APPLICATION OF BEHAVIOR CHANGE AND PERSUASION THEORIES TO A MULTI-MEDIA INTERVENTION DESIGNED TO IMPROVE THE HOME FOOD ENVIRONMENT AND DIET QUALITY OF RESOURCE-LIMITED PARENTS WITH YOUNG CHILDREN

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ABSTRACT

APPLICATION OF BEHAVIOR CHANGE AND PERSUASION THEORIES TO A MULTI-MEDIA INTERVENTION DESIGNED TO IMPROVE THE HOME FOOD ENVIRONMENT AND DIET QUALITY OF RESOURCE-LIMITED PARENTS WITH YOUNG CHILDREN

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Background. Few interventions have focused on a parent-based, home food-centered approach as a way to improve the relatively poor quality of US children's diets. This dissertation evaluated one such intervention by combining two theoretical models taken from the fields of health psychology/behavior change (Social Cognitive Theory; SCT) and health communication/persuasion (Heuristic-Systematic Model; HSM). The novel combination of these two theoretical orientations was intended to combine the often distinct fields of nutrition and communication to ultimately uncover new ways to improve child diet quality.

Aims. 1) Explore whether and how the level of parent motivation and/or parent ability (education level) affects cognitive processing of the intervention materials by parents who receive intervention materials; 2) Compare intervention and control groups according to knowledge gain and change in key personal factors in the SCT (self-efficacy, outcome expectancies, skills); and 3) Compare intervention and control groups according to changes in parent attitudes toward healthy eating, parent diet quality, parent modeling behaviors, home food availability and accessibility, and child diet quality.

Methods. A newly developed intervention package designed for low-income parents of 3-5 year old children in the Head Start preschool program was tested in an eight-week randomized controlled trial. Researchers recruited 42 participants who were randomized into control (n=19) and intervention (n=23) groups and who received the intervention package or nothing beyond

Head Start materials, respectively. Researchers collected cognitive and dietary data and a home food inventory at pre-study (week 0) and post-study (week 8) in participant homes.

Results. Analyses of HSM constructs in intervention participants (n=16 who remained in the study at week 8) revealed a significant positive relationship between the perceived similarity heuristic and change in parent attitude toward the child eating healthfully during the study (β=0.13, p=0.02) and significant negative relationship between systematic processing (number of correct responses on knowledge test) and parent attitude toward the child eating healthfully during the study (β=-0.09, p=0.02). The latter finding was in the opposite direction than expected. No other Aim 1analyses were significant. No significant changes in SCT, home food environment, or adult or child dietary constructs/measures were detectable in the intervention group compared to the control group, and thus, Aims 2 and 3 were not supported. Post-hoc analysis of the combined sample of intervention and control participants (n=35 who completed week 8) revealed significant correlations between many measured constructs, and a well-fitting path model (motivation and education → percent of nutrient-dense foods available in the home → adult diet quality → child diet quality) was identified that explained 15.4% of the variance in child diet quality.

Conclusions and Implications. Post-hoc path analysis demonstrated the importance of the home food environment, particularly availability of nutrient-dense foods in the entire small sample of parents. Although there were few significant findings in processing intervention materials and no significant differences between the intervention and control groups in changes in attitude, theoretical, or behavior change, some trends in the data, particularly in the Social Cognitive Theory, home food environment, and adult diet quality variables presented interesting leads for future research.

To my husband, Jason Reznar, my best friend and soul mate. Luf you, hundee! Thanks for your unconditional love, support, and never-ending encouragement.

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CHAPTER 1

INTRODUCTION

1.1. Background

The quality of children's diets in the US is poor despite decades of effort, potentially due in part to lack of effective parent-based interventions that reach beyond traditional approaches. Children consume far more energy-dense foods, like candy, sweets, and salty snacks, than recommended and too few nutrient-dense foods, like fruit, vegetables, whole grains, and low-fat dairy/dairy alternatives. Home food environments influence the eating preferences that children adopt and consequently affect child diet quality. Few interventions have targeted changes in the home food environment as an avenue to improve child diet quality. Therefore, a cross-disciplinary health communication and nutrition education intervention based on established theory is especially promising to improve home food environment and child diet quality. Given the challenges that resource-limited parents face in providing a healthy home food environment, it is imperative that interventions target resource-limited parents with young children to establish healthy eating patterns as early in the life-course as possible.

The work described in this dissertation was conducted under the guidance of Dr. Sharon Hoerr. In June 2010, Dr. Hoerr was awarded an NIH R21 to develop and pilot test an intervention to educate parents about appropriate home food environment and child-centered feeding practices. The original NIH grant involved developing the intervention materials and determining if they are effective. My dissertation is a supplement to the NIH grant and intended to examine how the parent-centered intervention may produce positive changes in child diet quality.

In entirety, the objective of my dissertation was to evaluate a parent-based, multimedia intervention for parents with 3-5 year old children in the Head Start Program through the lens of a persuasive theoretical framework. The theoretical models employed were the Heuristic-Systematic Model (HSM) of persuasion and the Social Cognitive Theory (SCT). The HSM posits that persons form or change attitudes using both systematic processing of messages (complex cognitive thought) and heuristic cues (short-cut processing). SCT describes human behavior as reciprocal interaction among personal factors (knowledge, skills, self-efficacy, and outcome expectations) and a person's social and physical environment, emphasizing learning through modeling.

To achieve the objective of this project, the specific aims were as follows (See **Figure 3-2** for conceptual model).

1.2. Specific aims and hypotheses

Aim 1: Explore whether and how the level of parent motivation and/or parent ability (education level) affects cognitive processing of the intervention materials by parents who receive intervention materials.

Hypothesis 1.1: Parents with high motivation and ability will be more likely to use systematic processing (knowledge acquisition) when processing intervention materials and parents with low motivation and ability will be more likely to use heuristic processing when processing intervention materials.

Hypothesis 1.2: Parents who use higher amounts of a combination of heuristic and systematic processing compared to those who use less will have more positive change in attitudes toward healthy eating.

Hypothesis 1.3: Parents who use more systematic processing compared to those who use less systematic processing will have more positive change in attitudes toward healthy eating, leading to improved diet quality of parents.

Aim 2: Compare intervention and control groups according to knowledge gain and change in key personal factors in the SCT (self-efficacy, outcome expectancies, skills).

Hypothesis 2.1: Parents in the intervention group will experience greater knowledge gain and thereby demonstrate greater changes in self-efficacy, outcome expectancies, and behavioral skills compared to parents in the control group.

Research Question 2.1: How does the relationship between knowledge gain and SCT constructs affect parent attitudes toward healthy eating, home food environment, and parent diet quality in the intervention group compared to the control group?

Aim 3: Compare intervention and control groups according to changes in parent attitudes toward healthy eating, parent diet quality, parent modeling behaviors, home food availability and accessibility, and child diet quality.

Hypothesis 3.1: Intervention parents will experience more positive changes in parent attitudes toward healthy eating and thereby experience more improvements in diet quality than control parents.

Hypothesis 3.2: Intervention parents will exhibit greater improvements in modeling of nutrient-dense (ND) foods, child diet quality, and availability and accessibility of ND foods in the home than parents in the control group.

Hypothesis 3.3: Control parents will experience less change in modeling of energy-dense (ED) foods and availability and accessibility of ED foods in the home compared to intervention parents.

1.3. Significance

This study used the HSM framework to investigate how parents processed SCT-derived intervention materials. In the future, findings from this study will be used to refine intervention materials and develop additional supportive materials for this and other populations.

CHAPTER 2

REVIEW OF LITERATURE

2.1. Child diet quality in the U.S.

2.1.1. Poor diet quality in young children

The Dietary Guidelines for Americans, which represents federal dietary recommendations, have identified several key nutrients of concern for children of all ages – calcium, potassium, fiber, magnesium, and vitamin E – suggesting that nutrient-dense foods like fruit, vegetables, whole grains, and low-fat dairy/dairy alternatives need to be emphasized to ensure nutritional adequacy (US Department of Health and Human Services et al., 2005). The US Department of Agriculture MyPlate food guide recommends that children 2-3 years of age consume daily 1 cup of fruit, 1 cup of vegetables, 1½ ounce equivalents of whole grains, and 2 cup equivalents of low-fat dairy/dairy alternatives and that children 4-8 years consume 1 to 1½ cups of fruit, 1½ cups of vegetables, 2½ ounce equivalents of whole grains, and 2½ cup equivalents of low-fat dairy/dairy alternatives (US Department of Agriculture, 2012). However, the majority of children fail to meet these recommendations. Data from the 2001-2004 National Health and Nutrition Examination Survey (NHANES) indicates that 32% of 2-3 year old children eat less than the recommended amount of fruit, 80% eat less than the recommended amount of vegetables, 99% eat less than the recommended amount of whole grains, and 10% eat less than the recommended amount of dairy (Krebs-Smith et al., 2010). Children 4-8 years of age are even less likely to meet the recommendations, with 63%, 92%, nearly 100%, and 42% failing to consume enough fruit, vegetables, whole grains, and dairy respectively.

Overall assessments of diet quality in children support these data. The Healthy Eating Index (HEI) is a diet quality indicator used to measure adherence to the Dietary Guidelines for

Americans (US Department of Agriculture, 2010). Children aged 2-5 years and 6-11 years of age have an overall HEI score of 59.6 and 54.7 out of 100, respectively (Fungwe et al., 2009). Subcomponent scores for total vegetables, dark green and orange vegetables and legumes, and whole grains all fall far short of recommendations and older children also have poor scores for total and whole fruit. Children, particularly younger children, do score well in the dairy category, with children 2-5 years scoring an average 10 out of 10 (score of 10 achieved with ≥1.3 cup equivalents of dairy). Dairy intake is lower in 6-11 year old children (HEI score = 8.7 out of 10) and is even lower later in childhood (HEI score = 7.7 out of 10 for 12-17 year olds).

A cluster analysis of national data revealed that 2-3 year olds in low-income households were most likely to conform to a pattern the authors called "Big Eaters," which was marked by excess energy intake and relatively high amounts of fat, sodium, and cholesterol (Knol et al., 2005). Although the predominant pattern in 4-8 year age group was the "Light Eaters" pattern, characterized by low energy intake compared to the other clusters, 40% of the children's energy was in the form of discretionary fat and added sugars and they did not consume enough servings from nutrient-dense food groups. The authors expected, but failed to find, an ideal or balanced diet pattern, in these young children from low-income households (Knol et al., 2005).

Research that compares diet quality of lower-income children to higher-income children fails to find significant differences between the two groups. Guenther and colleagues (2008) compared HEI scores for 2-18 year old children in households <185% of the Federal poverty line[1] to the same aged children in households ≥185% of the Federal poverty line. The authors found no differences in overall HEI or subcomponent HEI scores, with the exception of total

[1] Households income <185% of the Federal poverty line was chosen because this income level is required for participation in the Special Supplemental Nutrition Program for Women, Infants, and Children program (WIC) and free or reduced school meal plans.

vegetable scores, in which lower income children actually had significantly better HEI scores than higher income children (total vegetables HEI=2.5 and 2.2 out of 5, respectively). The authors offer that these findings may be attributable to low-income children's participation in the National School Lunch program. In the same report, researchers also analyzed diet quality of all persons 2 years and older in households <130% of the Federal poverty line[2] versus households ≥130% of the Federal poverty line. Individuals in higher income households had significantly better scores in total vegetable (low income HEI = 3.0, high income HEI = 3.3), dark green and orange vegetable (low income HEI =1.0, high income HEI=1.2), whole grain (low income=0.8, high income=0.9) scores, but a worse sodium score (low income HEI=4.4, high income HEI=3.8, with a score indicating lower sodium intake). These findings suggest the need for interventions directed toward parents in low-income households to promote home food environments in which the parent is able to model intake of nutrient-dense foods (see section 2.3.6) while the child is developing his or her taste preferences (see section 2.2).

2.1.2. Importance of child diet quality to health

Childhood is a time of considerable growth and development that requires optimal nutrition. The brain develops to promote cognitive advances in memory and attention (Casey et al., 2000) and bone mass increases as long bones grow (Davies et al., 2005; Prentice et al., 2006). Poor diet quality has traditionally also been associated with deficiency diseases such as iron-deficiency, most recently determined to be at a prevalence of 5% among 3-5 year olds (Centers for Disease Control and Prevention (CDC), 2002). In recent decades, diet quality has been targeted in relation to childhood obesity and its affiliated health consequences—hypertension,

[2] Household income <130% of the Federal poverty line was chosen because this level of income is required for participation in the Food Stamp program, now known as the Supplemental Nutrition Assistance Program.

dyslipidemia, type 2 diabetes, diseases formerly seen almost exclusively in adults (Dietz, 1998). National survey data indicate that 21% of 2-5 year olds are overweight and 10.4% are obese (Ogden et al., 2010). Conversely, high quality diets rich in fruits, vegetables, and whole grains protect against development of cardiovascular disease (Joshipura et al., 2001), diabetes (Ford & Mokdad, 2001), and other chronic diseases (World Health Organization, 2003). Intake of calcium-rich foods, particularly those fortified with vitamin D like milk, yogurt and orange juice, help promote bone health (Institute of Medicine, 2011).

2.1.3. Energy-dense and nutrient-dense dietary patterns

Energy dense foods appear to displace nutrient dense foods in children's diets. Kant (2003) analyzed dietary intake of all children aged 8-18 years of age included in the National Health and Nutrition Examination Survey and found that children who consume high amounts of energy-dense foods consume fewer nutrient-dense foods. High intake of energy-dense foods increases total energy intake, making it more likely that children who consume energy-dense diets will become overweight or obese (Kant, 2003). For example, one intervention that aimed to increase fruit and vegetable intake in families with a 6-11 year old child also resulted in a decrease in high-fat, high-sugar foods, suggesting that energy-dense and nutrient-dense foods displace each other and that an increase in one may lead to an decrease in the other (Epstein et al., 2001).

2.2. Dietary trends during childhood

2.2.1. Development of taste preferences

Children develop preferences for foods and flavors early in life that may influence diet quality. Children are genetically predisposed to accept salty and fat flavors like those in energy

dense foods and to reject bitter flavors like those in vegetables (Birch & Davison, 2001). Children's willingness to try new foods increases and peaks between 1-2 years of age and then steadily declines through age 4 (Cashdan, 1994). At least 5-10 exposures to a new food may be needed before a child will accept it (Birch & Fisher, 1998). Parent intake of energy and macronutrients accounted for 30-40% of variance in child energy and macronutrient in one study (Vauthier et al., 1996). Moreover, variance estimates were approximately 10% higher when parents and children shared more than 45 meals a week together compared to ≤45 meals (Vauthier et al., 1996). These results highlight the importance of shared environment and repeat exposure. Given these findings about taste preference development at early ages, young childhood (3-5 years) appears to be a key point of establishing preferences for healthy foods and setting the stage and the child's mindset to taste new ones.

2.2.2. Trends in childhood dietary quality and patterns.

As suggested by FVI and HEI data already presented, diet patterns do not remain stable over time. A longitudinal study by Lytle and colleagues (2000) collected 24-hour food recalls of 291 children from third grade through eighth grade and found significant decreases in reported consumption of any fruit (65% reported fruit intake in 3rd grade, 56% in 5th grade, and 37% in 8th grade) in any vegetable intake (56% in 3rd grade, 50% in 5th grade, and 42% in 8th grade), and in milk intake (99% in 3rd grade, 98% in 5th grade, and 90% in 8th grade), but significant increases in soft drink consumption (21% in 3rd grade, 31% in 5th grade, 57% in 8th grade). However, other evidence indicates that these changes are universal for growing children and that dietary patterns remain broadly similar during childhood (Johnson et al., 2008). For instance, while the percent of children meeting recommendations for vegetable, fruit, and milk servings

decline during childhood, the rank-order of their diet quality remains the same (Mannino et al., 2004). In other words, those children with the highest fruit, vegetable, and milk intake at age 5 also had the highest intake at age 9. In addition, one study found that food preferences remain relatively stable during childhood, with bread, pasta, and desserts being the most liked and raw and cooked vegetables the most disliked foods at ages 2, 4, and 8 years (Skinner et al., 2002).

2.2.3. Eating behaviors track throughout childhood

In a longitudinal study of 300 children using the parent-completed Child Eating Behavior Questionnaire (Wardle et al., 2001), responsiveness to satiety (e.g. my child gets full easily), slow eating (e.g. my child eats slowly), and emotional under-eating (e.g. my child eats less when upset) decreased between 4 and 11 years of age while food responsiveness (e.g. my child is always asking for food), enjoyment of food (e.g. my child loves food), food fussiness (e.g. my child refuses new foods at first), and emotional overeating increased (e.g. my child eats more when anxious) (Ashcroft et al., 2008). However, the rank-order of these traits was persistent over time, such that, for example, the fussiest eaters at age 4 tended to be the fussiest eaters at age 11 (Ashcroft et al., 2008). It seems then that over time, children experience typical changes in eating behaviors that increase responsiveness to a high-fat/high-sugar food environment (Larson et al., 2009; Sallis & Glanz, 2009) through increases in factors like food responsiveness, enjoyment of food, and emotional overeating and decreases in responsiveness to satiety and slow eating, and that individual eating behavior patterns tend to be planted early in life (Ashcroft et al., 2008). This might be due to parent feeding behaviors or due to genetic predispositions or an interaction of both, within the home food and social environment (Birch, 1999).

In addition, mothers seem to overestimate the quality of their children's diets. Kourlaba and colleagues (2009) analyzed data on 2287 children 2-5 years of age, including children's HEI

scores and their mother's perceptions of child diet quality. Overall, 18% of children had a poor diet (HEI < 50), 82% had a diet needing improvement (50 ≤ HEI ≤ 80), and 0.2% had a good diet. Of all mothers of children with "poor" or "needs improvement" diets, 83% classified their children's diets as good. Mothers who chose foods based on health were more likely to overestimate their children's diet quality than mothers who chose foods based on child's preferences or other factors (Kourlaba et al., 2009).

2.3. Home Food Environment

2.3.1. Parent and child dietary concordance

Fisk and colleagues (2010) found that mothers' prudent diet scores were highly correlated with 3 year-old child prudent diet scores (r 0.55, p <0.001), with mothers' diet quality accounting for the majority of the variance in the model for child diet quality. Other studies have found correlations between parents and children of various ages for various foods: beverage consumption (2-3 year old) (Hoerr, Lee et al., 2006), diet quality (3-5 year old; 24 month old) (Hoerr, Horodynski et al., 2006; Papas et al., 2009), calcium intake (3-5 year old) (Hoerr et al., 2009), healthy and unhealthy snack intake (9-13 year old) (Brown & Ogden, 2004), and fruit and vegetable consumption (5 year old; 12-36 month old; 4-12 year old; grades 4-6) (Fisher et al., 2002; Horodynski et al., 2010; Reinaerts et al., 2007; Sylvestre et al., 2007). Parent intake was the strongest predictor of child fruit and vegetable intake, with child gender, food neophobia, and child enjoyment of food being other significant predictors of vegetable intake (2-6 year old) (Cooke et al., 2004).

Some studies report weaker associations between parent and child diet, including a recent meta-analysis, which reported that studies of parent-child diet pattern similarity typically report

correlations in the 0.2 to 0.33 range (Wang et al., 2010), with correlations of less than 0.3 generally considered weak, between 0.3 to <0.5 considered moderate, and ≥ 0.5 considered strong. Wang and colleagues suggest that parent-child diets are not as similar as some may believe particularly since diet patterns and habit may be influenced by a number of different factors like peer influence and offerings at school. However, the authors only examined total energy and fat intake, which may not be the best marker of diet pattern similarity. Of note, the authors report that studies with younger children (<10 years of age) tend to have stronger correlations than studies with older children. Unfortunately, the authors did not analyze dietary similarity in smaller units of age than 0-9 years versus 10 years or older. Nonetheless, the finding that parent-child similarities are stronger for younger children is notable since the proposed study will target parents of children 3-5 years of age.

Similarity in dietary intakes between parents and younger children may be due to several factors like feeding behaviors (e.g., modeling, and similarity in taste preferences due to feeding behaviors), genetic transmission of taste preferences, and neighborhood food access. One major factor and certainly a prerequisite for dietary similarity is the home food availability – the presence of foods in the home – and home food accessibility – the ease with which children can obtain foods in the home. Food availability and accessibility are factors largely under the control of parents. The home food environment is a major focus of this dissertation. The home food environment is important because adverse food environments can contribute to childhood obesity (Newby, 2007), and it comprises the context within which feeding behavior occurs.

2.3.2. Food availability.

The relationship between food intakes of parent and child is intuitive, especially for younger children, given that parents control the foods that are brought into the home and foods

that are served during meals. In fact, one survey of nutrition educators suggested that nutrition gatekeepers – caregivers that do the majority of food shopping and cooking – control approximately 72% of the foods that their children consume both in and out of the home (Wansink, 2006). A telephone survey of parents similarly found that, on average, parents perceived that they influence 66% of the food their children consume (Wansink, 2006). Some investigators have recognized the important role that parents play in child diet quality and suggest that parents should be the primary target of interventions to improve child diet quality and weight status (Golan & Crow, 2004a, 2004b; Gross et al., 2010; Haire-Joshu & Nanney, 2002; Nicklas et al., 2001; Reinaerts et al., 2007). Indeed, parents or caregivers will be the focus of the proposed intervention.

Given that younger preschool children (3 years old) have the ability to regulate their food intake in response to hunger and fullness whereas older preschool children (5 years old) may consume more food when presented larger amounts (Rolls et al., 2000), it is important that a child's home environment supports healthy choices. One aspect of the home food environment is availability, the presence of foods in the home. Fruit and vegetable (grades 4-6; grade 3; review of all ages mostly elementary to middle school; grade 4; 4-12 year old; preschool) (Cullen et al., 2003; Hearn et al., 1998; Jago et al., 2007; Kratt et al., 2000; Reinaerts et al., 2007; Spurrier et al., 2008), high-fat food (6-10 years old) (Gable & Lutz, 2000), and sweet and salty snack (preschool) (Spurrier et al., 2008) home availability has been shown to influence child intake in a number of studies. The literature as a whole, however, is unclear as to whether high availability of nutrient-dense food or low availability of energy-dense food has an impact on overall child diet quality. Johnson et al. (2010) found that the mother's intake of both core ("healthy"; e.g. vegetables, all types of cereals) and non-core ("unhealthy"; e.g. biscuits, fats) foods categorized

according to the Australian dietary guidelines was associated with 11 year-old children's intake and that availability was only associated with non-core foods.

2.3.3. Assessment of food availability

As noted by Bryant, (Bryant & Stevens, 2006) availability assessments should be performed shortly after grocery shopping, adjusted for number of days since the last shopping trip and ask about usual food availability. Pantry or cupboard food items can indicate less preferred food or long-term food storage, because these items can last for longer periods of time. Availability is a "gauge of exposure" (Bryant & Stevens, 2006). It is not known if food availability is moderated by anything like feeding behaviors or something else, because high-availability items might only be eaten by a single household member. Therefore, the home food environment can be influenced by the composition of the household, including the ages and number of persons living and dining in the household.

2.3.4. Home food accessibility

Home food accessibility, the existence of foods in a form and place that encourages consumption, is also an important predictor of child intake beyond mere availability. One study of 4^{th} to 6^{th} grade students found that FV availability was significantly related to intake among those with high preferences for FV. Both FV availability and accessibility, on the other hand, were significantly associated with intake among those with low preference for FV (Cullen et al., 2003). This suggests that for children with high preference for FV, availability alone is sufficient for intake, and that for children with low preference, FV must be convenient (e.g. peeled and sliced carrot sticks in the refrigerator) to facilitate intake. No studies have been identified that have examined food accessibility among young children 3-5 years of age.

2.3.5. Successful modification of home food environment

Krukowski et al. (Krukowski et al., 2010) found significant reductions of high-fat foods in the home after a weight loss 6 month intervention, but the environmental changes were not associated with weight changes. Other studies have found positive changes in both the home food environment and participant weight status (Gorin et al., 2007; Gorin et al., 2008). However, these studies focused only on adult intervention participants and did not extend to children living in the household. A few intervention studies have aimed to improve diet quality of children (Fulkerson et al., 2010; Pearson et al., 2010; Sweitzer et al., 2010; Wardle et al., 2003), but many of them have been school-based and/or child-centered with the intent to reach parents indirectly (Baranowski et al., 2000; Evans et al., 2006; Fitzgibbon et al., 2005; Sirikulchayanonta et al., 2010). Few intervention studies have focused on the home food environment of preschool children, especially those in low-income households (Haire-Joshu et al., 2008; Stark et al., 2011; Wyse et al., 2010), and the literature acknowledge that this line of study is still in its formative stage (Hingle et al., 2010; Skouteris et al., 2010).

In spite of the work presented, there are gaps in the literature that have not been addressed or fully investigated, particularly among young children. First, the relationship between availability and accessibility is unclear. Few studies, for example, have investigated whether food availability or food accessibility is more important or if there are particular circumstances under which one is more important than the other or whether dependent on the age of the child. Second, many studies have focused on fruit and vegetable availability and accessibility relative to intake and few have examined the impact of energy-dense food in the home food environment. Third, no identified home environment investigations or interventions

have examined the impact of the home food environment on overall diet quality. Instead studies have tended to focus on intake of specific foods, such as fruit and vegetables.

2.3.6. Food modeling

Child food intake is influenced by the intake of those around them. For instance, preschool children showed increased preference for snacks when receipt of the snack was not contingent on performing a specific behavior and the snack was presented by an attentive teacher (Birch et al., 1980). However, other experimental studies with preschool children and teachers as models have shown only some support for this finding (Hendy, 1999; Hendy & Raudenbush, 2000).

These differences may perhaps be explained by limited exposure that children have to these teacher models, compared to exposure to parents. Indeed, family food preparers have been shown to strongly influence intake of other family members, and the more meals that children shared with food preparers, the stronger the relationship was between child and food preparer fruit and vegetable intake for 5-12 year old children (Hannon et al., 2003). Another study demonstrated that modeling by mothers (e.g. how often she ate something in front of the child that she also wanted the child to eat) was strongly associated with an increase in healthy food intake by the child and a moderate decrease in unhealthy foods (Kroller & Warschburger, 2009). Sutherland et al. (2008) conducted an observational experiment comparing 2-6 year old food choices in a simulated grocery store to parent reports of grocery shopping behavior and found healthfulness of parent and child choices to be significantly associated.

A noteworthy study to specifically examine and improve modeling of food behaviors among African American mothers (Tibbs et al., 2001) reported several interesting findings. First, modeling in general was related to fruit and vegetable intake, but the authors noted that there was

room for improvement in the reported frequency of modeling behaviors. In addition, the authors reported that the relationship between modeling and eating behaviors was stronger than between modeling and intake, suggesting that examining only fruit and vegetables, while parsimonious, does not account for the complexity of dietary patterns and behaviors. Finally, parents were more likely to model some behaviors (e.g. sitting with the child at dinner, eating foods they wanted their child to eat) than others (e.g. eating low-fat snacks), implying for example that parents may question cost or taste and thus not have those items available.

2.3.7. Relationship between socioeconomic status, dietary patterns, and home food environment

One comprehensive review indicates that children in low socioeconomic families eat less fruits and vegetables, have parents who eat less fruit and vegetables, and live in homes with lower fruit and vegetable availability (Rosenkranz & Dzewaltowski, 2008). Energy dense diets in young children were associated with low household income and participation in the Federal Food Stamp Program (Mendoza et al., 2006). These results are not surprising, given that healthy foods have been found to be more expensive than energy dense foods (Drewnowski & Specter, 2004). Indeed, data from the 2009 Michigan Behavioral Risk Factor Survey for adults indicates that educational level and household income have an inverse relationship with consuming fewer than five servings of fruit and vegetables per day. That is, 80.9% of Michiganders with less than a high school education and 80.3% with a household income <$20,000 have inadequate fruit and vegetable intake compare to 70.7% of college graduates and 73.0% of those with a household education of ≥$75,000 (Fussman, 2010). Other studies have found that cost is second only to taste in influencing food choices (Glanz et al., 1998) and that food cost is a barrier to maintaining a healthy home environment (Ard et al., 2007). In addition, low-income neighborhoods tend to

have a higher concentration of fast-food restaurants and low concentration of grocery stores and other outlets that offer fresh fruits and vegetables (Larson et al., 2009; Sallis & Glanz, 2009).

2.4. Theoretical orientation

2.4.1. Enhanced efficacy of theory-based interventions

Literature reviews suggest that theory-based interventions are more efficacious than those not informed by explicit theoretical frameworks (Baranowski et al., 2003; Baranowski et al., 1999). One theoretical orientation that is often employed in behavior change research is Social Cognitive Theory (Bandura, 1986). Social Cognitive Theory is a learning theory that indicates that humans learn their behavior by watching others (i.e. models) as a function of their social environment and cognitive structures. Bandura called this concept of behavior, cognitive factors, and the environment all interacting to influence each other reciprocal determinism. Baranowski is a prominent nutrition education researcher who has recognized the complementary fit between SCT and dietary patterns in family environments (Baranowski, 1997) and several researchers have subsequently applied SCT in a number of nutrition research studies (Cullen et al., 2003; Dave et al., 2010; Gross et al., 2010; Reynolds et al., 1999; Young et al., 2004).

2.4.2. Social Cognitive Theory

In addition to examining and attempting to influence the home food environment, food modeling, and dietary behavior, the current research measured and improved upon personal cognitive constructs from SCT: outcome expectancies, self-efficacy, and skills (Bandura, 1986). Outcome expectancies are positive or negative outcomes that a person expects to occur as a result of a behavior (e.g. reducing risk of chronic disease as a result of a healthy diet). Self-efficacy is the confidence one has in his or her ability to carry out a behavior, even in the face of difficulties (e.g. confidence that one can purchase healthy foods even when low on cash).

Outcome expectancies and self-efficacy are sometimes confounded in research, but the two are not interchangeable and work in concert. In other words, one may have a positive outcome expectancy about a behavior, but unless he or she has the confidence to perform the behavior, it is less likely to occur. Finally, SCT addresses skill building and knowledge gain relevant to the behavior to enhance one's capability for carrying out the behavior.

2.4.3. Heuristic-Systematic Model of Persuasion.

The HSM posits that people judge information and messages using a combination of two forms of processing, heuristic and systematic (Chaiken, 1980; Chaiken et al., 1989; Eagly & Chaiken, 1993). *Systematic* processing is effortful, analytic assessment of information. *Heuristic* processing is economical and requires much less cognitive effort. The predominant type of processing varies according to motivation (e.g. messages that are personally relevant to the recipient will induce more systematic processing) and ability (e.g. more available time will allow for more systematic processing). This model posits that people try to conserve resources as much as possible. As a result, processors will rely on heuristic processing as a short cut to make a decision about the information, but supplement the heuristic cues with systematic processing when not confident about the decision reached through heuristic processing. Heuristic cues that lessen cognitive effort to assist in decision-making, and those to be examined in this research project, include perceived similarity (messages from a similar source are perceived to be more valid), source credibility (a message from a source perceived to be more expert or more knowledgeable is more valid), and perceived message quality (higher quality messages are perceived to be more valid). With respect to the current project, I examined how similar parents perceived themselves to be to parents featured in video clips, how credible parents perceived the

source of both the written materials and videos, and the perceived quality of print and video materials.

CHAPTER 3

METHODS

3.1. Preliminary study procedures

This methods chapter describes research activities supported by National Institutes of Health grant 1R21HD064876-01A1, funded September 7, 2010 through August 31, 2011. This grant supported my major professor's project (hereafter referred to as "grant project") as well as my dissertation research (hereafter referred to as "dissertation"). It is necessary to describe activities of both closely related projects as well as to distinguish between the two projects to highlight my original contribution. Note that I was project manager for the entire grant period and was heavily involved with all grant activities, including those not essential to achieve my dissertation aims.

The objective of the original grant project was to develop a parent-centered feeding intervention and to conduct a pilot test of the intervention. My dissertation elaborated upon the grant project pilot test by applying two theoretical models and evaluating participants' home food environments and adult and child diet quality. There are two important considerations of the remaining discussion of methodology. First, although my dissertation aims did not address intervention development, I will describe the intervention materials and their development in order to provide context for my dissertation. Second, the study sample for the grant project pilot study is the same as for my dissertation, but my dissertation's elaboration on the original grant project required substantial revision of two original instruments and the addition of 13 new instruments.

During the first phase of the grant period, September 2010 through April 2011, a research team consisting of my major professor, a behavioral psychologist, a school psychologist, a

biostatistician, a video production team, two exceptional dietetic undergraduates, and I developed and cognitively tested written intervention materials and recorded, edited, and tested video intervention materials. The second phase, May 2011 through August 2011, was the pilot test. The study time table and summary of study activities are shown in (**Figure 3-1**).

Again, intervention development was part of the grant project and not incorporated in my dissertation aims. The intervention content drew on previous work in Dr. Hoerr's Behavioral Nutrition Laboratory that examined the relationship between seven parent feeding constructs and child diet and weight status. Hoerr's previous work found that the home food environment and parent modeling behaviors were significantly related to child diet quality (Murashima et al., 2011; Murashima et al., 2012). Therefore, the intervention developed for the grant project was intended to be a self-guided parent workbook and video package designed to improve child diet and weight status partly by reinforcing positive food modeling behaviors and by offering practical ways to evaluate and improve the parents' home food environments. The workbook and video format was patterned after an intervention package called The Incredible Years, which is also a workbook- and video-based intervention for parents, but focused on child behavior problems (Webster-Stratton, 1992; Webster-Stratton et al., 1988; Webster-Stratton & Reid, 2003).

The final intervention package was a 100-page manual divided into 5 major topical chapters, (1) food environment, (2) food modeling, (3) praise & encouragement, (4) making mealtime fun, and (5) how to handle difficult behaviors at the table. Chapters were further subdivided into a total of 23 subsections (3-6 per chapter; hereafter referred to as "lessons"), and a companion DVD of 23 short (2-3 minute) clips matched to each lesson (see **Appendix 1** for abbreviated intervention manual; entire manual and DVD clips can be accessed at

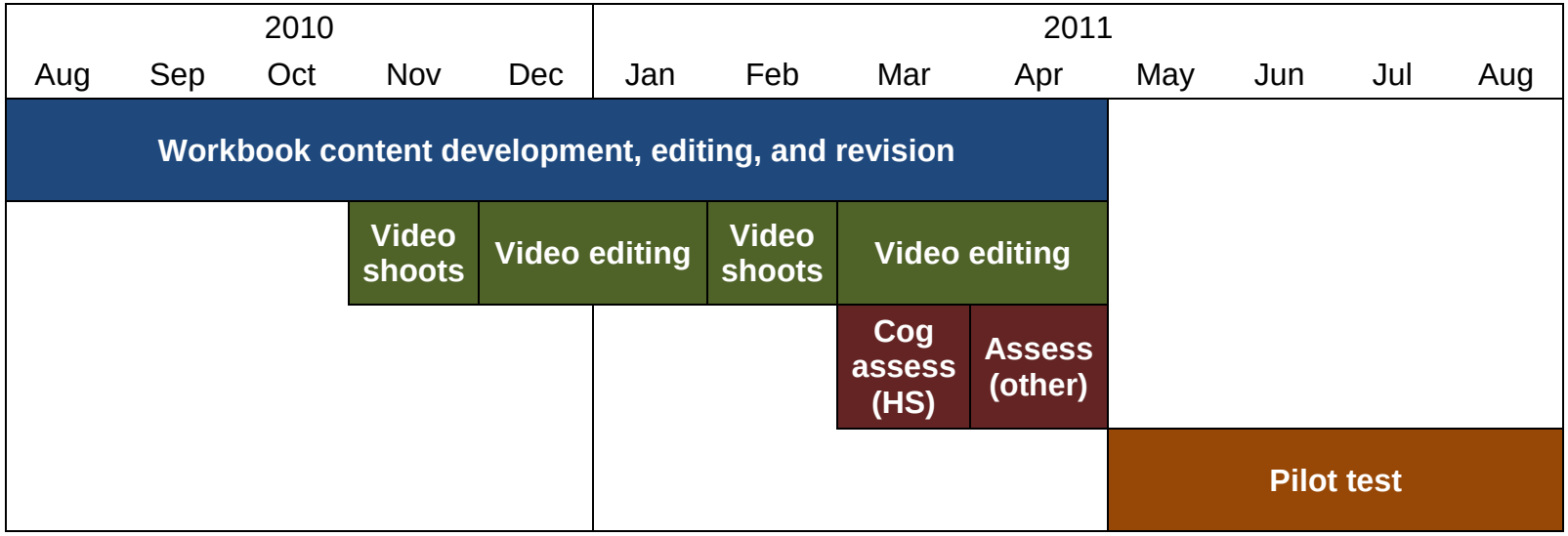

Figure 3-1. Study activities and timeline. Cog assess (HS) = Cognitive assessments with Head Start parents, Assess (other) = Assessments with non-Head Start parents and content experts. For interpretation of the color in this and all other figures, the reader is referred to the electronic version of this dissertation.

http://amolpavangadkar.com/eat_healthy/videos.php?c=1). Each of the lessons was structured with a brief introduction, followed by a prompt to watch the corresponding DVD segment, questions about the DVD clip for the participant's response, and an activity. In addition, many lessons featured tips, key points, things to think about, and ideas or suggestions. DVD clips were interview segment compilations featuring 14 sets of Head Start parents. Parents described their experiences with each of the topics highlighted in the intervention. Researchers recruited video interviewees according to race/ethnicity (2 white families, 4 black families, 4 families with a white parent and a black parent, and 4 families of other single or combination race/ethnicities) so that a variety of perspectives representative of Head Start families could be captured.

Researchers performed face validity and cognitive assessments of the material with 11 Head Start parents that did not participate in the video sessions. Head Start evaluators helped with content validity by completing 1-2 manual chapters and watching the accompanying DVD clips. They then completed the Instructional Materials Motivation Survey (IMMS; Keller, 1987a, 1987b). Researchers also interviewed the Head Start participants using IMMS concepts (see **Appendix 2 and Appendix 3** for IMMS surveys and interview scripts), and modified the materials to accommodate feedback. After modification, the researchers gave the materials to parents not enrolled in the Head Start program and to content experts. These evaluators provided open-ended feedback and suggestions for changes.

3.2. Pilot study design

The pilot study was a 14 week randomized controlled trial, with an 8-week study phase and a follow-up visit at week 14. Researchers collected data for this dissertation and the grant project during the pilot study, with the primary points of data collection occurring at baseline

(week 0; pre-study), week 8 (post-study), and week 14 (follow-up visit), as described below. Grant project data collected during week 14 were not used for this dissertation.

3.3. Pilot test sample and recruitment

Researchers recruited 42 parents of 3-5 year old children enrolled in the Capital Area Head Start (CACS) program. Head Start is a national preschool program for children from 3 to 5 years of age. In order to be eligible for Head Start, gross household income must be at or below 100% of the federal poverty level (http://cacsheadstart.org/LinkClick.aspx?fileticket=CjidWzMKNh8%3d&tabid=1172), although 10% of each class may consist of special needs children that are exempt from income restrictions. The CACS program for this study services four Michigan counties: Ingham, Eaton, Clinton, and Shiawassee. The demographic characteristics of the CACS enrollees are shown in **Table 3-1**, along with the characteristics of children in the pilot sample and in the entire US Head Start program.

Table 3-1. Demographic characteristics of Head Start children in the pilot sample, the CACS 2010-11 class, and the US in Fiscal Year 2009.*

	Pilot Sample (n=41)	CACS Enrollees (2010-11 School Year, n=1,620)	US Enrollees (FY 2009, n=904,153)
Child race			
White	43.9%	58.0%	39.9%
Black	29.3%	26.0%	30.0%
Bi-Racial	17.1%	13.4%	7.8%
Other	9.8%	2.6%	23.0%
Child ethnicity			
Hispanic	14.6%	17.0%	35.9%
Child BMI percentile			
≥85th percentile	31.7%	42.0%	N/A
≥95th percentile	17.1%	21.0%	N/A

*Data for CACS enrollees were obtained via personal correspondence with CACS HS administrative staff. Data for US Enrollees were obtained from http://eclkc.ohs.acf.hhs.gov/hslc/mr/factsheets/fHeadStartProgr.htm.

Parents were invited to participate via verbal announcements at Head Start family fun nights, fliers posted in Head Start schools and sent home with children (see **Appendix 4**), and personal invitation by study personnel stationed near Head Start classrooms during child pick-up and drop-off times. To qualify for the study, parents had to be 18 years old or older, reachable by phone, and able to speak and read English. The target child could not have special needs other than speech, language, and/or orthopedic issues, because special needs children often have different food and mealtime needs compared to children without special needs (Allen, 2011; Andrew et al., 2012; Hammons & Fiese, 2010; Provost et al., 2010).

3.4. Pilot test procedures

Researchers obtained human subjects research approval of all study procedures, instruments, and consent forms from the Michigan State University Institutional Review Board before beginning the study. The PI and study coordinator trained five research assistants to

conduct all research procedures (see **Appendix 5** for abbreviated study protocol). Two research staff conducted the first study visit at each participant's home. First, the research aide obtained informed consent from each participant. Next, one research aide assisted the participants with the paper surveys that took approximately 30-45 minutes to complete, while the other aide conducted the home food inventory. Aides also measured height and weight of both the children and caregivers to fulfill requirements by the grant funding agency, although those data were not used for this dissertation. Participants randomly drew numbers out of an opaque bag to determine study group placement (even numbered draws were assigned to the intervention group and odd numbered draws were assigned to the control group). Those randomized into the intervention group were provided the first chapter of the intervention manual and a copy of the intervention DVD.

Researchers contacted intervention participants weekly for 8 weeks to promote adherence to the study schedule and answer any questions or concerns participants may have had. For weeks 1, 3, 5, and 7, participants were contacted by phone and asked six questions about what stood out in the assigned workbook section, if anything impeded progress with the workbook, and how long that week's workbook/DVD session took to complete (see **Appendix 6** for full script). Research staff also conducted interim study home visits for intervention participants at weeks 2, 4, and 6 to administer the same script in person and provide workbook materials for the subsequent two weeks until the next home visit. At these interim home visits, researchers examined participant workbooks and completed forms to capture participant compliance and comprehension (see **Appendix 7** for abstraction form). Researchers did not contact control participants during the eight week study period with the exception of a letter at week 4-5 to remind control participants of their involvement in the study and to let them know that

researchers would be contacting them soon to schedule an end-of-study visit (see **Appendix 8** for control group mid-study letter).

Research staff visited both intervention and control participants for end-of-study visits at week 8 and week 14. These home visits were similar to baseline visits in that participants completed the full set of study surveys and researchers collected anthropometric measures and a home food inventory. At week 8, intervention participants completed two program evaluation surveys that were modeled after those used for the Incredible Years (see **Appendix 9 and Appendix 10** for evaluations and evaluation data). Participants received $40 at week 8 and $60 at week 14.

3.5. Pilot study measurement and variables

All measures collected for my dissertation are summarized in

Table 3-2 (see **Appendix 11** for full instruments), and are differentiated from measures collected for the original grant project in **Table 3-3**. Subsequent discussion will focus on dissertation measures only. All instruments except for the knowledge test (described below) were adapted from literature. Each of the instruments corresponds to one of the constructs included in the dissertation concept model (**Figure 3-2**).

Instruments using Likert or semantic differential response options were evaluated for internal consistency using Cronbach's coefficient alphas (Cronbach, 1951). Alphas range between 0 and 1, with a higher alpha indicating a more reliable instrument. Items were individually removed from the scale to determine if the reliability of the scale increased, and if so, those items were omitted from the scale. The researcher used this procedure to obtain the maximum scale reliability, indicating that remaining items were those most highly correlated

items in the scale (Yu, 2001). All single time-point alphas (week 8 or week 0) for scales that were used for final analysis were at or above 0.80 (**Table 3-4**). Researchers have suggested that alphas of 0.7 or above are acceptable and lower alphas unacceptable (Nunnally & Bernstein, 1994).

Table 3-2. Summary of measures collected for dissertation listed by construct, instrument, item format, and time of measure.

	Measure/ Construct	**Instrument**	**Number of Items**	**Item Format**	**Week 0**	**Week 8**	**Week 14**
1	Motivation	Cho & Boster Outcome Relevant Scale	8	Likert	X		
2	Ability	Education	1	Multiple Choice	X		
3	Systematic Processing	Knowledge Test	12	Multiple Choice		X	X
4	Heuristic Processing	Perceived Similarity Source Credibility Perceived Message Quality	6 8 5	Likert Semantic Diff Likert		X	X
5	Attitude	Attitude Scales	4 sets of 6	Semantic Diff	X	X	X
6	Social Cognitive Theory (SCT) Constructs	Hildebrand & Betts Outcome Expectancy and Self-Efficacy scales Parent Feeding Questionnaire*	5 (SE) 6 (OE) 6	Likert Likert Likert	X	X	X
7	Home Food Environment	Home Food Inventory (completed by research aides)	195	Yes/No Multiple Choice	X	X	X
8	Parent Food Intake	Block Brief 2000	70	Scaled Frequency and Quantity	X	X	X
9	Child Food Intake	Block Kids Food Screener 2007*	39	Scaled Frequency and Quantity	X	X	X
10	Demographic Information	Demographic Questionnaire*	10	Multiple Choice and Open-Ended Short Answer	X	X	X

*Data from these instruments were also collected for the grant project, to answer different research questions, see Table 2. Note that a subset of Parent Feeding Questionnaire items were used for the dissertation and all items of the Parent Feeding Questionnaire were used for the grant project.

Table 3-3. Summary of additional measures collected for grant project listed by construct, instrument, item format, and time of measure.

	Measure/ Construct	**Instrument**	**Number of Items**	**Item Format**	**Week 0**	**Week 8**	**Week 14**
1	Parent Feeding Behaviors	Parent Feeding Questionnaire*	31	Likert	X	X	X
2	Child Food Intake	Block Kids Food Screener 2007*	39	Scaled Frequency and Quantity	X	X	X
3	Child Height & Weight	N/A	N/A	N/A	X	X	X
4	Adult Height & Weight	N/A	N/A	N/A	X	X	X
5	Demographic Information	Demographic Questionnaire*	10	Multiple Choice and Open-Ended Short Answer	X	X	X

*Data from these instruments were also collected for the dissertation, to answer different research questions, see Table 2; note that a subset of Parent Feeding Questionnaire items were used for the dissertation and all items of the Parent Feeding Questionnaire were used for the grant project

Table 3-4. Scales administered for dissertation Likert scale and semantic differential response options, number of items retained from original scale and Cronbach's alpha reliability of final scales.

	# Items retained/ #original items	Final Cronbach's alpha, week 8	Final Cronbach's alpha, week 8-0 change scale
Motivation: Cho & Boster Outcome Relevant Scale*	5/8	0.81	N/A
Heuristic: Perceived Similarity	6/6	0.92	N/A
Heuristic: Source Credibility	4/8	0.98	N/A
Heuristic: Perceived Message Quality	5/5	0.80	N/A
Attitude: Parent eating healthfully	3/6	0.96	0.87
Attitude: Solid fats & added sugar	5/6	0.95	0.91
Attitude: Home food availability	4/6	0.88	0.94
Attitude: Child eating healthfully	3/6	0.90	0.71

Table 3-4 (cont'd)

	# Items retained/ #original items	Final Cronbach's alpha, week 8	Final Cronbach's alpha, week 8-0 change scale
SCT: Self efficacy	5/5	0.93	0.46
SCT: Outcome expectancy inhibitors	0/3	0.49	0.49
SCT: Outcome expectancy promoters	3/3	0.83	0.86
SCT: Fruit & vegetable encouragement skills	2/2	0.80	0.22
SCT[1]: Sugar sweetened beverage discouragement skills	2/2	0.82	0.75
SCT: Sweet & salty snack discouragement skills	0/2	0.62	0.06

[1]SCT=Social Cognitive Theory construct.
*Scale only administered at week 0, so alpha shown is week 0 alpha. N/A = not applicable for instruments that were only administered at a single time point and thus lack change scales.

3.5.1. Outcome-relevant motivation.

The researcher used a modified version of Cho and Boster's (2005) outcome-relevant involvement scale to measure parents' motivation to eat healthfully. The original scale includes eight items with a 7-point Likert response option (1=strongly disagree, 7=strongly agree). **Table 3-5** shows the mean, standard deviation, and correlation matrix for individual items in the involvement scale. Standardized alpha reliability of the scale with all items was 0.75. Items 1, 2, and 3 were omitted from the final scale, which improved the alpha reliability to 0.81.

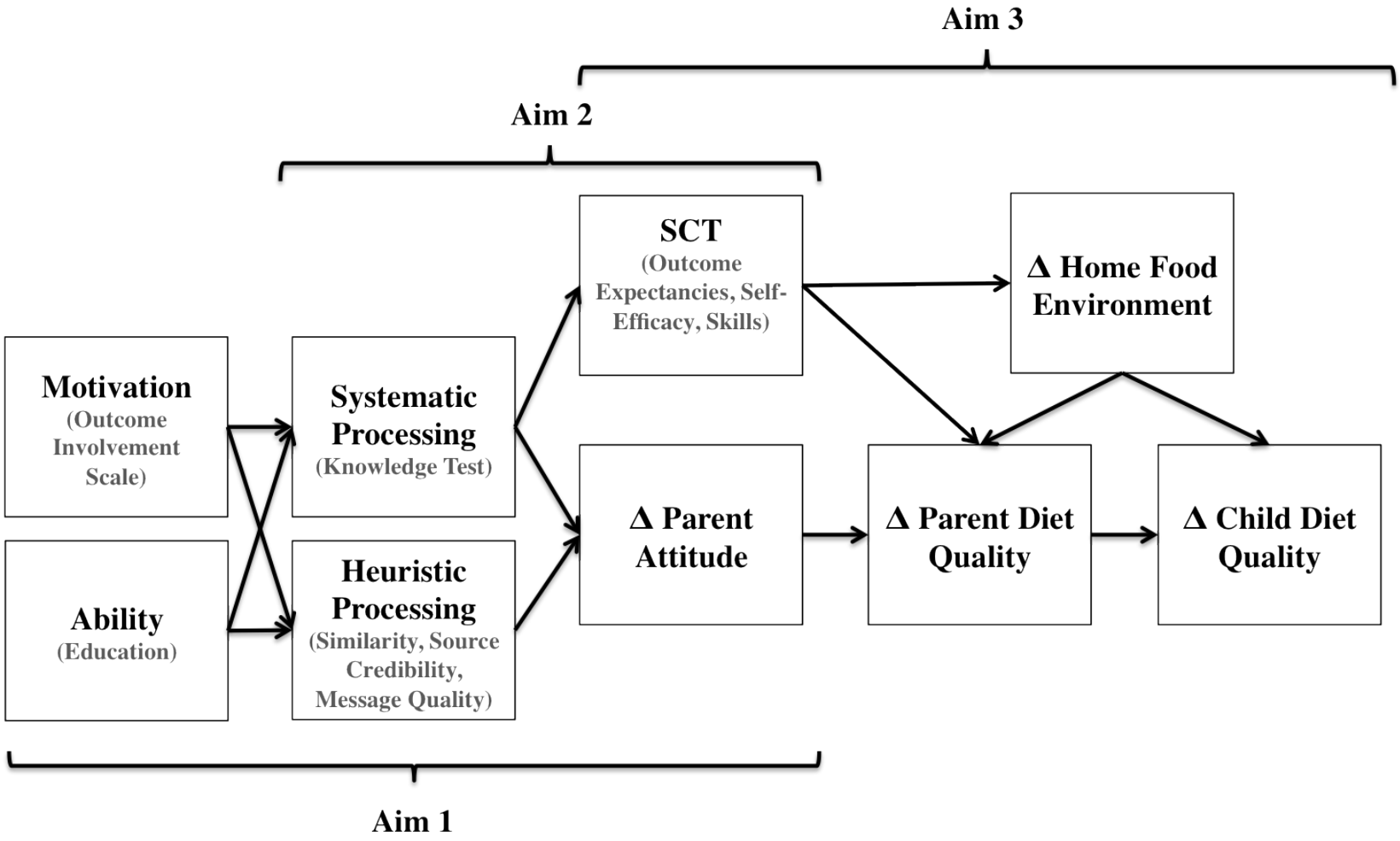

Figure 3-2. Study concept model for dissertation. SCT = Social Cognitive Theory.

Table 3-5. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the outcome-relevant motivation scale at week 0 for both intervention and control participants (n=41).

Item		Mean	SD	1	2	3	4	5	6	7
1. The amount of healthy food that I eat has little impact on my life.	R	5.12	2.40	--	--	--	--	--	--	--
2. My life would be changed if I ate more healthy food.		6.12	1.54	-0.12	--	--	--	--	--	--
3. My quality of life would not change depending on the amount of healthy food I eat.	R	5.85	1.56	-0.03	0.44***	--	--	--	--	--
4. It is easy for me to think of ways that my intake of healthy food influences my well-being.†		5.54	1.43	0.13	-0.02	0.02	--	--	--	--
5. Consuming the recommended amount of healthy food affects my daily life.†		5.41	1.60	0.02	0.08	0.21	0.42***	--	--	--
6. It is difficult for me to think of ways the amount of healthy food impacts my life.†	R	5.63	1.53	0.33**	0.00	0.08	0.57***	0.66***	--	--
7. My well-being has little to do with the amount of healthy food I eat.†	R	6.12	1.27	0.29*	0.40***	0.49***	0.20	0.38*	0.47***	--
8. All in all, the effects of eating healthy food on my life would be little.†	R	6.15	1.35	0.23	0.06	0.35**	0.27*	0.53***	0.46***	0.58***

*p<0.1, **p<.05, ***p<.01; R=reverse-coded; †Item retained in final scale. Likert response options ranged from 1=strongly disagree to 7=strongly agree. Reverse scored (R) and non-reverse items were coded such that higher scores reflect positive evaluations of healthy food.

3.5.2. Systematic Processing/Topical Knowledge.

A 12-item multiple choice knowledge questionnaire was developed de-novo. Each of the items were directly adapted from workbook content and lesson objectives in order to ascertain how well participants understood concepts related to home food environment, portion size, and parent modeling. The knowledge test evaluated topical knowledge for all participants, whereby participants with a higher number of correct responses demonstrated more knowledge of the concepts. In addition, a higher number of correct items on the knowledge tests also indicated a higher amount of systematic processing among intervention participants. **Table 3-6** shows the response profile to individual items. The knowledge measure used for subsequent analysis included the total number of correct responses.

Table 3-6. Knowledge test individual items, number and percent of intervention and control participants answering each item correctly at week 8 (n=35)

Item		n	Percent
1.	What is the **best** description of what a healthy food is?	20	57%
2.	What is the **best** choice for a sweet snack?	24	69%
3.	What is an appropriate serving size of a food for a preschooler?	23	66%
4.	Which of the following is the **best** way to keep healthy food visible and accessible?	34	97%
5.	What are the recommendations for beverages for preschoolers?	33	94%
6.	Which is the **best** description of snacking by preschoolers?	32	91%
7.	Which of the following is the **best** description of preschoolers tasting new foods?	22	63%
8.	When your preschooler is about to try a new food that he or she has never tried, which of the following is the best way to handle the situation?	29	83%
9.	Should the TV be ON or OFF during mealtimes and why?	29	83%
10.	Should two adults in the household discuss food disagreement IN FRONT of preschool children or IN PRIVATE and why?	35	100%
11.	What is the **best** example of modeling healthy eating using words?	34	97%

Table 3-6 (cont'd)

12.	Does eating healthy in front of your preschool child (modeling) make a difference and why or why not?	35	100%

3.5.3. Heuristic Processing.

Three forms of heuristic processing were measured among intervention participants: perceived similarity, perceived message quality, and perceived source credibility. The perceived similarity scale was originally developed by Lakey et al. (1996) and subsequently modified by Paukert et al. (2008). Participants used 9-point Likert response options (1=very dissimilar, 9=very similar) to evaluate six characteristics in response to the statement "How similar or dissimilar are the people in the DVD clips to you in the following ways?" All items were retained, with a standardized scale reliability of 0.92.

Perceived message quality was assessed using a five-item scale. Respondents used 7-point Likert items (1=strongly disagree, 7=strongly agree) to appraise the guidebook (Smith et al., In press; Smith et al., 2004). All items were retained (α=0.80).

Participants evaluated source credibility by responding to the statement "I feel the authors of the parent guidebook are…" using eight sets of bipolar adjectives anchored at opposite ends of a 7-point scale, 8-item scale (McCroskey & Teven, 1999; Smith et al., In press). The final scale included item sets 2, 5, 6, and 7 and had a reliability of 0.98.

Means, standard deviations, and the correlation matrix for each of the heuristic scale items are shown in **Table 3-7, Table 3-8,** and **Table 3-9**.

Table 3-7. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the perceived similarity scale among intervention participants at week 8 (n=16).

Item	Mean	SD	1	2	3	4	5
1. Values	6.38	1.59	--	--	--	--	--
2. Personality	6.13	1.45	0.79***	--	--	--	--
3. Hobbies & interests	5.75	1.39	0.74***	0.77***	--	--	--
4. Overall	6.38	1.75	0.81***	0.87***	0.81***	--	--
5. Ethnic background	5.38	2.50	0.25	0.55**	0.51**	0.41*	--
6. Cultural background	5.13	2.55	0.35	0.68***	0.63***	0.54**	0.96***

*p<0.1, **p<.05, ***p<.01. All items retained. Likert response options ranged from 1=very dissimilar to 9=very similar. Higher scores indicate higher perceived similarity.

Table 3-8. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the perceived message quality scale among intervention participants at week 8 (n=16).

Item	Mean	SD	1	2	3	4
1. I felt the materials in the guidebook were appropriate.	6.56	0.63	--	--	--	--
2. I felt the materials in the guidebook were effective.	6.50	0.63	0.42*	--	--	--
3. I felt the materials in the guidebook were informative.	6.63	0.62	0.24	0.85***	--	--
4. I felt the materials in the guidebook were credible.	6.63	0.62	0.41*	0.34	0.30	--
5. I felt the materials in the guidebook were effective.	6.56	0.63	0.49**	0.42*	0.24	0.75***

*p<0.1, **p<.05, ***p<.01. All items retained. Likert response options ranged from 1=strongly disagree to 7=strongly agree. Higher scores indicate higher perceived message quality.

Table 3-9. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the perceived source credibility scale among intervention participants at week 8 (n=16).

Item anchors		Mean	SD	1	2	3	4	5	6	7
1. Inexpert/expert		6.13	0.81	--	--	--	--	--	--	--
2. Unethical/ethical†		6.06	1.61	0.35	--	--	--	--	--	--
3. Honest/dishonest	R	5.56	2.19	-0.23	-0.24	--	--	--	--	--
4. Trained/Untrained	R	6.31	1.49	-0.15	-0.09	0.51**	--	--	--	--
5. Uninformed/informed†		6.19	1.47	0.26	0.92***	-0.16	-0.15	--	--	--
6. Unprincipled/principled†		6.19	1.47	0.20	0.92***	-0.14	-0.15	0.97***	--	--
7. Incompetent/competent†		6.38	1.50	0.07	0.90***	-0.21	-0.12	0.96***	0.96***	--
8. Trustworthy/Untrustworthy	R	6.25	1.61	-0.18	-0.08	0.52**	0.91***	-0.11	-0.11	-0.07

*p<0.1, **p<.05, ***p<.01; R=reverse-coded; †Items retained in final scale. Items were semantic differential items anchored by the adjectives shown on a scale of 1 to 7. Reverse scored (R) and non-reverse items were coded such that higher scores reflect more positive ratings of source credibility.

3.5.4. Attitudes.

Researchers assessed parent attitudes toward healthfulness of their own dietary habits, their children's dietary habits, and their home food environment. Parents responded to four question stems (1) "For me, eating healthy food is…," (2) "For me, eating foods high in solid fats and added sugars is…," (3) "Having healthy food available in the home is…," and (4) "My child eating healthy food is…" using semantic-differential scales. The scales each contained six identical sets of bipolar adjectives anchored on opposite ends of 7-point response options. The final scales include (1) parent eating healthy: item sets 1, 2, and 3 (α=0.96 at week 8 and α=0.87 for change scores) (2) solid fats and added sugars: item sets 1, 2, 3, 4, and 6 (α=0.95 at week 8 and α=0.91 for change scores) (3) healthy food available: item sets 1, 2, 3, and 4 (α=0.88 at week 8 and α=0.94 for change scores) (4) child eating healthy: item sets 1, 2, and 3 (α=0.90 at week 8 and α=0.71 for change scores). **Table 3-10** through **Table 3-13** display attitude means, standard deviations, and correlations for the intervention and control participants at week 0 and week 8 and change between weeks 0 and 8.

Table 3-10. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the parent attitude toward healthfulness of own diet, intervention and control participants at week 0, week 8, and change between weeks 0 and 8.

Week 0 (n=38)								
Item anchors		Mean	SD	1	2	3	4	5
1. Good/bad	R	6.63	0.82	--	--	--	--	--
2. Positive/negative	R	6.76	0.59	0.71***	--	--	--	--
3. Beneficial/harmful	R	6.79	0.47	0.56***	0.69***	--	--	--
4. Valuable/worthless	R	6.47	0.80	0.40***	0.30*	0.41***	--	--
5. Calming/distressing	R	5.58	1.37	0.32**	0.24	0.19	0.14	--
6. Acceptable/unacceptable	R	6.39	1.05	0.71***	0.50***	0.50***	0.38**	0.46***
Week 8 (n=35)								
Item anchors		Mean	SD	1	2	3	4	5
1. Good/bad†	R	6.69	0.80	--	--	--	--	--
2. Positive/negative†	R	6.66	0.76	0.93***	--	--	--	--
3. Beneficial/harmful†	R	6.77	0.49	0.87***	0.88***	--	--	--
4. Valuable/worthless	R	6.71	0.62	0.88***	0.84***	0.84***	--	--
5. Calming/distressing	R	6.00	1.28	0.60***	0.51***	0.51***	0.63***	--
6. Acceptable/unacceptable	R	6.69	0.68	0.90***	0.87***	0.75***	0.83***	0.58***
Week 8-0 (n=32)								
Item anchors		Mean	SD	1	2	3	4	5
1. Good/bad†	R	0.06	0.72	--	--	--	--	--
2. Positive/negative†	R	-0.09	0.59	0.70***	--	--	--	--
3. Beneficial/harmful†	R	0.00	0.51	0.53***	0.86***	--	--	--
4. Valuable/worthless	R	0.28	0.92	0.56***	0.29	0.21	--	--
5. Calming/distressing	R	0.53	1.57	0.31*	0.09	0.04	0.25	--
6. Acceptable/unacceptable	R	0.34	0.94	0.50***	0.12	0.20	0.26	0.33*

*p<0.1, **p<.05, ***p<.01; R=reverse-scored; †Items retained in final scale. Items were semantic differential items anchored by the adjectives shown on a scale of 1 to 7. Items were reverse coded so that higher scores reflect more positive attitudes about parents eating healthfully.

Table 3-11. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the parent attitude toward eating solid fats and added sugars, intervention and control participants at week 0, week 8, and change between weeks 0 and 8.

Week 0 (n=40)							
Item anchors	Mean	SD	1	2	3	4	5
1. Good/bad	5.25	1.85	--	--	--	--	--
2. Positive/negative	5.15	1.86	0.86***	--	--	--	--
3. Beneficial/harmful	5.68	1.72	0.75***	0.83***	--	--	--
4. Valuable/worthless	5.38	1.61	0.72***	0.67***	0.80***	--	--
5. Calming/distressing	4.20	1.77	0.31**	0.25	0.38***	0.36**	--
6. Acceptable/unacceptable	4.45	1.71	0.54***	0.57***	0.53***	0.51***	0.29*
Week 8 (n=35)							
Item anchors	Mean	SD	1	2	3	4	5
1. Good/bad†	4.09	1.80	--	--	--	--	--
2. Positive/negative†	4.23	1.73	0.89***	--	--	--	--
3. Beneficial/harmful†	4.60	1.79	0.84***	0.85***	--	--	--
4. Valuable/worthless†	4.26	1.92	0.78***	0.86***	0.86***	--	--
5. Calming/distressing	3.26	1.75	0.36**	0.46***	0.46***	0.57***	--
6. Acceptable/unacceptable†	3.46	1.70	0.69***	0.71***	0.68***	0.82***	0.63***
Week 8-0 (n=34)							
Item anchors	Mean	SD	1	2	3	4	5
1. Good/bad†	-1.12	2.10	--	--	--	--	--
2. Positive/negative†	-0.82	2.05	0.84***	--	--	--	--
3. Beneficial/harmful†	-1.03	2.25	0.69***	0.75***	--	--	--
4. Valuable/worthless†	-1.06	1.95	0.57***	0.61***	0.73***	--	--
5. Calming/distressing	-0.88	2.18	0.23	0.23	0.43***	0.47***	--
6. Acceptable/unacceptable†	-1.00	1.86	0.49***	0.59***	0.70***	0.62***	0.28*

*p<0.1, **p<.05, ***p<.01. †Items retained in final scale. Items were semantic differential items anchored by the adjectives shown on a scale of 1 to 7. Higher scores reflect more negative attitudes toward eating solid fats and added sugars.

Table 3-12. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the parent attitude toward healthfulness of foods available in the home, intervention and control participants at week 0, week 8, and change between weeks 0 and 8.

Week 0 (n=39)								
Item anchors		Mean	SD	1	2	3	4	5
1. Good/bad	R	6.72	0.79	--	--	--	--	--
2. Positive/negative	R	6.67	0.84	0.88***	--	--	--	--
3. Beneficial/harmful	R	6.77	0.54	0.77***	0.88***	--	--	--
4. Valuable/worthless	R	6.67	0.70	0.82***	0.88***	0.84***	--	--
5. Calming/distressing	R	6.26	1.04	0.31**	0.37**	0.34**	0.26*	--
6. Acceptable/unacceptable	R	6.74	0.59	0.85***	0.83***	0.80***	0.86***	0.41***
Week 8 (n=32)								
Item anchors		Mean	SD	1	2	3	4	5
1. Good/bad†	R	6.91	0.30	--	--	--	--	--
2. Positive/negative†	R	6.94	0.25	0.80***	--	--	--	--
3. Beneficial/harmful†	R	6.94	0.25	0.80***	0.47***	--	--	--
4. Valuable/worthless†	R	6.91	0.30	0.63***	0.36**	0.80***	--	--
5. Calming/distressing	R	6.34	1.12	0.49***	0.31*	0.31*	0.49***	--
6. Acceptable/unacceptable	R	6.81	0.59	0.82***	0.36**	0.80***	0.82***	0.58***
Week 8-0 (n=30)								
Item anchors		Mean	SD	1	2	3	4	5
1. Good/bad†	R	0.10	0.61	--	--	--	--	--
2. Positive/negative†	R	0.13	0.68	0.97***	--	--	--	--
3. Beneficial/harmful†	R	0.10	0.31	0.69***	0.76***	--	--	--
4. Valuable/worthless†	R	0.20	0.66	0.80***	0.78***	0.75***	--	--
5. Calming/distressing	R	0.07	1.34	-0.18	-0.20	-0.27	-0.25	--
6. Acceptable/unacceptable	R	0.03	0.56	0.60***	0.44***	0.18	0.63***	0.09

*p<0.1, **p<.05, ***p<.01; R=reverse-scored; †Items retained in final scale. Items were semantic differential items anchored by the adjectives shown on a scale of 1 to 7. Items were reverse coded so that higher scores reflect more positive attitudes about having healthy foods in the home.

Table 3-13. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the parent attitude toward healthfulness of child's diet, intervention and control participants at week 0, week 8, and change between weeks 0 and 8.

Week 0 (n=40)								
Item anchors		Mean	SD	1	2	3	4	5
1. Good/bad	R	6.83	0.55	--	--	--	--	--
2. Positive/negative	R	6.80	0.61	0.97***	--	--	--	--
3. Beneficial/harmful	R	6.80	0.61	0.89***	0.93***	--	--	--
4. Valuable/worthless	R	6.80	0.56	0.79***	0.70***	0.70***	--	--
5. Calming/distressing	R	6.40	1.15	0.44***	0.48***	0.48***	0.44***	--
6. Acceptable/unacceptable	R	6.70	0.85	0.65***	0.77***	0.77***	0.51***	0.62***
Week 8 (n=33)								
Item anchors		Mean	SD	1	2	3	4	5
1. Good/bad†	R	6.91	0.29	--	--	--	--	--
2. Positive/negative†	R	6.85	0.36	0.75***	--	--	--	--
3. Beneficial/harmful†	R	6.85	0.36	0.75***	0.76***	--	--	--
4. Valuable/worthless	R	6.85	0.36	0.75***	0.76***	1.00***	--	--
5. Calming/distressing	R	6.61	0.93	0.44***	0.55***	0.65***	0.65***	--
6. Acceptable/unacceptable	R	6.91	0.29	0.27	0.16	0.45***	0.45***	0.32*
Week 8-0 (n=32)								
Item anchors		Mean	SD	1	2	3	4	5
1. Good/bad†	R	0.06	0.25	--	--	--	--	--
2. Positive/negative†	R	0.03	0.40	0.63***	--	--	--	--
3. Beneficial/harmful†	R	0.03	0.40	0.31*	0.40**	--	--	--
4. Valuable/worthless	R	0.00	0.44	0.30*	0.18	0.37**	--	--
5. Calming/distressing	R	0.22	1.26	0.06	0.30*	0.37**	0.17	--
6. Acceptable/unacceptable	R	0.16	0.85	-0.05	0.18	0.27	-0.35**	0.42**

*p<0.1, **p<.05, ***p<.01; R=reverse-scored; †Items retained in final scale. Items were semantic differential items anchored by the adjectives shown on a scale of 1 to 7. Items were reverse coded so that higher scores reflect more positive attitudes toward the child eating healthfully.

3.5.5. Social Cognitive Theory.

Three predominant constructs from SCT were assessed for the dissertation research: self-efficacy, outcome expectancies, and skills. Five self-efficacy and six outcome expectancy items were adapted from a study by Hildebrand & Betts (2009) to evaluate parents' confidence in serving healthy foods and the value they placed on healthy foods for the family, respectively. The self-efficacy scale used a 7-point Likert format (1=very sure I can, 7=very sure I cannot). The outcome expectancy scale was also a 7-point Likert format (1=strongly disagree, 7=strongly agree). Self-efficacy descriptive statistics are shown in **Table 3-14**. All items were retained in the final scale (α=0.93 at week 8 and α=0.46 for change scores). Outcome expectancy items are presented separately as behavioral inhibitors (**Table 3-15**) and promoters (**Table 3-16**). Inhibitors had low alpha reliability (α=0.49 at week 8 and α=0.49 for change scores), suggesting that items were not measuring the same construct (Cronbach, 1951). Thus, the inhibitor scale was not used for the remainder of the analyses. The promoter scale exhibited acceptable reliability (α=0.83 at week 8 and α=0.86 for change scores) and all items were retained.

The Parent Feeding Questionnaire (Murashima et al., 2011) was used to collect self-reported food modeling skills. Six of the original scale items were used regarding having fruit and vegetables, sugar-sweetened beverages, and sweet and salty snacks available in the house and eating those foods in front of the child (**Table 3-17-Table 3-19**). Parents responded using a 5-point Likert response (1=never, 5=always). Fruit and vegetable skill items had α=0.80 at week 8 and α=0.22 for change scores. Sugar-sweetened beverage skill items had α=0.82 at week 8 and α=0.75 for change scores. Sweet and salty snack skill items had α=0.62 at week 8 and α=0.06 for change scores. Sweet and salty snack items were eliminated from further analysis due to

unacceptable reliability. Fruit and vegetables items were retained because week 8 reliability was acceptable and the intervention had a heavy focus on fruit and vegetable intakes and behaviors.

The PFQ also contains one item related to milk intake, “I drink milk in front of my child.” This item was used by Murashima and colleagues (2011) in combination with fruit and vegetable items as part of a “Nutrient Dense Encouraging” scale. For this dissertation, the inclusion of the milk item with the fruit and vegetable items reduced the fruit and vegetable alpha at week 8 from 0.80 to 0.67, indicating that the milk item was not a good fit with the fruit and vegetable items. Thus, the milk item was omitted from further analysis.

Table 3-14. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the self-efficacy scale, intervention and control participants at week 0, week 8, and change between weeks 0 and 8.

Week 0 (n=42)							
Item		Mean	SD	1	2	3	4
1. Serve healthy foods to my family when preparing meals at home?	R	6.52	0.94	--	--	--	--
2. Serve healthy foods to my family when eating meals away from home?	R	5.43	1.48	0.60***	--	--	--
3. Prepare tasty, easy recipes that are healthy?	R	6.33	0.95	0.40***	0.55***	--	--
4. Serve healthy food to my family when I am low on money for buying food?	R	5.60	1.45	0.57***	0.41***	0.54***	--
5. Serve my family healthy foods when I do not have a lot of time?	R	5.33	1.60	0.54***	0.55***	0.60***	0.58***
Week 8 (n=35)							
Item		Mean	SD	1	2	3	4
1. Serve healthy foods to my family when preparing meals at home?	R	6.43	1.20	--	--	--	--
2. Serve healthy foods to my family when eating meals away from home?	R	5.46	1.42	0.64***	--	--	--
3. Prepare tasty, easy recipes that are healthy?	R	6.17	1.07	0.84***	0.64***	--	--
4. Serve healthy food to my family when I am low on money for buying food?	R	5.60	1.35	0.74***	0.74***	0.84***	--
5. Serve my family healthy foods when I do not have a lot of time?	R	5.43	1.58	0.60***	0.75***	0.58***	0.83***

Table 3-14 (cont'd)

Week 8-0 (n=35) Item		Mean	SD	1	2	3	4
1. Serve healthy foods to my family when preparing meals at home?	R	-0.03	0.82	--	--	--	--
2. Serve healthy foods to my family when eating meals away from home?	R	0.14	1.29	0.06	--	--	--
3. Prepare tasty, easy recipes that are healthy?	R	-0.11	0.80	0.13	0.02	--	--
4. Serve healthy food to my family when I am low on money for buying food?	R	0.17	1.34	0.19	0.10	0.32*	--
5. Serve my family healthy foods when I do not have a lot of time?	R	0.26	1.70	0.17	0.22	-0.04	0.28

*p<0.1, **p<.05, ***p<.01; R=reverse-coded. All items retained. Likert response options ranged from 1=very sure I can to 7=very sure I cannot. Items were reverse coded so that higher scores reflect higher self-efficacy.

Table 3-15. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the outcome expectancy inhibitor scale intervention and control participants at week 0, week 8, and change between weeks 0 and 8.

Week 0 (n=41)					
Item		Mean	SD	1	3
1. Healthy foods can be expensive.	R	3.24	1.98	--	--
3. Sometimes it takes too much time to prepare healthy foods.	R	4.98	1.92	0.31**	--
5. Buying healthy foods may mean more trips to the store.	R	3.68	2.20	0.46***	0.34**
Week 8 (n=34)					
Item		Mean	SD	1	3
1. Healthy foods can be expensive.	R	3.09	1.80	--	--
3. Sometimes it takes too much time to prepare healthy foods.	R	4.71	1.80	0.28	--
5. Buying healthy foods may mean more trips to the store.	R	3.74	1.97	0.12	0.33*
Week 8-0 (n=34)					
Item		Mean	SD	1	3
1. Healthy foods can be expensive.	R	-0.09	1.76	--	--
3. Sometimes it takes too much time to prepare healthy foods.	R	-0.09	1.52	0.11	--
5. Buying healthy foods may mean more trips to the store.	R	0.21	2.43	0.10	0.09

*p<0.1, **p<.05, ***p<.01; R=reverse scored. Likert response options ranged from 1=strongly disagree to 7=strongly agree. Items were reverse coded so that higher scores reflect more positive outcome expectancies.

Table 3-16. Means, standard deviations (SD), and Pearson's correlation coefficients of individual items in the outcome expectancy promoter scale, intervention and control participants at week 0, week 8, and change between weeks 0 and 8.

Week 0 (n=41)				
Item	Mean	SD	2	4
2. Healthy foods help protect my family from diseases like cancer and heart disease.	6.44	1.30	--	--
4. Healthy foods can help keep my family from getting sick with colds and infections.	5.93	1.59	0.56***	--
6. Healthy foods can help my family members have a healthy weight.	6.24	1.46	0.81***	0.71***
Week 8 (n=35)				
Item	Mean	SD	2	4
2. Healthy foods help protect my family from diseases like cancer and heart disease.	6.21	1.25	--	--
4. Healthy foods can help keep my family from getting sick with colds and infections.	5.91	1.46	0.67***	--
6. Healthy foods can help my family members have a healthy weight.	6.41	1.21	0.62***	0.55***
Week 8-0 (n=35)				
Item	Mean	SD	2	4
2. Healthy foods help protect my family from diseases like cancer and heart disease.	-0.14	1.87	--	--
4. Healthy foods can help keep my family from getting sick with colds and infections.	-0.03	1.77	0.53***	--
6. Healthy foods can help my family members have a healthy weight.	0.11	1.94	0.83***	0.68***

*p<0.1, **p<.05, ***p<.01; R=reverse scored. All items retained. Likert response options ranged from 1=strongly disagree to 7=strongly agree. Higher scores reflect more positive outcome expectancies.

Table 3-17. Means, standard deviations (SD), and Pearson's correlation coefficients of fruit and vegetable skill items, intervention and control participants at week 0, week 8, and change between weeks 0 and 8.

Week 0 (n=41)				
Item		Mean	SD	8.
8.	I keep fruits and vegetables available that my child can eat.	4.49	0.55	--
26.	I eat fruits and vegetables in front of my child.	4.29	0.87	0.16
Week 8 (n=35)				
Item		Mean	SD	8.
8.	I keep fruits and vegetables available that my child can eat.	4.34	0.59	--
26.	I eat fruits and vegetables in front of my child.	4.26	0.74	0.67***
Week 8-0 (n=34)				
Item		Mean	SD	8.
8.	I keep fruits and vegetables available that my child can eat.	-0.06	0.55	--
26.	I eat fruits and vegetables in front of my child.	0.09	1.00	0.12

*p<0.1, **p<.05, ***p<.01. Both items retained. Likert response options ranged from 1=never to 5=always. Higher scores indicate more self-reported nutrient-dense encouraging behavior.

Table 3-18. Means, standard deviations (SD), and Pearson's correlation coefficients of sugar sweetened beverage skill items, intervention and control participants at week 0, week 8, and change between weeks 0 and 8.

Week 0 (n=40)					
Item			Mean	SD	10.
10.	I keep sugar-sweetened beverages where my child can reach them.	R	3.53	1.38	--
29.	I drink sweetened beverages in front of my child.	R	3.15	1.19	0.72***
Week 8 (n=35)					
Item			Mean	SD	10.
10.	I keep sugar-sweetened beverages where my child can reach them.	R	3.77	1.19	--
29.	I drink sweetened beverages in front of my child.	R	3.29	1.15	0.69***
Week 8-0 (n=33)					
Item			Mean	SD	10.
10.	I keep sugar-sweetened beverages where my child can reach them.	R	0.18	1.53	--
29.	I drink sweetened beverages in front of my child.	R	0.12	1.05	0.61***

*p<0.1, **p<.05, ***p<.01; R=reverse-coded. Both items retained. Likert response options ranged from 1=never to 5=always. Items were reverse-coded so that higher scores indicate more self-reported energy-dense discouraging behavior.

Table 3-19. Means, standard deviations (SD), and Pearson's correlation coefficients of energy-dense snack skill items, intervention and control participants at week 0, week 8, and change between weeks 0 and 8.

Week 0 (n=41)					
Item			Mean	SD	9.
9.	I keep sweets, candy or salty snacks where my child can reach them.	R	4.05	1.20	--
28.	I eat sweets, candy or salty snacks in front of my child.	R	3.44	1.12	0.47***
Week 8 (n=41)					
Item			Mean	SD	9.
9.	I keep sweets, candy or salty snacks where my child can reach them.	R	4.00	0.85	--
28.	I eat sweets, candy or salty snacks in front of my child.	R	3.56	1.02	0.45***
Week 8-0 (n=41)					
Item			Mean	SD	9.
9.	I keep sweets, candy or salty snacks where my child can reach them.	R	0.00	1.06	--
28.	I eat sweets, candy or salty snacks in front of my child.	R	0.18	0.98	0.03

*p<0.1, **p<.05, ***p<.01; R=reverse-coded. Likert response options ranged from 1=never to 5=always. Items were reverse scored so that higher scores indicate more self-reported energy-dense discouraging behavior.

3.5.6. Home food inventory.

Research aides evaluated the home food environment using the 195-item Home Food Inventory (HFI) developed by Fulkerson and colleagues (2008). The instrument consists of a list of foods grouped into 17 categories (e.g. cheese, butter, fruit, vegetables), and research evaluators mark 'yes' or 'no' to indicate *availability* of each item in the home Two questions ascertain *accessibility* on the counter tops and in the refrigerator by asking which of a list of items are visible and readily accessibility, including fresh vegetables, soda pop, and candy.

Foods were categorized into nutrient-dense and energy-dense categories using definitions and examples put forth in the 2010 Dietary Guidelines for Americans (DGA). The 2010 DGA states that nutrient-dense foods are those that provide vitamins and minerals and contain relatively few calories (US Department of Agriculture & US Department of Health and Human

Services, 2010). Examples include fruit, dark green and orange vegetables, and whole grains, legumes, and low-fat milk and milk products. Conversely, the DGA describes foods to reduce, here after referred to as energy-dense foods, as those that are consumed in high quantities and tend to displace nutrient-dense items. Examples of those that the DGA suggests are energy-dense are those high in saturated fat (e.g. full-fat cheeses, pizza, desserts, chicken mixed dishes, and sausages/franks/bacon/ribs); solid fats (e.g. grain-based desserts, pizza, full-fat cheese, sausage/franks/bacon/ribs, fried white potatoes); added sugar (e.g. soda/energy drinks/sports drinks, desserts, fruit-drinks, candy); sodium (e.g. chicken mixed dishes, pizza, pasta dishes); and refined grains (e.g. breads, pizza, grain-based desserts, tortillas/burritos/tacos). **Table 3-20** and **Table 3-21** show the items categorized as energy-dense and nutrient-dense. It should be noted that meat products were categorized with the beef/pork/lamb item as energy-dense and the chicken/turkey and fish items as nutrient-dense. Given that all meat products offer a ready supply of protein and other nutrients like iron, one might argue that all meats could be categorized as nutrient-dense. The decision to include beef/pork/lamb in the energy-dense category was made because the percent of calories from saturated fat of beef fat is 50% and for pork fat is 40% whereas for chicken it is 30% (US Department of Agriculture & US Department of Health and Human Services, 2010). In addition, sausage/franks/bacon/ribs, beef/beef mixed dishes, and burgers together contribute to 13.4% of the saturated fat in the US diet (US Department of Agriculture & US Department of Health and Human Services, 2010).

Table 3-20. HFI energy-dense items by HFI food category* and food examples.

Food category*	**Individual foods**	**Instrument Item Numbers**
Cheese	Full-fat block and shredded cheese, cottage cheese, cream cheese, processed cheese	1a, 1b, 1f, 1g, 1i, 1k

Table 3-20 (cont'd)

Food category*	Individual foods	Instrument Item Numbers
Milk/Dairy	Whole milk, heavy cream, full-fat sour cream	2c, 2d, 2e
Butter, margarine, oils	Regular butter, margarine, lard/shortening	3a, 3c, 3h
Salad dressing	Regular dressing	4a
Condiments	Regular mayonnaise	5a
Deli, luncheon, sandwich meat and sausage	Sliced ham/roast beef, bologna, salami, bacon/breakfast sausage, hot dogs/bratwurst/polish sausage	9b, 9c, 9d, 9e, 9f
Meats and other protein	Beef/pork/lamb	10b
Frozen desserts	Regular ice cream, frozen ice cream treats	11a, 11d
Microwavable or quick-cook foods	Pizza, burritos, chicken nuggets, French fries, egg rolls, ramen noodles	12a-12h
Bread	White bread, English muffins, bagels, pita bread, croissants	13b, 13d, 13f, 13k, 13l
Desserts	Regular cookies, cake, muffins, pastries	14a, 14c, 14e, 14g, 14h
Chips, crackers, and other snack foods	Potato, corn, tortilla chips, cheese puffs, bagel chips, granola bars	15d, 15f, 15g, 15i, 15k, 15q
Non-alcoholic beverages	Soda, iced teas, sports drinks, fruit drinks	20a, 20c, 20e, 20g
Candy	Chocolate, hard, gummi, fruit-based, chewy candy	21a-21e

*The food categories are presented in accordance with HFI authors' groupings and are not meant to represent DGA groupings. For instance, the HFI and the USDA (Ahuja et al., 2012) both group heavy cream and sour cream conceptually with milk products, but neither heavy cream nor sour cream contribute to dairy equivalencies, only to discretionary solid fats (Bowman et al., 2008).

Table 3-21. HFI nutrient-dense items by HFI food category and food examples.

Food category	Individual foods	Instrument Item Numbers
Milk/Dairy	Skim and low-fat milk, reduce-fat yogurt	2a, 2b, 2h, 2j

Table 3-21 (cont'd)

Food category	Individual foods	Instrument Item Numbers
Vegetables	Broccoli, carrots, green beans, lettuce, potatoes, greens, tomatoes, mixed vegetables, etc.	7a-7t
Fruit	Apples, bananas, grapes, melons, mixed fruit, oranges, strawberries, clementines	8a-8z
Deli, luncheon, sandwich meat and sausage	Sliced turkey or chicken	9a
Meats and other protein	Chicken/turkey, tofu, veggie burgers, fish, lentils, beans, peanut butter, eggs	10a, 10c-10j
Frozen desserts	Frozen yogurt, frozen yogurt treats	11c, 11e
Bread	Wheat bread, English muffins, bagels, pita bread	13a, 13c, 13e, 13j
Chips, crackers, and other snack foods	Whole grain snack crackers; peanuts, cashews, or other nuts	15a, 15p
Non-alcoholic beverages	100% fruit juice, bottled water, soy/rice milk	20f, 20h, 20i

3.5.7. Parent Dietary Intake.

Parent intake was assessed using the Block Brief Food Frequency Questionnaire FFQ 2000. The Block Adult FFQ has 70-items and was developed using data from the National Health and Nutrition Examination Survey (NHANES) III (NutritionQuest, 2009). The first Block Brief FFQ was 60-items and validated in three different populations (Block et al., 1990). No studies have validated the current Block Brief 2000.

3.5.8. Child Dietary Intake.

The Block Kids Food Screener 2007 for Ages 2-17 was used to measure child food intake. The Food Screener is a shortened, 39-item FFQ that asks how many days the child ate a particular food item in the last week (none, 1 day, 2 days, 3-4 days, 5-6 days, or everyday) and item-specific quantity that is consumed in one day (e.g. a little/some/a lot; 1 bowl/2 bowls/3 bowls). Various versions of the full Block Kids FFQ have been tested for validity and reliability

(Block, 2008; Cullen et al., 2008; Marshall et al., 2008; Smith & Fila, 2006). The Block Kids Food Screener 2007 has not been validated, but a validation study is currently in its third manuscript revision (Hoerr SH, Guo W, NutritionQuest, personal communication, April 2012).

3.5.9. Diet quality.

Overall diet quality of adults and children was assessed using the Healthy Eating Index (HEI) 2005. HEI-2005 scores dietary quality according to the presence and amount of 12 components (Patricia M. Guenther, Jill Reedy, & Susan M. Krebs-Smith, 2008; US Department of Agriculture, 2010). HEI-2005 scores range from 0 to 100, and HEI subscore ranges vary for different components, shown in **Table 3-22**. In a 2008 evaluation, Guenther and colleagues (Patricia M. Guenther, Jill Reedy, Susan M. Krebs-Smith et al., 2008) performed a rigorous set of tests to assess content validity, construct validity, and reliability of the HEI-2005 (an updated version of the instrument released in 2005), and concluded that the HEI is highly valid and predictive of health outcomes.

The mean HEI-2005 score of the pilot study at week 8 was 66.6 (90% confidence interval 63.4, 70.0) for parents and 65.0 (90% confidence interval 62.9, 67.0) for children. In comparison, data from the National Health and Nutrition Examination Survey, 2003-2004, indicate a mean HEI-2005 score of 57.5 (95% confidence interval 56.0, 59.0) for all individuals in the US 2 years of age and older (P. M. Guenther et al., 2008) and 59.6 (no confidence interval provided) for children 2-5 years of age (Fungwe et al., 2009). Although the data from the pilot study are similar to national figures, the fact that pilot HEI data are slightly higher than national data may be attributed, in part, to use of a food frequency questionnaire (over the past week) for pilot data rather than a one-day dietary recall for national data.

HEI-2005 was calculated by using a publicly accessible SAS program and SAS-formatted MyPyramid equivalency databases published by the USDA (available at http://www.cnpp.usda.gov/healthyeatingindex.htm). This SAS program joined each individual's average daily quantity of each food in the respective food frequency questionnaires with SAS-formatted equivalency data by unique food code, enabling calculation of HEI-2005 for each individual and the entire study population.

Table 3-22. Healthy Eating Index 2005 components and standards[1].

Component	**Maximum Points**	**Standard for Maximum Score**	**Standard for Minimum Score**
Total Fruit (includes 100% juice)	5	≥0.8 cup equiv. per 1,000 kcal	No Fruit
Whole Fruit (not juice)	5	≥0.4 cup equiv. per 1,000 kcal	No Whole Fruit
Total Vegetables	5	≥1.1 cup equiv. per 1,000 kcal	No Vegetables
Dark Green and Orange Vegetables and Legumes[2]	5	≥0.4 cup equiv. per 1,000 kcal	No Dark Green or Orange
Total Grains	5	≥3.0 oz equiv. per 1,000 kcal	No Grains
Whole Grains	5	≥1.5 oz equiv. per 1,000 kcal	No Whole Grains
Milk[3]	10	≥1.3 cup equiv. per 1,000 kcal	No Milk
Meat and Beans	10	≥2.5 oz equiv. per 1,000 kcal	No Meat or Beans
Oils[4]	10	≥12 grams per 1,000 kcal	No Oil
Saturated Fat (R)	10	≤7% of energy[5]	≥15% of energy
Sodium (R)	10	≤0.7 grams per 1,000 kcal	≥2.0 grams per 1,000 kcal
Calories from Solid Fats, Alcoholic beverages, and Added Sugars (SoFAAS; R)	20	≤20% of energy	≥50% of energy

[1]Intakes between the minimum and maximum levels are scored proportionately, except for Saturated Fat and Sodium (see note 5).

[2]Legumes counted as vegetables only after Meat and Beans standard is met.

[3]Includes all milk products, such as fluid milk, yogurt, and cheese, and soy beverages.

[4]Includes nonhydrogenated vegetable oils and oils in fish, nuts, and seeds.

[5]Saturated Fat and Sodium get a score of 8 for the intake levels that reflect the 2005 Dietary Guidelines, <10% of calories from saturated fat and 1.1 grams of sodium/1,000 kcal, respectively.
(R) The last 3 components – saturated fat, sodium, and SoFAAS – are reverse-scored, such that the higher the intake of these foods and nutrients, the lower the score for that component.

3.5.10. Demographic characteristics.

Demographic items collected include age, race/ethnicity, and sex of adults and children living in the household in a format modeled after the US Census format (US Census Bureau, 2011). In addition, education (multiple choice with choices of: no high school, some high school, high school diploma/GED, some college, college graduate, graduate training beyond college) and employment status of adults in the household (two multiple choice questions; employed, yes/no; if employed, what type, full time, part time, other) were asked. Time since last major grocery shopping trip and time until next major grocery shopping trip were also included (9 multiple choice options for each, today, 1 day, 2 days, 3-4 days, 5-6 days, 1-2 weeks, 3-4 weeks, more than 1 month, don't know).

3.6. Statistical methods

Analyses were conducted using SAS software (version 9.3, SAS Institute, Inc). The significance level alpha for all statistical tests was set at 0.10 because of the small sample size and exploratory nature of the study. Descriptive univariate analysis of each questionnaire item was conducted to inspect variable distribution (means, medians, standard deviations). As previously noted, Cronbach's alpha was used to examine the internal consistency of all scales at baseline.

3.6.1. Analysis for Aim 1.

Relationships between motivation (mean of retained items in the outcome relevant scale at week 0), ability (education level reported at week 0), heuristic processing (mean responses for each of the three heuristic scales: similarity, source credibility, and perceived message quality at week 8), systematic processing (number of correct responses from the knowledge test at week 8), change attitudes (mean of retained items for each of the four attitude scales at week 8 minus at week 0), and adult dietary quality (mean healthy eating index score at week 8) were evaluated using a series of generalized linear models. For Hypothesis 1.1, I fitted four main models – one with systematic processing as the dependent variable and the other three with heuristic processing as the dependent variables. The main independent variables in these models were motivation and ability.

For Hypothesis 1.2, changes in each of the four attitudes toward healthy eating (mean value at week 8 – mean value at week 0) were the dependent variables and systematic and heuristic processing were the independent variables.

For Hypothesis 1.3, a mediation analysis was conducted as described by Baron and Kenny (1986; MacKinnon et al., 2007). The mediation model tested is depicted in **Figure 3-3**. For each of the four attitude scales, model parts a, b, and c depicted in the figure were run as generalized linear models, so that the independent variable was systematic processing; the mediator was each of the parent attitudes; and the outcome variable was parent dietary quality. Path a represents the relationship between the independent variable (systematic processing) and mediator (parent attitude); path b represents the relationship between the mediator (parent attitude) and the outcome variable (parent dietary quality); and path c represents the relationship between the independent variable (systematic processing) and outcome variable (parent dietary

quality). Mediation occurs when path a is significant and path c is significant, but path c is considerably reduced or no longer significant when path a and path b are both controlled. (Baron & Kenny, 1986; MacKinnon et al., 2007)

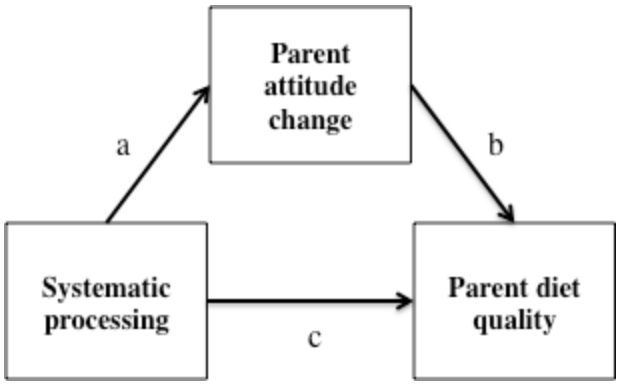

Figure 3-3. Hypothesis 1.3 Mediation Model

3.6.2. Analysis for Aims 2 and 3.

Whereas aim 1 hypotheses focused only on processing of intervention materials by intervention participants only, aims 2 and 3 were concerned with differences between intervention and control participants on attitude change, changes in SCT measures, the home food environment, and adult and child diet quality during the intervention period. To examine these differences, student t-tests were conducted comparing change scores of intervention participants for each of the measures to change scores of control participants.

3.6.3. Post-hoc analysis.

The post-hoc analysis included intervention and control participants, combined, to explore overall relationships between motivation, education, SCT measures, attitudes, home food environment, and adult and child diet quality. Pearson's correlations were obtained for all variable combinations. Significant correlations were displayed graphically using the original

dissertation concept model as a guide. Several path models were then run from the graphic correlation graphic using PROC CALIS in SAS 9.3, and the model showing acceptable fit was presented for future testing in a larger study population. The model fit statistics considered include: (1) the model chi-square (when not statistically significant, the researcher fails to reject the hypothesis that there are no discrepancies between model predictions and population co variances); (2) the root mean square error of approximation (RMSEA, values below 0.05 may indicate a good fit); (3) the comparative fit index (CFI, values $\geq$0.95 may indicate good fit); and (4) standardized root mean square residual (SRMSR, values $\leq$0.08 may indicate good fit) (Kline, 2011). In addition, the effect size of the model is presented as percent of variance in the outcome attributable to the model.

CHAPTER 4

RESULTS

4.1. Overall Results

Researchers recruited 42 adults into the study, for both the grant study and the dissertation. Participants were overwhelmingly female (**Table 4-1**). Approximately half were non-Hispanic white, a quarter non-Hispanic black, and the remainder, Hispanic or other/mixed race. The majority of participants were in their late twenties or early thirties, although four control parents were over 40 years of age, two of whom were grandparents to the target Head Start child. With the exception of one control participant who did not have a high school degree, all participants were high school educated or beyond. The study population was well-educated, with 59% having some college education and 29% having a college degree or graduate training beyond college. More participants were unmarried than married. No significant differences between intervention and control participants were detected in the categorical variables shown.

Nineteen individuals were randomized to the control group and 23 were randomized to the intervention group. A total of 19 control participants (100%) and 16 intervention participants (70%) completed week 8 and week 14 (there was no loss to follow-up between weeks 8 and 14), for an overall study completion rate of 83%. Seven of the original 23 intervention participants withdrew before the end of the study. One of these attrition participants provided unreliable information on the demographic form, but researchers visually assessed that this participant was a white female, Hispanic ethnicity unknown. Of the other six attrition participants, 5 (83%) were female; 5 (83%) had some college, 1 (17%) had a graduate degree or higher; 1(17%) was less than or equal to 25 years of age, 3 (50%) were 26-30 years of age, 2 (33%) were greater than 30 years of age; and 2 (33%) were white, non-Hispanic, 2 (33%) were black non-Hispanic, 2 (33%)

were other race. There were no statistically significant differences between attrition and non-attrition participants according to sex, education, age, and race using Fisher's exact test (data not shown).

Table 4-1. Demographic characteristics of control (n=23) and intervention participants (n=19).*†

	Control		Intervention	
	n	(%)	n	(%)
Adult sex				
Male	1	(5%)	1	(5%)
Female	18	(95%)	21	(95%)
Adult race/ethnicity				
White, non-Hispanic	11	(58%)	12	(55%)
Black, non-Hispanic	5	(26%)	6	(27%)
Hispanic	2	(11%)	1	(5%)
Other	1	(5%)	3	(14%)
Adult age				
18 - 25 years	2	(11%)	4	(18%)
26 - 30 years	5	(26%)	9	(41%)
31 - 35 years	6	(32%)	7	(32%)
36 - 40 years	2	(11%)	2	(9%)
> 40 years	4	(21%)	0	(0%)
Adult education				
High school degree or less	3	(16%)	2	(9%)
Some college	9	(47%)	15	(68%)
College degree or more	7	(37%)	5	(23%)
Adult employment				
Full time	3	(16%)	13	(59%)
Part time	6	(32%)	2	(9%)
Not employed	9	(47%)	7	(32%)
Other	1	(5%)	0	(0%)
Adult Marital Status				
Married	8	(42%)	6	(27%)
Not married	11	(58%)	17	(77%)

*One intervention participant was excluded due to unreliable demographic data
†Chi-squares on all data in table for differences between control and intervention participants were all non-significant

Aim 1 hypothesized that motivation and ability would affect whether parents in the intervention group exposed to study materials would use systematic processing or heuristic processing of the materials, that the type of processing would influence attitude change during the intervention, and that the attitude change would be associated with improved diet quality of parents. The results for hypothesis 1.1 regarding the effect of motivation and ability on systematic and three types of heuristic processing are shown in **Table 4-2**. No models were significant and Hypothesis 1.1 was not supported.

Table 4-2. Generalized linear models for Hypothesis 1.1 predicting message processing at week 8 from motivation at week 0.

	Beta	SE	T value	p value
Model 1. Systematic Processing (n=15)				
Motivation	0.37	0.49	0.76	0.46
Education				
High school versus college	1.59	2.11	0.76	0.47
Some college versus college	1.95	1.33	1.46	0.17
F = 1.88 (3,11), p=.19, R^2 = 0.34				
Model 2. Heuristic Processing - Perceived Similarity (n=15)				
Motivation	-0.05	0.42	-0.13	0.90
Education				
High school versus college	1.28	1.79	0.71	0.49
Some college versus college	1.73	1.13	1.53	0.15
F = 1.03 (3,11), p=.42, R^2 = 0.22				
Model 3. Heuristic Processing - Perceived Message Quality (n=15)				
Motivation	-0.01	0.14	-0.07	0.94
Education				
High school versus college	0.45	0.59	0.76	0.46
Some college versus college	0.03	0.37	0.07	0.95
F = 0.22 (3,11), p=.88, R^2 = 0.06				
Model 4. Heuristic Processing - Perceived Source Credibility (n=15)				
Motivation	0.14	0.44	0.32	0.75
Education				
High school versus college	0.72	1.90	0.38	0.71
Some college versus college	-0.43	1.20	-0.36	0.73
F = 0.13 (3,11), p=.94, R^2 = 0.03				

Table 4-3 displays the results for hypothesis 1.2, regarding the effect of systematic and heuristic processing on change in four types of parent attitudes towards themselves eating healthfully, eating solid fats and added sugars, having healthy food available in the home, and their children eating healthfully. The first three models were not significant. The fourth model, regarding parents' attitudes toward their children eating healthfully was significant. In contrast to the hypothesized relationship, however, parents with lower amounts of systematic processing and higher amounts of the heuristic perceived similarity of themselves to those in the DVD clips had positive attitude change about their children eating healthfully. Hypothesis 1.2 was partially supported.

Of interest is model 4, which was significant with an adjusted R^2 of 39%. In that model, systematic processing and attitude change about the child eating healthfully were significantly negatively related, meaning that the more systematically that parents processed intervention materials the more negatively their attitude changed between weeks 0 and 8. In that same model, there was a significant positive relationship between parents who perceived themselves to be similar to parents featured in the DVD clips and attitude change toward child eating healthfully. Perceived similarity was also positively related to attitude change toward having food available in the home in model 3, although the overall model was not significant.

Model 2 was also not statistically significant overall, but within that model source credibility and attitude change toward eating solid fats and added sugars were positively related. Taking into account the way the variables were coded, this relationship can be interpreted to mean that the more credible that parents perceived the authors of the workbook to be, the more

negatively parents were to evaluate intake of solid fats and added sugars over the course of the study.

Table 4-3. Generalized linear models for Hypothesis 1.2 predicting attitude changes between week 0 and week 8 from systematic and heuristic processing at week 8.

	Beta	SE	T value	p value
Model 1. Attitude change - Adult eating healthy (n=16)				
Systematic processing	-0.01	0.04	-0.32	0.76
Heuristic processing - perceived similarity	-0.03	0.06	-0.54	0.60
Heuristic processing - perceived message quality	0.23	0.21	1.13	0.28
Heuristic processing - perceived source credibility	-0.03	0.06	-0.49	0.63
F = .35 (4,11), p=.84, R^2 = 0.11				
Model 2. Attitude change - Adult eating solid fats and added sugars (n=16)				
Systematic processing	0.41	0.24	1.68	0.12
Heuristic processing - perceived similarity	-0.13	0.33	-0.39	0.71
Heuristic processing - perceived message quality	-1.14	1.14	-1.00	0.34
Heuristic processing - perceived source credibility	0.65	0.35	1.84	**0.09**
F =1.65 (4,11), p=.23, R^2 = 0.38				
Model 3. Attitude change - Healthy food availability (n=15)				
Systematic processing	0.02	0.05	0.48	0.64
Heuristic processing - perceived similarity	-0.13	0.07	-1.81	**0.10**
Heuristic processing - perceived message quality	0.27	0.24	1.12	0.29
Heuristic processing - perceived source credibility	-0.03	0.08	-0.42	0.69
F =1.03 (4,10), p=.44, R^2 = 0.29				
Model 4. Attitude change - Child eating healthy (n=15)				
Systematic processing	-0.09	0.03	-2.67	**0.02**
Heuristic processing - perceived similarity	0.13	0.05	2.67	**0.02**
Heuristic processing - perceived message quality	0.08	0.16	0.54	0.60
Heuristic processing - perceived source credibility	-0.01	0.05	-0.22	0.83
F =3.2 (4,10), **p=.06**, R^2 = 0.56				

The results for hypothesis 1.3, which posited that parents with more systematic processing would experience more attitude change and would thereby improve diet quality during the study as a result of receipt of intervention materials, are shown in **Table 4-4**. Although the relationship between systematic processing and change in adult diet quality was

significant, none of the other relationships in the mediation models were significant. Therefore, hypothesis 1.3 was not supported. However, it is noteworthy that the relationship between systematic processing and adult diet quality change was significant, but in a direction opposite of that expected. In other words, those that processed intervention materials more systematically had a more negative change in adult diet quality during the study.

Table 4-4. Mediation Models for Hypothesis 1.3 predicting change in adult diet quality from attitude changes and systematic processing.

Mediation Model 1. Systematic processing → Attitude change - parent eating healthfully → Adult diet quality change (n=16)					
Independent Variable	Dependent Variable	Beta	SE	T value	p value
Systematic processing	Attitude change - adult eating healthfully	-0.01	0.04	-0.25	0.80
Attitude change - adult eating healthfully	Adult diet quality change	4.33	8.66	0.50	0.62
Systematic processing	Adult diet quality change	-2.18	1.10	-1.99	**0.07**
Mediation Model 2. Systematic processing → Attitude change - solid fats and added sugars → Adult diet quality change (n=16)					
Systematic processing	Attitude change - solid fats and added sugars	0.32	0.24	1.38	0.19
Attitude change - solid fats and added sugars	Adult diet quality change	-1.08	1.29	-0.84	0.42
Systematic processing	Adult diet quality change	-2.18	1.10	-1.99	**0.07**
Mediation Model 3. Systematic processing → Attitude change - healthy food availability → Adult diet quality change (n=15)					
Systematic processing	Attitude change - healthy food availability	0.01	0.05	0.20	0.85
Attitude change - healthy food availability	Adult diet quality change	-0.77	7.17	-0.11	0.92
Systematic processing	Adult diet quality change	-2.18	1.10	-1.99	**0.07**

Table 4-4. Mediation Models for Hypothesis 1.3 predicting change in adult diet quality from attitude changes and systematic processing.

Mediation Model 4. Systematic processing → Attitude change - child eating healthfully → Adult diet quality change (n=15)					
Systematic processing	Attitude change - child eating healthfully	-0.06	0.04	-1.54	0.15
Attitude change - child eating healthfully	Adult diet quality change	12.15	7.93	1.53	0.15
Systematic processing	Adult diet quality change	-2.18	1.10	-1.99	**0.07**

Aims 2 and 3 predicted changes in SCT constructs, home food environment, attitudes, child diet quality, and parent diet quality in the intervention group compared to the control group. **Table 4-5** shows the results of t-tests comparing the amount of change in each of the measures between baseline and the end of the study in the intervention versus the control group. The intervention group did not experience significant positive changes in the attitude, theoretical, or behavior measures compared to the control group. Neither Aim 2 nor Aim 3 was supported. Although not significant, the intervention group did experience positive changes during the intervention in promoter outcome expectancies, fruit and vegetable encouraging skills, sugar sweetened beverage discouraging skills, and adult diet quality.

Table 4-5. Pre-study to post-study (week 8) change in attitude, Social Cognitive Theory (SCT), home food environment, and diet quality measure in intervention (n=16), versus control groups (n=19).

Construct	Individual measure	Intvn mean (n=16)	Control mean (n=19)	Diff (Intvn - Control)	St Dev	SE	T	p
Attitude Change	Parent eating healthfully attitude change	0.08	-0.09	0.17	0.51	0.17	1.04	0.31
	Solid fats and added sugars attitude change	-0.94	-1.05	0.11	1.74	0.59	0.19	0.85
	Healthy food availability attitude change[1]	0.11	0.12	-0.01	0.53	0.18	-0.06	0.95
	Child eating healthfully attitude change[1]	0.04	0.04	0.01	0.28	0.10	0.07	0.94
SCT Change	Self-efficacy change	-0.03	0.18	-0.20	0.70	0.24	-0.86	0.40
	Outcome expectancy promoter change	0.31	-0.30	0.61	1.65	0.56	1.01	0.32
	FV encouraging modeling skills change	0.16	-0.16	0.31	0.60	0.20	1.54	0.13
	SSB[2] discouraging skills change	0.34	-0.18	0.53	1.21	0.42	1.26	0.22
Home Food Environment Change	Change in percent nutrient dense foods available	0.02	0.04	-0.02	0.08	0.03	-0.68	0.50
	Change in percent energy dense foods available	0.00	-0.02	0.02	0.08	0.03	0.87	0.39
	Change in access to nutrient dense foods	0.88	0.79	0.09	1.77	0.60	0.14	0.89
	Change in access to energy dense foods	-0.69	-0.42	-0.27	1.67	0.57	-0.47	0.64
Diet Quality Change	Adult diet quality change	1.13	-1.08	2.21	8.91	3.02	0.73	0.47
	Child diet quality change	-0.62	1.72	-2.35	8.25	2.80	-0.84	0.41

Intvn = Intervention; SCT = Social Cognitive Theory

[1]Intervention n=15, Control n=18

[2]Sugar Sweetened Beverages

4.2. Post-hoc analysis.

Although not expressly articulated in the dissertation aims and hypotheses, it was of interest to explore relationships between motivation, education, social cognitive theory, home food environment, and adult and child diet quality in intervention and control parents combined. Means, standard deviations, and correlation between these variables are shown in **Table 4-6**. Other than motivation and education, all other variables were those collected post-study at week 8.

One interesting finding is that child diet quality is significantly positively correlated with parent diet quality and negatively correlated with energy dense food accessibility and not with any other parent-focused variables, with the exception of a weak correlation with parent self-reported sugar-sweetened beverage discouragement. This suggests that parent behavior and physical environment are more important direct contributing factors to child diet quality than parent cognitive constructs.

Parent diet quality, in turn, was also positively correlated with percent of nutrient-dense foods available in the home and nutrient-dense accessibility and negatively related to energy-dense food availability and accessibility. In addition, education, self-efficacy, and sugar-sweetened beverage discouragement were significantly correlated with parent diet quality. None of the attitude scales were significantly correlated with adult diet quality.

In order to visualize relationships between all the variables included in **Table 4-6** and to propose tentative path models, significant correlations are summarized graphically in **Figure 4-1**, using the dissertation concept model as the theoretical foundation. From that model, path models were fit. The path model shown in **Figure 4-2** is the path model that described the data the most

comprehensively and fit the data well. The model described 15.4% of the variance in child diet quality.

Table 4-6. Correlation matrix for main study variables, intervention and control group combined.

	Variable	N	Mean	Std Dev	1	2	3	4	5	6
1	Motivation	41	5.83	1.14	--	--	--	--	--	--
2	Education	41	2.17	0.63	0.10	--	--	--	--	--
3	SCT: Self-efficacy	35	5.82	1.17	0.42***	-0.12	--	--	--	--
4	SCT: Outcome exp promoters	35	6.20	1.12	0.73***	0.32*	0.22	--	--	--
5	SCT: PFQ FV encouragement	35	4.30	0.61	0.13	-0.02	0.36**	0.15	--	--
6	SCT: PFQ SSB discouragement	35	3.53	1.08	0.16	0.38**	0.18	0.25	0.05	--
7	Attitude: Parent eating healthy	35	6.70	0.66	0.35**	0.03	0.45***	0.40**	0.18	0.18
8	Attitude: solid fats & added sugar	35	4.13	1.64	0.12	-0.09	-0.18	0.07	-0.07	-0.14
9	Attitude: Healthy food availability	33	6.83	0.46	0.28	0.05	0.15	0.26	0.06	-0.05
10	Attitude: Child eating healthy	33	6.87	0.31	0.50***	0.12	0.13	0.56***	0.21	0.03
11	HFE: Percent nutrient dense	35	0.51	0.09	0.32*	0.38**	0.16	0.24	0.06	0.52***
12	HFE: Percent energy dense	35	0.38	0.09	-0.35**	-0.30*	-0.13	-0.27	0.03	-0.53***
13	HFE: Nutrient dense access	35	3.49	1.40	0.19	0.22	0.15	0.10	0.20	0.17
14	HFE: Energy dense access	35	2.63	1.33	0.03	-0.29*	0.13	-0.01	0.36**	-0.41***
15	Adult diet quality	35	66.63	11.39	0.22	0.33**	0.28*	0.27	0.07	0.67***
16	Child diet quality	35	64.98	7.25	0.13	0.06	-0.01	0.01	0.04	0.29*

***p<0.01, **p<0.05, *p<0.10; SCT=Social cognitive theory, PFQ=Parent feeding questionnaire, FV=Fruit and vegetable, SSB=Sugar sweetened beverage, HFE=Home food environment

Table 4-6. (Cont'd)

	Variable	7	8	9	10	11	12	13	14	15
1	Motivation	--	--	--	--	--	--	--	--	--
2	Education	--	--	--	--	--	--	--	--	--
3	SCT: Self-efficacy	--	--	--	--	--	--	--	--	--
4	SCT: Outcome exp promoters	--	--	--	--	--	--	--	--	--
5	SCT: PFQ FV encouragement	--	--	--	--	--	--	--	--	--
6	SCT: PFQ SSB discouragement	--	--	--	--	--	--	--	--	--
7	Attitude: Parent eating healthy	--	--	--	--	--	--	--	--	--
8	Attitude: solid fats & added sugar	-0.17	--	--	--	--	--	--	--	--
9	Attitude: Healthy food availability	0.58***	-0.33*	--	--	--	--	--	--	--
10	Attitude: Child eating healthy	0.49***	-0.30*	0.82***	--	--	--	--	--	--
11	HFE: Percent nutrient dense	0.09	0.00	0.09	0.18	--	--	--	--	--
12	HFE: Percent energy dense	-0.10	-0.12	-0.06	-0.15	-0.89***	--	--	--	--
13	HFE: Nutrient dense access	-0.03	0.06	-0.03	0.01	0.45***	-0.34**	--	--	--
14	HFE: Energy dense access	0.04	-0.12	-0.10	-0.07	-0.34**	0.43***	0.00	--	--
15	Adult diet quality	0.19	-0.04	-0.04	0.01	0.52***	-0.48***	0.32*	-0.39**	--
16	Child diet quality	0.01	-0.25	-0.01	0.09	0.21	-0.27	0.25	-0.37**	0.39**

***p<0.01, **p<0.05, *p<0.10; SCT=Social cognitive theory, PFQ=Parent feeding questionnaire, FV=Fruit and vegetable, SSB=Sugar sweetened beverage, HFE=Home food environment

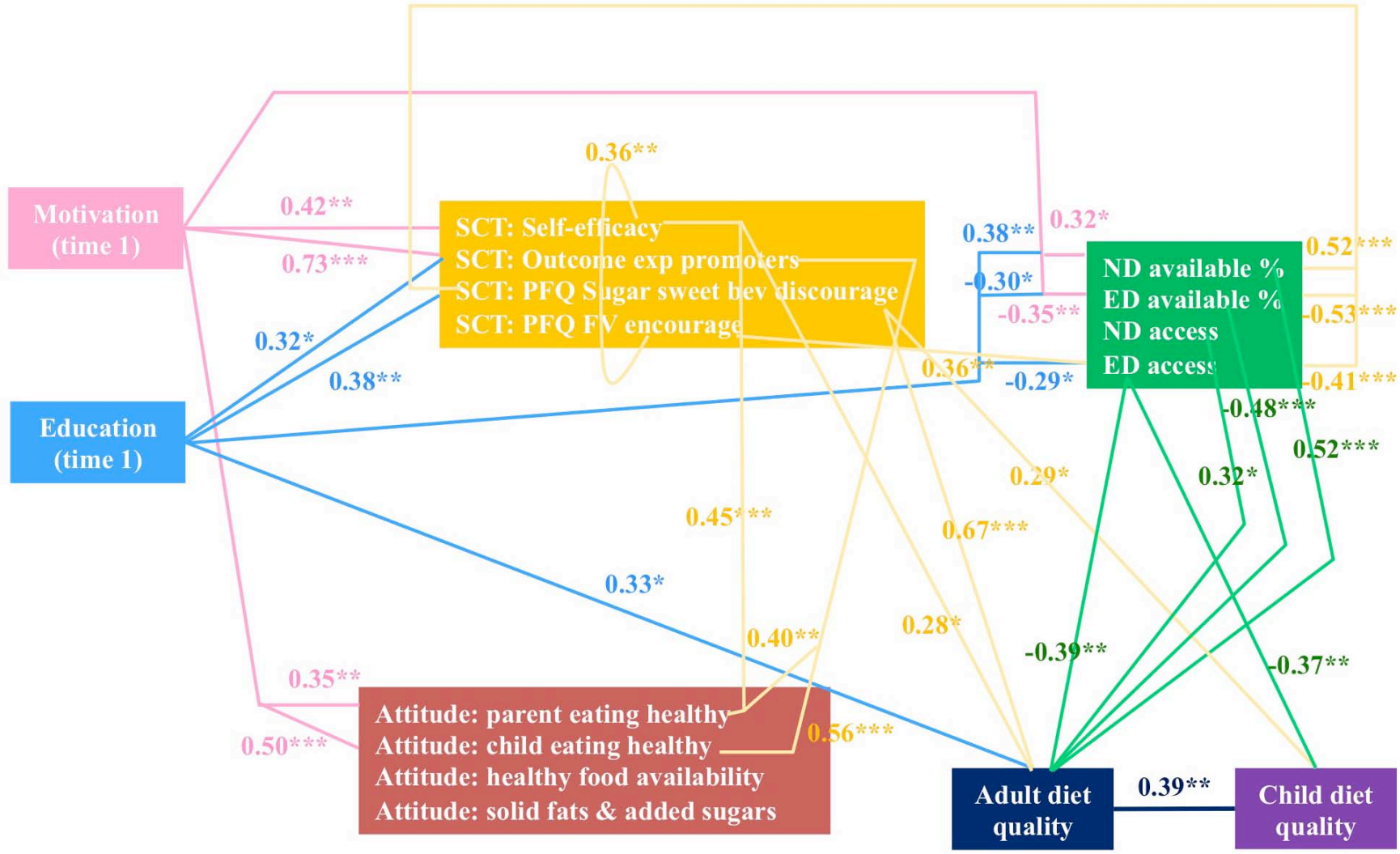

Figure 4-1. Graphic summary of significant correlations. Numbers shown are Pearson's r from Table 4-6. *p<0.1, **p<0.5, ***p<.01

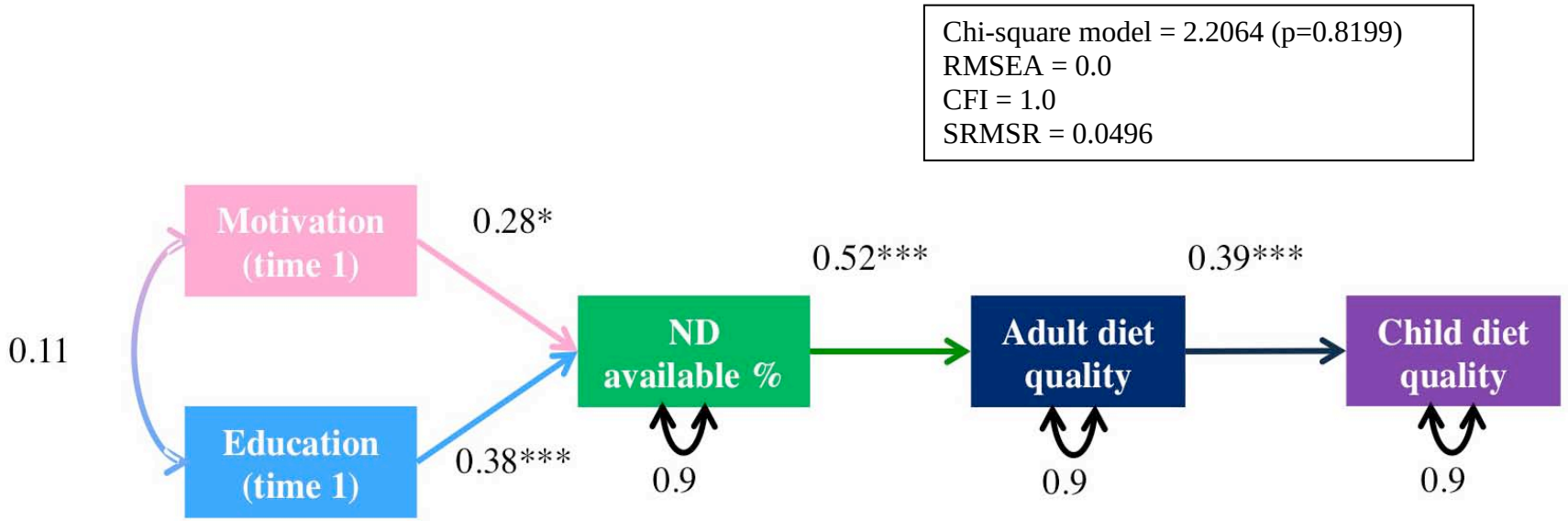

Figure 4-2. Path model. Numbers shown are the standardized path coefficients. *p<0.1, **p<0.5, ***p<.01. RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMSR = standardized root mean square residual

CHAPTER 5

DISCUSSION

5.1. Main findings.

The objective of this research was to evaluate a newly developed intervention for low-income parents to improve feeding practices and home food environment. The framework for evaluation was based largely on two theoretical models: the Social Cognitive Theory and the Heuristic-Systematic Model (HSM). The Social Cognitive Theory has been used in a number of different ways related to dietary interventions aimed in part at parents of infants, toddlers, preschool, and school-aged children; namely, to inform future interventions (Byrd-Bredbenner et al., 2011; Kolopaking et al., 2011; Wiig & Smith, 2009) and in the development and evaluation of such interventions (Baranowski, et al., 2003; Beech, et al., 2003; Burgess-Champoux, et al., 2008; Haire-Joshu, et al., 2008; Harvey-Berino & Rourke, 2003; Horodynski, et al., 2011; Klohe-Lehman, et al., 2007; Monteiro, et al., 2011; Nyberg, et al., 2011; Story, et al., 2003). Conversely, no studies have been identified that have used the HSM for dietary interventions in this study population. Therefore, this dissertation was an attempt to bridge the fields of behavioral nutrition and health communication by combining these theories and to thereby uncover potential new ways of improving child diet quality.

5.1.1. Aim 1 - Heuristic Systematic Model in practice

The first aim of this dissertation was to investigate how low-income parents of preschool-aged children processed materials of the intervention using HSM as framework. In particular, the three hypotheses of aim 1 proposed that (1) parents with high motivation and ability would use more systematic processing whereas those with low motivations and ability would use more

heuristic processing; (2) higher use of systematic and/or heuristic processing would be associated with more positive change in pare attitudes from pre- to post-study; and (3) that high use of systematic processing would be associated with positive change in attitudes and, in turn, would result in positive change in adult diet quality. Neither hypotheses 1.1 nor 1.3 were supported by the data, but 1.2 was partially supported because one of the attitudes, "parent attitude toward the child eating healthfully," was significantly explained by a model containing three types of heuristic processing and systematic processing.

One specific component of this model that was significant was the positive relationship between attitude change and perceived similarity of parents featured in the intervention DVD clips. In developing our intervention, particular attention was paid to maximizing perceived similarity. The parents in the video were recruited from the same Head Start program as the pilot intervention participants were. In addition, we sought racial/ethnic diversity in video participants, striving to recruit equal numbers of participants who were of white, black, Hispanic, and other races/ethnicities to represent the diversity of Head Start enrollment.

The perceived similarity results agree with a long line of evidence in communication research suggesting that perceived similarity, also known as homophily, can enhance persuasiveness of a message (McQueen et al., 2011; Moyer-Gusé, 2008; Rogers & Bhowmik, 1970; Slater & Rouner, 2002). Slater and colleagues (2003) found that identification with a message source modified the relationship between message type and three types of dietary change message characteristics: (1) message believability, (2) message usefulness, and (3) message clarity. The importance of perceived similarity is also supported by the Social Cognitive Theory (Bandura, 1986). Bandura, in his landmark publication introducing the Social Cognitive Theory, cited research suggesting that a person will be more likely to try a behavior and

experience increased self-efficacy, if a similar rather than a less similar model demonstrates the behavior. This is supported by quantitative and qualitative data from the Witness Project, in which culturally similar role models and health advisors were key to increasing mammography rates among African American women (Bailey et al., 2000).

The second significant model component was a negative relationship between attitude change and systematic processing that which was opposite of the predicted direction. It is well documented that changing another's attitude is difficult, particularly when the attitude is strongly held (Eagly & Chaiken, 1995). Indeed, in the dissertation pilot study, the mean of parent attitudes toward children eating healthfully at baseline was already very positive with 6.85 on a 7-point scale. Wood, Rhodes, and Biek (1995) suggest that individuals with strong attitudes and extensive working knowledge, or "beliefs and prior experiences that come to mind when one is confronted with an attitude object [in this case, feeding children healthfully; p. 293]," can engage in selective information processing, or biased receipt and evaluation of information that in agreement with currently held attitudes and discard of information in disagreement with current attitudes. In other words, "people who believe themselves knowledgeable might reject an appeal because they think they already possess substantial support for their own judgment, rendering further consideration of the topic unnecessary (Wood et al., 1995, p. 298)." This is demonstrated in a recent study of breast cancer advocates, in which the education and scientific literacy were inversely related to attitude toward regulation of a potential carcinogen (Silk et al., 2012). The authors surmise that the more highly educated and scientifically literate participants may perceive the carcinogen presented in the study to be of lesser significance than other carcinogens that they have more experience with.

One manifestation of resistance to attitude change is counter arguing, or generating arguments that contradict intervention content (Petty & Cacioppo, 1986; Slater & Rouner, 2002). Resistance and counter arguing were observed anecdotally during the study, particularly by one participant who repeatedly emphasized that she was currently in college and implied that the simplicity of the intervention materials was not designed for well-educated parents like her.

Attitudes that are ego-defensive, or those that are held to protect one's self-concept against threats, are associated with discounting information and tend to be very resistant to change (Eagly & Chaiken, 1993). Given that parenting feeding style and the underlying practices that characterize the style are internally governed (Hughes et al., 2005; Ventura et al., 2010), it is reasonable to surmise that attitudes toward child feeding could be highly ego-involved. Lapinski and Boster (2001) proposed and tested a model of ego-involvement regarding college students' attitudes toward being serious students. In it, they suggest that an ego-defensiveness reaction against information threatening their concept of being serious students leads to message discounting,[1] source derogation,[2] and lack of adherence to message recommendations. Although there is no evidence that participants in this dissertation research engaged in disparaging intervention source, given the high source credibility (mean=6.2 on a 7-point scale), it would be interesting to explore the extent to which parent feeding attitudes are ego-defensive and whether that influences intervention processing and effectiveness.

As noted in Chapter 3 on Methods, systematic processing was evaluated using a knowledge test developed de-novo for this dissertation, with the intent of measuring systematic processing, or how thoroughly participants deliberated the intervention materials. Development

[1] Lack of trust in message

[2] Expression of lack of trust in the message source

of an instrument such as this is typically a rigorous process that involves development and design, pilot testing, and psychometric evaluation (Friedenberg, 1995). Specifically, psychometric tests are expected to be reliable, which can refer to consistency in test scores over time (test-retest reliability) or correlation between items with a scale measuring a single construct (internal reliability). Validity is the another important property of psychometric tests, including construct validity, that the test is measuring what it was intended to measure, and content validity, that the test measures all aspects of the tested domain. Test developers confer with subject matter experts and conduct pilot testing to evaluate test reliability and validity as well as to improve individual item quality and clarity (Friedenberg, 1995; Kline, 2000; Kline, 2005). Unfortunately, the restricted timeline and budget of the dissertation project precluded such in-depth assessment of the knowledge test for this study. Thus, it is likely that the knowledge test did not optimally measure systematic processing. If so, the relationship between systematic processing and attitude change may have been an artifact of the knowledge test design.

Overall, the HSM did not fit the dissertation concept model well, given that hypotheses 1.1. and 1.3 were not supported and one of the findings of hypothesis 1.2 was in a direction opposite to that expected. It could be that the HSM truly does not describe the process by which low-income parents engage in parent feeding interventions materials. In contrast, one similarly conceived study that used HSM to investigate message processing found that ability, including education level, significantly predicted knowledge gain after exposure to breast cancer messages (Smith et al., Under review). It should be noted that the sample in the Smith et al. study was highly educated, with nearly three-quarters of the sample (72.4%) having a college degree or post-college graduate training compared to 29.3% of the dissertation pilot study sample.

However, in the breast cancer study, even lay messages written at low reading level enhanced knowledge gain, suggesting that the messages used could be effective for a less educated population. It is important to reiterate that HSM testing in my dissertation research was conducted only among intervention participants, which was a sample size of 16 at the week 8 post-study visit. Adjusted model R2 for several of the models were upwards of 20%, indicating that 20% of the variance of the outcome variable is explained by the model. This is encouraging, despite the fact that the models were largely non-significant and bode well for re-testing the HSM in a larger population.

A potential change that may make the HSM more useful for studies with low-income parents like the target population is to consider alternate ways of conceptualizing ability other than just education level. Some variables thought to influence ability as provided in the Elaboration Likelihood Model (Petty & Cacioppo, 1986), the predecessor to the HSM, include presence of distractions while processing, message repetition, and message comprehensibility. Eagly and Chaiken (1993) provide time pressure as another example of a variable that may influence ability. Low-income parents may have different demands and time constraints than higher-income parents, which could justify considering different measures of ability in future models.

5.1.2. Aims 2 and 3 – parent attitudes, SCT, home food environment, and diet quality

No significant differences were detected in pre- to post-study change in Aim 2 and 3 variables in the intervention group compared to the control group. Thus, neither Aim 2 nor Aim 3 were supported. It is noteworthy, however, that several changes were in the expected direction,

including positive changes in the intervention group on parent attitude toward eating healthfully, outcome expectancy promoters, fruit and vegetable modeling skills, sugar-sweetened beverage discouraging skills, and adult diet quality compared to the control group which experience negative changes in each of these variables between pre- and post-study. The lack of significant findings is likely due in large part to the limited sample size.

5.1.3. Post-hoc analysis – pooled correlations and path model

In order to investigate the relationships of the dissertation concept model constructs more comprehensively, I pooled the intervention and control groups and calculated correlation between all variables measured in both groups (i.e. non-HSM variables) at post-test. This was a valid procedure because there were no significant differences between groups from pre-test to post-test. One interesting finding is that none of the attitude measures were significantly correlated with the respective behavioral measures, i.e. adult diet quality, child diet quality, and home food accessibility and availability. A number of reviews and meta-analyses have found many variables that moderate the relationship between attitudes and behavior (Crano & Prislin, 2006; O'Keefe, 2002). By definition, then, presence of an inhibiting moderator or absence of a promoting moderator may attenuate the relationship between attitude and behavior. Crano and Prislin (2006) report that attitude-behavior moderators tend to fall into three categories: meta-attitudinal (e.g. temporal stability, attitude accessibility, certainty, attitude strength); self-interest (how closely an attitude is tied to self); and attitude assessment (explicit measurement is more predictive of attitude-behavior consistency than implicit measures). A recent study on organ donation found that self-efficacy mediated the relationship between attitude and organ donation (Anker et al., 2010). This is especially intriguing because parent attitude toward eating healthy is

significantly correlated with self-efficacy in Table 4-6 and Figure 4-1, and self-efficacy, in turn, is correlated with adult diet quality.

In contrast to the HSM, the Social Cognitive Theory explained the data well, which squares with its frequent use in dietary change interventions (Hingle et al., 2010; Sahay et al., 2006). Particularly, the sugar-sweetened beverage (SSB) discouraging skill was strong correlated with several variables, including adult diet quality, nutrient dense availability, and energy dense availability and accessibility, and SSB discouraging skill was also moderately correlated with education and child diet quality. I attempted to fit a path model from education → SSB discouraging → adult diet quality → child diet quality, but the model did not fit the data well. However, the numerous correlations are encouraging and intriguing, especially in light of the negative publicity that SSBs have received in last several years in relation to child weight and diet quality (Hawkes, 2010; Ludwig et al., 2001; Malik et al., 2006; Reedy & Krebs-Smith, 2010; Wang et al., 2008). Several studies have examined the relationship between parent and child consumption, and/or home availability of SSB, with promising results (Berge et al., 2011; Bjelland et al., 2011; Ezendam et al., 2010; Hoerr, Lee et al., 2006; Hoerr et al., 2009; Pinard et al., 2011; Spurrier et al., 2008).

Another striking finding was the correlation between adult and child diet quality. As previously described, most evidence indicates that children's diets and parent's diets are correlated, whether overall patterns (Beydoun & Wang, 2009; Fisk et al., 2010; Hoerr, Horodynski et al., 2006; Papas et al., 2009), specific foods (Brown & Ogden, 2004; Fisher et al., 2002; Horodynski et al., 2010; Reinaerts et al., 2007; Sylvestre et al., 2007), or specific nutrients (Cullen et al., 2002) are considered. Often, concordance is low to modest, as suggested by the meta-analysis by Wang and colleagues (Wang et al., 2010), with correlations in the 0.2 to 0.3

range, but overall relationship do vary from study to study according to which component is considered, how the data were modeled, and the statistics that are reported. In this dissertation, adult and child diet quality described by the Healthy Eating Index were correlated with an $r=0.39$ ($p<0.05$). Other than adult diet quality, the only other variables that were directly significantly correlated with child diet quality were modeling (SSB discouragement modeling skills) and energy dense food accessibility, suggesting that research focusing on the home food environment and parental skills related to mealtime behaviors are potentially important ways to positively influence children's diet quality.

5.2. Strengths and limitations.

This dissertation research based on a pilot study had a number of strengths. It was a unique intervention development and evaluation project that combined all of the following aspects: (1) target population of low-income parents with young children, (2) home-based, (3) use of the Social Cognitive Theory and Heuristic Systematic Model, (4) objective in-home assessment of the home eating environment, (5) diet quality of children and parents. This combination of features adds to the emerging literature on the contribution of home food environment and modeling to diet quality of preschool children. Perhaps the most enlightening part of the data analysis and results is that of the post-hoc analysis. In particular, it was quite encouraging that a well-fitting path model was identified with a sample of 35 parents.

This is one of few interventions, if not the only intervention, with the goal of improving diet quality or preventing obesity in young children, that has used a dual-media format, i.e. workbook and DVD clips. This format has the potential to appeal to those who learn best using different modalities, like tactile versus aural versus visual. Overall, parents responded well to the

intervention, both in terms of format and content. In the qualitative evaluation data collected, 94% of the intervention participants agreed or strongly agreed that they would recommend the program to a friend; 100% liked the activities; and 94% agreed that the program was effective in changing their families' mealtimes. When asked in an open-ended question what they learned that helped them and their families, parents most often mentioned concepts in Chapters 2 ("Different ways to talk to her and encourage her to eat healthy," "To ignore some behaviors and use positive encouragement to reinforce desired behaviors") and Chapter 4 ("I've learned that getting my child involved in prepering [sic] the food helps her want to eat it and helps her with trying new foods.").

One positive aspect of the limited sample size is that we were able to conduct multiple in-home visits with parents in the intervention group to evaluate intervention progress and enhance compliance. This also allowed us to collect detailed process evaluation measures that will enhance future iterations of the intervention and allow us to streamline intervention content and deployment.

This dissertation research did have limitations that must be described. Most importantly, the sample size was a limiting factor of the data analysis in that there was not enough statistical power to detect many significant findings. This occurred because the grant project had distinct aims and hypotheses and a different primary outcome. Thus, the grant project was not specifically powered to detect differences in HSM variables, home food environment, or child diet quality. For the grant project, a sample size of approximately 40 participants was determined to be adequate to detect a 0.4 unit change on a 5-point average Likert scale of the Parent Feeding Questionnaire. Because the sample size was fixed prior to development of dissertation aims and hypotheses, the sample size of the dissertation research was accordingly budget-limited. Despite

that, the relatively high R^2 of the HSM, the non-significant data trends of Aims 2 and 3, and the significant correlations and path model identified in post-hoc analysis provide indicate that a larger sample would yield significant results. It is important to bear in mind that this project was conceived as a small pilot project from its inception and did allow us to obtain baseline and expected change data to use to power future studies.

There was a fairly high respondent burden with this study. Questionnaires took 30-45 minutes to complete, which may have compromised the integrity of the data. However, there were research aides present at each data collection visit, and the aides reported that parents made mention of the large number of questionnaires but overall were quite compliant. In addition to the length of time the surveys take to complete, the high number of study home visits will not be realistic in a larger study.

5.3. Recommendations for future studies.

The data gathered for this pilot study will be used to generate a larger-scale R01 grant application. To prepare for the larger study, intervention materials are currently being revised in a number of ways: chapters are being packaged as separate manuals so that the material is less daunting to parents, graphic appeal of materials are being enhanced by a professional graphic design firm, and parent evaluation interviews are being conducted to further tailor content to low-income parents. The internet is also being considered as an intervention distribution channel, the feasibility of which is also being investigated in parent interviews. We also plan to conduct a survey of the Head Start parent population to ascertain prevalence of internet connection in homes, internet connection speed, and familiarity of parents with internet so that parents do not perceive participation to be unnecessarily burdensome. Current data indicates that 21% of

Americans do not use the internet and only 66% have high-speed internet access (Smith & Pew Research Center, 2010). Those least likely to have internet access include those living in households earning less than $30,000 annually and those with less than a high school education (Zickuhr et al., 2012). Thus, we will need to make arrangements for those without reliable internet usage to participate, such as providing hard copies of intervention materials and conducting surveys via mail or telephone, to ensure that the results of the larger study are as generalizable to the target population as possible.

Future, larger versions of this study may benefit from including additional information in analyses. One such variable is parent BMI. In this dissertation 49% of the adults were obese (BMI $\geq$30) and 78% were overweight (BMI $\geq$ 25). In comparison, 36% of US adults are obese and 69% are overweight (Flegal et al., 2012). Anthropometric data were collected for the grant project and not used for the dissertation because the primary outcome of the dissertation was diet quality rather than BMI. However, research suggests that trends in obesity prevalence correspond to increased eating out of the home, fewer family meals, and increased portion sizes (Lachat et al., 2012; Nicklas et al., 2001) and that diet quality and BMI (Boynton et al., 2008; Laraia et al., 2007) and diet quality and abdominal obesity (Wolongevicz et al., 2010) are inversely related. Thus, it may be important to consider the effect of BMI of parents in future studies, given that diet quality of the parents may differ according to weight status, which could conceivably affect the home food environment and cognitive factors affecting eating decisions.

It may also be advantageous to consider other demographic characteristics in future studies, like the number and ages of children in the household and parent race/ethnicity and income level. Although parents and their children share the home food environment and thus share moderate dietary concordance, as discussed previously, each member of the family also experiences

individual environments outside of the home that also shape eating behaviors. General parenting behaviors differ across children in response to child characteristics like sex, birth order, and abilities (Holden & Miller, 1999; Keller & Zach, 2002). Therefore, it would be interesting to examine the impact of family composition characteristics on diet quality of parents and children. For all aspects of this dissertation research - home food environment, diet quality, and HSM – it would be informative to obtain a more diverse population. For example, recent HSM studies have primarily been done in largely white, highly educated female populations (Silk et al., 2012; Smith et al., in press). A larger sample of both men and women and a larger spectrum of income and education level would yield additional information about the utility of the HSM. In addition, involvement of a larger group of both mothers and fathers, again of more diverse socioeconomic strata, would provide more breadth analyses of diet quality and home food environment.

It is important to use the knowledge garnered from the pilot feasibility study to improve data collection methods and precision of results. Logistically, the pilot study revealed that the response burden of participants was high, the number of study visits unrealistic in a much larger study, and there was no data collected to evaluate the effect of timing of low-income food benefit distribution on data collection, particularly with respect to the home food environment. The surveys took 30-45 minutes, which may discourage participants from participating regardless of incentive, and those that do participate may not be able to dedicate undivided attention that acquisition of high quality data entails. In particular, the survey noted to consume the greatest amount of time by research aides was the 8-page Adult Block Brief 2000, for which participants were requested to report usual frequency and serving size of 67 different food items. This may have been overwhelming and tedious to some participants. Alternatively, researchers could perform 3-day dietary recalls over the telephone. Dietary recalls are generally considered the

gold standard in dietary assessment instruments and may not be as cost-prohibitive as generally believed (Kristal et al., 2005). Thus, conducting dietary recalls for adult dietary data could both reduce perceived participant burden and improve accuracy and cost. In addition, the number of study visits would have to be drastically reduced or eliminated in a larger study to ensure that data collection is manageable for research staff. Finally, it would be useful to collect time when food benefits are received each month. If, for instance, families stock up on food items shortly after receiving food benefits, the food environment may be more (or less, depending on purchase habits) nutrient-dense. Likewise, families who often use up benefits for some time before receipt of the next month's benefits may then experience dwindling of food in the home. This could also affect quality of the home food environment. It would be important to characterize these potential differences in the quality of the home food environment with respect to food assistance benefits in future research.

The sample size of the R01 study can be calculated using data from this dissertation. To determine the appropriate sample size for a study that detects differences in parent diet quality from pre-study to post-study in the control group compared to the intervention group, the following data from this dissertation were used: a change score of 1.1 for the intervention group (i.e. an increase 1.1 units of the HEI from pre- to post-study in the intervention group), a change score of -1.1 for the control group, a pooled standard deviation of 8.9, and a desired power of 80%. These specifications yielded a required sample size of 512 persons. The attrition rate in this study was 17%. Adjusting for losses to follow-up, then, the requested sample size for an R01 would be approximately 615 persons. It would also be desired to retest the path model confirmed in this dissertation (**Figure 4-2**). Structural equation modeling, including path analysis, typically requires large sample sizes of 200 or more participants (Kline, 2011). Kline (2011) indicates that

to estimate a sample size to maximize confidence in results, one should strive for 20 participants for each parameter in a model. The path model shown in **Figure 4-2** includes eight parameters, four direct effect parameters, three variance parameters, and one covariance parameters, which would therefore best be retested with a sample size of at least 160 participants. Thus, the previously identified sample size of 615 would be more than adequate for path analysis as well.

5.4. Conclusions

In summary, parent and child diet quality were highly correlated in this dissertation. Moreover, parent modeling, particularly of SSB, and home food environment were correlated with parent and child diet quality. Future studies with larger samples will be able to further explore how modeling and food environment moderate or mediate the relationship between adult and child diet quality. Further, it would interesting to tease out the relationships between parent attitudes and behaviors, such as whether self-efficacy indeed mediates or moderates the relationship between them. Finally, the possibility of future use of a modified version of the HSM in a larger population is interesting. These applications will certainly be a valuable contribution to the burgeoning field of parent-centered interventions to improve child diet quality and prevent child overweight.

APPENDICES

APPENDIX 1

ABBREVIATED INTERVENTION WORKBOOK

Eat Healthy, Your Kids are Watching

A parent's guide to developing healthy eating in preschoolers

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INTRODUCTION

The **purpose** of this guide is for you to learn how to help your children eat healthy for their normal growth and development. A key idea is that parents can control and do some things that will reduce stress to make meals and eating pleasant. The positive focus is on parents having healthy foods available and then eating these foods in front of their children. Also included are good ways to encourage, praise and talk to your child about food. You will even learn how to get your child to taste new foods without battles.

The development of this guide was strongly influenced by work of Carolyn Webster-Stratton, who created a program called The Incredible Years. The Incredible Years is a program that uses video and workbooks to reduce child behavior problems. Because the Incredible Years has been so successful, we used a similar format to help parents and children work through mealtime issues. Like Webster-Stratton, we focus on changes in the environment with activities to support these changes. For more information about the Incredible Years, see www.incredibleyears.com.

This guide includes short video clips (2-3 minutes) that show effective and ineffective ways that real parents interact with their children around food. Each clip has questions to think about, examples, short activities, practice points, and reminders to post in the house.

Please note that the video clips are unique in showing **real parents dealing with real feeding issues** and doing the best that they can. This means what is shown in a video clip is not necessarily what is recommended, but shown to help you think about what you do.

Overall key concepts

- Parental control that is disguised, like control of the environment and meal planning, helps to reduce child resistance at the table.
- Want your kids to reach for a healthy snack? Make sure fruits and veggies are within reach.
- Kids learn from watching you. Eat fruits and veggies and your kids will too.
- Let them learn by serving themselves. Let your kids serve themselves at dinner. Teach them to take small amounts at first. Tell them they can get more if they're still hungry.

- Children are still growing. Help them grow up strong. Serve fat-free or low-fat milk at meals.
- Sometimes new foods take time. Kids don't always take to new foods right away. Offer fruits and veggies many times. Give them a taste at first and be patient with them.
- Patience works better than pressure. Offer your children new foods. Then let them choose how much to eat. Kids are more likely to enjoy a food when eating it is their own choice. It also helps them to learn to be independent.

Symbols in this guide

Watch the DVD clip

Questions to think about

Activities

Things to Consider

CHAPTER 1: Food Environment

"Eat Healthy for a Happy Home"

The **food environment** means the foods around you. The purpose of this chapter is to show how the food environment affects the choices you make and offer your children. It is important to know how the choices you make can teach your child to make similar choices. The food environment affects your child's growth and development.

When parents control the food environment in advance and "behind the scenes," it helps to make meals and eating pleasant and reduces stress.

Part 1.1 What is in Your Fridge?

Think about the foods you have in your home. What types of foods do you buy for your family? Are there some from each food group? (Grains, Fruits, Vegetables, Dairy, Meat/Meat alternative) What are common snack foods in your home?

Put the DVD in the player, click on Lessons and click on Lesson 1, then, click on **"1.1 What's in your fridge?"** Find out what parents have on hand for their families. While watching, ask yourself what foods you have in your fridge and in your cupboards.

Watch Clip 1.1: What is in your fridge?

Questions

1. What foods and comments caught your attention?

   _____

   _____

2. "**Healthy foods" are high in vitamins and minerals but low in added sugar and solid fats**. What foods did the parents show that would be healthy?

   _____

   _____

3. Do you agree or disagree with what the parents in the video clip thought were healthy foods and drinks?

   _____

   _____

APPENDIX 2

IMMS SURVEY

Instructional Materials Motivation Survey

John M. Keller

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Tallahassee, Florida 32306-3030

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information before using.

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INSTRUCTIONS

1. There are 36 statements in this questionnaire. Please think about each statement in relation to the instructional materials you have just studied, and indicate how true it is. Give the answer that truly applies to you, and not what you would like to be true, or what you think others want to hear.

2. Think about each statement by itself and indicate how true it is. Do not be influenced by your answers to other statements.

3. Record your responses on the answer sheet that is provided, and follow any additional instructions that may be provided in regard to the answer sheet that is being used with this survey. Thank you.

1 (or A) = Not true

2 (or B) = Slightly true

3 (or C) = Moderately true

4 (or D) = Mostly true

5 (or E) = Very true

1. When I first looked at this activity, I had the impression that it would be easy for me.

2. There was something interesting at the beginning of this activity that got my attention.

3. This material was more difficult to understand than I would like for it to be.

4. After reading the introductory information, I felt confident that I knew what I was supposed to learn from this activity.

5. Completing the exercises in this activity gave me a satisfying feeling of accomplishment.

6. It is clear to me how the content of this material is related to things I already know.

7. Many of the pages had so much information that it was hard to pick out and remember the important points.

8. These materials are eye-catching.

9. There were stories, pictures, or examples that showed me how this material could be important to some people.

10. Completing this activity successfully was important to me.

11. The quality of the writing helped to hold my attention.

12. This activity is so abstract that it was hard to keep my attention on it.

13. As I worked on this activity, I was confident that I could learn the content.

14. I enjoyed this activity so much that I would like to know more about this topic.

15. The pages of this activity look dry and unappealing.

16. The content of this material is relevant to my interests.

17. The way the information is arranged on the pages helped keep my attention.

18. There are explanations or examples of how people use the knowledge in this activity.

19. The exercises in this activity were too difficult.

20. This activity has things that stimulated my curiosity.

21. I really enjoyed studying this activity.

22. The amount of repetition in this activity caused me to get bored sometimes.

23. The content and style of writing in this activity convey the impression that its content is worth knowing.

24. I learned some things that were surprising or unexpected.

25. After working on this activity for awhile, I was confident that I would be able to pass a test on it.

26. This activity was not relevant to my needs because I already knew most of it.

27. The wording of feedback after the exercises, or of other comments in this activity, helped me feel rewarded for my effort.

28. The variety of reading passages, exercises, illustrations, etc., helped keep my attention on the activity.

29. The style of writing is boring.

30. I could relate the content of this activity to things I have seen, done, or thought about in my own life.

31. There are so many words on each page that it is irritating.

32. It felt good to successfully complete this activity.

33. The content of this activity will be useful to me.

34. I could not really understand quite a bit of the material in this activity.

35. The good organization of the content helped me be confident that I would learn this material.

36. It was a pleasure to work on such a well-designed activity.

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Manual for the *Instructional Materials Motivation Survey* (IMMS)

John Keller

Florida State University[1]

Purpose

The Instructional Materials Motivation Survey is intended to be a situational measure of students' motivational reactions to instructional materials. It was designed in accordance with the theoretical foundation represented by the ARCS Model (Keller, 1987a, 1987b). This theory is derived from the current literature on human motivation; hence, many of the items in the IMMS are similar in intent (but not in wording) to items in established measures of psychological constructs such as need for achievement, locus of control, and self-efficacy, to mention three examples.

Method

After reviewing the concepts and strategies that comprise the ARCS model and a variety of instruments used to measure motivational constructs, a pool of items was prepared.

Results

Reliability estimates based on Cronbach's alpha measure were obtained for each subscale and the total scale. They were:

Attention: .89 Confidence: .90 Total Scale: .96

Relevance: .81 Satisfaction: .92

In a validational study, differences in two sets of instructional materials with respect to format, content, and other features affecting motivation were reflected in the differences in scores on the IMMS.

Note:

Additional information concerning the development of this survey and the results of the validation study will be included in the next draft of this document.

References

Keller, J.M. (1987). Strategies for stimulating the motivation to learn. Performance & Instruction, 26(8), 1-7.

Keller, J.M. (1987). The systematic process of motivational design. Performance & Instruction, 26(9), 1-8.

IMMS SCORING GUIDE

Instructions: The response scale ranges from 1 to 5. This means that the minimum score on the 36 item survey is 36, and the maximum is 180 with a midpoint of 108. The minimums, maximums, and midpoints for each subscale vary because they do not all have the same number of items.

An alternate scoring method is to find the average score for each subscale and the total scale instead of using sums. For each respondent, divide the total score on a given scale by the number of items in that scale. This converts the totals into a score ranging from 1 to 5 and makes it easier to compare performance on each of the subscales.

There are no norms for the survey. As it is a situation specific measure, there is no expectation of a normal distribution of responses. As data become available from a variety of applications of the scales, descriptive statistical information will be published.

Attention Items	**Confidence Items**
2 15 (reverse) 24	1 13 35
8 17 28	3 (reverse)
11 20 29 (reverse)	19 (reverse)
12 (reverse) 22 (reverse) 31 (reverse)	4 25
	7 (reverse)

	34 (reverse)
Relevance Items	**Satisfaction Items**
6 18 33	5 32
9 23	14 36
10 26 (reverse)	21
16 30	27

Scores are determined by summing the responses for each subscale and the total scale. Please note that the items marked *reverse* are stated in a negative manner. The responses have to be reversed before they can be added into the response total. That is, for these items, 5 = 1, 4 = 2, 3 = 3, 2 = 4, and 1 = 5.

APPENDIX 3

IMMS INTERVIEW SCRIPT

What did you think about Lesson X? What do you think Lesson X was trying to communicate?

ATTENTION

1. Anything catch your attention in Chapter X? What was engaging?

2. Quality of writing?

3. Parts that were boring?

4. Learn anything that you didn't know before?

5. Anything to improve materials in Chapter X?

6. Distractions that kept you from the materials?

7. Length of time: too long, too short, or just right?

8. What type of graphics or pictures might help with attention and understanding?

CONFIDENCE/COMPREHENSION

1. Difficulty too easy, too hard, just right?

2. Was there anything confusing or that you had trouble with? How can we clarify?

3. Amount of information: too much, too little, just right?

4. Exercises: too difficult, too easy, just right?

5. Confidence in test on the material?

6. How accurate did you perceive the materials/videos to be? Similarity? PMQ? Credibility?

7. Was there anything you disagreed with?

8. Do you see yourself incorporating any of the ideas or suggestions in the materials? If so what? How easy will this be for you?

9. Are there suggestions that you would like to incorporate but seem too hard or unrealistic?

RELEVANCE/FEASIBILITY

1. How relevant is the content to your life? How useful is the material to your own life?

2. Did you learn anything or did you already know most of the information?

3. If you learned, did this do a good job of building on what you already know?

4. Did you feel that reviewing this material was worth your time?

5. Do you think parents like you will find this information helpful?

6. Do you see yourself incorporating the information into your lives? How?

SATISFACTION

1. How much did you enjoy on a scale of 1 to 5 (highest)?

2. Were there things that you would like to learn more about?

3. Did you feel that the format flowed well?

Any suggestions for changes or additions?

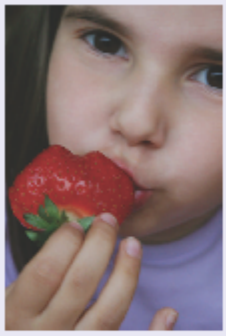
Anything you particularly liked/disliked?

How can we make it better?

APPENDIX 4

STUDY FLIER

MSU and CACS Head Start
Parent Feeding Research Study



Study Description

The purpose of this research study is to test a multi-media education program about home food & mealtime practices.

Details

- Recruiting 40 Head Start parents who are willing to try our materials
- Up to $75 cash for participating ($35 at end; $40 at 2 month follow-up)

Requirements

- Mother, father, or caregiver 18+ years with a 3-5 year old Head Start child
- Reachable by telephone; weekly access to DVD player
- Must speak and read English
- Children without special needs except for speech, language, and/or orthopedic issues

Contact

If interested, contact MSU Study Coordinator:

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APPENDIX 5

ABBREVIATED STUDY PROTOCOL

Version 10.28.10

STUDY MANUAL

PARENT FEEDING INTERVENTION DEVELOPMENT STUDY

Improving feeding practices for child diet and weight in low income families

NIH GRANT R21 HD064876-01A1
PI: HOERR, SHARON

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SPECIFIC AIMS

The prevalence of overweight and obesity in young children, 2-5 years of age, is unacceptably high at 24% and increasing at such rates that it has become a primary U.S. health care issue, especially in families with limited resources. The health and social consequences of childhood obesity are both acute and chronic, in part, because obesity tracks from childhood into adulthood. Health professionals seem at a loss with how to halt the increase, much less reverse this major problem. At the same time, resources required for treatment of obesity consequences like diabetes, hypertension and cardiovascular disease are escalating. Within the multiple-factor etiology of child obesity, poor diet quality, in terms of high intakes of energy-dense foods and low intakes of nutrient dense foods, is a major factor.

There is great interest in how parent feeding practices relate to the child's weight status and diet quality, but the specific nature and degree of the relationship is unclear. In laboratory settings, middle income parents who practice restrictive feeding tend to have children with higher weights and poorer diet quality due, in part, to inadequate development of self-regulatory ability among these children. On the other hand, it is also clear that permissive parenting and feeding practices relate to obesity in young children and to poor diet quality. Yet, recent pediatric guidance has recommended that parents "avoid overly restrictive feeding behaviors" in response to child obesity without addressing overly permissive practices. Emerging data suggest that increasing childhood obesity positively correlates with declines in family meal structure that include parent feeding practices. There is a critical need to evaluate the direction of the relationship between child weight status and family meals and the extent to which this relationship might be an effective strategy to address this national health care crisis. Furthermore, current problems with feeding instruments limit measurement of parental interventions to improve child-feeding practices. Such problems include few studies of families with limited incomes, a focus on demanding and restrictive practices and little focus on potential benefits of persuasive and covert environmental control.

The *long-term goal* of this study is to develop and test behavioral strategies for an R01 application to reduce childhood obesity and improve diet quality. The *objective* of this application is to build upon findings about parental feeding practices to develop and test interactive nutrition education materials for low-income parents. The research team of a behavioral nutritionist, a developmental psychologist, a quantitative methodologist in sociology, a biostatistician, and a producer in health communications is well positioned to complete this work, given the lengthy experience of the first two investigators with limited income populations. The specific aim and hypothesis are:

Aim. Develop and pilot test a video-based interactive educational intervention to improve caregivers' feeding control practices and optimize children's weight and food intake.

Hypothesis: A video based educational intervention can improve caregivers' non-directive and food environmental control and optimize their children's food intake and weight status.

Findings from this study will provide important information to health professionals who recognize the importance of emphasizing positive parent-child feeding interactions, but who have lacked evidence-based guidelines for action. This study will be an important step for evidence-based feeding guidelines and recommendations that health and child development professionals can use, especially those working with limited income parents of preschoolers.

METHODS

Study design

The research team will design an educational intervention building on the findings and constructs from the framework and instrument developed in a previous project [Murashima, 2010]. The intervention will take the form of a video-based, interactive educational intervention to improve parental feeding control and thereby optimize their child's food intake and weight status.

The goal here is working with stakeholders to produce a self-study guide involving short video segments for an interactive DVD with menu selection options plus a companion discussion guide and workbook including homework assignments [Webster-Stratton, 2003]. The interactive intervention will be used both to educate parents about the different types of feeding control and their effect on children's food intake and weight status and to stimulate discussion and reflection.

The rationale for selecting this type of education intervention includes several factors. 1) Healthy People 2010 cites the goal to "Use communication strategies strategically to improve health" especially with low income populations to reduce the 'digital divide' [U.S. Department of Health and Human Services, 2000]. 2) A review of evidence-based communication tools demonstrated that those most likely to increase understanding are structured, tailored and interactive [Trevena, et al., 2006]. 3) Video-based interventions targeting low-income parents have improved parenting skills [Gardner, et al., 2006; Silk, et al., 2008]. 4) Short films known as education-entertainment (E-E) have positively affected peoples' intention to change their behavior [Hether, et al., 2008; Lapinski & Nwulu, 2008; Valente, et al., 2007]. The E-E perspective is based, in part, on Social Learning Theory and suggests that observational learning can change knowledge, attitudes and behavior [Bandura, 2001; Igartua, et al., 2003; Piotrow, et al., 1990; Singhal, et al., 2008]. Recent studies suggest that adding emotion and involvement enhances the explanatory power of a video-based intervention to change behavioral intent [Bae & Kang, 2008]. 5) Finally, such a video based intervention was requested by pediatric residents and caregivers from a well child clinic in Lansing, Michigan as a way to provide useful and engaging information important to children's diet quality and weight status [Lee, et al., 2008]. Inadequate evaluation of interactive health communications has been a criticism of the Scientific Panel of Interactive Health Communications [Robinson, et al., 1998]. Thus, their recommended evaluation template will be used for the video intervention (Appendix 1). The template includes both formative and process evaluation as well as outcome evaluation [Robinson, et al., 1998].

Target population
The target population is families with 3-5 year old children participating in the Head Start programs in several counties of central Michigan (Ingham, Eaton, Shiawassee, Clinton). Head Start is a national program for children 3-5 years old from families with a gross income less than 130% of the poverty index. Nationally, one million children participate in Head Start Program, and 10% must be those with special needs (such as asthma or a physical, mental or emotional disability). In the target area, 1,323 children were enrolled Fall 2008 [40.4% white, 28.4% African-American, 9.8% Hispanic American, 2.4% Asian/American Indian and 18.7% multiple races]. At that time, there was a high rate of overweight children with 45.0% >85th percentile of BMI-for-age; 25.8% >95th percentile; compared to 54.5% between the 5th and 85th percentile and 0.5% under the 5th percentile.

Recruiting participants
The researchers and Head Start staff will recruit parents (defined as the primary food caregiver in the household) of a 3-5 year old child participating in the Head Start program. Recruitment tools include flyers. Parents must be 18 years old or older, reachable by phone, and speak and read English. The target child must not have special needs other than speech, language, and/or orthopedic issues. From past research experience with Head Start in central Michigan, 95% of the primary food caregivers will be mothers. Using an incentive of a $25 gift certificate to a local grocery store has worked well in the past in Michigan, where 330 mothers were recruited from ~1300 eligible participants within 3 months. Given good cooperation with Head Start staff, this method is feasible.

Procedures
<u>Part A. Video-taping to select families for vignettes.</u>
Researchers will recruit 16 families. Then, researchers will contact the parents to schedule home appointments for interviewing and videotaping. An authentic and natural home environment will be the key to producing effective messages. The researchers will request that the parents avoid "staging" their homes during these visits. During the home visit, researchers will first query parents about their family food preparation practices and mealtime interactions focusing on the three types of feeding control practices. Video producers at CAS Media, the media production unit of the College of Communication Arts & Science at MSU, will videotape parent-child interactions during mealtime. The parents' incentive for completing a home visit will be $40 cash.

Participants, Part A. Sixteen families will be recruited from Head Start sites by ethic/racial diversity for 4 Caucasian, 4 African American, 4 Hispanic American, and 4 Asian-American families. After initial home interviews,

researchers will select 1-2 families from each race-ethnic group for further videotaping during mealtimes, depending upon their confidence in front of the camera and ability to articulate. Informed consent will be obtained from each caregiver prior to any assessment or interviews.

Part B. Formative assessment and development of lessons and video vignettes.

The pilot data demonstrated seven sub constructs of parental feeding control, three of which were associated with negative child outcomes in diet and weight status, and four of which showed positive outcomes. The goal for the intervention is to design an interactive educational program to help parents reduce their use of high control, contingency feeding, and modeling energy-dense foods and increase their practice of child-centered feeding, modeling nutrient-dense foods, meal structure and meal timing. To this end, we will develop a six lesson self-study guide with video vignettes to stimulate discussion and feature real parents of diverse race-ethnicities in their own homes feeding their preschool children. Each lesson in the study guide, designed to be completed within 30 minutes and written at a 3rd to 5th grade reading level, will follow a pattern used in a successful mental health curriculum used across the world called, "The Incredible Years" by Webster-Stratton [Webster-Stratton, et al., 1988]; [Webster-Stratton, 2003] (Appendix 2). Each lesson will have the following format:

1) Key concepts
2) 3-10 video vignettes featuring a feeding control sub-construct each followed by questions to think about; considerations and brainstorming ideas as appropriate
3) Questions that parents ask about the concept with answers
4) Post-it notes and handouts
5) Behavior record with the child's response to be charted for one week

Following an introductory lesson, the next two lessons will focus on the child centered feeding constructs and then move to three lessons will start with a positive focus on the feeding environment constructs (food accessibility, meal time and meal structure). The parent centered feeding control behaviors to be reduced will be used as poor examples in the vignettes when child centered feeding practices are discussed. There will be a bonus lesson or feature like 'Cooking with Kids' and 'Fun with Food' with simple recipes and activities that parents and kids can engage in the kitchen.

The senior producer will draft storyboards for the vignettes. Use of simple animations will help involve small children who might be present during viewing. Studies have shown that video segments punctuated by bar charts, graphics, cartoons and music can be motivational and aid understanding [Delp

& Jones, 1996; Trevena, et al., 2006], so researchers will employ these techniques. The use of graphics will aid transitions between certain segments and reinforce the messages. Music that parents like will be customized for the videos and varied to highlight key messages. We plan to integrate these messages with those developed by USDA in 'Maximizing the Messages'[US Department of Agriculture & Food and Nutrition Service, 2008b]. Keller's ARCS Model of motivational design will be used to develop videos, self-study workbook and handouts that are intrinsically motivating for the parent by capturing **A**ttention, having **R**elevant content, and promoting learner **C**onfidence and **S**atisfaction (Appendix 3)[Song & Keller, 2001].

The delivery of the intervention is proposed as follows (underlined weeks include a home visit):

Week 1- Introductory Lesson 1 to a parent group at a Head Start site and baseline measurements;
Week 2- An educator does a home visit to assess the home food environment and teach Lesson 2 leaving the materials for the next 2 weeks.
Week 3- Parents track daily progress on food accessibility and an educator calls to check progress;
Week 4- Parents do Lesson 3 on meal structure;
Week 5- Parents track progress with meal structure and an educator does a home visit;
Week 6- Parents do Lesson 4 on meal timing;
Week 7- Parents track daily progress with meal timing and an educator calls to check progress;
Week 8- An educator visits for evaluation of parent progress and teaches Lesson 5 on child centered feeding practices leaving Lesson 6 for the parents;
Week 9- Parent tracks progress with child centered practices;
Week 10- An educator visits home to evaluate progress, conduct all post measurements and deliver incentive.

Participants, Part B. Researchers will recruit 12 parents, three from each race/ethnic group plus Mixed race-ethnicities, to review the materials using the Instructional Motivation Measurement Survey (IMMS; Appendix 4) [Keller, 1987a, 1987b]. The IMMS is a 36-item Likert scored instrument intended to be a situational measure of people's motivational reactions to instructional materials. It was designed in accordance with the theoretical foundation represented by the ARCS Model [Keller, 1987a, 1987b]. Reviewed scripts with scores less than 3.5 out of a maximum score of 5 for any of the four ARCS domains will be analyzed and edited. Each parent will review the video scripts and the accompanying workbook material for 3 (?) lessons, so that

each will be reviewed by 3 parents. Compensation will be a $20 gift card to a grocery store.

Part C. Video-taping for the educational vignettes.
After reviewing and editing the scripts and handouts, researchers will then select 4-8 parents for use in the educational video segments. These featured parents will be videotaped for several hours. Incentive for this portion will be $300 cash per family upon completion of the home mealtime videotaping. The researchers will use the data and materials to develop DVDs with six menu-selected lessons and video vignettes. Research staff will collect consent and video release materials from all participants in the videotaping segments and the production process. This will facilitate the distribution of the final video-based study guides to reach a wider audience on the web and any future media outlets.

Part D. Formative assessment of video segments.
Before pilot testing, 12 new parents, three from each of the four race/ethnic groups, will be recruited to evaluate the materials (6 lessons) using IMMS again. Each parent will be asked to review the video segments and the accompanying study guide from 2 lessons, so that each will be reviewed by 4 parents. Additional formative evaluation on each lesson will consist of cognitive interviews with at least 4 parents for each lesson to check for understanding of the message and any additional info that should be included [Willis, 2005]. Incentives for this task will be $20 gift cards.

Part E. Pilot test of the interactive intervention.
Forty caregivers who have not participated in the data collection in Part A will be recruited. The delivery venue for the pilot test of the intervention will begin at a Head Start parent meeting to minimize inconvenience to the families and allow for provision of childcare. At the first parent meeting, researchers and educators will introduce the program, collect consent forms and baseline measurements (Appendix 5) and conduct the first lesson and video segments providing instructions for home study. Parents will take home a self-study guide and follow the proposed delivery schedule as outlined earlier in Part B. At the third and last home visit, post-treatment measurements will be taken, incentives distributed, and arrangements made for a 2-month follow-up visit and final measurements. The incentive for the post measurements is $30 and for the 2 month follow-up is $45 as gift cards to a local large grocery store. Fidelity of lesson delivery. To make sure the intervention itself is carried out by parents as intended (watching tapes, doing homework and completing the workbook activities and sheets) fidelity assessment will be done by the parents and SNAP-Ed educators at each session and at the end of the intervention using check sheet format [Esters, et

al., 2008; Strayer, et al., 2010]. These procedures will be used and refined in the pilot test and implemented in a randomized intervention trial.

Analysis, Part E. A paired t-test will compare the scores for types of feeding control practices and child intake variables (frequency and amount of nutrient-dense foods and energy-dense foods; BMI percentile of child) between Time 1 (before viewing any video segments) and Time 2 (after the intervention). To rule out the possibility that a small proportion of the many significance tests to be performed have given statistically significant results by chance alone, we will also perform a repeated-measures Multivariate Analysis of Variance or a nonparametric test, if the data are not normally distributed.

Timeline of activities

	2010				2011							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Prep. IRB Approval	X											
Prep. Develop screening questions for 16 families	X											
Prep. Develop baseline/post questionnaire about family eating (e.g. food prep, eating out, family meals)	X											
Part A. Develop lessons & video vignettes	X	X	X									
Part A. Production Plan; videotaping of 16 families for vignette selection	X	X	X									
Part B. Draft storyboards (ARCS)			X									
Part B. Recruit 12 families & conduct IMMS; revision of materials				X								
Part C. Videotaping for educational vignettes of 4-8 families					X	X						
Part D. Formative assessment of lessons & videos by 12 families; revisions						X	X					
Part E. Develop protocols for home visits & phone calls.						X	X					
Part E. Train research aides for pilot							X					
Part E. Pilot intervention in 40 families, Home visits								X	X	X		
Part E. 2 month follow up visit											X	
Part E. Analysis											X	X
Part E. Manuscript preparation											X	X

Important Dates

Oct 25, 2010	Taping for Part A begins
Nov 10-Nov 19, 2010	End of taping for Part A
Jan 24-Feb 25, 2011	Taping for Part C begins

STUDY AT-A-GLANCE

Activity	Dates	# Parents	Description	Incentive
Part A. Videotape family selection	Sep - Nov 2010	16	• Recruit from 1540 parents (Fall 2010 enrollment); From Parent Involvement Committee or Family Advocate (FA) meeting • Schedule home appointments • Request authentic and natural home environment and avoidance of "staging" homes. • Completion of questionnaires • Videotape of parent-child interactions during mealtime	$40 cash
Part B. Formative assessment & rx development	Nov - Dec 2010	12	• Develop a four lesson self-study guide with video vignettes • Each lesson in the study guide designed to be completed within 30 minutes and written at a 3rd to 5th grade reading level • Researchers will recruit 12 parents to review the materials using the IMMS • Each parent will review the video scripts and the accompanying workbook material for 2 lessons	$20 gift card to grocery store
Part C. Videotaping vignettes	Jan - Feb 2011	4-8	• Recruit 4-8 parents for video segments. • Tapings will last several hours • Research staff will collect consent and video release materials from all participants in the videotaping segments and the production process	$300 cash
Part D. Formative Assessment	Feb - Mar 2011	12	• 12 new parents recruited to evaluate the materials (Videos and study guides) using IMMS • Each parent will be asked to review 2 video segments and the accompanying study guide • Cognitive interviews with at least 4 of the parents for each.	$20 gift cards
Part E. Pilot test	Apr - Jun 2011	40	• 40 caregivers will be recruited; Spring Head Start enrollment is in March • Delivery begins at Head Start parent meeting • At 1st meeting, researchers will introduce the program, collect consent forms and baseline measurements and conduct the first lesson and video segments providing instructions for home study. • Parents will take home a self-study guide and follow the delivery schedule in Part B. • At 3rd home visit, post-treatment measurements will be taken, incentives distributed, and arrangements made for a 2-month follow-up visit and final measurements.	$30 post $45 2m FU $75 total in grocery gift cards

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APPENDIX 6

STUDY PROGRESS PHONE CALL/VISIT SCRIPT

SCRIPT & NOTES:
Last week, you had chapter 1.1 to 1.3 about: What's in your Fridge, What are Healthy Foods, and Having Healthy Snacks Visible & Accessible.

What stands out to you in these sections?

What new things did you learn?What went particularly well? Why?

Did you run into any problems with the material, writing, or video clips? What?

Did you run into any problems with any specific activity?

How long did it take you to complete?

Is there anything this week that interfered with your ability to get the activities done (e.g. lack of time; environmental distractions; family issues)?

Thank you! *(If not already scheduled)* Can we schedule the next home appointment?

Other notes:

APPENDIX 7

COMPLIANCE AND COMPREHENSION ABSTRACTION FORM

ID#_____ Objectives Question Form **WEEKS 1 & 2**

1.1 What's in your fridge?

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Activity	Y	N	Y	N
Notes about 1.1				

1.2 What are healthy foods?

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Question 4	Y	N	Y	N
Activity	Y	N	Y	N
Notes about 1.2				

1.3 Have healthy snacks visible and accessible for children

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Question 4	Y	N	Y	N
Question 5	Y	N	Y	N
Notes about 1.3 Questions				

1.3 continued

Do you have healthy foods where your child can see and reach them?

Yes No → Why not?_____

Okay, what's an example of how you've made a healthy food accessible?

_____

1.4 How much does your child need?

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Question 4	Y	N	Y	N
Notes about 1.4				

1.4 continued

Does your child need the same amount of food as you?

Yes No → How much does he/she need? _____

Okay, why do you think so?

_____

1.5 Healthy eating helps children develop.

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Activity	Y	N	Y	N
Notes about 1.5				

1.6 The Challenges of Getting Healthy Foods

Questions/Activities	Completed?		Understood?	
Pre-video questions	Y	N	Y	N
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Activity part 1	Y	N	Y	N
Activity part 2	Y	N	Y	N
Notes about 1.6				

ID#_____ Objectives Question Form **WEEKS 3 & 4**

2.1 Modeling overview

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Activity	Y	N	Y	N
Notes about 2.1				

2.2 Talking about eating healthy

Do you talk about eating healthy with your child?

Yes ↓ No → Ok, why not? _____

Ok, please give an example:

2.3 Tasting new foods

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Question 4	Y	N	Y	N
Question 5	Y	N	Y	N
Activity	Y	N	Y	N
Notes about 2.3				

2.3 Continued

Do you believe it is important for your child to taste new foods?

Yes ↓ No → Why not? _____

2.3 Tasting new foods (continued)

Ok, please explain why you think it is important _____

2.4 Creating a good mealtime environment

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Activity 1	Y	N	Y	N
Activity 2	Y	N	Y	N
Activity 3	Y	N	Y	N
Notes about 2.4				

2.5 Challenges and contradictions in modeling

Does your child and family benefit when all caregivers are consistent?

Yes No ⟶ Why not? _____

↓ _____

Does your child and family suffer when caregivers are inconsistent?

Yes No ⟶ Why not? _____

↓

Ok, how?

_____

_____

ID#_____ Objectives Question Form **WEEKS 5 & 6**

3.1 Types of praise

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Question 4	Y	N	Y	N
Activity 1	Y	N	Y	N
Activity 2	Y	N	Y	N
Notes about 3.1				

3.2 Encouraging tiny steps

Has your child taken any small steps towards eating healthy or trying something new?

Yes → Okay, what have you done to encourage your child to take this step?

No → Okay, what could you do to encourage your child to take a small step in this direction?

_____

_____

_____

3.3 Praise yourself and your partner

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Activity part 1	Y	N	Y	N
Activity part 2	Y	N	Y	N
Notes about 3.3				

3.3 continued

Is praising yourself or your partner part of being a good model for your child?

Yes ↓ No → Ok, why not? _____

Ok, how is it part of being a good model?

_____

3.4 Catch them in the act

If your child is behaving well at mealtime is it important to acknowledge the specific behavior?

Yes No ⟶ Ok, why don't you think so? _____

↓

Ok, please give an example

_____

Are there **some** bad behaviors (that aren't safety issues) you can ignore at mealtime?

Yes No ⟶ Ok, why can't you ignore them?_____

↓

Ok, please give an example

_____

Activity notes:

_____

3.5 Body language of praise

Does body language make praise more powerful? Like making eye contact, hugging or smiling at your child.

Yes No ⟶ if not, what effect does body language have?_____

↓

Ok, how does your child benefit when you use body language with praise?

_____

4.1 parent feeding behaviors

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Question 4	Y	N	Y	N
Question 5	Y	N	Y	N
Activity part 1	Y	N	Y	N
Activity part 2	Y	N	Y	N
Activity part 3	Y	N	Y	N
Notes about 4.1				

4.2 Can you use food rewards for good behavior?

Is it a good idea to use food as a reward?

Yes No ⟶ Ok, why not? _____

↓

Ok, what makes it a good idea?

_____

Can you use things other than food as rewards?

Yes No ⟶ Why not? _____

↓

Okay, please give an example of what can be used

_____

4.3 Some rules and limits can help

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Activity	Y	N	Y	N
Notes about 4.3				

Are rules at mealtime good for preschoolers?

Yes → Ok, why do preschoolers like rules?

No → Ok, why not? _____

_____

4.4 involving the child and making mealtime fun

Questions/Activities	Completed?		Understood?	
Question 1	Y	N	Y	N
Question 2	Y	N	Y	N
Question 3	Y	N	Y	N
Activity part 1	Y	N	Y	N
Activity part 2	Y	N	Y	N
Notes about 4.4				

5.1 Pressure to eat vs. encouragement

Is using pressure the best way to get your child to eat?

Yes No ⟶ Ok, what is the best way and why? _____

Ok, why do you think pressure is best?

_____

Does using encouragement at mealtimes work for your child?

Yes No ⟶ what happens when you use encouragement? ____

Ok, why do you think it works better than pressure?

_____

5.2 How to handle "sometimes" foods

Are there foods that should be for adults only?

Yes No ⟶ Ok, how do you handle sometimes foods? _____

Ok, please give an example of an adult's only food in your home and why your child is restricted from eating it.

_____

5.3 Is punishment necessary?

Is punishing your child at mealtimes necessary?

Yes No ⟶ Ok, why does punishment have a negative effect?

_____

Ok, what makes the punishment necessary?

_____

APPENDIX 8

CONTROL GROUP CONTACT LETTER

MICHIGAN STATE
UNIVERSITY

June 14, 2011

«First_Name» «Last_Name»
«Street_Address»
«City», MI «Zip_Code»

Hi «First_Name»,

Thank you so much for your willingness to participate in our MSU-Capital Area Head Start Parent Feeding study! We really appreciate the time you set aside on «Week_0_Baseline» for us to come to your home to complete surveys and take you and your child's height and weight.

We just wanted to send a quick hello and reminder that we will be calling soon to set up a week 8 visit. Your week 8 visit will be approximately **«HOME_WEEK_8»**. At this visit, we will again ask you to complete surveys and take you and your child's height and weight. You will receive $35 at the end of this visit.

If you have any questions or would prefer to give us a call, please call Dr. Sharon Hoerr's nutrition lab at (517) 355-8474 x 156 or Melissa Reznar, the study coordinator, at (248) 470-0064.

Thanks again from the study team!

Sharon Hoerr, PhD, RD

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APPENDIX 9

INTERVENTION EVALUATIONS

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
1. This was an acceptable program for our family's mealtimes.	1	2	3	4	5
2. Most parents would find this program appropriate for mealtimes.	1	2	3	4	5
3. This program was effective in changing my family's mealtimes.	1	2	3	4	5
4. I will suggest the use of this program to other parents.	1	2	3	4	5
5. My family and I needed this program because our mealtimes needed to be better.	1	2	3	4	5
6. Most parents would find this program good for improving mealtimes.	1	2	3	4	5
7. The program suggested good ways to handle problems in my family's mealtimes.	1	2	3	4	5
8. I liked the activities used in the program.	1	2	3	4	5
9. Overall, the program was beneficial for my family.	1	2	3	4	5

I. **How much has your home food environment changed, if at all, since you began the program (think about healthy and unhealthy foods in your home and how visible they are to the child)?**

1	2	3	4	5
A lot of **positive** change	A little **positive** change	No change	A little **negative** change	A lot of **negative** change

II. **How much has your food modeling changed, if at all since you began the program (think about role modeling in front of your child; mealtime distractions; and trying new foods)?**

1	2	3	4	5
A lot of **positive** change	A little **positive** change	No change	A little **negative** change	A lot of **negative** change

III. **How much has your praising changed, if at all, since you began the program (think about specific, labeled praise; praising yourself and your partner; and using body language)?**

1	2	3	4	5
A lot of **positive** change	A little **positive** change	No change	A little **negative** change	A lot of **negative** change

IV. **How much has making mealtime fun changed, if at all, since you began the program (think about types of parent feeding behaviors; involving the child in mealtime preparations; and using non-food rewards)?**

1	2	3	4	5
A lot of **positive** change	A little **positive** change	No change	A little **negative** change	A lot of **negative** change

V. **How much has difficult mealtime behavior changed, if at all, since you began the program (think about pressure & encouragement; sometimes foods; and using ignoring versus punishment)?**

1	2	3	4	5
A lot of **positive** change	A little **positive** change	No change	A little **negative** change	A lot of **negative** change

VI. **What have you learned from the program that has helped you and your family?**

_____

_____

_____

APPENDIX 10

INTERVENTION EVALUATION DATA

	Mean	Std	Range	Strongly disagree		Disagree		Neutral		Agree		Strongly Agree	
				n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
This was an acceptable program for our family's mealtimes.	4.4	0.62	3-5	0	(0%)	0	(0%)	1	(6%)	8	(50%)	7	(44%)
Most parents would find this program appropriate for mealtimes.	4.7	0.48	4-5	0	(0%)	0	(0%)	0	(0%)	5	(31%)	11	(69%)
This program was effective in changing my family's mealtimes.	4.2	0.41	4-5	0	(0%)	0	(0%)	1	(6%)	12	(75%)	3	(19%)
I will suggest this program to other parents	4.5	0.63	3-5	0	(0%)	0	(0%)	1	(6%)	6	(38%)	9	(56%)
My family and I needed this program because our mealtimes needed to be better.	3.6	0.81	2-5	0	(0%)	1	(6%)	6	(38%)	7	(44%)	2	(13%)
Most parents would find this program good for improving mealtimes.	4.5	0.63	3-5	0	(0%)	0	(0%)	1	(6%)	6	(38%)	9	(56%)
The program suggested good ways to handle problems in my family's mealtimes.	4.1	0.89	2-5	0	(0%)	1	(6%)	2	(13%)	7	(44%)	6	(38%)
I liked the activities used in the program.	4.3	0.48	4-5	0	(0%)	0	(0%)	0	(0%)	11	(69%)	5	(31%)
Overall, the program was beneficial for my family.	4.5	0.63	3-5	0	(0%)	0	(0%)	1	(6%)	6	(38%)	9	(56%)

How much have the following things changed since you began the program?

	n	Mean	Std	Range	A lot positive		A little positive		No change		A little negative		A lot negative	
					n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Home food environment	13	1.8	0.44	1-2	3	(23%)	10	(77%)	0	(0%)	0	(0%)	0	(0%)
Food modeling	13	1.6	0.65	1-3	6	(46%)	6	(46%)	1	(8%)	0	(0%)	0	(0%)
Praising	13	1.8	0.83	1-3	6	(46%)	4	(31%)	3	(23%)	0	(0%)	0	(0%)
Making mealtimes fun	15	1.7	0.46	1-2	4	(27%)	11	(73%)	0	(0%)	0	(0%)	0	(0%)
Difficult behavior	15	1.9	0.46	1-3	2	(13%)	12	(80%)	1	(7%)	0	(0%)	0	(0%)

APPENDIX 11

STUDY INSTRUMENTS

Outcome-relevant scale

	Strongly Disagree						Strongly Agree
The amount of healthy food that I eat has little impact on my life.	1	2	3	4	5	6	7
My life would be changed if I ate more healthy food.	1	2	3	4	5	6	7
My quality of life would not change depending on the amount of healthy food I eat.	1	2	3	4	5	6	7
It is easy for me to think of ways that my intake of healthy food influences my well-being.	1	2	3	4	5	6	7
Consuming the recommended amount of healthy food affects my daily life.	1	2	3	4	5	6	7
It is difficult for me to think of ways the amount of healthy food impacts my life.	1	2	3	4	5	6	7
My well-being has little to do with the amount of healthy food I eat.	1	2	3	4	5	6	7
All in all, the effects of eating healthy food on my life would be little.	1	2	3	4	5	6	7

Knowledge Test

1. What is the **best** description of what a healthy food is?

    a. A food that is organic and pesticide-free

    b. A food that has a lot of vitamins and minerals with little added sugar and solid fat.**

    c. A food that is low-fat and has more than 3 grams of fiber.

2. What is the **best** choice for a sweet snack?

    a. 100% juice

    b. An orange**

    c. Applesauce

3. What is an appropriate serving size of a food for a preschooler?

    a. 1 Tablespoon per year of age**

b. Enough to cover the bottom of the plate with a thin layer

c. About 1 cup

4. Which of the following is the **best** way to keep healthy food visible and accessible?

    a. By stocking the freezer with frozen fruit juice pops

    b. By putting healthy food in clear, plastic containers at the front of the fridge where kids can reach them**

    c. By making sure chips are on top of the fridge out of reach

5. What are the recommendations for beverages for preschoolers?

    a. Children should have as much 100% fruit juice as they want, because it is packed with nutrients

    b. Children should have whatever they want to drink, because beverages don't count as much as food

    c. Children should only have ½ cup of fruit juice a day because there is natural sugar in it that can cause cavities**

6. Which is the **best** description of snacking by preschoolers?

    a. Preschool children need to eat every 2-3 hours and many children have 2 snacks a day**

    b. Preschool children should snack whenever they want, even right before meals, because they are growing

    c. Preschool children should never snack so that they are hungry at mealtime

7. Which of the following is the **best** description of preschoolers tasting new foods?

    a. Preschoolers should have at least four bites of every new food, because that's the only way to know for sure if they like it

b. If the child just puts the food on his or her tongue it's okay, because it takes up to 15 times before they like it**

c. A child should be made a different food, if they don't want to taste a new food

8. When your preschooler is about to try a new food that he or she has never tried, which of the following is the best way to handle the situation?

    a. Telling your child that you don't like a food so they know that you won't eat it

    b. Letting the child taste a food to decide for him or herself, if they like it before saying anything**

    c. Making the child have at least 4 bites of the food, before giving up on it

9. Should the TV be ON or OFF during mealtimes and why?

    a. TV ON, because the TV helps keep the kids quiet

    b. TV OFF, because children will not eat too much when distracted by TV**

    c. TV OFF, because the child will learn to enjoy the taste of their food more when there are less distractions.

10. Should two adults in the household discuss food disagreement IN FRONT of preschool children or IN PRIVATE and why?

    a. IN FRONT so children know how to handle conflicts

    b. IN PRIVATE so that both adults teach the same thing and do not confuse the child**

    c. IN FRONT so that the child can decide who to agree with

11. What is the **best** example of modeling healthy eating using words?

    a. "These apples are a great sweet snack, because they have lots of nutrients."**

b. “Broccoli is not bad, when you put cheese on it.”

c. “I hate zucchini, but you might like it.”

12. Does eating healthy in front of your preschool child (modeling) make a difference and why or why not?

    a. NO, they are too young to know what is going on and will figure out their own tastes when they are older

    b. NO, what I eat has no affect on what they eat

    c. YES, they learn by watching me and others in the house, even when we do not know they are watching**

Heuristic Cues: Perceived Similarity

How similar or dissimilar are the people in Clip 1 to you in the following ways?

	Very Similar								**Very Dissimilar**
Values	1	2	3	4	5	6	7	8	9
Personality	1	2	3	4	5	6	7	8	9
Hobbies & interests	1	2	3	4	5	6	7	8	9
Overall	1	2	3	4	5	6	7	8	9
Ethnic background	1	2	3	4	5	6	7	8	9
Cultural background	1	2	3	4	5	6	7	8	9

Heuristic Cues: Source Credibility

I felt the source of the materials in Lesson 1 of the workbook was…

Inexpert						Expert
1	2	3	4	5	6	7
Unethical						Ethical
1	2	3	4	5	6	7
Dishonest						Honest
1	2	3	4	5	6	7
Untrained						Trained
1	2	3	4	5	6	7
Uninformed						Informed
1	2	3	4	5	6	7
Unprincipled		3	4	5		Principled

1	2				6	7
Incompetent						Competent
1	2	3	4	5	6	7
Untrustworthy						Trustworthy
1	2	3	4	5	6	7

Heuristic Cues: Perceived Message Quality

	Strongly Disagree						**Strongly Agree**
I felt the materials in Lesson 1 were appropriate.	1	2	3	4	5	6	7
I felt the materials in Lesson 1 were effective.	1	2	3	4	5	6	7
I felt the materials in Lesson 1 were informative.	1	2	3	4	5	6	7
I felt the materials in Lesson 1 were credible.	1	2	3	4	5	6	7
I felt the materials in Lesson 1 were thorough.	1	2	3	4	5	6	7

Attitudes

For me, eating healthy food is…
For me, eating snack food is…
Having healthy food available in the home is…
My child eating healthy foods is…

Good						Bad
1	2	3	4	5	6	7
Positive						Negative
1	2	3	4	5	6	7
Beneficial						Harmful
1	2	3	4	5	6	7
Valuable						Worthless
1	2	3	4	5	6	7
Calming						Distressing
1	2	3	4	5	6	7
Acceptable						Unacceptable
1	2	3	4	5	6	7

Social Cognitive Constructs: Self-Efficacy

How sure are you that you can do these things?

	Very Sure I CAN			**Unsure**			**Very Sure I CANNOT**
Serve healthy foods to my family when	1	2	3	4	5	6	7

preparing meals at home?							
Serve healthy foods to my family when eating meals away from home?	1	2	3	4	5	6	7
Prepare tasty, easy recipes that are healthy?	1	2	3	4	5	6	7
Serve healthy food to my family when I am low on money for buying food?	1	2	3	4	5	6	7
Serve my family healthy foods when I do not have a lot of time?	1	2	3	4	5	6	7

Social Cognitive Constructs: Outcome Expectancies

	Strongly Disagree						**Strongly Agree**
Healthy foods can be expensive.	1	2	3	4	5	6	7
Healthy foods help protect my family from diseases like cancer and heart disease.	1	2	3	4	5	6	7
Sometimes it takes too much time to prepare healthy foods.	1	2	3	4	5	6	7
Healthy foods can help keep my family from getting sick with colds and infections.	1	2	3	4	5	6	7
Buying healthy foods may mean more trips to the store.	1	2	3	4	5	6	7
Healthy foods can help my family members have a healthy weight.	1	2	3	4	5	6	7

Social Cognitive Constructs: Skills: Parent Feeding Questionnaire

	Never	**Rarely**	**Some-times**	**Most of the time**	**Always**
I beg my child to eat dinner.	1	2	3	4	5
I spoon-feed my child to get him or her to eat dinner.	1	2	3	4	5
I physically struggle with my child to get him or her to eat (for example, putting my child in the chair so he or she will eat).	1	2	3	4	5
I warn my child that you will take away something other than food if he or she doesn't eat (for example, "If you don't finish your meal, there will be no TV tonight after dinner").	1	2	3	4	5
I promise my child to something other than food if he or she eats (for example, "If you eat your beans, we can play ball after dinner").	1	2	3	4	5

	Never	Rarely	Some-times	Most of the time	Always
I encourage my child to eat something by using food as a reward (for example, “If you finish your vegetables, I’ll get you some ice cream”).	1	2	3	4	5
I warn my child that I will take a food away if the child doesn’t eat (for example, “If you don’t finish your vegetables, you won’t get dessert”).	1	2	3	4	5
I keep fruits and vegetables available that my child can eat.	1	2	3	4	5
I keep sweets, candy or salty snacks where my child can reach them.	1	2	3	4	5
I keep sugar-sweetened beverages* where my child can reach them. *Drinks like Coke, 7-Up, Sunny Delight, Hawaiian Punch, or aguas frescas (DO NOT include 100% fruit juice and diet soda)	1	2	3	4	5
I limit my child’s access to sweets, candy, salty snacks or sweetened beverages by not having them readily available.	1	2	3	4	5
I allow my child to play and watch TV during meals.	1	2	3	4	5
We eat dinner together as a family.	1	2	3	4	5
I allow my child to eat whenever he/she is hungry during a day.	1	2	3	4	5
I allow my child to decide when to eat meals and snacks.	1	2	3	4	5
I allow my child to eat an hour before meals.	1	2	3	4	5
I set regular meal times for my child.	1	2	3	4	5
I have my child sit down at home while eating.	1	2	3	4	5
I allow my child to eat while standing or walking.	1	2	3	4	5
I say something positive about the food my child is eating during dinner.	1	2	3	4	5
I reason with my child to get him or her to eat (for example, “Milk is good for your health because it will make you strong”).	1	2	3	4	5
I help my child to eat dinner (for example, cutting the food into smaller pieces).	1	2	3	4	5
I compliment the child for eating food (for example, “What a good boy! You’re eating your beans”).	1	2	3	4	5
I encourage my child to eat by arranging the food to make it more interesting (for example, making smiley faces on the pancakes).	1	2	3	4	5

	Never	Rarely	Some-times	Most of the time	Always
I ask my child questions about the food during dinner.	1	2	3	4	5
I eat fruits and vegetables in front of my child.	1	2	3	4	5
I drink milk in front of my child.	1	2	3	4	5
I eat sweets, candy or salty snacks in front of my child.	1	2	3	4	5
I drink sweetened beverages in front of my child.	1	2	3	4	5
I worried that my child is overweight right now	1	2	3	4	5
I am worried that my child will become overweight.	1	2	3	4	5

Home Food Inventory (Completed by research aide)

Home Food Inventory

Date: |___|___| / |___|___| / |___|___|

Look in areas in your home where your household stores food, including the refrigerator, freezer, pantries, cupboards, and other storage areas (list follows in that order). Please check "yes" or "no" to each of the food product/item/category below. Check "yes" to a food product/item/category if it is present anywhere in your home (opened or unopened) as you are completing this form. Check "no" to a food product/item/category if it is not present anywhere in your home as you are completing this form.

Lower fat products will be labeled as "reduced-fat," "low-fat," "light," "nonfat," or "skim" on product and can be interchangeable.

1. Cheese

Yes	No	
1❑	0❑	a. Shredded or block regular cheese (example: American, cheddar)
1❑	0❑	b. Sliced regular cheese (example: American, cheddar)
1❑	0❑	c. Shredded or block of reduced-fat cheese (example: low fat cheddar)
1❑	0❑	d. Sliced reduced-fat cheese (example: low fat cheddar, low fat swiss)
1❑	0❑	e. String cheese
1❑	0❑	f. Mozzarella cheese
1❑	0❑	g. Regular ricotta or cottage cheese (minimum of 4% fat)
1❑	0❑	h. Reduced–fat ricotta or cottage cheese (2% or low fat on label)
1❑	0❑	i. Regular cream cheese
1❑	0❑	j. Reduced-fat cream cheese or neufchatel
1❑	0❑	k. Cheez Whiz, Velveeta, canned cheese or other similar cheese

Go to next page.

2. Milk/Dairy (see the "other beverage" section for non-dairy beverages)

Yes	No	
1❑	0❑	a. Skim milk
1❑	0❑	b. 1% or 2% low fat milk
1❑	0❑	c. Whole milk
1❑	0❑	d. Half and half, whipping cream or heavy cream
1❑	0❑	e. Sour cream or sour cream/cheese dips
1❑	0❑	f. Reduced-fat sour cream or low fat sour cream/cheese dips
1❑	0❑	g. Chocolate or flavored milk
1❑	0❑	h. Reduced-fat yogurt (with or without fruit)
1❑	0❑	i. Regular yogurt (made from whole milk, with or without fruit)
1❑	0❑	j. Reduced-fat yogurt drinks

3. Butter, Margarine and Oils

Yes	No	
1❑	0❑	a. Regular butter
1❑	0❑	b. Light butter
1❑	0❑	c. Regular margarine or butter substitute
1❑	0❑	d. Light margarine or butter substitute
1❑	0❑	e. Olive oil
1❑	0❑	f. Vegetable oil (example: canola oil, corn oil)
1❑	0❑	g. Seed oil (example: sunflower oil, sesame oil)
1❑	0❑	h. Lard or shortening

4. Salad Dressing

Yes	No	
1❑	0❑	a. Regular dressing (example: blue cheese dressing, Caesar, ranch)
1❑	0❑	b. Light/reduced fat dressing (example: light blue cheese, light Italian)

5. Condiments

Yes	No	
1❑	0❑	a. Regular mayonnaise
1❑	0❑	b. Light/reduced fat mayonnaise
1❑	0❑	c. Miracle Whip or other sandwich spread
1❑	0❑	d. Mustard or ketchup

6. How many other types of condiments (e.g., BBQ sauce, horseradish sauce, tartar sauce, steak sauce) do you estimate you have in your home? *(Mark only one response)*

0❑ None
1❑ 1-5
2❑ 6-10
3❑ More than 10

Fulkerson JA, Nelson MC, Lytle LA, Moe S, Heitzler C, Pasch KE. The validation of a home food inventory. International Journal of Behavioral Nutrition and Physical Activity, 2008, 5;55.

Note, please mark whether each vegetable present is fresh, canned or frozen *(mark all that apply)*. *For example, if you have both fresh and canned asparagus in your home, you would check "yes" to asparagus and check in both the fresh and canned columns.*

7. Vegetables

Yes	No		Fresh	Can/Jar	Frozen
			(Mark all that apply)		
1❑	0❑	a. Asparagus	1❑	1❑	1❑
1❑	0❑	b. Beets	1❑	1❑	1❑
1❑	0❑	c. Bell peppers (example: green, red)	1❑	1❑	1❑
1❑	0❑	d. Broccoli	1❑	1❑	1❑
1❑	0❑	e. Cabbage	1❑	1❑	1❑
1❑	0❑	f. Cauliflower	1❑	1❑	1❑
1❑	0❑	g. Carrots	1❑	1❑	1❑
1❑	0❑	h. Celery	1❑	1❑	1❑
1❑	0❑	i. Corn	1❑	1❑	1❑
1❑	0❑	j. Cucumbers	1❑	1❑	1❑
1❑	0❑	k. Green beans	1❑	1❑	1❑
1❑	0❑	l. Lettuce (example: romaine, endive)	1❑	1❑	1❑
1❑	0❑	m. Mushrooms	1❑	1❑	1❑
1❑	0❑	n. Peas	1❑	1❑	1❑
1❑	0❑	o. Potatoes	1❑	1❑	1❑
1❑	0❑	p. Spinach/other greens (collard)	1❑	1❑	1❑
1❑	0❑	q. Squash (example: butternut, zucchini)	1❑	1❑	1❑
1❑	0❑	r. Sweet potatoes	1❑	1❑	1❑
1❑	0❑	s. Tomatoes	1❑	1❑	1❑
1❑	0❑	t. Mixed vegetables	1❑	1❑	1❑

Go to next page.

Note, please check whether each fruit present is fresh, canned, frozen, or dried (*mark all that apply*). *For example, if you have both fresh and frozen blueberries in your home, you would check "yes" to blueberries and check in both the fresh and frozen columns.*

8. Fruit

Yes	No		Fresh	Can/Jar	Frozen	Dried
			(Mark all that apply)			
1❑	0❑	a. Apples	1❑	1❑	1❑	1❑
1❑	0❑	b. Apple sauce	1❑	1❑	1❑	1❑
1❑	0❑	c. Apricots	1❑	1❑	1❑	1❑
1❑	0❑	d. Avocado	1❑	1❑	1❑	1❑
1❑	0❑	e. Bananas	1❑	1❑	1❑	1❑
1❑	0❑	f. Blueberries	1❑	1❑	1❑	1❑
1❑	0❑	g. Cranberries	1❑	1❑	1❑	1❑
1❑	0❑	h. Dates	1❑	1❑	1❑	1❑
1❑	0❑	i. Grapes (red or green)	1❑	1❑	1❑	1❑
1❑	0❑	j. Grapefruit	1❑	1❑	1❑	1❑
1❑	0❑	k. Kiwi	1❑	1❑	1❑	1❑
1❑	0❑	l. Lemons or limes	1❑	1❑	1❑	1❑
1❑	0❑	m. Mango	1❑	1❑	1❑	1❑
1❑	0❑	n. Melons (example: watermelon)	1❑	1❑	1❑	1❑
1❑	0❑	o. Mixed fruit/fruit cocktail	1❑	1❑	1❑	1❑
1❑	0❑	p. Nectarines	1❑	1❑	1❑	1❑
1❑	0❑	q. Oranges	1❑	1❑	1❑	1❑
1❑	0❑	r. Pears	1❑	1❑	1❑	1❑
1❑	0❑	s. Peaches	1❑	1❑	1❑	1❑
1❑	0❑	t. Pineapple	1❑	1❑	1❑	1❑
1❑	0❑	u. Plums	1❑	1❑	1❑	1❑
1❑	0❑	v. Prunes	1❑	1❑	1❑	1❑
1❑	0❑	w. Raisins	1❑	1❑	1❑	1❑
1❑	0❑	x. Raspberries	1❑	1❑	1❑	1❑
1❑	0❑	y. Strawberries	1❑	1❑	1❑	1❑
1❑	0❑	z. Tangerines/Clementines	1❑	1❑	1❑	1❑

Go to next page.

9. Deli, Luncheon, Sandwich Meat and Sausage

Yes	No	
1❑	0❑	a. Sliced turkey or chicken deli meat
1❑	0❑	b. Sliced ham, roast beef
1❑	0❑	c. Bologna
1❑	0❑	d. Salami, summer sausage, pepperoni
1❑	0❑	e. Bacon, breakfast sausage
1❑	0❑	f. Hot dogs, bratwurst, polish sausage

10. Meats and Other Protein (Fresh, frozen, canned or jar)

Yes	No	
1❑	0❑	a. Chicken/turkey (example: burgers, breasts, whole)
1❑	0❑	b. Beef, pork, lamb (example: burgers, steaks, roasts, chops)
1❑	0❑	c. Tofu, seitan, tempeh, textured vegetable protein (TVP)
1❑	0❑	d. Veggie burgers
1❑	0❑	e. Fish (example: canned, packet, fresh or frozen tuna, salmon, cod)
1❑	0❑	f. Shellfish (example: shrimp, scallops, crab)
1❑	0❑	g. Lentils
1❑	0❑	h. Beans (example: black beans, pinto beans, kidney beans)
1❑	0❑	i. Peanut butter or other nut butter
1❑	0❑	j. Eggs

11. Frozen Desserts (Ice cream/yogurt type only)

Yes	No	
1❑	0❑	a. Regular ice cream (any flavor)
1❑	0❑	b. Reduced-fat ice cream (any flavor)
1❑	0❑	c. Frozen yogurt (any flavor)
1❑	0❑	d. Frozen treats made with ice cream or pudding
1❑	0❑	e. Frozen treats made with ice milk, frozen yogurt, sherbet, sorbet
1❑	0❑	f. Frozen fruit juice bars
1❑	0❑	g. Frozen soy or rice desserts

12. Microwavable or Quick-Cook Frozen Foods

Yes	No	
1❑	0❑	a. Pizza (any variety)
1❑	0❑	b. Hot Pockets (any flavor)
1❑	0❑	c. Pizza rolls or bagel snacks (any flavor)
1❑	0❑	d. Burritos or other Mexican snacks
1❑	0❑	e. Chicken nuggets
1❑	0❑	f. French fries or tater tots
1❑	0❑	g. Egg rolls
1❑	0❑	h. Ramen noodles

Fulkerson JA, Nelson MC, Lytle LA, Moe S, Heitzler C, Pasch KE. The validation of a home food inventory. International Journal of Behavioral Nutrition and Physical Activity, 2008, 5;55.

Note, please check whether each bread present is fresh or frozen *(mark all that apply)*. *For example, if you have both fresh and frozen whole wheat rolls in your home, you would check "yes" to whole wheat bread or rolls and check in both the fresh and frozen columns.*

13. Bread

Yes	No		Fresh (Mark all that apply)	Frozen (Mark all that apply)
1❑	0❑	a. Wheat bread or rolls	1❑	1❑
1❑	0❑	b. White bread/rolls (example: baguette)	1❑	1❑
1❑	0❑	c. English muffins (wheat)	1❑	1❑
1❑	0❑	d. English muffins (white)	1❑	1❑
1❑	0❑	e. Bagels (wheat)	1❑	1❑
1❑	0❑	f. Bagels (white, any flavor)	1❑	1❑
1❑	0❑	g. Tortillas (wheat, sprout)	1❑	1❑
1❑	0❑	h. Tortillas (flour, any flavors)	1❑	1❑
1❑	0❑	i. Tortillas (corn)	1❑	1❑
1❑	0❑	j. Pita bread (wheat, sprout)	1❑	1❑
1❑	0❑	k. Pita bread (white, any flavor)	1❑	1❑
1❑	0❑	l. Croissants	1❑	1❑

Note, please check whether each prepared dessert type present is homemade or store-bought (mark all that apply). *For example, if you have both homemade and store-bought chocolate chip cookies in your home, you would check "yes" to regular cookies and check in both the store bought and homemade columns.*

14. Prepared Desserts *(do not count boxed mixes that are not prepared)*

Yes	No		Store-bought (Mark all that apply)	Homemade (Mark all that apply)
1❑	0❑	a. Regular cookies (any flavor/variety)	1❑	1❑
1❑	0❑	b. Reduced-fat cookies (any flavor/variety)	1❑	1❑
1❑	0❑	c. Regular cake/cupcakes (any flavor)	1❑	1❑
1❑	0❑	d. Reduced-fat cake/cupcakes (any flavor)	1❑	1❑
1❑	0❑	e. Regular muffins (any flavor/variety)	1❑	1❑
1❑	0❑	f. Brownies/bars (any variety)	1❑	1❑
1❑	0❑	g. Other snack cakes (any variety)	1❑	1❑
1❑	0❑	h. Pastry, sweet rolls, donuts	1❑	1❑

15. Chips, Crackers and Other Snack Foods

Yes	No	
1❑	0❑	a. Whole grain snack crackers (labeled "whole grain" or "whole wheat", example: Triscuit)
1❑	0❑	b. Regular snack crackers (example: Saltines, Wheat Thins)
1❑	0❑	c. Reduced-fat snack crackers (example: Reduced-fat Wheat Thins)
1❑	0❑	d. Regular potato chips
1❑	0❑	e. Reduced-fat potato chips (example: Baked Lays)
1❑	0❑	f. Corn chips (example: Fritos)
1❑	0❑	g. Tortilla chips
1❑	0❑	h. Reduced-fat tortilla chips (example: baked tortilla chips)
1❑	0❑	i. Cheese curls or puffs
1❑	0❑	j. Reduced fat cheese curls or puffs (example: baked Cheetos)
1❑	0❑	k. Regular bagel chips
1❑	0❑	l. Reduced-fat bagel chips
1❑	0❑	m. Graham crackers
1❑	0❑	n. Pretzels, any shape
1❑	0❑	o. Popcorn (microwave bags or bags of prepared popcorn)
1❑	0❑	p. Peanuts, cashews or other nuts
1❑	0❑	q. Regular granola bars, sports bars
1❑	0❑	r. Reduced-fat granola bars, sports bars

16. Are any of the chips, crackers or other snacks checked above in prepackaged snack size or single size portions *(do not count granola, sports bars, meal supplement bars)?*

1❑ Yes
0❑ No

Dry Breakfast Cereal

17. How many ready-to-eat cereals do you have that are labeled "whole grain," "whole wheat" or have at least 3 grams of fiber per serving? *(Check one response)*

0❑ None
1❑ One
2❑ Two or three
3❑ Four or more

8. How many ready-to-eat cereals indicate on the nutrition label that they have less than 6 grams of sugar per serving? *(Check one response)*

0❑ None
1❑ One
2❑ Two or three
3❑ Four or more

Fulkerson JA, Nelson MC, Lytle LA, Moe S, Heitzler C, Pasch KE. The validation of a home food inventory. International Journal of Behavioral Nutrition and Physical Activity, 2008, 5;55.

19. How many ready-to-eat cereals indicate on the nutrition label that they have <u>6 or more grams of sugar</u> per serving ? *(Check one response)*

0❑ None
1❑ One
2❑ Two or three
3❑ Four or more

20. <u>Beverages *(do not include alcoholic beverages)*</u>

Yes	No	
1❑	0❑	a. Regular soda pop (any variety, flavor)
1❑	0❑	b. Diet soda pop (any variety, flavor)
1❑	0❑	c. Prepared iced teas or lemonade (example: Snapple)
1❑	0❑	d. Prepared light iced teas or lemonade (example: diet Snapple)
1❑	0❑	e. Sports drinks (example: Gatorade)
1❑	0❑	f. 100% fruit juice (labeled as 100% juice)
1❑	0❑	g. Fruit drinks (example: <100% juice, Capri Sun)
1❑	0❑	h. Bottled water (unsweetened, any variety, flavor)
1❑	0❑	i. Soy milk, rice milk (any variety, flavor)

21. <u>Candy</u>

Yes	No	
1❑	0❑	a. Chocolate candy (any variety, except chocolate exclusively for baking)
1❑	0❑	b. Hard candy
1❑	0❑	c. Gummis
1❑	0❑	d. Fruit rollups, fruit snacks or other fruit based candy
1❑	0❑	e. Chewy candy (example: Skittles, caramel)

22. Now please look around your kitchen (countertop, top of refrigerator, table) and indicate which of the following items are visible and readily accessible.

Yes	No	
1❑	0❑	b. Canned or dried fruit
1❑	0❑	c. Fresh vegetables
1❑	0❑	d. Regular snack crackers, pretzels, chips, popcorn
1❑	0❑	e. Reduced-fat snack crackers, pretzels, chips, popcorn
1❑	0❑	f. Dry cereal
1❑	0❑	g. Bread or rolls
1❑	0❑	h. Regular soda pop
1❑	0❑	i. Diet soda pop
1❑	0❑	j. Candy
1❑	0❑	k. Regular cookies, cake, cupcakes, muffins
1❑	0❑	l. Reduced-fat cookies, cake, cupcakes, muffins

Fulkerson JA, Nelson MC, Lytle LA, Moe S, Heitzler C, Pasch KE. The validation of a home food inventory. International Journal of Behavioral Nutrition and Physical Activity, 2008, 5;55.

23. Now please open your refrigerator. Which of the following items can you see without moving items around?

Yes	No	
1❑	0❑	a. Skim milk (any flavor)
1❑	0❑	b. 1% or 2% low fat milk (any flavor)
1❑	0❑	c. Whole milk (any flavor)
1❑	0❑	d. 100% fruit juice (any flavor)
1❑	0❑	e. Fruit drinks/sports drinks (not 100% juice)
1❑	0❑	f. Regular soda pop
1❑	0❑	g. Diet soda pop
1❑	0❑	h. Bottled/contained water
1❑	0❑	i. Regular cheese (example: American, cheddar, Swiss, parmesan)
1❑	0❑	j. Reduced-fat cheese (example: low fat cheddar, low fat Swiss)
1❑	0❑	k. Reduced-fat yogurt (with or without fruit)
1❑	0❑	l. Regular yogurt (made from whole milk, with or without fruit)
1❑	0❑	m. Reduced-fat yogurt drinks
1❑	0❑	n. Fresh ready-to-eat vegetables
1❑	0❑	o. Fresh ready-to-eat fruit

Block Brief 2000

BRIEF FOOD QUESTIONNAIRE

RESPONDENT ID NUMBER

TODAY'S DATE

	DAY	YEAR
Jan		
Feb		
Mar	00	2000
Apr	01	2001
May	02	2002
Jun	03	2003
Jul	04	2004
Aug	05	2005
Sep	06	2006
Oct	07	2007
Nov	08	2008
Dec	09	2009

This form is about the foods you usually eat.
It will take about 15 - 25 minutes to complete.

- Please answer each question as best you can. Estimate if you aren't sure.
- Use only a No. 2 pencil.
- Fill in the circles completely, and erase completely if you make any changes.

Please print your name in this box.

SEX
- Male
- Female

If female, are you pregnant or breast feeding?
- No
- Yes
- Not female

AGE

WEIGHT pounds

HEIGHT ft. in.

This form is about your usual eating habits in the past year or so. This includes all meals or snacks, at home or in a restaurant or carry-out. There are two kinds of questions for each food.

HOW OFTEN, on average, did you eat the food during the past year?
*Please DO NOT SKIP any foods. Mark "Never" if you didn't eat it.

HOW MUCH did you usually eat of the food?
*Sometimes we ask how many you eat, such as 1 egg, 2 eggs, etc., ON THE DAYS YOU EAT IT.
*Sometimes we ask "how much" as A, B, C or D. LOOK AT THE ENCLOSED PICTURES. For each food, pick the picture (bowls or plates) that looks the most like the serving size you usually eat. (If you don't have pictures: A=1/4 cup, B=1/2 cup, C=1 cup, D= 2 cups.)

TYPE OF FOOD	HOW OFTEN IN THE PAST YEAR									HOW MUCH EACH TIME SEE PORTION SIZE PICTURES FOR A-B-C-D				
	NEVER	A FEW TIMES per YEAR	ONCE per MONTH	2-3 TIMES per MONTH	ONCE per WEEK	TWICE per WEEK	3-4 TIMES per WEEK	5-6 TIMES per WEEK	EVERY DAY					
How often do you eat each of the following foods all year round?														
Eggs, including egg biscuits or Egg McMuffins (Not egg substitutes)	○	○	○	○	○	○	○	○	○	How many eggs each time	○ 1	○ 2	○ 3	○ 4
Bacon or breakfast sausage, including sausage biscuit	○	○	○	○	○	○	○	○	○	How many pieces	○ 1	○ 2	○ 3	○ 4
Cooked cereals like oatmeal, cream of wheat or grits	○	○	○	○	○	○	○	○	○	Which bowl		○ B	○ C	○ D
Cold cereals like Corn Flakes, Cheerios, Special K, fiber cereals	○	○	○	○	○	○	○	○	○	Which bowl		○ B	○ C	○ D
Which cereal do you eat most often? ○ Product 19, Just Right, Total	MARK ONLY ONE: ○ Bran Buds, Raisin Bran, Fruit-n-Fiber, other fiber cereals ○ Other cold cereal, like Corn Flakes, Cheerios, Special K													
Cheese, sliced cheese or cheese spread, including on sandwiches.	○	○	○	○	○	○	○	○	○	How many slices	○ 1	○ 2	○ 3	○ 4
Yogurt (not frozen yogurt)	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
How often do you eat each of the following fruits?														
Bananas	○	○	○	○	○	○	○	○	○	How many each time	○ 1/2	○ 1	○ 2	○ 3
Apples or pears	○	○	○	○	○	○	○	○	○	How many	○ 1/2	○ 1	○ 2	○ 3
Oranges, tangerines, not including juice	○	○	○	○	○	○	○	○	○	How many	○ 1/2	○ 1	○ 2	○ 3
Applesauce, fruit cocktail, or any canned fruit	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
Any other fruit, like grapes, melon, strawberries, peaches	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D

TYPE OF FOOD	HOW OFTEN IN THE PAST YEAR									HOW MUCH EACH TIME SEE PORTION SIZE PICTURES FOR A-B-C-D				
	NEVER	A FEW TIMES per YEAR	ONCE per MONTH	2-3 TIMES per MONTH	ONCE per WEEK	TWICE per WEEK	3-4 TIMES per WEEK	5-6 TIMES per WEEK	EVERY DAY					
How often do you eat each of the following vegetables, including fresh, frozen, canned or in stir fry, at home or in a restaurant?														
French fries, fried potatoes or hash browns	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
White potatoes not fried, incl. boiled, baked, mashed & potato salad	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Sweet potatoes, yams, or sweet potato pie	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Rice, or dishes made with rice	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Baked beans, chili with beans, pintos, any other dried beans	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Refried beans	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Green beans or green peas	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Broccoli	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Carrots, or stews or mixed vegetables containing carrots	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Spinach, or greens like collards	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Cole slaw, cabbage	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Green salad	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Raw tomatoes, including in salad	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ 1/4	⬭ 1/2	⬭ 1	⬭ 2
Catsup, salsa or chile peppers	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How many TBSP.	⬭ 1	⬭ 2	⬭ 3	⬭ 4
Salad dressing or mayonnaise (Not lowfat)	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How many TBSP.	⬭ 1	⬭ 2	⬭ 3	⬭ 4
Any other vegetable, like corn, squash, okra, cooked green peppers, cooked onions	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	How much	⬭ A	⬭ B	⬭ C	⬭ D
Vegetable soup, vegetable beef, chicken vegetable, or tomato soup	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	Which bowl		⬭ B	⬭ C	⬭ D

TYPE OF FOOD	HOW OFTEN IN THE PAST YEAR									HOW MUCH EACH TIME SEE PORTION SIZE PICTURES FOR A-B-C-D				
	NEVER	A FEW TIMES per YEAR	ONCE per MONTH	2-3 TIMES per MONTH	ONCE per WEEK	TWICE per WEEK	3-4 TIMES per WEEK	5-6 TIMES per WEEK	EVERY DAY					
MEATS														
Do you ever eat chicken, meat or fish? ○ Yes ○ No IF NO, SKIP TO NEXT PAGE														
Hamburgers, cheeseburgers, meat loaf, at home or in a restaurant	○	○	○	○	○	○	○	○	○	How much meat	○ 1/8 lb.	○ 1/4 lb.	○ 1/2 lb.	○ 3/4 lb.
Tacos, burritos, enchiladas, tamales	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
Beef steaks, roasts, pot roast, or in frozen dinners or sandwiches	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
Pork, including chops, roasts, or dinner ham	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
When you eat beef or pork, do you ○ Avoid eating the fat ○ Sometimes eat the fat ○ Often eat the fat ○ I don't eat meat														
Mixed dishes with meat or chicken, like stew, corned beef hash, chicken & dumplings, or in frozen meals	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
Fried chicken, at home or in a restaurant	○	○	○	○	○	○	○	○	○	# medium pieces	○ 1	○ 2	○ 3	○ 4
Chicken or turkey not fried, such as baked, grilled, or on sandwiches	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
When you eat chicken, do you ○ Avoid eating the skin ○ Sometimes eat the skin ○ Often eat the skin ○ N/A														
Fried fish or fish sandwich, at home or in a restaurant	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
Any other fish or shellfish not fried, including tuna	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
Hot dogs, or sausage like Polish, Italian or Chorizo	○	○	○	○	○	○	○	○	○	How many	○ 1	○ 2	○ 3	○ 4
Boloney, sliced ham, turkey lunch meat, other lunch meat	○	○	○	○	○	○	○	○	○	How many slices	○ 1	○ 2	○ 3	○ 4
When you eat lunch meats, are they ○ Usually low-fat ○ Sometimes ○ Rarely low-fat ○ N/A														

TYPE OF FOOD	HOW OFTEN IN THE PAST YEAR									HOW MUCH EACH TIME SEE PORTION SIZE PICTURES FOR A-B-C-D				
	NEVER	A FEW TIMES per YEAR	ONCE per MONTH	2-3 TIMES per MONTH	ONCE per WEEK	TWICE per WEEK	3-4 TIMES per WEEK	5-6 TIMES per WEEK	EVERY DAY					
Pasta, breads, spreads, snacks														
Spaghetti, lasagna, or other pasta with tomato sauce	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
Cheese dishes without tomato sauce, like macaroni and cheese	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
Pizza, including carry-out	○	○	○	○	○	○	○	○	○	How many slices	○ 1	○ 2	○ 3	○ 4
Biscuits, muffins	○	○	○	○	○	○	○	○	○	How many each time	○ 1	○ 2	○ 3	○ 4
Rolls, hamburger buns, English muffins, bagels	○	○	○	○	○	○	○	○	○	How many each time	○ 1/2	○ 1	○ 2	○ 3
White bread or toast, including French, Italian, or in sandwiches	○	○	○	○	○	○	○	○	○	How many slices	○ 1	○ 2	○ 3	○ 4
Dark bread like rye or whole wheat, including in sandwiches	○	○	○	○	○	○	○	○	○	How many slices	○ 1	○ 2	○ 3	○ 4
Tortillas	○	○	○	○	○	○	○	○	○	How many each time	○ 1	○ 2	○ 3	○ 4
Margarine on bread, potatoes or vegetables	○	○	○	○	○	○	○	○	○	How many pats (Tsp.)	○ 1	○ 2	○ 3	○ 4
Butter on bread, potatoes or vegetables	○	○	○	○	○	○	○	○	○	How many pats (Tsp.)	○ 1	○ 2	○ 3	○ 4
Peanuts or peanut butter	○	○	○	○	○	○	○	○	○	How many TBSP.	○ 1	○ 2	○ 3	○ 4
Snacks like potato chips, corn chips, popcorn (Not pretzels)	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
Doughnuts, cake, pastry, pie	○	○	○	○	○	○	○	○	○	How many pieces	○ 1	○ 2	○ 3	○ 4
Cookies (Not lowfat)	○	○	○	○	○	○	○	○	○	How many	○ 1-2	○ 3-5	○ 6-7	○ 8+
Ice cream, frozen yogurt, ice cream bars	○	○	○	○	○	○	○	○	○	How much	○ A	○ B	○ C	○ D
When you eat ice cream or frozen yogurt, is it	○ Usually low-fat		○ Sometimes		○ Rarely low-fat		○ N/A							
Chocolate candy, candy bars	○	○	○	○	○	○	○	○	○	How many bars	○ 1 small	○ 1 medium	○ 1 large	○ 2 large

TYPE OF BEVERAGE	HOW OFTEN IN THE PAST YEAR									HOW MUCH EACH TIME SEE PORTION SIZE PICTURES FOR A-B-C-D				
	NEVER	A FEW TIMES per YEAR	ONCE per MONTH	2-3 TIMES per MONTH	ONCE per WEEK	TWICE per WEEK	3-4 TIMES per WEEK	5-6 TIMES per WEEK	EVERY DAY					
How often do you drink the following beverages?														
Real orange or grapefruit juice, Welch's grape juice, Minutemaid juices, Juicy Juice	○	○	○	○	○	○	○	○	○	How many glasses each time	○ 1	○ 2	○ 3	○ 4
Hawaiian Punch, Sunny Delight, Hi-C, Tang, or Ocean Spray juices	○	○	○	○	○	○	○	○	○	How many glasses each time	○ 1	○ 2	○ 3	○ 4
Kool Aid, Capri Sun or Knudsen juices	○	○	○	○	○	○	○	○	○	How many glasses each time	○ 1	○ 2	○ 3	○ 4
Instant breakfast milkshakes like Carnation, diet shakes like Slimfast, or liquid supplements like Ensure	○	○	○	○	○	○	○	○	○	How many glasses or cans	○ 1	○ 2	○ 3	○ 4
Glasses of milk (any kind)	○	○	○	○	○	○	○	○	○	How many glasses	○ 1	○ 2	○ 3	○ 4
When you drink glasses of milk what kind do you usually drink? MARK ONLY ONE:	○ Whole milk ○ Reduced fat 2% milk ○ Low-fat 1% milk				○ Non-fat milk ○ Rice milk ○ Soy milk				○ I don't drink milk or soy milk					
Cream, Half-and-Half or non-dairy creamer in coffee or tea	○	○	○	○	○	○	○	○	○	Total TBSP. on those days	○ 1	○ 2	○ 3-4	○ 5+
Regular soft drinks, or bottled drinks like Snapple (Not diet drinks)	○	○	○	○	○	○	○	○	○	How many bottles or cans	○ 1	○ 2	○ 3-4	○ 5+
Beer	○	○	○	○	○	○	○	○	○	How many bottles or cans	○ 1	○ 2	○ 3-4	○ 5+
Wine or wine coolers	○	○	○	○	○	○	○	○	○	How many glasses	○ 1	○ 2	○ 3-4	○ 5+
Liquor or mixed drinks	○	○	○	○	○	○	○	○	○	How many drinks	○ 1	○ 2	○ 3-4	○ 5+

During the past year, have you taken any vitamins or minerals regularly, at least once a month?

○ No, not regularly ○ Yes, fairly regularly →

(IF YES) WHAT DID YOU TAKE FAIRLY REGULARLY?

VITAMIN TYPE	HOW OFTEN					FOR HOW MANY YEARS?					
	DIDN'T TAKE	A FEW DAYS per MONTH	1-3 DAYS per WEEK	4-6 DAYS per WEEK	EVERY DAY	LESS THAN 1 YR	1 YEAR	2 YEARS	3-4 YEARS	5-9 YEARS	10+ YEARS
Multiple Vitamins. Did you take…											
Regular Once-A-Day, Centrum, or Thera type	○	○	○	○	○	○	○	○	○	○	○
Stress-tabs or B-Complex type	○	○	○	○	○	○	○	○	○	○	○
Antioxidant combination type	○	○	○	○	○	○	○	○	○	○	○
Single Vitamins (not part of multiple vitamins)											
Vitamin A (not beta-carotene)	○	○	○	○	○	○	○	○	○	○	○
Beta-carotene	○	○	○	○	○	○	○	○	○	○	○
Vitamin C	○	○	○	○	○	○	○	○	○	○	○
Vitamin E	○	○	○	○	○	○	○	○	○	○	○
Folic acid, folate	○	○	○	○	○	○	○	○	○	○	○
Calcium or Tums, alone or combined with vit. D or magnesium	○	○	○	○	○	○	○	○	○	○	○
Zinc	○	○	○	○	○	○	○	○	○	○	○
Iron	○	○	○	○	○	○	○	○	○	○	○
Selenium	○	○	○	○	○	○	○	○	○	○	○
Vitamin D, alone or combined with calcium	○	○	○	○	○	○	○	○	○	○	○

If you took vitamin C or vitamin E:

How many milligrams of vitamin C did you usually take, on the days you took it?

○ 100 ○ 250 ○ 500 ○ 750 ○ 1000 ○ 1500 ○ 2000 ○ 3000+ ○ don't know

How many IUs of vitamin E did you usually take, on the days you took it?

○ 100 ○ 200 ○ 300 ○ 400 ○ 600 ○ 800 ○ 1000 ○ 2000+ ○ don't know

How often do you use fat or oil in cooking?

○ Less than once per week ○ A few times per week ○ Once a day ○ Twice a day ○ 3+ per day

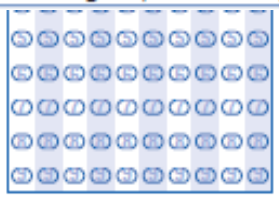
What kinds of fat or oil do you usually use in cooking? MARK ONLY ONE OR TWO

○ Don't know, or Pam ○ Butter/margarine blend ○ Lard, fatback, bacon fat
○ Stick margarine ○ Low-fat margarine ○ Crisco
○ Soft tub margarine ○ Corn oil, vegetable oil
○ Butter ○ Olive oil or canola oil

Did you ever drink more beer, wine or liquor than you do now? ○ Yes ○ No

Block Kids Screener 2007

Think about everything your child ate or drank last week. Remember what your child had for breakfast, lunch, dinner, after school, while watching TV, at bedtime, and on the weekend.



	HOW MANY DAYS LAST WEEK DID YOUR CHILD EAT OR DRINK IT?						HOW MUCH IN ONE DAY?		
	None last week	1 day last week	2 days last week	3-4 days last week	5-6 days last week	Every day last week			
Cereal, like corn flakes, Frosted Flakes	○	○	○	○	○	○	○ 1 bowl	○ 2 bowls	○ 3 bowls
Cooked cereal, like oatmeal	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Eggs, breakfast sandwiches or breakfast burritos	○	○	○	○	○	○	○ 1 egg	○ 2 eggs	○ 3 eggs
Breakfast bars, granola bars, Protein bars	○	○	○	○	○	○	○ 1/2	○ 1	○ 2
Glasses of milk	○	○	○	○	○	○	○ 1 glass	○ 2 glasses	○ 3+glasses
Real fruit juice, like orange juice, apple juice, or Mexican fruit drinks like licuados (DO NOT include soda)	○	○	○	○	○	○	○ 1 glass	○ 2 glasses	○ 3+glasses
Drinks like Coke or 7-Up, Sunny Delight, Hawaiian Punch, or aguas frescas (DO NOT include diet soda)	○	○	○	○	○	○	○ 1 bottle	○ 2 bottles	○ 3+bottles
Apples, bananas, or oranges	○	○	○	○	○	○	○ 1/2	○ 1	○ 2
Applesauce, fruit cocktail	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Any other fruit, like strawberries, grapes	○	○	○	○	○	○	○ A little	○ Some	○ A lot
French fries, hash browns, tater tots	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Other potatoes, like mashed or boiled	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Ketchup or salsa	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Lettuce salad	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Tomatoes, including on salad	○	○	○	○	○	○	○ 1/4 tomato	○ 1/2 tomato	○ 1 tomato
Green beans or peas	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Other vegetables, like corn, carrots, greens, broccoli	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Vegetable soup, tomato soup, any soup or stew with vegetables in it	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Chili beans, pinto beans, black beans, including in burritos	○	○	○	○	○	○	○ A little	○ Some	○ A lot

	HOW MANY DAYS LAST WEEK DID YOUR CHILD EAT OR DRINK IT?						HOW MUCH IN ONE DAY?		
	None last week	1 day last week	2 days last week	3-4 days last week	5-6 days last week	Every day last week			
Refried beans	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Hamburgers, cheeseburgers	○	○	○	○	○	○	○ 1 small	○ 1 large	○ 2 large
Hot dogs, corn dogs, or sausage	○	○	○	○	○	○	○ 1	○ 2	○ 3
Lunch meat like boloney, ham, Lunchables	○	○	○	○	○	○	○ 1 slice	○ 2 slices	○ 3+ slices
Pizza or pizza pockets	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Spaghetti or ravioli with tomato sauce	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Macaroni and cheese	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Chicken, including nuggets, wings, tenders, also in sandwiches or stew	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Fish, fish sticks or sandwiches, tuna, shrimp	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Burritos or tacos	○	○	○	○	○	○	○ 1/2	○ 1	○ 2
Beef like roast, steak or in sandwiches	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Meat balls, meat loaf, beef stew, Hamburger Helper	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Pork, like chops, roast, ribs	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Popcorn	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Snack chips like potato chips, Doritos, Fritos, tortilla chips	○	○	○	○	○	○	○ A few	○ Small bag	○ Large bag
Ice cream	○	○	○	○	○	○	○ 1 scoop	○ 2 scoops	○ 3 scoops
Candy, candy bars	○	○	○	○	○	○	○ Mini	○ Small	○ Large
Cookies, donuts, cakes like Ho-Hos	○	○	○	○	○	○	○ A little	○ Some	○ A lot
Cheese. Remember cheese in sandwiches or nachos with cheese or quesadillas	○	○	○	○	○	○	○ 1 slice	○ 2 slices	○ 3+ slices
Whole wheat bread or rolls (NOT white bread)	○	○	○	○	○	○	○ 1 slice	○ 2 slices	○ 3 slices

What kind of cereal did your child eat?

- ○ Plain Cheerios, Grape Nuts, Shredded Wheat, Wheaties, Wheat Chex, Kix
- ○ Honey Nut Cheerios, Cap'n Crunch, Lucky Charms, Life, Golden Grahams, Frosted Mini Wheats, Raisin Bran
- ○ Other sweet cereals, like Frosted Flakes, Froot Loops
- ○ Any other cereal, like Corn Flakes, Rice Krispies

What kind of milk did your child drink?

○ Whole milk ○ Low fat 1% milk ○ Chocolate milk ○ Lactaid milk
○ Reduced fat 2% milk ○ Nonfat milk ○ Soy milk ○ Don't know

Demographic Questionnaire

1. How many adults older than 18 years are living in your home, including you? _____

2. Please complete the table below for each adult older than 18 years living in the home (if there are more than 3, please let the research staff know).

	You (Adult 1)	**Adult 2**	**Adult 3**
Relationship to You	N/A	❒ Husband or wife ❒ Other relative ❒ Roomate ❒ Unmarried partner ❒ Other (_____)	❒ Husband or wife ❒ Other relative ❒ Roomate ❒ Unmarried partner ❒ Other (_____)
Sex	❒ Male ❒ Female	❒ Male ❒ Female	❒ Male ❒ Female
Age	_____	_____	_____
Date of Birth	____ ____ / ____ ____ / m m d d ____ ____ ____ ____ y y y y	____ ____ / ____ ____ / m m d d ____ ____ ____ ____ y y y y	____ ____ / ____ ____ / m m d d ____ ____ ____ ____ y y y y
Hispanic, Latino, or Spanish origin?	❒ Yes ❒ No	❒ Yes ❒ No	❒ Yes ❒ No
Race (all that apply)	❒ White ❒ Black/African American ❒ American Indian ❒ Asian Indian ❒ Asian non-Indian (Chinese, Japanese, etc.) ❒ Other (_____)	❒ White ❒ Black/African American ❒ American Indian ❒ Asian Indian ❒ Asian non-Indian (Chinese, Japanese, etc.) ❒ Other (_____)	❒ White ❒ Black/African American ❒ American Indian ❒ Asian Indian ❒ Asian non-Indian (Chinese, Japanese, etc.) ❒ Other (_____)
Education	❒ No high school	❒ No high school	❒ No high school

	You (Adult 1)	**Adult 2**	**Adult 3**
	❒ Some high school ❒ High school diploma or GED ❒ Some college ❒ College graduate ❒ Graduate training beyond college	❒ Some high school ❒ High school diploma or GED ❒ Some college ❒ College graduate ❒ Graduate training beyond college	❒ Some high school ❒ High school diploma or GED ❒ Some college ❒ College graduate ❒ Graduate training beyond college
Employed?	❒ Yes ❒ No	❒ Yes ❒ No	❒ Yes ❒ No
If employed, what type of employment?	❒ Full time ❒ Part time ❒ Other	❒ Full time ❒ Part time ❒ Other	❒ Full time ❒ Part time ❒ Other

3. How many children 18 years or younger are living in your home, including the Head Start Child in this study? _____

4. Please complete the table below for each child 18 years or younger living in the home (if there are more than 4, please let research staff know).

	Head Start Child (Child 1)	**Child 2**	**Child 3**	**Child 4**
Relationship to You	❒ Biological son or daughter ❒ Adopted son or daughter ❒ Grandchild ❒ Other (_____)	❒ Biological son or daughter ❒ Adopted son or daughter ❒ Grandchild ❒ Other (_____)	❒ Biological son or daughter ❒ Adopted son or daughter ❒ Grandchild ❒ Other (_____)	❒ Biological son or daughter ❒ Adopted son or daughter ❒ Grandchild ❒ Other (_____)
Sex	❒ Male ❒ Female	❒ Male ❒ Female	❒ Male ❒ Female	❒ Male ❒ Female
Age	_____	_____	_____	_____
Date of Birth	__ __ / __ __ / m m d d __ __ __ __	__ __ / __ __ / m m d d __ __ __ __	__ __ / __ __ / m m d d __ __ __ __	__ __ / __ __ / m m d d __ __ __ __

	Head Start Child (Child 1)	**Child 2**	**Child 3**	**Child 4**
	y y y y	y y y y	y y y y	y y y y
Hispanic, Latino, or Spanish origin?	❒ Yes ❒ No	❒ Yes ❒ No	❒ Yes ❒ No	❒ Yes ❒ No
Race (all that apply)	❒ White ❒ Black/African American ❒ American Indian ❒ Asian Indian ❒ Asian non-Indian (Chinese, Japanese, etc.) ❒ Other (____________)	❒ White ❒ Black/African American ❒ American Indian ❒ Asian Indian ❒ Asian non-Indian (Chinese, Japanese, etc.) ❒ Other (____________)	❒ White ❒ Black/African American ❒ American Indian ❒ Asian Indian ❒ Asian non-Indian (Chinese, Japanese, etc.) ❒ Other (____________)	❒ White ❒ Black/African American ❒ American Indian ❒ Asian Indian ❒ Asian non-Indian (Chinese, Japanese, etc.) ❒ Other (____________)

5. How often do you go grocery shopping?
   - ❒ Less than once a month
   - ❒ Once a month
   - ❒ 2-3 times a month
   - ❒ Once a week
   - ❒ 2-3 times a week
   - ❒ Other ( )

6. How long ago did someone in the home last go on a major grocery trip?
   - ❒ Today
   - ❒ 1 day
   - ❒ 2 days
   - ❒ 3-4 days
   - ❒ 5-6 days
   - ❒ 1-2 weeks
   - ❒ 3-4 weeks
   - ❒ More than 1 month
   - ❒ Don’t know

7. How long from now is someone in the home planning on going on the next major grocery trip?
   - ❒ Today
   - ❒ 1 day
   - ❒ 2 days

- ❒ 3-4 days
- ❒ 5-6 days
- ❒ 1-2 weeks
- ❒ 3-4 weeks
- ❒ More than 1 month
- ❒ Don't know

8. Is anyone in the home on Food Stamps or SNAP?
   - ❒ Yes
   - ❒ No
   - ❒ Don't know

9. Is anyone in the home receiving nutrition education from the Food Stamp program or SNAP-Ed?
   - ❒ Yes
   - ❒ No
   - ❒ Don't know

10. Is anyone in the home in the Supplemental Nutrition Program for Women, Infants, and Children (WIC)?
    - ❒ Yes
    - ❒ No
    - ❒ Don't know

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