 2019:1367493519852463.
138. Augustine JM, Kimbro RT. Associations and intervening mechanisms between family structure and young children's obesity. *Journal of Family Issues*. 2017;38(16):2277-2302.
139. Cunningham SA, Chandrasekar EK, Cartwright K, Yount KM. Protecting children's health in a calorie-surplus context: Household structure and child growth in the United States. *PLoS One*. 2019;14(8).
140. Ash T, Agaronov A, Aftosmes-Tobio A, Davison KK. Family-based childhood obesity prevention interventions: a systematic review and quantitative content analysis. *International Journal of Behavioral Nutrition and Physical Activity*. 2017;14(1):113.

APPENDIX A

Recruitment Flyer



- Are you a mom of a child aged 2 to 5 years old?
- Are you at least 18 years of age?
- Are you the primary caregiver for your 2 to 5 year old? child?

If you answered **YES** to these questions...

You are invited to participate in a study that will help us understand how moms decide what and how they feed their preschooler.

Participants will receive a \$25 electronic gift card for completing a survey that takes about 15-20 minutes to complete

Access the screening questions and survey here: <https://is.gd/preschoolers>

Additional opportunity to participate in an interview:

- Conducted by a research team member
- If selected, you may receive an additional \$50 gift card

If you have questions about this opportunity, please contact:

Andrea Bushaw via text or call **763-355-2484**
Or email andrea.b.bushaw@vanderbilt.edu

Participation in this study is voluntary.

Date of IRB Approval: 03/18/2019

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APPENDIX B

REDCap Form (Eligibility Checklist and Online Survey)

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Page 1

Screening Questions for eligibility

Please complete the survey below.

Thank you!

Screening for eligibility to participate in study		
	yes	no
Are you a mom of a child aged 2 to 5 years old?	<input type="radio"/>	<input type="radio"/>
Are you at least 18 years of age?	<input type="radio"/>	<input type="radio"/>
Are you the primary caregiver for your 2 to 5 years old child?	<input type="radio"/>	<input type="radio"/>

Has your 2 to 5 year old child ever been diagnosed with a medical condition that affects his or her ability to eat? Yes No

Date

(date (day-month-year))

Your Date of birth (mother)

(Date of birth)

Child date of birth

Racial background

	Black/African American	Caucasian	Asian	Native American	Other	Not known	Prefer not to answer
Your racial background (mother)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Child's racial background	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ethnic background

	Hispanic/Latino	Non-Hispanic	Not known	Prefer not to answer
Your ethnicity (mother)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ethnicity of child	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What is your current marital status?

married living with a partner divorced/separated widowed never married

What is your relationship to your child?

Biological mother Adoptive mother Step-mother Grandmother Foster mother
 Other

Please explain your relationship to your child:

Does the child you're thinking about when answering this survey have siblings?

 Yes No

Please list the ages of the child's siblings.

(if less than 1 year of age, record as 0)How tall are you?
FEET:

INCHES:

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09/28/2018 11:39am

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What is your weight (in pounds)?

_____ (pounds)

What is the total years of schooling you completed?

_____ (if you completed 12th grade or completed a GED, record 12)

What was your annual family income last year?

- Under \$10,000
 \$10,001-\$45,000
 \$45,001-\$75,000
 \$75,001-\$100,000
 \$100,001-\$150,000
 More than \$150,000
 Prefer not to answer

What is your current employment status?

- Full time Part time Unemployed/looking for a job Unemployed/not looking for a job

How many hours do you currently work each week?

What type of work do you do?

Choose the region in which you live:

- Mid-West Region New England Region Mid-Atlantic Region Southern Region
 South-West Region Rocky Mountain Region Coastal Region

What is your child's gender?

- male female
 (assigned gender at birth)

Does your child receive care/schooling outside of the home?

- Yes No

How many days per week does your child attend daycare or preschool?

_____ (if different each week, provide an average)

How many months old was your child when he/she first started daycare or preschool?

_____ (months)

What is your child's weight in pounds?

_____ (pounds)

How tall is your child?

FEET: _____

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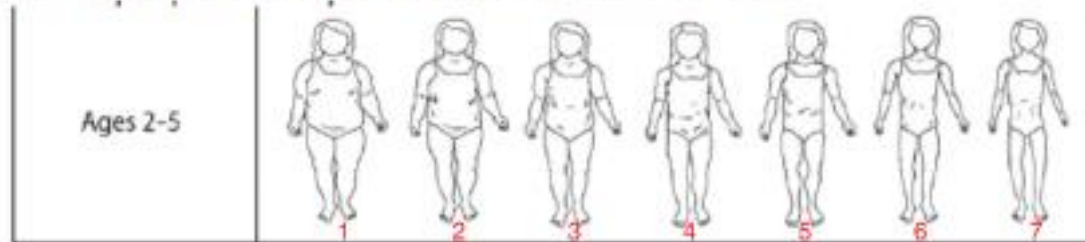
 REDCap

INCHES: _____

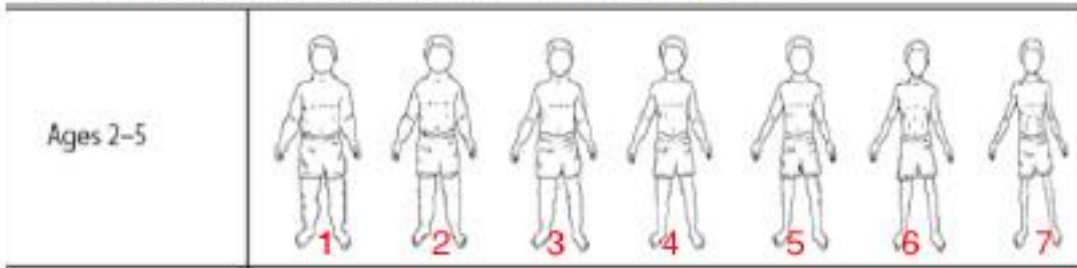
How would you describe your child's body stature?

- underweight
 a little underweight
 about the right weight
 a little overweight
 overweight

Select the image that most closely resembles your child's body shape as it is today.



Select the image that most closely resembles your child's body shape as it is today.



Choose the corresponding number that describes your child's body shape as it appears today:

- 1
 2
 3
 4
 5
 6
 7

Has your child's pediatrician/healthcare provider ever been concerned about your child's weight being too high?

- Yes
 No

At what age(s) was your pediatrician/healthcare provider concerned about your child's weight being too high? Check all that apply.

- birth
 6 months
 9 months
 12 months
 18 months
 24 months (age 2 years)
 36 months (age 3 years)
 Age 4 years
 Age 5 years
 My pediatrician has always been concerned about my child's weight being too high

Does your child subscribe to a special diet?

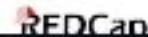
- Yes
 No

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Please name and/or describe the special diet to which your child adheres:

How many times, on average, does your child eat in a restaurant over the course of a typical week?

How often does your child watch TV while eating meals at home?

- Always Sometimes
 Never

Who typically prepares the meals for your child at home?

Choose the things that influence you when you shop for food for your family.

- Cost of food
- Selection of foods available at local grocer
- Child preferences for certain foods
- Parent preferences for certain foods
- Healthy food options
- Tasty food options
- Convenience
- Routine
- Food items are on sale
- other
- Nothing influences me
(choose all that apply)

Please explain what influences you when you shop for food for your family:

You have completed Page 1 of 5.

Please click Submit to move to the next page.

1. Do you find any of these foods tempting (that is, do you want to eat more of them than you think you should)?
(check those which apply)

- chocolate
 chips
 cakes
 ice cream
 bread/toast
 fizzy drinks
 cookies
 sweets
 popcorn
 pastries
 pizza
 fried foods
 crackers
 other foods
 I don't find any food tempting

You checked other foods, please specify:

2. Do you intend NOT to eat too much of these foods you find tempting in the previous question?

- Yes No

3. Do you intend to have a healthy diet?

- Yes No

4. Please read the following statements and click the buttons most appropriate to you.

For the next few questions, please understand that:

- "Tempting foods" are any food you want to eat more of than you think you should.
- "Eating Intentions" refer to the way you are aiming to eat, for example, you may intend to avoid tempting foods or eat healthy foods.

	Never	Rarely	Sometimes	Often	Always
I give up too easily on my eating intentions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm good at resisting tempting food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I easily get distracted from the way I intend to eat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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- | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| If I am not eating in the way I intend to I make changes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I find it hard to remember what I have eaten throughout the day | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

You have completed Page 2 of 5.

Please click [Submit](#) to move to the next page.

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The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by choosing how often you felt or thought a certain way. In the last month,

	Never	Almost Never	Sometimes	Fairly Often	Very Often
1. How often have you been upset because of something that happened unexpectedly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. How often have you felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. How often have you felt nervous and "stressed"?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. How often have you felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. How often have you felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In the last month,

	Never	Almost Never	Sometimes	Fairly Often	Very Often
6. How often have you found that you could not cope with all the things that you had to do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. How often have you been able to control irritations in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. How often have you felt that you were on top of things?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. How often have you been angered because of things that were outside of your control?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. How often have you felt difficulties were piling up so high that you could not overcome them?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

You have completed Page 4 of 5.

Please click [Submit](#) to move to the next page.

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09/28/2018 11:44am

Please complete the survey below.

Thank you!

The Child Feeding Questionnaire (CFQ)

INSTRUCTIONS: Using the scale below, please choose one button for each question which best corresponds to your answer. If you have more than one child, please continue to consider your preschooler as you answer the questions.

	Never	Seldom	Half of time	Most of time	Always
When your child is at home, how often are you responsible for feeding him/her?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often are you responsible for deciding what your child's portion sizes are?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often are you responsible for deciding if your child has eaten the right kind of foods?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using the scale below, please indicate how you would classify your own weight at each of these 4 time periods listed below.

	Markedly underweight	Underweight	Average	Overweight	Markedly overweight
Your childhood (5 to 10 years old)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your adolescence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your 20's (leave blank ONLY if you are < 20 years of age)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Currently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using the scale below, please indicate how you would classify your child's weight at each of these 4 time periods listed below.

	Markedly underweight	Underweight	Average	Overweight	Markedly overweight
Your child during the first year of life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your child as a toddler	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your child as a pre-schooler	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Using the scale below, please choose the button for each question which best corresponds to your answer. Please answer about your child who is in our study.

	Unconcerned	Slightly unconcerned	Neutral	Slightly concerned	Concerned
How concerned are you about your child eating too much when you are not around him/her?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How concerned are you about your child having to diet to maintain a desirable weight?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How concerned are you about your child becoming over weight?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using the scale below, please choose one button for each question which best corresponds to your answer. Please answer about your child who is in our study.

	Disagree	Slightly disagree	Neutral	Slightly agree	Agree
I have to be sure that my child does not eat too many sweets (candy, ice cream, cake or pastries).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have to be sure that my child does not eat too many high fat foods.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have to be sure that my child does not eat too much of his/her favorite foods.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intentionally keep some foods out of my child's reach.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I offer sweets (candy, ice cream, cake, pastries) to my child as a reward for good behavior.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I offer my child her favorite foods in exchange for good behavior.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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	Disagree	Slightly disagree	Neutral	Slightly agree	Agree
If I did not guide or regulate my child's eating, he/she would eat too many junk foods.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I did not guide or regulate my child's eating, he/she would eat too much of his/her favorite foods.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child should always eat all of the food on her plate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have to be especially careful to make sure my child eats enough.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If my child says "I'm not hungry", I try to get him/her to eat anyway.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I did not guide or regulate my child's eating, he/she would eat much less than he/she should.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Using the scale below, please choose one button for each question which best corresponds to your answer. Please answer about your child who is in our study.

	never	rarely	sometimes	mostly	always
How much do you keep track of the sweets (candy, ice cream, cake, pies, pastries) that your child eats?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How much do you keep track of the snack food (potato chips, Doritos, cheese puffs) that your child eats?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How much do you keep track of the high fat foods that your child eats?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

You have completed the last page.

Please click Submit.

Eating Self-Control Items							
Respond to the following statements with the number that most closely matches how you feel:							
	strongly disagree ¹	2	3	4	5	6	strongly agree ⁷
I am good at resisting tempting foods.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a hard time breaking bad eating habits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I eat inappropriate things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I eat certain things that are bad for my health, if they are delicious.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I refuse to overindulge on foods that are bad for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	strongly disagree ¹	2	3	4	5	6	strongly agree ⁷
People would say that I have iron self-discipline with my eating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to work effectively toward long-term health goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sometimes I can't stop myself from eating something, even if I know it is bad for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often eat without thinking through the health consequences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wish I had more self-discipline in food consumption.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

You have completed Page 3 of 5.

Please click [Submit](#) to move to the next page.

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APPENDIX C

Interview Guide

Qualitative Interview Guide

Introduction: I am Andrea Bushaw, a PhD candidate in nursing science at Vanderbilt University School of Nursing. Our discussion today will involve some open-ended questions about your experiences feeding (child's name). The information you provide will help provide a better understanding of how moms of preschoolers decide what and how they feed their preschooler as well as how families of preschoolers approach mealtime and activity. There are no anticipated risks for you to participate in this interview.

The interview will take about 30 minutes. I am interested in hearing about your experiences and opinions. There are no right or wrong answers to the questions. Please answer the questions however you see appropriate. You may choose to refuse to answer a question or stop the interview at any time. If a question sounds confusing, please ask me to clarify.

All information you provide will be kept anonymous. A random numerical code has been assigned to you and will be linked to your responses. The only exception to maintaining confidentiality and privacy is if I am told something to indicate you may hurt yourself or someone else. In this case, I will need to share that information with appropriate individuals who can help. The interview will be audio recorded for transcription purposes. If you would like to participate in this study, I ask you to provide consent verbally for your participation in the study with a "yes, I would like to participate", indicating we may proceed.

Questions for participant (in bold):

1. I see (child's name) has attended daycare for (time period). First, I'd like to learn more about (her/his) snacks and meals while he/she is at daycare. Do you know what (child's name) eats over the course of a day at daycare? Can you give me some examples of what is offered?

- a. What say/influence do you have in what your child eats at daycare?
- b. How do you communicate your preferences? What things either help you or block you from communicating your preferences? (Prompt: For example, how easy is it to contact the director or staff in charge of meals/food?)
- c. How do you follow up with the daycare to see if they did what you asked? What kinds of things either help or block your from following up? (Prompt: For example, are the staff easy to contact and welcoming to parent feedback?)

2. Now, let's talk a little about weeknight meals.

- a. Please describe 2 or 3 typical weeknight meals for (child's name).
- b. How do you handle it when [child's name] doesn't like the food being served?
- b. Now, thinking about dinner you had last night. Describe for me what everyone had for dinner last night, including (child's name)?

3. The next set of questions are about feeding (child's name) at home.

- a. How often do you typically eat at home?

- b. What are typical foods you include at breakfast . . . what about lunch? . . . and dinner? . . . what are some typical snacks for (child's name)? [Prompt: What do you consider a healthy meal/healthy snack for (child's name)]?
- c. How often would you say you eat as a family at home during the course of a week?
- d. When eating at home, where are meals eaten? (Prompt: at the table?)
- e. Can you describe a typical breakfast scene? Can you describe a typical dinner scene?
- f. Is the TV typically on or off during mealtime? Does [child's name] eat with the rest of the family? Do the adults (mom, dad, grandparents, etc.) in the house eat meals with (child's name)? Does (child's name) eat the same food/dinner/breakfast as the adults (mom, dad, grandparents) in the house?
- g. When do you use food as a special treat?
- h. How do you use food to manage (child's name) behavior?

4. Now, let's talk about the meals (child's name) eats outside the home.

- a. When (child's name) is eating outside the home, what kind of control do you have over the food (he/she) is eating? [Prompt: What frustrates you when choosing foods for (child's name) when dining out?]
- b. What helps you decided where to go out to eat when you dine outside the home?
- c. When [child's name] is not eating at home, where are you typically getting (his/her) food? (Prompt: restaurants, friends' homes, extended family).

5. Now I'd like to learn a little more about what it's like for you when you shop for food.

- a. What influences you the most when you shop for food? Any other things? [Prompt: Cost? What (child's name) requests/likes? Time? Weekly ads? Ease of preparation? Prepared foods?]
- b. Are there any types of foods for meals or snacks you would like to provide to (child's name) that you don't? If so, what are they? What are the main reasons you don't provide these?

6. The next set of questions are about your decisions around food.

- a. Are there foods (child's name) eats that you don't?
- b. How do you know when you are hungry/full/ satisfied?
- c. How do you know when (child's name) is hungry/ full/satisfied? Is it hard to know (child's name) hunger/sated cues?
- d. If you could improve (child's name) nutrition or diet, what would you focus on improving? Why?
- e. How do you know when your child does not like a food? If it is something you feel is nutritious and they should it, do you reintroduce the food? If so, how? How often does that work?
- f. Now let's talk about some other behaviors. How do you most often reward good behavior for [child's name]? [Are rewards typically food-based?] [Prompt: *ask if child has siblings: is this the same for [child's name] siblings? If no, what is different? Why different?]
- g. Please describe the sleeping habits of (child's name). [Prompts: Bedtime routine/ room arrangement (TV in room, lights)] How many hours does (child's name) typically sleep at night? [*Ask if child has siblings: is this the same for (child's name) siblings? If no, how is it different? Why different?]

h. *(Ask only if child has siblings)*. Does (child's name) follow the same routine around mealtime as [his/her] siblings? If no, how is it different? Why is (his/her) routine around mealtime different from (his/her) siblings?

7. Let's talk a little bit about physical activity:

- a. What do you like to do to stay active?
- b. During a typical week, tell me about what you do, if anything, to stay physically active? (Prompt: If parent indicates they are active: How much time per day would you say you are physically active?)
- c. What does [child's name] love to do that's active? How much time per day would you estimate (child's name) is physically active?
- d. Tell me about the activities that (child's name) does that are organized (i.e. teams, classes).
- e. What is (child's name) favorite thing to do? [Prompt: What is (child's name) favorite physical activity inside? And what about outside?]
- f. Tell me about your neighborhood. Do the kids in the neighborhood play outside? [If not, why?]

8. Finally, I'd like to chat a bit about [child's name] visits with [his/her] pediatrician/healthcare provider.

- a. Tell me about your visits with your pediatric health care provider. Does he/she ever ask about what (child's name) eats?
- b. Does (child's name) pediatric health care provider show you (his/her) growth chart or tell you about how he/she is growing? (If yes, what have they told you?)
- c. Are you familiar with the terms "height and weight percentiles"? Have you ever been told (child's name) height and weight percentiles? [If yes, what have you been told are (child's name) height and weight percentiles?]
- d. Tell me what comes to mind when the pediatric healthcare provider says what [child's name] weight and height are? [Prompt: how do you feel about (child's name) height and weight?]
- e. Do you have any recommendations for healthcare providers as they work with other moms of preschoolers, thinking about what and how you choose to feed your child?

Is there anything else you would like to share about how (child's name) eats or how you make decisions about what to feed (child's name)?