ASSOCIATIONS BETWEEN FOOD CHOICE VALUES OF PARENTAL GUARDIANS, SOCIOECONOMIC STATUS, HOME FOOD AVAILABILITY, AND CHILD DIETARY INTAKE

by

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ABSTRACT

JORDAN E. LYERY. Associations between food choice values of parental guardians, socioeconomic status, home food availability, and child dietary intake. (Under the direction of DR. CHARLIE L. REEVE)

Previous research has found that food choice values (FCVs), socioeconomic status (SES), and home food availability (HFA) are associated with child dietary intake. However, the relationships between these variables have been poorly studied. Therefore, the purpose of the current study was (1) to better understand the relationships between parental FCVs, HFA, and child dietary intake, and (2) to examine the relationships between SES and these constructs. Participants were 193 parental guardians of a child between the ages of 6-11, recruited from MTurk. Participants completed measures on FCV, SES, HFA, and reported the dietary intake of their child. Path analysis using OLS regression was conducted to examine the pathways through which the variables were associated. Results indicated that parental FCVs, particularly the organic, weight control/health, sensory appeal, and convenience values had small to medium effects on HFA and child dietary intake. Generally, higher endorsement of the organic and weight control/health values were associated with increased availability and child dietary intake of healthy foods and decreased availability and child dietary intake of unhealthy foods. The opposite relationships were found with the sensory appeal and convenience values. Additionally, HFA did mediate the relationships between FCVs and child dietary intake. Similarly, higher SES generally predicted increased availability and child dietary intake of healthy foods and decreased availability and child dietary intake of unhealthy foods. SES did not predict parental FCVs. HFA also mediated the relationships between SES and child dietary intake. The current study was the first to examine the relationships between parental FCVs, SES, HFA, and child dietary intake as part of a single model. The findings have important implications for interventions targeting weight status or dietary intake in children, by suggesting that parental and environmental/social factors may be important to address.

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CHAPTER 1: INTRODUCTION

In 2009-2010, almost one third of children ages 6-11 in the US were overweight; additionally, 18% of children ages 6-11 were obese (Ogden, Carroll, Kit, & Flegal, 2012). Prevalence rates of obesity in the US have increased more than 400% for children aged 6-11 from 1971 to 2010 (Fryar, Carroll, & Ogden, 2012). Overweight and obesity during childhood is associated with health consequences in adulthood including increased risk of mortality, hypertension, stroke, heart disease, and diabetes (Reilly & Kelly, 2012).

Traditionally, a biomedical approach has described childhood obesity as a result of biological factors, such as genetics and perinatal factors, and personal behaviors, such as diet and physical activity level (Ebbeling, Pawlak, & Ludwig, 2002). Central to health psychology is the biopsychosocial (BPS) model, which provides a more comprehensive approach to understanding how health outcomes are the product of biological, psychological, and social processes (Engel, 1977). Furthermore, the BPS model highlights the importance of multi-level and multi-system influences, in addition to individual level factors, on health outcomes (Engel, 1977). Thus, theories that relate to BPS and multi-level approaches to understanding childhood obesity may provide a more accurate picture of the development of childhood obesity.

The Home Food Environment

The home food environment (HFE) framework provides a multi-level approach to understanding childhood obesity and dietary intake (Figure 1; Rosenkranz &

Dzewaltowski, 2008). The framework includes the following three components: built and natural environments, socio-cultural environments, and political and economic environments. Each of these components includes macro- and micro-level factors. Examples of macro-level factors are availability and accessibility of food stores (built and natural environments), race, ethnicity, and cultural identity (socio-cultural environment), and federal and community programs (political and economic environments). Examples of micro-level factors include home food availability, family structure, and family socioeconomic status (SES), respectively. The HFE framework primarily emphasizes psychological and social influences on child obesity and dietary intake. However, the model also proposes that child characteristics, including biological and genetic factors, may mediate or moderate the associations between characteristics of the home food environment and child dietary intake (Rosenkranz & Dzewaltowski, 2008).

Although the HFE framework includes numerous constructs, home food availability (HFA) has been found to be particularly important in predicting child dietary intake (Blanchette & Brug, 2005). Especially for young children, who consume more of their daily caloric intake in the home than older children and adolescents (Poti & Popkin, 2011), the foods that parental guardians make available in the home is posited to affect diet quality and weight status of children (Rosenkranz & Drewaltowski, 2008). Several studies have found HFA to be associated with child and adolescent food intakes (Campbell et al., 2007; Cutler, Flood, Hannan, & Neumark-Sztainer, 2011; Haerens et al., 2008; Hanson, Neumark-Sztainer, Eisenberg, Story, & Wall, 2005; Pearson, Biddle, & Gorely, 2009; Reinaerts, de Nooijer, Candel, & de Vries, 2007; Vereecken, Haerens, De Bourdeaudhuij, & Maes, 2010).

HFA may also be related to child dietary intake and weight status by its role in establishing taste preferences. Children generally prefer foods that are available and accessible in their homes (Nicklas et al., 2001; Patrick & Nicklas, 2005; Rhee, 2008). Thus, children who are exposed to fruits and vegetables in the home are more likely to develop a liking for these foods than children who do not have fruits and vegetables available at home. Developing a preference for foods is associated with increased consumption of those foods (Wardle et al., 2003). Thus, providing healthy foods in the home and limiting unhealthy foods in the home may promote healthy eating behaviors in children through development of taste preferences.

The Food Choice Process Model

Given the potentially important influence of HFA on child dietary intake and thus weight status, it is important to gain an understanding of the factors that influence parental guardians' decisions about the foods that they make available to their children. The food choice process model, proposed by Furst, Connors, Bisogni, Sobal, and Falk (1996), provides a framework for understanding how food choices are made (Figure 2). The food choice process model proposes three main components of factors that influence food choice: life course factors, influences, and personal system. Life course factors refer to major life events that create a change in food choice and establish a trajectory for the future. Some examples include moving to a new place, being diagnosed with a disease, or getting married. Influences, such as cultural ideals, personal factors (food preferences, personality), resources (socioeconomic factors, skills, knowledge), and social factors (support from social contacts) represent the second level of the model. Personal systems represent the narrowest point in the model and refer to individual cognitive processes that people develop and use to make decisions regarding food choice. In particular, food choice values (FCVs), defined as factors that individuals consider when deciding what foods they want to purchase and/or consume (e.g. taste, cost, and natural content of foods), are a key part of the personal systems thought to influence food choice and eating behaviors (Furst et al., 1996; Sobal & Bisogni, 2009). According to the model, life course factors (such as socioeconomic factors) influence variables comprising the personal systems (such as FCVs) (Furst et al., 1996; Sobal & Bisogni, 2009).

Furthermore, the food choice process model underlies BPS and multi-level approaches. For example, the model includes biological (e.g., genetic predispositions) psychological (e.g., food preferences and personality), and social (e.g., parenting and social norms) factors. Regarding multi-level components, the model proposes that social, political, and historical contexts, cultural traditions and ideals, socioeconomic factors, and individual level factors, like attitudes and values, are posited to affect food choice. The food choice process model also proposes that these multi-level factors interact with each other. For example, the broader influences, like SES, are expected to shape FCVs (Furst et al., 1996). Although the food choice process model includes many factors that are thought to influence food choices, FCVs and SES have been identified by previous research as being particularly important in shaping food choices.

FCVs including health, taste, cost, convenience, and managing inter-personal interactions are the primary FCVs that individuals consider, according to the food choice process model (Furst et al., 1996). Other researchers have identified similar FCVs, but have also included others. For example, Steptoe, Pollard, and Wardle (1995) have also identified mood, natural content, weight control, familiarity, and ethical concern as important FCVs, and did not identify managing inter-personal relationships. Similarly, Lyerly and Reeve (in press) also identified comfort, organic, tradition, and safety as FCVs that individuals consider. When using FCVs to make decisions regarding food choice, individuals must also manage these various values. These processes involve categorizing foods and situations, prioritizing conflicting values, and balancing priorities (Connors, Bisogni, Sobal, & Devine, 2001). In support of the theoretical model that FCVs influence food choice, certain FCVs have been associated with self-reported consumption of particular foods. For example, adults who endorse the value of health when consuming foods, report increased consumption of fruits and vegetables and a decreased consumption of sweets (Eertmans, Victoir, Vansant, & Van den Bergh, 2005; Glanz, Basil, Maibach, Goldberg, & Snyder, 1998).

Previous research, therefore, provides some support for the associations between personal FCVs, HFA, and personal dietary intake. Although it seems likely that these same FCVs would influence the types of foods that parents purchase for their children, there is little empirical evidence to support this generalization. For example, parents who endorse the value of health may have more fruits and vegetables available in the home since they consume more fruits and vegetables. However, limited research has specifically examined how FCVs of parents are associated with foods that they actually purchase and make available in their home (Tarkiainen & Sundqvist, 2005). There has also been limited research examining how parental FCVs are associated with child dietary intake (Oellingrath, Hersleth, & Svendsen, 2012; Roos, Lehto, & Ray, 2012). Furthermore, while several studies have found some evidence that HFA is associated with child dietary intake (Campbell et al., 2007; Cutler et al., 2011; Hanson et al., 2005;

Haerens et al., 2008; Pearson et al., 2009; Reinaerts et al., 2007; Vereecken et al., 2010), none of these studies have also examined parental FCVs. Thus, previous research in this area has not tested whether HFA mediates the relationship between parental FCVs and child dietary intake. Inclusion of these constructs in a single model will allow for a better understanding of how parental FCVs, HFA, and child dietary intake are associated with each other.

Home Food Environment and Socioeconomic Status

In addition to FCVs, previous research has also identified SES as an important distal factor that influences food choice. Socioeconomic indicators such as income, wealth, and education level, may influence certain food choices both directly and indirectly. For example, having higher income may facilitate the purchase of fresh fruits and vegetables because such foods are more available in higher income neighborhoods (Darmon & Drewnowski, 2008). Similarly, owning kitchen appliances may facilitate the purchase of foods that require more preparation. Higher education level may result in better knowledge about nutrition and thus facilitate the purchase of healthier foods (Sobal & Bisogni, 2009). Research shows that parental guardians with lower education or income do have decreased availability of healthy foods (i.e. fruits and vegetables) and increased availability of unhealthy foods (i.e. sweets and snack foods) in the home compared to those with higher education and/or income levels (Campbell et al., 2002; Cutler et al., 2011; MacFarlane, Crawford, Ball, Savige, & Worsley, 2007). Additionally, higher levels of SES are associated with increased intake of healthy foods and decreased intake of unhealthy foods in adults (Darmon & Drewnowski, 2008; Larson & Story, 2009; Raffensperger et al., 2010) and children (Bere, van Lenthe, Klepp, & Brug, 2008; Cutler et al., 2011; Hilsen, van Stralen, Klepp, and Bere, 2011; Verceecken et al., 2010).

Despite linking SES to HFA and dietary intake, previous research has not tested the pathways through which these effects occur and specifically whether parental FCVs mediate these relationships. For example, individuals of higher SES may place less emphasis on certain FCVs (such as price or convenience) than those of lower SES (Sobal & Bisogni, 2009). Preliminary research has supported this mechanism suggested by the food choice process model in that SES is associated with differences in FCVs. In particular the values of price (Dammann & Smith, 2009; Lawrence et al., 2009), convenience (Dammann & Smith, 2009; Lawrence et al., 2009; Sealy, 2010), and tradition (Lawrence et al., 2009; Sealy, 2010), have been found to be important in determining food choice among those of lower SES. The importance of health (Inglis, Ball, & Crawford, 2009) and access (Darmon & Drewnowski, 2008) has differed between individuals of lower and higher SES. Thus, it is possible that parental FCVs may mediate the associations between SES and HFA and SES and child dietary intake. Similarly, previous research has not tested whether the relationship between SES and child dietary intake is mediated by HFA.

Thus, the overall purpose of the proposed study is twofold: (1) to better understand the relationships between parental FCVs, HFA, and child dietary intake, and (2) to examine the relationships between SES and these constructs.

CHAPTER 2: LITERATURE REVIEW

As noted above, for children home food availability (HFA) is theorized to be a key determinant of dietary intake and subsequent weight status (Rosenkranz & Dzewaltowski, 2008). Additionally, the food choice process model proposes that food choice values (FCVs) play an important role in making decisions about which foods to purchase (Furst et al., 1996). Although, parental FCVs may predict HFA and subsequent child dietary intake, there is limited research examining this relationship. Thus, the primary research questions of the proposed study are to understand the relationships between parental FCVs, HFA, and child dietary intake. Specifically, this study assesses whether FCVs of parental guardians predict HFA (labeled 1 in Figure 3), whether HFA predicts child dietary intake (labeled 2 in Figure 3), and whether parental FCVs predict child dietary intake (labeled 3 in Figure 3). The extant literature pertaining to each of these relations will be reviewed below.

Second, the influence of socioeconomic status (SES) on this model will be examined. SES is a broad domain referring to an individual or family's position in society based on the ability to access or have power over resources and wealth (Mueller & Parcel, 1981). Although typically not well defined, SES is usually measured by a variety of indicators including occupation type, level of education, income, or a combination of these factors (Shavers, 2007). In addition to HFA, SES has also been theorized to be an important determinant of child dietary intake (Rosenkranz &

Dzewaltowski, 2008). Similarly, the food choice process model includes socioeconomic factors as important distal factors that may influence food choice (Furst et al., 1996). For example, distal factors, such as SES, are expected to influence more proximal factors of food choice, such as FCVs (Furst et al., 1996; Sobal & Bisogni, 2009). Therefore, SES may predict parental FCVs (labeled 4 in Figure 3), HFA (labeled 5 in Figure 3), and child dietary intake (labeled 6 in Figure 3). SES may also modify the association between parental FCVs and HFA (labeled 7 in Figure 3).

Parental FCVs and HFA

There has been limited research examining how parental FCVs are associated with HFA. Although some research has shown that intentions to purchase foods are associated with actual purchase of these foods or that FCVs are associated with dietary intake, no studies have specifically tested the hypothesis that parental FCVs will be associated with HFA. Thus, the current study will address this gap.

Although not specifically examining parents, a few studies have examined how FCVs of adults are associated with the purchase of organic foods. One study found that individuals' intentions to purchase organic food did predict their purchase of organic foods (Tarkiainen & Sundqvist, 2005). Other studies examining FCVs that predict purchase of organic foods have found that individuals who were concerned with environmental and other ethical issues (Honkanen, Verplanken, & Olsen, 2006; Michaelidou & Hassan, 2008), natural content of foods (Onyango, Hallman, & Bellows, 2007), and food safety (Michaelidou & Hassan, 2008) were more likely to purchase organic foods. Thus, it can be implied that if parents more highly endorse the organic value, they are more likely to purchase organic foods, therefore making these foods available in the home. Similarly, the research discussed in the next section, which has found support that FCVs are associated with dietary intake, may suggest that these foods are more available in the home.

HFA and Child Dietary Intake

Several studies have examined whether HFA is associated with child and adolescent dietary intake (Campbell et al., 2007 Cutler et al., 2011; Haerens et al., 2008; Hanson et al., 2005; Pearson et al., 2009; Reinaerts et al., 2007; Vereecken et al., 2010). HFA may be associated with child dietary intake simply because foods that are available in the home are foods that children have access to, or because taste preferences of children are influenced by foods that are available and accessible (Niklas et al., 2001; Patrick & Nicklas, 2005; Rhee, 2008; Wardle et al., 2003).

Studies in this area have found that availability of unhealthy snack foods is associated with an increased likelihood of consuming unhealthy snack foods or increased fat intake in children and adolescents (Campbell et al., 2007; Cutler et al., 2011; Haerens et al., 2008; Verceecken et al., 2010) and a decreased likelihood of consuming fruits and vegetables (Cutler et al., 2011; Haerens et al., 2008; Vereecken et al., 2010). Availability of fruits and vegetables in the home has been associated with increased consumption of these items in children and adolescents (Cutler et al., 2011; Haerens et al., 2008; Hanson et al., 2005; Pearson et al., 2009; Reinaerts et al., 2007) and decreased consumption of unhealthy foods (Cutler et al., 2011). Furthermore, a review by Blanchette and Brug (2005) found that availability and accessibility of fruits and vegetables were among the most important determinants of fruit and vegetable consumption in young children.

The existing literature demonstrates a relationship between HFA and child dietary intake. The current study extends the literature by testing a mediation model in which it is predicted that HFA will mediate the relationship between parental FCVs and child dietary intake.

Parental FCV and Child Dietary Intake

A few studies have examined the associations between personal FCVs and dietary intake among adults (Eertmans et al., 2005; Glanz et al., 1998). For example, Eertmans et al., (2005) found that higher endorsement of the weight control value was associated with a decrease in reported consumption of soda, sweet snacks, and salty snacks and an increase in reported consumption of fruit and overall dietary healthfulness. Likewise, there was a positive association between endorsement of the health value and consumption of milk and overall dietary healthfulness. Similarly, Glanz et al. (1998), found that FCVs of taste, nutrition, cost, convenience, and weight control predicted reported dietary intake of various foods after controlling for demographic characteristics and lifestyle factors (e.g., smoking and physical activity level). Higher consumption of fruits and vegetables was predicted by higher values of taste, nutrition, convenience, and weight control. Higher endorsement of the convenience value predicted an increase in fast food consumption and higher endorsement of the weight control value predicted a decrease in fast food consumption. The cost value did not predict fruits and vegetable or fast food consumption, but was positively associated with consumption of breakfast cereals.

In addition to examining FCVs and dietary intake in adults, two studies have examined how parental FCVs are associated with child or adolescent dietary intake

(Oellingrath et al., 2012; Roos et al., 2012). These studies found that parents' selection of health and organic as important FCVs was associated with children having more varied eating patterns (eating varied meals that are recommended) (Oellingrath et al., 2012), higher intakes of nutrient-dense foods (e.g., fruits, vegetables, and rye bread) and lower intakes of energy-rich foods (e.g., pizza, hamburgers, meats, pastries, sweets, crisps, and soda) (Roos et al., 2012). Furthermore, parents' selection of convenience as an important FCV was negatively associated with children eating a varied diet (Oellingrath et al., 2012) and intakes of healthy foods and positively associated with intakes of unhealthy foods (Roos et al., 2012).

Few studies have been conducted to examine whether FCVs predict personal dietary intake and whether parental FCVs predict child dietary intake. However, results from these studies show that FCVs are associated with personal and child dietary intake. The current study tests whether parental FCVs predict child dietary intake, adding to the limited research conducted in this area. Additionally, previous studies have not attempted to examine the pathways through which FCVs affect dietary intake. It is possible that parental FCVs have a direct effect on child dietary intake and that this relationship is partially due to indirect effects via HFA. The current study will add to the existing literature by examining whether HFA mediates the relationship between parental FCVs and child dietary intake.

SES and Parental FCVs

The secondary focus of this study is to assess the degree to which differences in SES influence parental FCVs, HFA, and child dietary intake. As suggested by the food choice process model, SES may influence FCVs (Furst et al., 1996). Several qualitative studies have found that the values of price (Dammann & Smith, 2009; Lawrence et al., 2009), convenience (Dammann & Smith, 2009; Lawrence et al., 2009; Sealy, 2010), and tradition (Lawrence et al., 2009; Sealy, 2010), are important in determining food choice among those of lower SES. Additionally, a few quantitative studies have also examined how FCVs differ based on level of income (Glanz et al., 1998; Inglis et al., 2009; Steptoe et al., 1995).

Several studies have specifically examined how income and education influence FCVs and food purchasing behaviors among adults. Research examining FCVs among adults with low income or low education found that cost (Dammann & Smith, 2009; Inglis et al., 2009; Lawrence et al., 2009) and time constraints (Lawrence et al., 2009; Sealy, 2010) were perceived barriers in purchasing healthy foods, such as fresh fruits and vegetables. Although some individuals were unaware of the link between nutrition and long-term health, others understood the link between nutrition and health and valued health when purchasing foods. However, due to the high costs of healthy foods, these individuals often did not purchase healthy foods despite noting health as an important value (Dammann & Smith, 2009; Lawrence et al., 2009). One quantitative study among low and high income women asked participants to select from a list of 525 food and beverage items, which items they generally purchase when grocery shopping. Then, participants were a given a hypothetical increase in food budget; low income women picked more healthy food items while high income women picked more unhealthy items; however, there were still differences in overall healthiness of food purchases within the two groups even when budget was increased (Inglis et al., 2009). Furthermore, quantitative studies have found that cost (Glanz et al., 1998; Steptoe et al., 1995), familiarity (Steptoe et al., 1995), and convenience (Glanz et al., 1998) are more important FCVs for those with lower income, and sensory appeal is less important among those with lower income (Steptoe et al., 1995).

Several qualitative and quantitative studies have explored how FCVs may differ based on SES. Values of cost and convenience were generally recognized across studies as important values that women of low income or low educational attainment consider. As these findings are consistent with the food choice process model, the current study tests whether SES predicts parental FCVs.

SES and HFA

Generally, lower SES is associated with decreased availability or purchase of healthy foods like fruits and vegetables and increased availability or purchase of unhealthy foods like sugars, fats, and processed foods. Individuals with lower incomes are more likely to have processed and energy dense foods available in the home (Darmon & Drewnowski, 2008), and are less likely to have fruits, vegetables, and other foods that are high in fiber and low in salt, fat, and sugar available in the home (Campbell et al., 2002; Darmon & Drewnowski, 2008; MacFarlane et al., 2007; Turrell, Hewitt, Patterson, Oldenburg, & Gould, 2002). Education level has also been associated with HFA. For example, individuals with higher educational levels are more likely to report having fruits and vegetables available in the home compared to individuals with lower educational levels (Campbell et al., 2002; Cutler et al., 2011; MacFarlane et al., 2007; Turrell et al., 2002). Additionally, individuals with higher educational levels are more likely to report having limited availability of unhealthy foods in the home, while individuals with lower educational levels are more likely to report that unhealthy foods are always available

(Campbell et al., 2002; Cutler et al., 2011; MacFarlane et al., 2007; Verceecken et al., 2010).

The current literature demonstrates a positive association between SES and availability of healthy foods in the home and a negative association between SES and availability of unhealthy foods in the home. The current study adds to the existing literature in this area by examining the association between SES and HFA within a larger model. Additionally, the model will test whether the association between SES and HFA is mediated by parental FCVs, which is currently untested. Furthermore, it is possible that SES may modify the relationship between parental FCVs and HFA. Although this has not been tested in previous research, there is some evidence from the qualitative research discussed here that certain FCVs, although noted as important, may not result in actual purchase of these foods among individuals of lower SES. Thus, this study also tested whether SES moderated the association between parental FCVs and HFA.

SES and Child Dietary Intake

Similar to the association between SES and HFA, SES has also been positively associated with consumption of healthy foods and negatively associated with consumption of unhealthy foods. Several studies and review articles have found these associations in adults (Darmon & Drewnowski, 2008; Larson & Story, 2009; Raffensperger et al., 2010). Two studies have examined the association between family SES and child dietary intake. One study found that household income was positively associated with dietary intake of fruits and vegetables in children, and negatively associated with intake of unhealthy snack foods (Culter et al., 2011). Another study found that parental education level was positively associated with child dietary intake of healthy foods and negatively associated with child dietary intake of unhealthy foods (Verceecken et al., 2010).

A few particularly relevant studies have also examined these relationships as part of a path model. A longitudinal study in Norway by Bere et al. (2008) found a positive relationship between both parental income and parental education level and the amount of fruits and vegetables that adolescents consume. For the relationship between education and dietary intake, accessibility of fruits and vegetables in the home mediated this relationship. Hilsen et al. (2011) conducted a trend study, and found similar results. Fruit and vegetable consumption decreased over time among children of parents with a lower education, but increased in children of parents with higher education. The relationship between fruit and vegetable consumption and parental education level was mediated by accessibility and child preferences. Adolescents of higher educated parents had increased accessibility and preference of fruits and vegetables over time.

SES has also been shown to be associated with dietary intake in adults and children. Additionally, two studies have found that accessibility (similar to HFA) is an important mediator in this relationship. The current study attempted to replicate these results and also included parental FCVs as part of the model to further extend research in this area. Inclusion of parental FCV and HFA into the model allowed for testing whether the association between SES and child dietary intake was due to direct or indirect effects. For example, parental FCVs, HFA, or both parental FCVs and HFA may mediate the relationship between SES and child dietary intake.

Limitations of the Extant Literature

As discussed throughout the previous sections, a major limitation of research in this area is that the majority of studies have only examined the association between two variables in the proposed model. Furthermore, some of the single associations proposed in the current study, in particular the association between parental FCVs and HFA has not been tested in previous research. Thus, the current study extends research in this area by incorporating parental FCVs, SES, HFA, and child dietary intake into a single model. Specifically, this model also examines the pathways that link these constructs. Specifically, the current study tests whether HFA mediates the association between parental FCVs and child dietary intake, whether parental FCVs mediate the association between SES and HFA, and whether parental FCVs, HFA, or both parental FCVs and HFA mediate the association between SES and child dietary intake. Lastly, the model allows for testing whether SES moderates the association between FCVs and HFA, which has not been previously examined.

An additional limitation is that many of these studies have not used rigorous measurement devices in assessing the variables of interest. For example, only three of the five quantitative studies examining FCVs used a validated measure to assess FCVs (Eertmans et al., 2005; Oellingrath et al., 2012; Roos et al., 2012). Others selected only specific values (e.g., taste, nutrition, cost, convenience, and weight control in Glanz et al., 1998) to examine. The current study uses a validated measure to assess FCVs. Similarly, none of the studies examining HFA used a comprehensive food inventory to assess availability of foods in the home. Instead, previous research has asked participants to report availability of between four (Hanson et al., 2005) and 12 items in the home

(Haerens et al., 2008). Additionally, many of these studies used dichotomous variables for whether a given item was or was not present in the home. Although this may provide some information regarding types of foods available in the home, these lists are not comprehensive. A validated and comprehensive household food inventory was used in the current study to measure HFA. While a majority of studies in this area have used validated food frequency questionnaires or semi-structured interviews to measure dietary intake, others have only measured fruits and vegetables (Bere et al., 2008; Glanz et al., 1998; Reinaerts et al., 2007). The current study uses a validated food frequency questionnaire to assess dietary intake of a variety of food types. Finally, only a handful of studies examining SES have included more than one measure of SES (Bere et al., 2008; Cutler et al., 2011; Raffensperger et al., 2010; Turrell et al., 2002). Instead of using a single indicator of SES, four indicators of SES were measured in the current study to examine a broader context of SES than has been examined in most previous research.

Research Objectives

Given that many of the relationships between these constructs are not well understood, this was an exploratory study and specific hypotheses could not be made. However, based on the research presented in the literature review, some general predictions can be posited.

Research objective 1: Parental FCVs, HFA, and child dietary intake

1a. Parental FCVs will predict HFA (labeled 1 in Figure 3).

1b. HFA will predict child dietary intake (labeled 2 in Figure 3).

1c. Parental FCVs will predict child dietary intake (labeled 3 in Figure 3). The effect of parental FCVs on child dietary intake is expected to be partially via an indirect effect through HFA.

Research objective 2: SES, parental FCVs, HFA, and child dietary intake

2a. SES will predict parental FCVs (labeled 4 in Figure 3).

2b. SES will predict parental HFA (labeled 5 in Figure 3). The effect of SES on HFA is expected to be partially via an indirect effect through parental FCVs.

2c. SES will predict parental child dietary intake (labeled 6 in Figure 3). The effect of SES on child dietary intake is expected to be partially via indirect effects through parental FCVs, HFA, and both parental FCVs and HFA.

2d. SES will moderate the association between parental FCVs and HFA (labeled 7 in Figure 3).

Below are some examples of expectations based on the general objectives. For example, it is expected that the parental weight control/health and organic values would be associated with increased fruit and vegetable HFA and child dietary intake and decreased high-fat/high-sugar HFA and child sugar and soda intake. The opposite associations were expected for parental accessibility and convenience values. Furthermore, it was expected that there would be no associations between some variables. For example, there would be no expected relationship between the parental tradition value and fruit and vegetable HFA. In regards to SES, it was specifically hypothesized that higher SES would be positively associated with parental FCVs such as weight control/health and organic and negatively associated with parental FCVs such as accessibility and convenience. Furthermore, it is expected that higher levels of SES would predict increased HFA and child fruit and vegetable intake and decreased HFA and child sugar and soda intake.

CHAPTER 3: METHODOLOGY

Participants

Parental guardians were recruited from Amazon's MTurk (*N* = 224). MTurk is a participant recruitment website that is open to a worldwide popoulation. For the current study, the sampling population was restricted to individuals living in the US. To be eligible for participation, participants had to be at least 18 years old and a parental guardian to a child between the ages of 6-11. Additionally, at least one of these children had to be currently living in the home and all children living in the home had to be between the ages of 6-11. To control some potential threats to internal validity, additional inclusion criteria were that the participant must typically purchase food for his or her household and that no household members could be on a medically prescribed or restricted diet (e.g., gluten free diet, diet for hypertension, food allergies, etc.). An age range of 6-11 was selected because younger children consume more of their daily caloric intake in the home than older children and adolescents (Poti & Popkin, 2011). Therefore, it is likely that the home food environment is more important in determining child dietary intake in younger children than in older children and adolescents who are more likely to purchase food for themselves. Eligibility was further restricted to participants who only had children in the 6-11 age range since the types of foods purchased for younger children may be different than the types of foods purchased for older children. For a similar rationale, participants with any household members on a medically prescribed or restricted diet were excluded.

A total of 224 participants provided complete responses to the survey. Nine participants were removed based on responses indicating they were not eligible (e.g., child living at home was not between the ages of 6-11). Additionally, participants who completed the survey in less than ten minutes were removed (*N* = 16). Prior pilot testing confirmed that the minimum time to complete the survey was greater than 10 minutes. Finally, an additional six participants were found to be multivariate outliers and (see details in the measures section) were removed. Thus, the final operational sample for data analyses was *N* = 193.

A majority of parental guardians (i.e., the respondents) were female (61.1%), white (78.8%), and the average age was 34.53 years (*SD* = 6.97). Two thirds of participants were married (66.8%), more than half of participants had a bachelor's degree or higher (56.5%), and the average annual household income was $52,226.95 (*SD* = $29,461.69). In regards to child demographic characteristics (i.e., the target child), about half were female (49.7%), the majority were white (73.6%), and the average age was 7.94 years *(SD* = 1.63). All demographic statistics are presented in Table 1.

Measures

Parental Food Choice Values (FCVs)

The Food Choice Value Scale (Lyerly & Reeve, in press) was used to measure parental FCVs. The 25-item scale measures eight factors of FCVs: convenience, accessibility, tradition, comfort, organic, safety, sensory appeal, and weight control/health. A description of each factor can be found in Table 2 and the full list of items can be found in Appendix C. Participants are asked to report how important each item is when purchasing foods for his or her family on a scale of 1-not at all important to 5- very important. Although Lyerly and Reeve (in press) report four studies concerning its internal consistency and validity, item and subscale level statistics were reexamined in the current sample to ensure proper psychometric functioning.

Item level statistics (i.e., item endorsement and item variability) were similar to results from the original validation study (see Table 3). Similarly, the range of item-total correlations for these 25 items was .35 to .83, which is also consistent with the original research. Internal consistency for each of the subscales was estimated using Cronbach's alpha. Alpha coefficients across the eight scales were as follows: sensory appeal (α = .63), accessibility (α = .64), tradition (α = .73), safety (α = .74), health/weight concern (α = .82), organic (α = .81), convenience (α = .88), and comfort (α = .89). To determine how well the current data fit the eight-factor model, a confirmatory factor analysis was conducted. The following guidelines are used when examining model fit statistics: CFI and TLI values >.95 suggest good fit and values >.90 suggest adequate fit (Hu & Bentler, 1999), RMSEA values <.05 suggest good fit and values <.08 suggest acceptable fit (Browne & Cudeck, 1992). Model fit statistics confirmed that the original model adequately fit the current data ($X^2 = 404.50$, $X^2/df = 1.64$, CFI = .93, TLI = .91, RMSEA = .057). Furthermore, each item loaded onto the expected factor and factor loadings ranged from .53 to .92 (Table 3).

Home Food Availability (HFA)

HFA was measured using a modified version of the Home Food Inventory (HFI; Fulkerson et al., 2008). The HFI is a comprehensive list of both healthy and unhealthy foods and beverages that may be available in the home. Respondents are asked to look through their pantries and refrigerators when completing the inventory and mark ‘yes’ or ‘no’ to indicate whether an item is or is not present in their home. Additionally, two questions ask participants to report accessibility of certain foods. For example, one question asks participants to look in their refrigerator and without moving any items, report whether they can see various foods and beverages (e.g., skim milk, regular soda, fresh fruits, etc.). The second asks about food items that are accessible on countertops and tables. Fulkerson et al. (2008) found adequate agreement between individuals' reports of HFA using the HFI and trained personnel who completed the HFI ($\kappa = .61$ to .95). Reports from the HFI were also positively correlated with the number of food group servings and nutrients reported via a 24-hr dietary recall. For example, energy intake was significantly and positively associated with the high-fat, high-sugar (HFHS) food availability score for parents and adolescents (aged 10-17).

For the current study, the scale was modified to include only items that pertain to three categories of foods: dairy (12 items), fruits and vegetables (46 items), and HFHS food items (71 items) (Appendix D). The HFHS food availability score includes the following types of items: regular-fat versions of dairy products, frozen desserts, prepared desserts, savory snacks, added fats, sugary beverages, high-fat quick foods, microwavable foods, and candy. These three categories were selected because they closely align to food categories contained in the Dietary Screener Questionnaire (e.g., dairy, fruits and vegetables, added sugar, added sugar from soda). The score for each category is the proportion of items present in the home. Thus, scores closer to 1 would indicate that more items from that category are available in the home.

Child Dietary Intake

Child dietary intake was measured by the Dietary Screener Questionnaire (DSQ; National Cancer Institute, 2014; Appendix E). The DSQ is supported by the National Cancer Institute and is used in the National Health and Nutrition Examination Survey (NHANES). The measure consists of 28 items, which asks about the frequency of consumption of various foods during the past month. For children under the age of 12, parents serve as a proxy to complete the DSQ. A set of algorithms, which have been calibrated using data from 24-hr recalls, have been developed to calculate estimates of dietary intake of fruits and vegetables, added sugars, dairy, whole grains, fiber, and calcium. To provide the most accurate estimate of dietary intake based on the appropriate portion size for children, algorithms take into account age and sex of the child. After applying the algorithms, dairy and fruit and vegetable scores indicate the number of cups per day of dairy or fruits and vegetables that are consumed. The sugar and soda values indicate the amount of added sugars in teaspoons consumed per day, in general and from soda, respectively. The DSQ has been shown to have good agreement with reports from 24-hr dietary recalls.

In the current study, only the dairy, fruits and vegetables, added sugars, and soda categories were examined. These four categories of dietary intake closely align to the three categories of HFA (dairy, fruits and vegetables, and HFHS foods), thus making it possible to examine whether HFA of a given food category is associated with intake of that food category. For example, dairy HFA aligns with dairy intake, fruit and vegetable HFA align with fruit and vegetable intake, and HFHS HFA align with sugar and soda intake. On the other hand, it would be difficult to match any one food category of HFA with dietary intake of fiber or calcium, since these nutrients come from a variety of food sources.

Composite Socioeconomic Status (SES) Score

Data were collected on four socioeconomic indicators (described below). These four individual indicators were used to create a composite (or formative) score of SES

Subjective social standing was measured using the MacArthur Scale of Subjective Social Status (MacArthur Foundation, 2008). Participants are given a picture of a ladder with ten rungs and asked to place an X where they believe that they stand in their community (Appendix F). The MacArthur Scale of Subjective Social Status has been found to have moderate correlations with income and education; the correlations are similar to the correlations found between education and income (Operario, Adler, & Williams, 2004). Additionally, research has shown that individuals can accurately report their social standing and that subjective report of social standing is associated with health outcomes (APA, 2007).

Educational level was assessed via a single item, "What is the highest degree you have earned?", and six response options were provided: 1) less than high school, 2) high school diploma or GED, 3) associate degree or other two-year degree, 4) bachelors degree, 5) master's degree, and 6) terminal degree (e.g. MD, JD, PhD).

Estimated annual household income during the past 12 months was assessed via a single open-ended response item.

Income-needs ratio is a measure of poverty that was calculated based on the reported annual household income, number of adults, and number of children under the age of 18 living in the home. The US Census Bureau provides a list of poverty thresholds (in US dollars) based on annual household income, number of adults, and number of children under the age of 18 living in the home household. The total household income is divided by the appropriate poverty index (US Department of Commerce, 2011). The resulting number was left in its continuous form.

Before computing a weighted score, data were examined for multivariate outliers with respect to the set of four SES indicators. Specifically, leverage scores were computed for each participant and the formula 3k/*N*, where k equals the number of independent variables and *N* equals the sample size, was used to determine a critical score (Cohen, Cohen, West, & Aiken, 2003, p. 397). Using this formula, leverage scores above .060 would identify a case as a multivariate outlier. There were six cases with a leverage score above this value, and thus these six participants were removed from the sample (as noted above), resulting in a final sample size of $N = 193$.

An index reflecting family socioeconomic status was computed as a weighted score of the four individual SES indicators. The first unrotated principal component based on these four items was extracted. The component accounted for 66.0% of the observed score variance and SES is reported in a z-score metric with a mean of 0 and standard deviation of 1.

Control Variables

Basic descriptive information including age (of child and parent), sex (of child and parent), and racial/ethnic background (of child and parent) were collected. Other control variables included social desirability, weight status of parent and child, and household food insecurity.

Social desirability was measured using the Marlow Crowne Social Desirability Scale – 13 item (Form C) (Appendix G; Crowne & Marlow, 1960). For this measure, participants are asked to agree or disagree to a series of true/false statements that reflect common but undesirable behaviors or uncommon but desriable behaviors. Greater social desirability is indicated with higher scores. The 13 item scale has been found to be a relaible and valid alternative to the full 33 item scale (Reynolds, 1982). The internal consistency for the scale in the current study was good ($\alpha = .80$).

Weight status of the responding parent only was assessed via body mass index (BMI), which was calculated based on weight and height self-reported by the parent. For descriptive and reporting purposes, this can be dichotomized into an ordinal variable indicating “normal weight” vs. “overweight/obese.” Parents with a BMI $\geq$25 were considered overweight or obese (Centers for Disease Control, 2014).

Weight status of child was assessed two ways. First, the reporting parent was asked to estimate the child’s height and weight, which was then used to determine weight status. To determine weight status in children, the BMI value is compared to a growth chart standardized for sex and age. Children and adolescents who are at or above the 85^{th} percentile are considered overweight or obese (Centers for Disease Control, 2014). Second, the reporting parent was also asked a single item: “Over the past year, has a healthcare professional ever told you that your child is overweight or obese?” The choice to use alternate measures here was due to the concern that some parents may not be able to estimate child height or weight. Only nine of the participants responded yes to having been told by a healthcare professional that his or her child was overweight or obese. Due to limited variance in response to this item, weight status as measured by BMI was used to control for child weight status in all of the analyses.

Household food insecurity was measured using the US Adult Food Security Module (Appendix H; Bickel, Nord, Price, Hamilton, & Cook, 2000). The measure consists of 10 items that assess household food security. The sum of affirmative responses denotes the level of food insecurity, with higher scores indicating higher levels of food insecurity. The scale has been found to be valid using a large, nationally representaitve sample. In the current sample, the internal consistency value was $\alpha = .77$.

Design and Procedure

A cross-sectional survey was used. Participants were recruited through Amazon's MTurk and completed the survey online through QuestionPro. Since the HFI requires that respondents look through their kitchens for food items, participants were instructed to complete the survey at home. At the beginning of the survey, participants first answered questions to ensure that they met the inclusion criteria: 1) must be at least 18 years old, 2) must be a parental guardian to a child between the ages of 6-11, 3) at least one child between the ages of 6-11 must currently live in the home, 4) all children living in the home must be between the ages of 6-11, 5) must be responsible for purchasing food for one's family, and 6) no family members living in the household can be on a medically prescribed or restricted diet. Only participants who met all inclusion criteria questions were able to complete the survey. On average, participants completed the survey in approximately 18 minutes (M = 18.12, SD = 6.86) and they were paid $1.25 for completing the survey, which is consistent with payment policies on MTurk for this length of survey.

Analyses

Prior to the focal analyses, a variety of descriptive analyses were conducted to assess the distribution of parental FCVs, SES, HFA, and child dietary intake.

Research Objective 1: Parental FCVs, HFA, and Child Dietary Intake

Path analysis, using OLS regression, was conducted to examine the direct and indirect effects of parental FCVs on HFA and child dietary intake following standard practices (e.g., Cohen et al., 2003). Examining direct and indirect effects allows for testing whether the relationship between two variables is mediated by a third variable. Analyses in the current study examine whether HFA mediates the association between parental FCVs and child dietary intake. Statistically, mediation is denoted when the effects of parental FCVs on child dietary intake would be at least partially due to indirect effects via HFA. Direct effects are represented by the regression coefficient between a predictor and outcome variable, controlling for the effects of the potential mediator. Indirect effects are calculated by summing the cumulative product of the direct effect coefficients comprising the pathway from the predictor to the mediator to the outcome. For example, the indirect effect of the parental organic value on child dairy intake would involve multiplying the regression coefficients in each pathway (e.g., organic FCV to dairy HFA to dairy intake, organic FCV to fruit and vegetable HFA to dairy intake, and organic FCV to HFHS HFA to dairy intake) and summing these products. Total effects are calculated by summing the direct and indirect effects.

Although eight parental FCVs were assessed, only those that had at least one significant correlation with a HFA or child dietary intake item were included in models. Thus, for the current analyses, parental accessibility, health/weight control, organic, convenience, sensory appeal, and safety FCVs were included in the analyses. To control for the covariates, hierarchical multiple regression was used. All of the covariates including parent and child age, sex, weight status determined by BMI (obese or not obese), parental marital status (married or not married), parental race (white or non-white), social desirability, and household food insecurity, were entered in the first step. Independent variables were then entered into the second step. Standardized regression coefficients were used so that the coefficient represents the amount of change in the dependent variable given a unit increase in the independent variable. Thus, all observed effects represent the effect of a given predictor variable on a given outcome variable after accounting for all of the variance due to the covariates and holding constant all other predictors. Cohen's (1969) traditional effect size guidelines were used to examine the magnitude of effect sizes: small effect $r \geq .10$; medium effect $r \geq .24$; large effect $r \geq .37$).

Research Objective 2: SES, Parental FCVs, HFA, and Child Dietary Intake

Path analysis, using OLS regression, was also used to examine the direct and indirect effects of SES on parental FCVs, HFA, and child dietary intake. The same procedure outlined under Research Objective 1 was used. Path analysis was used to examine whether parental FCVs mediated the associations between SES and HFA and whether parental FCVs, HFA, and/or both parental FCVs and HFA mediated the associations between SES and child dietary intake.

To test whether SES moderated the associations between parental FCVs and HFA, interaction effects were tested using hierarchical multiple regression. An interaction is present when the effect of one variable (e.g., parental FCV) on another variable (e.g., HFA) is conditional on a third variable (e.g., SES). An interaction term was created by multiplying the independent variable and the moderating variable. All variables, including the interaction terms, were mean centered to create more meaningful interpretations. To determine whether moderation is present, the significance level of the interaction term was examined. A regression coefficient with a significance level of $p < .05$ indicates a significant moderation effect. To determine the nature of the moderation, simple slopes were plotted (Cohen et al., 2003).

In stage 1, all mean-centered covariates (see the list of covariates under Research Objective 1) were entered to remove the effects of these covariates. In stage 2, all mean-centered independent variables were entered: SES, parental FCVs of accessibility, weight control/health, organic, convenience, sensory appeal, and safety. In stage 3, the interaction term was entered. Each interaction term was tested in a separate model to examine whether an interaction was present between SES and the unique variance of each parental FCV. Thus, a total of 18 interaction models were analyzed: six models to test for the interaction between SES and each of the six parental FCVs for each of the three HFA outcomes.

CHAPTER 4: RESULTS

Descriptive Statistics and Zero-Order Relations

Descriptive statistics and correlations between study variables are found in Table 4.

Food Choice Values

The average scores on the FCVs subscales ranged from 1.95 to 3.82. Means close to 2 indicate that participants perceive a value as only a little important, while means close to 4 indicate that participants perceive a value as being quite a bit important. Values that were perceived to be less than moderately important (e.g., a mean of < 3) were comfort (*M* = 1.95, *SD* = 1.01), tradition (*M* = 2.14, *SD* = .92), and weight control/health (*M* = 2.68, *SD* = .95). Values that were perceived to be more than moderately important (e.g., a mean of >3) were organic (*M* = 3.33, *SD* = .89), convenience (*M* = 3.43, *SD* = .94), safety (*M* = 3.80, *SD* = .91), sensory appeal (*M* = 3.81, *SD* = .75), and accessibility (*M* = 3.82, *SD* = .75). Comfort had the lowest average, suggesting that participants viewed this value as least important, and accessibility, sensory appeal, and safety had the highest averages, suggesting that participants viewed these values as most important.

The averages and ranking of the importance of these values is generally consistent with previous research. For example, Steptoe et al. (1995) found that the three most important values were sensory appeal, convenience, and price (similar to accessibility). The three least important values were ethical concern (similar to organic), familiarity (similar to tradition), and mood (similar to emotion). Additionally, the means, standard deviations, and ranking of the importance of values are similar to values previously reported using the FCV questionnaire (Lyerly & Reeve, in press). There were significant correlations between FCVs. The highest correlations were observed between comfort and tradition (r = .65), safety and organic (r = .50), and safety and sensory appeal (r = .47).

Home Food Availability

Participants reported having almost half of all foods in each category available in their homes. For example, on average participants reported having 48% of the fruits and vegetables included on the HFI available in their homes. Participants reported having more fruits and vegetables (M = .48, SD = .18), than dairy (M = .45, SD= .15) and HFHS foods (M = .42, SD = .14). Due to differences in measuring HFA, it is difficult to compare these values with previous research. However, the finding that approximately half of all items were reported as being available in the home is consistent with previous research (Campbell et al., 2002; Vereecken et al., 2010). There were several significant correlations between HFA and parental FCVs, and the direction of these associations was consistent with expectations. For example, fruit and vegetable HFA was positively correlated parental weight control/health and organic FCVs (r = .16 and r = .25, respectively) and negatively correlated with convenience (r = -.21). HFHS HFA was positively correlated with parental accessibility and convenience FCV (r = .21 and r = .25, respectively) and negatively correlated with the parental organic FCV (r = -.17). In other words, parental FCVs like organic and weight control/health were associated with increased availability of healthy foods and decreased availability of unhealthy foods. The opposite associated were observed with parental FCVs like accessibility and convenience.

Child Dietary Intake

On average, parents reported that their children consumed approximately three and a half cups of dairy products per day (*M* = 3.41, *SD* = .37), four cups of fruits and vegetables per day (*M* = 4.07, *SD* = .32), and seven teaspoons per day of total added sugar and added sugar from soda (*M* = 7.17, *SD* = 1.13 and *M* = 6.78, *SD* = 1.82, respectively). National guidelines for dietary intake in children recommend that children between the ages of 6-11 consume approximately 2.5 servings of dairy per day, 3.5 servings of fruits and vegetables per day, and less than 120 kcal per day in added sugars (approximately 7.4 tsp (U.S. Department of Agriculture, 2010). Thus, parents reported higher dairy consumption, higher fruit and vegetable consumption, and slightly lower sugar consumption compared to national guidelines. Compared to the national standards for children between the ages of 6-11, parents in the current study reported that children consumed higher amounts of dairy products. The number of daily servings of dairy reported by adults on the Dietary Screener Questionnaire has been found to be consistent with reports obtained from 24 hour dietary recalls (National Cancer Institute, 2014). No information is available on whether child dairy intake reported on the Dietary Screener Questionnaire is consistent with other reports of child dairy intake. Other research suggests that the majority of children consume fewer servings of fruits and vegetables per day and more teaspoons of sugar than is recommended (Krebs-Smith, Guenther, Subar, Kirkpatrick, & Dodd, 2005).

Socioeconomic Status

On average, the annual household income of participants was approximately \$52,000 (*M* = \$52,226.95, *SD* = \$29,461.69), poverty income ratio was 258.98% (*SD* = 147.24%), and participants ranked their subjective social standing as average (*M* = 4.79, *SD* = 1.92). These results are generally consistent with national statistics and previous research. For example, the medium annual household income in the US is \$52,000 (US Department of Commerce, 2014). Based on the income-needs ratio, 14.5% of the sample met the official criteria for being in poverty (income-needs ratio < 100%). This is consistent with the national data of individuals living in poverty in the US (also 14.5%) (US Department of Commerce, 2014).

Significant correlations were found between child dairy intake and the parental FCVs of sensory appeal (*r* = .17), accessibility (*r* = .17), and convenience (*r* = .33); there was a negative correlation between child dairy intake and the organic FCV (*r* = -.19). Child dairy intake was also positively correlated with dairy (*r* = .21) and HFHS HFA (*r* = .24) and negatively correlated with fruit and vegetable HFA (*r* = -.14). No significant correlations were found between child fruit and vegetable intake and any parental FCVs. As expected, there was a positive correlation between child fruit and vegetable intake and fruit and vegetable HFA (*r* = .22). Child sugar intake was negatively correlated with the parental organic FCV (*r* = -.30) and positively correlated with the convenience FCV (*r* = .30). Similarly, child soda intake was negatively correlated with the organic FCV (*r* = -.24) and positively correlated with the accessibility (*r* = .15), convenience (*r* = .31), and comfort FCVs (*r* = .15). Both child sugar and soda intake were negatively correlated with fruit and vegetable HFA (*r* = -.35 and *r* = -.27, respectively) and positively correlated with HFHS HFA (*r* = .28 and *r* = .32, respectively).

Analysis of Research Objective #1: Parental FCVs, HFA, and Child Dietary Intake

Results of the path analysis of parental FCVs, HFA, and child dietary intake are found in Table 5, and an example of results shown in graphic form is shown in Figure 4.

Home Food Availability.

The parental organic, weight control/health, convenience, and safety FCVs did predict aspects of HFA. For dairy HFA, only the organic and interestingly the safety FCVs, had small effects on dairy HFA. As the organic FCV increases, dairy HFA decreases (β = -.15) and as the safety FCV increases, dairy HFA increases (β =.21). As expected, parental weight control/health and organic FCVs had small positive effects on fruit and vegetable HFA (β = .15 and .13, respectively) and the parental convenience FCV had a medium negative effect on fruit and vegetable HFA (β = -.24). In other words, higher parental endorsement of the weight control/health and organic values predicted an increase in fruit and vegetable HFA, but higher parental endorsement of the convenience value predicted a decrease in fruit and vegetable HFA. The parental FCVs that predicted HFHS HFA were organic, convenience, and safety. An increase in the organic value predicted a reduction in HFHS HFA (β = -.25) and an increase in convenience and safety values predicted an increase in HFHS HFA (β = .19 and .13, respectively).

These results show that the parental FCVs, particularly the organic and convenience values, do affect the types of foods that are made available in the home. Additionally, the results show that generally parental FCVs have larger effects on fruit and vegetable and HFHS HFA than on dairy HFA. The parental FCVs that are the largest predictors of HFA are the organic, convenience, and safety values. Contrary to expectations, accessibility and sensory appeal did not significantly predict any of the HFA outcomes.

Child Dairy Intake

All three types of HFA had at least small effects on child dairy intake. As expected, increased dairy HFA predicted an increase in child dairy intake ($\beta = .19$). Higher HFHS HFA was also associated with a small increase in child dairy intake ($\beta = .12$). On the other hand, fruit and vegetable HFA predicted a reduction in child dairy intake ($\beta = -.14$). Total effects indicate that higher parental endorsement of the organic value predicts a reduction in child dairy intake ($\beta = -.18$) and higher parental endorsement of the convenience and sensory appeal values predicted increases in child dairy intake ($\beta = .17$ and $\beta = .13$, respectively). In examining the decomposition of these effects, parental FCVs had only small direct effects on child dairy intake, and these effects were not statistically significant. Parental convenience and sensory appeal values predicted a small increase in child dairy intake (both $\beta = .10$), and the organic value predicated a small decrease in child dairy intake ($\beta = -.10$). These parental FCVs also had indirect effects on child dairy intake. For example, the total effects of the parental organic and convenience FCVs on child dairy intake were partially due to indirect effects through HFA. In other words, HFA did mediate the relationships between parental organic and convenience FCVs and child dairy intake.

Child Fruit and Vegetable Intake

Increased dairy and fruit and vegetable HFA both predicted an increase in child fruit and vegetable intake ($\beta = .15$ and $\beta = .20$, respectively). HFHS HFA did not predict child fruit and vegetable intake. Surprisingly, parental FCVs generally had no effects on child fruit and vegetable intake. Only the accessibility value had what would be considered a small effect on child fruit and vegetable intake. Contrary to expectations, higher endorsement of the accessibility value predicted an increase in child fruit and vegetable intake ($\beta = .12$) and this effect was almost entirely via the direct effect. Although the total effects of the other parental FCVs on child fruit and vegetable intake were minimal, these effects were generally partially via indirect effects through HFA.

Child Sugar Intake

Fruit and vegetable and HFHS HFA had medium to large effects on child sugar intake. As expected, an increase in fruit and vegetable HFA predicted a reduction in child sugar intake ($\beta = -.37$), and an increase in HFHS HFA predicted an increase in child sugar intake ($\beta = .35$). Dairy HFA had no effect on child sugar intake. The parental organic, convenience, and sensory appeal values had small total effects on child sugar intake. Specifically, higher endorsement of the organic value predicted a decrease in child sugar intake ($\beta = -.23$). Higher endorsement of the convenience and sensory appeal value predict increases in child sugar intake ($\beta = .16$ and $\beta = .12$, respectively). For the organic and sensory appeal values, the effects on child sugar intake were partially via indirect effects of HFA. Interestingly, the effect of the convenience value on child sugar intake was entirely via an indirect effect through HFA. Therefore, results suggest that HFA did mediate the relationships between parental organic, convenience, and sensory appeal FCVs and child sugar intake.

Child Soda Intake

The pattern of effects on child soda intake was similar to those found with child sugar intake. As expected, an increase in fruit and vegetable HFA predicted a reduction in child soda intake ($\beta = -.31$), and an increase in HFHS HFA predicted an increase in child soda intake ($\beta = .35$). Dairy HFA had no effect on child soda intake. As with child sugar intake, the parental organic, convenience, and sensory appeal values had small total effects on child soda intake. Higher endorsement of the organic value predicted a decrease in child soda intake ($\beta = -.19$). Higher endorsement of the convenience and sensory appeal values predicted increases in child soda intake ($\beta = .14$ and $\beta = .12$, respectively). For the organic and sensory appeal values, the effects on child soda intake were partially via indirect effects of HFA. Again, the effect of the convenience value on child soda intake was entirely via an indirect effect through HFA. Therefore, results suggest that HFA also mediated the relationships between parental organic, convenience, and sensory appeal FCVs and child soda intake.

Analysis of Research Objective #2: Effects of SES on Model

Results of the path analysis of SES, parental FCVs, HFA, and child dietary intake are found in Table 6. Overall, SES had only minimal effects on parental FCVs. The largest effect of SES was seen on the parental convenience value ($\beta = .08$), suggesting that an increase in SES predicts a slight increase in parents' valuing convenience. SES had essentially no effects on dairy and HFHS HFA. However, an increase in SES predicted an increase in fruit and vegetable HFA ($\beta = .17$). The results also indicated that this effect was almost entirely via a direct effect. Thus, parental FCVs did not mediate the relationship between SES and fruit and vegetable HFA. SES had a small positive effect on child dairy intake, such that an increase in SES predicted an increase in child dairy consumption (β = .10). The relationship between SES and child dairy intake was not mediated by parental FCVs or HFA. SES had essentially no effect on fruit and vegetable consumption. There was a minimal negative direct effect (β = -.06) but this effect was negated by a minimal positive indirect effect via HFA (β = .04). SES had a small negative effect on child sugar intake. In other words, an increase in SES predicted a reduction in child sugar intake (β = -.10). The results showed that the negative effect of SES on child sugar intake was partially via an indirect effect through HFA. A similar pattern of results was present for child soda intake. An increase in SES predicted a reduction in child soda intake (β = -.18), and again HFA partially mediated this relationship. These findings suggested that HFA does mediate the associations between SES and child fruit and vegetable, sugar, and soda intake.

Next, hierarchical multiple regression was used to examine whether SES moderate the relationships between parental FCV and HFA. In stage 1, all mean-centered covariates (see the list of covariates under Research Objective 1) were entered to remove the effects of these covariates. In stage 2, all mean-centered independent variables were entered: SES, parental FCV of accessibility, weight control/health, organic, convenience, sensory appeal, and safety. Each interaction term was tested in a separate model and entered in stage 3. The results are displayed in Tables 7-9. Results indicated that SES did not moderate the relationships between any of the six parental FCVs and dairy, fruit and vegetable, or HFHS HFA. Inclusion of each interaction terms in stage 3 did not result in a significant change in R^2 (i.e., $p > .05$ in all cases) indicating that there is no significant interaction effect. These results indicated that SES does not moderate the strength or direction of the associations between parental FCVs and HFA. Simple slopes were not plotted because no significant interaction effects were found.

CHAPTER 5: DISCUSSION

The purpose of the current study was to (1) better understand the relationships between parental FCVs, HFA, and child dietary intake, and (2) examine the relationships between SES and these constructs.

Objective 1

HFA

Results showed that only certain FCVs influenced the types of foods that parents make available in their homes. Generally, the organic, weight control/health, and convenience values were the only values that predicted the types of foods that parents make available. Additionally, these values had more influence on the availability of fruit and vegetables and high-fat, high sugar foods in the home than on the availability of dairy products. As expected, values like organic and weight control/health were associated with increased availability of healthy foods and decreased availability of unhealthy foods. On the other hand, the convenience value was associated with decreased availability of healthy foods and increased availability of unhealthy foods. Previous research has not examined how FCV are associated with home food availability and research examining how values are related to intended or actual purchase of foods has strictly focused on the organic value. Findings from these studies have also found that individuals who endorse organic values do in fact intend to or actually purchase more organic foods (Honkanen et al., 2006; Michaelidou & Hassan, 2008; Onyango et al., 2007).

Findings are only somewhat consistent with theoretical expectations proposed by the food choice process model (Furst et al., 1996). The model does not explicitly include HFA, but it can be assumed that food choice in part includes foods that are made available in the home. In other words, foods that are available in the home are foods that an individual chooses to purchase. The model proposes that FCV as a whole influence food choice. Findings from the current study, however, found that only particular values were associated with the types of foods that are made available in the home. For example, a surprising finding was that accessibility (i.e., physical and financial ease of purchasing a food) was not associated with availability of fruit and vegetable or high-fat/high-sugar food availability. Previous research has shown that individuals who have limited resources have increased availability of unhealthy foods and decreased availability of healthy foods (Darmon & Drewnowksi, 2008). Thus, it was expected that endorsement of the accessibility value would have similar associations with healthy and unhealthy food availability.

Child Dietary Intake

Overall, results demonstrated that the types of foods made available in the home were associated with the types of food that children consume. As expected, greater availability of each type of food in the home was associated with children consuming more of that food type. These findings are consistent with previous studies showing that greater availability of fruits and vegetables in the home is associated with children and adolescents consuming more fruits and vegetables (Cutler et al., 2011; Haerens et al., 2008; Hanson et al., 2005; Pearson et al., 2009; Reinaerts et al., 2007). Similarly, having increased availability of unhealthy snack foods is associated with an increased likelihood of consuming unhealthy snack foods or increased fat intake in youths (Campbell et al., 2007; Cutler et al., 2011; Haerens et al., 2008; Verceecken et al., 2010). Another finding was that increased availability of fruits and vegetables was also associated with a reduction in child sugar and soda intake. Again, this finding is consistent with previous research (Cutler et al., 2011).

Similar to the associations found between parental FCVs and HFA, only certain parental FCVs were associated with the types of food that children consume. Generally the organic, convenience, and sensory appeal values were the most important determinants of dietary intake in children. However, these values were only associated with dairy, sugar, and soda intake. For example, the organic value was associated with a reduction in the amount of high fat and high sugar foods that children consume. In contrast, the convenience and sensory appeal values were associated with an increase in the amount of high fat and high sugar foods that children consume. Previous research has also found that the convenience value is associated with increased consumption of soda and snack foods among adults (Glanz et al., 1998) and children (Oellingrath et al., 2012; Roos et al., 2012). The organic value has also been previously associated with a reduction in child intake of unhealthy foods (Roos et al., 2012).

In previous research, health and weight control values have been among the most important predictors of dietary intake, with higher endorsement of these values being associated with a reduction in the consumption of unhealthy foods (Eertmans et al., 2005; Glanz et al., 1998; Oellingrath et al., 2012; Roos et al., 2012). However, the weight control/health value in the current study was not associated with intake of unhealthy foods in children. The inconsistency in these findings may be due to differences in measurement of these values. For example, weight control/health is a combined value in scale used in the current study instead of two distinct values. Of the three items in the scale, two of these items are related to weight control and one item is related to health. Furthermore, one of the items included in the health subscale in previous research (Oellingrath et al., 2012; Roos et al., 2012) falls under the organic factor in the current scale. The discrepancy may also be to differences in samples. Both of the studies using an adult sample found that weight control was an important predictor of unhealthy food intake (Eertmans et al., 2005; Glanz et al., 1998), but only one of the two studies using a child or adolescent sample found an association between the weight control value in parents and child consumption of unhealthy foods (Oellingrath et al., 2012). Thus, it is possible that weight control is a more important predictor of intake of unhealthy foods among adults than among children. For example, parents' personal concern for weight control may not be reflected in the types of foods that they buy for their children.

An additional surprising finding was that accessibility was the only parental FCV that was associated with child intake of fruits and vegetables. Previous research has found that higher endorsement of health and weight control values are associated with an increase in consumption of healthy foods, like fruits and vegetables and that convenience is associated with a decrease in consumption of these foods (Eertmans et al., 2005; Glanz et al., 1998; Oellingrath et al., 2012; Roos et al., 2012). One explanation for these conflicting findings may be due to differences in how dietary intake was measured. Previous studies used very broad questions to assess dietary intake (e.g., 'fruits and vegetables'; Glanz et al., 1998) and food frequency questionnaires used in previous studies did not include scoring algorithms (Eertmans et al., 2005; Oellingrath et al., 2012;

Roos et al., 2012). For example, the frequency of vegetable consumption reported via a comprehensive food frequency questionnaire may be different than the frequency of vegetable consumption reported by a broad question like ‘how often do you eat fruits and vegetables?’.

As with the effects parental FCVs on HFA, the effects of parental FCVs on child dietary intake is only somewhat consistent with theory (Furst et al., 1996). Again, the results suggest that only particular values, in this case organic, convenience, and sensory appeal, are important in determining food choice. It may be important to further test this theory and to examine why certain FCVs, but not others, predict food choice.

The current study also found that the types of foods made available in the home do sometimes mediate the relationships between parental FCVs and child dietary intake. Generally, the largest effects of parental FCVs on child dietary intake were at least partially due to indirect effects through HFA. Interesting, the association between the convenience value and child sugar and soda intake was entirely due to an in direct effect via HFA. Previous research has not tested whether HFA mediates this association, making this an important contribution to the existing literature.

Objective 2

Contrary to expectations, SES was not associated with parental FCVs. The food choice process model (Furst et al., 1996) proposes that SES will influence the values that individuals have about food purchase and consumption. For example, it would be expected that individuals who have fewer economic resources would place higher importance on FCVs like accessibility and convenience. Focus groups with individuals of lower SES have found that values like accessibility, cost, and convenience are identified as the most important values that these individuals consider when purchasing foods (Dammann & Smith, 2009; Lawrence et al., 2009; Sealy, 2010). Additionally, a few quantitative studies have also examined how FCVs differ based on level of income (Glanz et al., 1998; Inglis et al., 2009; Steptoe et al., 1995). Quantitative studies have found that individuals of lower SES have a higher average score on the cost value (similar to accessibility here) (Glanz et al., 1998; Steptoe et al., 1995). One potential explanation for why there was no association between SES and any of the parental FCVs in the current study is that comparing the average endorsement of a given value between two groups is different than examining whether a value changes as SES increases. Additionally, it is possible that the samples among these studies differ. For example, it is possible that participants in qualitative studies among individuals with low SES may be more disadvantaged than individuals of lower SES in the current study. It is unlikely that individuals of extremely low SES would participate on MTurk, which requires Internet access, time, and provides minimal payment. Similarly, it is unlikely that individuals of extremely high SES would participate in MTurk, given that the time commitment is greater than the minimal payment received. Thus, these differences in samples may explain why no relationship between SES and FCVs were observed in the current study.

An increase in SES was associated with increased availability of fruits and vegetables in the home as expected, which is consistent with previous research (Campbell et al., 2002; Darmon & Drewnowski, 2008; MacFarlane et al., 2007; Turrell et al., 2002). However, the current study found no association between SES and availability of foods high in sugar and fat. Higher SES has also been linked with decreased availability of unhealthy foods in earlier research (Campbell et al., 2002; Cutler et al., 2011; Darmon &

Drewnowski, 2008; MacFarlane et al., 2007; Verceecken et al., 2010). As previously mentioned, discrepancies in these findings may be due to differences in measurement of SES and/or HFA or differences in the samples. Parental FCVs did not mediate the associations between SES and HFA, and previous research has not examined parental FCVs as potential mediators between SES and HFA.

SES also had small effects on child dietary intake. Higher SES was associated with children consuming more dairy, sugar, and soda, and these findings are consistent with previous research (Cutler et al., 2011; Verceecken et al., 2010). Unexpectedly, SES was not associated with fruit and vegetable intake among children in the current study. However, existing research has found that higher SES is associated with an increase in fruit and vegetable consumption among children and adolescents (Bere et al., 2008; Cutler et al., 2010; Hilsen et al., 2011; Verceecken et al., 2010). The lack of association between SES and child intake of fruits and vegetables in the current study may reflect differences in measurement of variables or in the samples. For example, the average age of children in the current study was approximately eight years, whereas existing studies have included older children and adolescents with average ages ranging from 10 (Verceecken et al., 2010) to approximately 13 years (Cutler et al., 2010). In the current study, HFA mediated the relationships between SES and child sugar and soda intake. Other studies examining a mediation model also found that the relationship between SES and child dietary intake was mediated by HFA (Bere et al., 2008; Hilsen et al., 2011). However, parental FCVs did not mediate the relationship between SES and any type of child dietary intake. The current study was the first to examine whether parental FCV mediated the relationship between SES and child dietary intake.

Lastly, results indicated that SES did not moderate the effects of parental FCVs on HFA. Previous research has not specifically tested whether parental FCVs have different effects on HFA across different levels of SES. However, previous research has indicated that the importance of FCVs differs based on SES and that despite noting a value as important, certain SES groups may not act on that value. For example, individuals of low SES have identified health as an important value, but ultimately do not purchase healthy foods because they cannot afford healthy foods (Dammann & Smith, 2009). Results from the current study provided no evidence that FCVs influence HFA differently as a function of SES.

Contributions and Limitations

The primary contribution of the current study was the examination of parental FCVs, SES, HFA, and child dietary intake as part of a single model. Despite the fact that previous research has studied the associations between some of the constructs in the model, no previous work has examined these constructs as part of a single model. Additionally, some of the single associations between constructs in the model have been poorly studied. For example, the current study was the first to examine whether parental FCVs were associated with child dietary intake. Similarly, limited research has previously examined the associations between SES and parental FCVs. Furthermore, previous research in this area has not examined the pathways through which SES and parental FCVs exert their effects on HFA and child dietary intake. The current study found that the types of foods made available in the home do mediate the relationship between certain FCVs and child dietary intake and the relationship between SES and child dietary intake. On the other hand, parental FCVs did not mediate the associations between SES and HFA or dietary intake. Thus, these results have further contributed to our understanding of how these constructs are associated.

The current study also addressed some of the measurement limitations present in existing research. Many existing studies have not used validated or comprehensive measures to assess variables. For example, past studies have measured HFA by asking participants to report the availability of only 4 to 12 items. Brief lists may not be sufficient to measure HFA. In contrast, validated measures were used to assess parental FCVs, HFA, and child dietary intake in the current study. Additionally, past research has often used a single indicator, such as income or education, to measure SES (e.g., Cutler et al., 2011; Turrell et al., 2002). A composite score, derived from four indicators of SES was used in the current study to provide a more accurate assessment of SES.

Despite contributions and strengths of the study, several limitations exist. First, there may be limitations associated with the sample and design. The MTurk population is not representative of the US population as a whole. As previously discussed, it is unlikely that individuals of extremely high or low SES participate on MTurk. Despite these limitations, MTurk samples have been found to be more representative of the national population than college student samples or other Internet samples (Buhrmester, Kwang, & Gosling, 2011). A cross-sectional study design was used and thus, temporal ordering of the model cannot be confirmed.

There are also several limitations associated with the measures used in the study. On the FCV scale, participants were instructed to rate how important each item was when deciding which foods to purchase for their family. However, a few of the items were written for the individual (e.g., item 7 ‘How likely it is to help me control my weight’).

Thus, there may have been some confusion when responding to these items. As with all measures of HFA or dietary intake, these measures will not include all foods that are available in the home or all foods that children consume, and responses may reflect the seasonal availability of foods. Additional considerations are that these measures may not be culturally appropriate for use with certain racial and ethnic groups. For example, the HFI contains food items that are popular in Western cultures and does not provide many ethnic foods or foods that may be native in other parts of the world. Lastly, the HFI does not take into account when the respondent last went grocery shopping. It would be expected that someone who just bought groceries would have greater availability of all foods, particularly fresh fruits and vegetables, than someone who was planning to buy groceries later that day. Despite these limitations, both of these measures have been validated, which is an improvement over measures used previously.

Additionally, all data were completely self-reported by parents. Thus, it is possible that parents may not have accurately reported HFA or child dietary intake. For example, parents may have over-reported HFA and intake of healthy foods and under-reported HFA and intake of unhealthy foods. To control for the possibility that participants may provide socially desirable responses, a measure of social desirability was included in the survey and social desirability was controlled for in the analyses. Since parents served as proxies for children to provide responses about child dietary intake, it is possible that responses may not be completely accurate. For example, parents may not know what their children eat at school or other locations outside of the home. However, the use of parents as proxies to report dietary intake on the Dietary Screener

Questionnaire is recommended for children under the age of 12 by the developer of the measure (National Cancer Institute, 2009).

Finally, an assumption made in the current study is that the values that parents report as important when making decision about what food to purpose are the values that parents actually use when making these decisions. In the area of health behavior, behavioral intentions, similar to values, are rarely strong predictors of health behavior (Schwarzer et al., 2007). Thus, the importance of FCVs reported by parents may or may not reflect the actual values that parents use when purchasing foods for their children.

Implications for Theory and Research

Results from the study have implications for theory, research, and practical applications. Two theoretical frameworks guided the formation of the study model: the HFE framework (Rosenkranz & Dzewaltowski, 2008) and the food choice process model (Furst et al., 1996). The HFE uses a multi-level approach to understand child dietary intake, and the current study included SES and HFA, which are identified as micro-level factors. According to the HFE framework, SES and HFA are expected to influence child dietary intake. The results indicated that HFA predicted child dietary intake. SES predicted child intake of dairy, sugar, and soda, but did not predict child fruit and vegetable intake. Thus, findings from the current study provide some support empirical support for the HFE framework.

The food choice process model also belies a multi-level approach to understanding food choice and proposes that FCVs influence food choice (i.e., HFA and dietary intake). Results from the study found that certain FCVs, particularly the organic, convenience, and sensory appeal values, did influence availability and intake of unhealthy foods. However, values like accessibility, weight control/health and safety generally were not associated with availability of foods or child dietary intake. Additionally, only one FCV, accessibility, was associated with intake of healthy foods. Further research is needed to confirm these results, but these findings may indicate that theory should be revised to include only specific values that have been shown to empirically predict food choice. The food choice process model also proposes that SES influences FCVs. However, results from the current study found that SES had essentially no effect on any of the FCVs. Additional research in this area is needed.

Results from the study also have important implications for the understanding of child dietary intake and weight status. For example, results indicated that both SES and some parental FCVs predicted unhealthy food intake in children. Thus, for children, family factors and larger socioeconomic factors play a role in determining child dietary intake, which may ultimately have an effect on weight status. In contrast to the traditional biomedical model of obesity, these findings suggest that factors other than genetics and personal behaviors (Ebbeling et al., 2002) are important in contributing to weight status. Therefore, findings from the study suggest that a BPS approach (Engel, 1977) to understanding child dietary behaviors may be more appropriate.

Findings also have implications for future research. Given that many of the relationships and pathways tested in the current study were previously unexamined, further research is needed to determine whether findings can be replicated. In regards to unexpected findings, it would be interesting to examine why only one of the parental FCVs or SES were associated with child fruit and vegetable intake. Since this finding was in contrast to previous research, the results may reflect biases in the current study.

Another possibility is that perhaps parental FCVs are more important predictors of unhealthy food intake than healthy food intake. Future research should also examine why certain FCVs, but not others, are associated with HFA and child dietary intake. Findings from this line of research would have important implications for existing theory on FCVs. For example, it may be appropriate to revise theory to include only FCVs that do predict food choice and not FCVs in general. Furthermore, additional research is needed to examine whether SES influences FCVs. Although numerous qualitative studies have identified particular values to be important among individuals of lower income, less research has examined how FCVs differ based on level of SES (Dammann & Smith, 2009; Lawrence et al., 2009; Sealy, 2010). The current sample was predominately a middle class sample, with few individuals having extremely high or low SES. Perhaps SES does influence values about food choice, but only at very high or very low levels of SES.

The current study tested a few pathways through which SES and parental FCVs may influence child dietary intake. Research in this area could be extended by examining other parental factors, such as health literacy, health conscientiousness, and attitudes about nutrition and health, that may influence child dietary outcomes. It would also be interesting to examine the extent to which child individual differences (e.g., personality, cognitive ability, etc.) moderate the effects of parental FCVs and HFA on child dietary intake. A final avenue for future research would be to examine FCVs in general and how FCVs align with actual behavior. Specifically, it would be interesting to identify particular individual factors that predict higher agreement between stated values and behaviors.

Practical applications of these findings should also be considered. First, HFA was found to mediate some of the associations between parental FCVs and child dietary intake and SES and child dietary intake. Increasing the availability of healthy foods and decreasing the availability of unhealthy foods in the home, may therefore be important in promoting healthier eating habits in children. Thus, it may be important to provide parents with education and resources needed to provide healthy food options and limit unhealthy food options. Providing parents with information about nutrition of foods and how child taste preferences are determined through repeated exposure, would be examples of methods to educate parents on providing healthier HFA. Beyond educating parents, designing communities and policies that provide access to healthy foods options is important. Parents may be aware of the importance of providing healthy food options to their children, but may lack the resources to purchase and provide these types of foods. Similarly, these findings have implications for health promotion and interventions aimed at establishing healthier eating habits and promoting a healthy weight status in children. It may be important to target parents and environmental and social factors in interventions aimed at improving child dietary intake.

Similarly, the finding that SES and HFA predict child dietary intake, has implications for designing and implementing interventions that target multiple levels. For example, health promotion programs and interventions could target multiple levels in an attempt increase the availability of healthy food options and decreasing the availability of unhealthy food options in the home. Interventions targeting individual level factors could include educating parents and providing them with recipes, cooking demonstrations, etc. Finding that SES predicts child dietary intake provides further support for the importance of environmental level factors in improving child dietary intake. Interventions could target environmental level factors by providing parents with the financial and physical resources to access and purchase healthy food options, having equitable distribution of grocery stores throughout a city, and policies that provide individuals of lower SES with resources to purchase healthier foods.

Conclusion

The current study examined the relationships and pathways that link SES, parental FCVs, HFA, and child dietary intake. Values that parents have about what foods to purchase, particularly organic, convenience, and sensory appeal values, do predict the types of foods made available in the home and the types of foods that children consume. Generally, the organic value predicted an increase in the availability and child intake of healthy foods and a decrease in the availability and child intake of unhealthy foods. Convenience and sensory appeal generally predicted a decrease in the availability and child intake of healthy foods and an increase in the availability and child intake of unhealthy foods. Additionally, the types of foods available in the home mediated the associations between parental values about foods and child dietary intake. SES did not predict parental FCVs, nor did parental FCVs mediate the relations between SES and HFA or SES and child dietary intake. However, SES did predict HFA and child dietary intake, such that higher SES was associated with an increase in availability and child intake of healthy foods and a decrease in availability and child intake of unhealthy foods. The types of foods made available in the home mediated the association between SES and child dietary intake. The study is the first to examine all four constructs in one model and contributes to the literature by examining the pathways that link these constructs.

Findings have important implications for how child dietary behavior is conceptualized and for research and interventions aimed at improving the diets of children and reducing the childhood obesity rate.

REFERENCES

American Psychological Association, Task Force on Socioeconomic Status. (2007). *Report of the APA Task Force on Socioeconomic Status.* Washington, DC: American Psychological Association.

Bere, E., van Lenthe, F., Klepp, K. I., & Brug, J. (2008). Why do parents' education level an income affect the amount of fruits and vegetables adolescents eat? *European Journal of Public Health, 18*(6), 611-615. doi: 10.1093/eurpub/ckn081

Bickel, G., M. Nord, C. Price, W.L. Hamilton, and J.T. Cook (2000). *Guide to Measuring Household Food Security, Revised 2000.* U.S. Dept. Agr., Food and Nutrition Service, Alexandria, VA.

Blanchette, L. & Brug, J. (2005). Determinants of fruit and vegetable consumption among 6-12-year-old children and effective interventions to increase consumption. *Journal of Human Nutrition and Dietetics, 18*, 431-443.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science, 6*, 3-5. doi: 10.1177/1745691610393980

Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods and Research, 21*, 230-258. doi: 10.1177/0049124192021002005

Campbell, K. J., Crawford. D. A., Jackson, M., Cashel, K., Worsley, A., Gibbons, K., & Birch,L. (2002). Family food environments of 5-6 year-old-children: Does socioeconomic status make a difference? *Asia Pacific Journal of Clinical Nutrition, 11*(S3), 553-561.

Campbell, K. J., Crawford, D. A., Salmon, J. Carver, A., Garnett, S. P., & Baur, L. A. (2007). Associations between the home food environment and obesity-promoting eating behaviors in adolescence. *Obesity,15*(3), 719-730.

Centers for Disease Control (2014). *Body mass index.*

Cohen, J. (1969). Statistical power analysis for the behavioral sciences. NY: Academic Press.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for behavioral science.* Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.

Connors, M., Bisogni, C. A., Sobal, J., & Devine, C. M. (2001). Managing values in personal food systems. *Appetite, 36*, 189-200. doi: 10.1006/appe.2001.0400

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*(4), 349-354.

Cutler, G. J., Flood, M., Hannan, P., & Neumark-Sztainer, D. (2011). Multiple sociodemographic and socioenvironmental characteristics are correlated with major patterns of dietary intake in adolescents. *Journal of the American Dietetic Association, 111*, 230-240. doi: 10.1016/j.jada.2010.10.052

Dammann, K. W., & Smith, C. (2009). Factors affecting low-income women's food choices and the perceived impact of dietary intake and socioeconomic status on their health and weight. *Journal of Nutrition Education and Behavior, 41*, 242-253. doi:10.1016/j.jneb.2008.07.003

Darmon, N., & Drewnowksi, A., (2008). Does social class predict diet quality? *The American Journal of Clinical Nutrition, 87*, 1107-1117.

Ebbeling, C. B., Pawlak, D. B., & Ludwig, D. S. (2002). Childhood obesity: public-health crisis, common sense cure. *Lancet, 360*(9331):473-482.

Eertmans, A., Victoir, A., Vansant, G. & Van den Bergh, O. (2005). Food-related personality traits, food choice motives and food intake: Mediator and moderator relationships. Food Quality and Preference, 16, 714-726. doi: 10.1016/j.foodqual.2005.04.007

Engel, G. L. (1977). The need for a new medial model: A challenge for biomedicine. *Science, 196*, 129-136.

Fryar, C. D., Carroll, M., & Carroll, M. (2012, September). Prevalence of obesity among children and adolescents: United States, trends 1963-1965 through 2009-2010. In: *NCHS Health and Stats*: National Center for Health Statistics.

Fulkerson, J. A., Nelson, M. C., Lytle, L., Moe, S., Heitzler, C., & Pasch, K. E. (2008). The validation of a home food inventory. *International Journal of Behavioral Nutrition and Physical Activity, 5*(55). doi: 10.1186/1479-5868-5-55

Furst, T., Connors, M., Bisogni, C. A., Sobal, J., & Falk, L. W. (1996). Food choice: A conceptual model of the process. *Appetite, 26*, 247-266.

Glanz, K., Basil, M., Maibach, E., Goldberg, J., & Snyder, D. (1998). Why Americans eat what they do: Taste, nutrition, cost, convenience, and weight control concerns as influences on food consumption. *Journal of the American Dietetic Association, 98*, 1118-1126.

Haerens, L., Craeynest, M., Deforche, B., Maes, L. Cardon, G., & De Bourdeaudhuij, I. (2008). The contribution of psychosocial and home environmental factors in explaining eating behaviours in adolescents. *European Journal of Clinical Nutrition, 62*, 51-59. doi: 10.1038/sj.ejcn.1602681

Hanson, N. I., Neumark-Sztainer, D., Eisenberg, M. E., Story, M., & Wall, M. (2005). Associations between parental report of the home food environment and adolescent intakes of fruits, vegetables, and dairy foods. *Public Health Nutrition, 8*(1), 77-85. doi: 10.1079/PHN2004661

Hilsen, M., van Stralen, M. M., Klepp, K. I., & Bere, E. (2011). Changes in 10-12 year old's fruit and vegetable intake in Norway from 2001 to 2008 in relation to gender and socioeconomic status – a comparison of two cross-sectional groups. *International Journal of Behavioral Nutrition and Physical Activity*, *8*(108), 1-11. doi:10.1186/14795868-8-108

Honkanen, P., Verplanken, B., & Olsen, S. O. (2006). Ethical values and motives driving organic food choice. *Journal of Consumer Behaviour, 5,* 420-430. doi: 10.1002/cb.190

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55. doi: 10.1080/10705519909540118

Inglis, V. Ball, K., & Crawford, D. (2009). Does modifying the household food budget predict changes in the healthfulness of purchasing choices among low- and high-income women? *Appetite, 52*, 273-279. doi:10.1016/j.appet.2008.10.005

Krebs-Smith, S. M., Guenther, P. M., Subar, A. F., Kirkpatrick, S. I., & Dodd, K. W. (2010). Americans do not meet federal dietary recommendations. *The Journal of Nutrition, 140*, 1832-1838. doi: 10.3945/jn.110.124826

Larson, N., & Story, M. (2009). A review of environmental influences on food choices. *Annals of Behavioral Medicine, 38*(Suppl 1), S56-S73. doi: 10.1007/s12160-009-9120-9

Lawrence, W., Skinner, C., Haslam, C., Robinson, S., Inskip, H., Barker, D., …Barker, M. (2009). Why women of lower educational attainment struggle to make healthier food choices: The importance of psychological and social factors. *Psychology and Health, 24*(9). 1003-1020. doi; 10.1080/08870440802460426

Lyerly, J. E., & Reeve, C. L. (2015). Development and validation of a measure of food choice values. *Appetite, 89*, 47-55. doi: 10.1016/j.appet.2015.01.019

MacArthur Foundation (2008). The MacArthur Research Network on SES and Health.

MacFarlane, A., Crawford, D., Ball, K., Savige, G., & Worsley, A. (2007). Adolescent home food environments and socioeconomic position. *Asia Pacific Journal of Clinical Nutrition, 16*(4), 748-755.

Michaelidou, N., & Hassan, L. M. (2008). The role of health consciousness, food safety concern and ethical identity on attitudes and intentions towards organic food. *International Journal of Consumer Studies, 32*, 163-170. doi: 10.111/j.1470-6431.2007.00619.x

Mueller, C. W., & Parcel, T. L. (1981). Measures of socioeconomic status: Alternatives and recommendations. *Child Development, 52*, 12-30.

National Cancer Institute. 2014. *Dietary Screener Questionnaire.*

Nicklas, T. A., Baranowski, T., Baranowski, J. C., Cullen, K., Rittenberry, L., & Olvera, N. (2001). Family and child-care provider influences on preschool children's fruit, juice, and vegetable consumption. *Nutrition Reviews, 59*(7), 224-235.

Oellingrath, I. M., Hersleth, M., & Svendsen, M. V. (2012). Association between parental motives for food choice and eating patterns of 12- to 13-year-old Norwegian children. *Public Health Nutrition*. doi: 10.1017/S1368980012004430

Ogden, C. L., Carroll, M. D., Kit, B. D., & Flegal, K. M. (2012). Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. *Journal of the American Medical Association, 307*(5), 483-490. doi: 10.1001/jama.2012.40

Onyango, B. M., Hallman, W. K., & Bellows, A. C. (2007). Purchasing organic food in the US food systems. A study of attitudes and practice. *British Food Journal, 109*(5), 399-411. doi: 10.1108/00070700710746803

Operario, D., Adler, N. E., & Williams, D. R. (2004). Subjective social status: Reliability and predictive utility for global health. *Psychology and Health, 19*(2), 237-246. doi: 10.1080/08870440310001638098

Patrick, H., & Nicklas, T. A. (2005). A review of family and social determinants of children's eating patterns and diet quality. *Journal of the American College of Nutrition, 24*(2), 83-92.

Pearson, N., Biddle, S. J. H., & Gorely, T. (2009). Family correlates of fruit and vegetable consumption in children and adolescents: A systematic review. *Public Health Nutrition, 12*(2), 267-283. doi: 10.1017/S1368980008002589

Poti, J. M., & Popkin, B. M. (2011). Trends in energy intake among US children by eating location and food source, 1977-2006. *Journal of the American Dietetic Association, 111*, 1156-1164. doi: 10.1016/j.jada.2011.05.007

Raffensperger, S., Kuczmarski, M. F., Hotchkiss, L., Cotugna, N., Evans, M. K., & Zonderman, A. B. (2010). The effect of race and predictors of socioeconomic status on diet quality in the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) study sample. *Journal of the National Medical Association, 102*(10), 923-930.

Reilly, J. J., & Kelly, J. (2012). Long-term impact of overweight and obesity in childhood and adolescence on morbidity and premature mortality in adulthood: A systematic review. *International Journal of Obesity 35,* 891-898. doi: 10.1038/ijo.2010.222

Reinaerts, E., de Nooijer, J., Candel, M., & de Vries, N. (2007). Explaining school children's fruit and vegetable consumption: The contributions of availability, accessibility, exposure, parental consumption and habit in addition to psychosocial factors. *Appetite, 48,* 248-258. doi: 10.1016/j.appet.2006.09.007

Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crown social desirability scale. *Journal of Clinical Psychology, 38*(1), 119-125.

Rhee, K. (2008). Childhood overweight and the relationship between parent behaviors, parenting style, and family functioning. *The Annals of the American Academy of Political and Social Science, 615,* 12-37. doi:10.1177/0002716207308400

Roos, E., Lehto, R., & Ray, C. (2012). Parental family food choice motives and children's food intake. *Food Quality and Preference, 24,* 85-91. doi: 10.1016/j.foodqual.2011.09.006

Rosenkranz, R. R., & Dzewaltowski, D. A. (2008). Model of the home food environment pertaining to childhood obesity. *Nutrition Reviews, 66*(3), 123-140. doi:10.1111/j.17534887.2008.00017.x

Schwarzer, R., Schüz, B., Ziegelmann, J. P., Lippke, S., Luszcynska, A., & Scholz, U. (2007). Adoption and maintenance of four health behaviors: Theory-Guided longitudinal studies on dental flossing, seat belt use, dietary behavior, and physical activity. *Annals of Behavioral Medicine, 33*, 156-166. doi: 10.1007/BF02879897

Sealy, Y. M. (2010). Parents' food choices: Obesity among minority parents and children. *Journal of Community Health Nursing, 27*, 1-11. doi: 10.1080/07370010903466072

Shavers, V. (2007). Measurement of socioeconomic status in health disparities research. *Journal of the National Medical Association, 99*(9), 1013-1023.

Sobal, J., & Bisogni, C. A. (2009). Constructing food choice decisions. *Annals of Behavioral Medicine, 38(*S1), S37-S46. doi: 10.1007/s12160-009-9124-5

Steptoe, A., Pollard, T. M., & Wardle, J. (1995). Development of a measure of the motives underlying the selection of food: The food choice questionnaire. *Appetite, 25*, 267-284.

Tarkiainen, A., & Sundqvist, S. (2005). Subjective norms, attitudes and intentions of Finnish consumers in buying organic food. *British Food Journal, 107*(11), 808-822. doi: 10.1108/00070700510629760

Turrell, G., Hewitt, B., Patterson, C., Oldenburg, B., & Gould, T. (2002). Socioeconomic differences in food purchasing behaviour and suggested implications for diet-related health promotion. *Journal of Human Nutrition and Dietetics, 15*, 355-364.

United States Department of Agriculture and the United States Department of Health and Human Services. *Dietary Guidelines for Americans 2010.*

United States Department of Commerce (2014). *Income and Poverty in the United States: 2013*.

United States Department of Commerce (2013). *Poverty thresholds*.

Vereecken, C., Haerens, L., De Bourdeaudhuij, I., & Maes, L. (2010). The relationship between children's home food environment and dietary patterns in childhood and adolescence. *Public health Nutrition, 13*(10A), 1729-1735. doi: 10.1017/S1368980010002296

Wardle, J., Cooke, L. J., Gibson, E. L., Sapochnik, M., Sheiham, A., & Lawson, M. (2003). Increasing children's acceptance of vegetables; a randomized trial of parent-led exposure. *Appetite, 40*, 155-162. doi: 10.1016/S0195-6663(02)00135-6

APPENDIX A: TABLES

Table 1: Participant demographic information

	Parent & family characteristics		Child characteristics	
	M (SD) or %	Range	M (SD) or %	Range
Age	34.53 (6.97)	20-61	7.94 (1.63)	6-11
Income	$52,226.95 ($29,461.69)	$0-140,000	-	-
% Poverty level	258.98 (147.24)	0-746.63	-	-
SSS	4.79 (1.92)	1-10	-	-
Female (%)	61.1	-	49.7	-
Race (%)				
White	78.8	-	73.6	-
African American	8.3	-	7.3	-
Latino	4.7	-	4.7	-
Asian	5.2	-	3.6	-
Biracial	3.1	-	10.4	-
Native American	0.0	-	0.5	-
Marital Status			-	
Married	66.8	-		-
Never married	18.7	-		-
Div/sep	14.0	-		-
Widowed	0.5	-		-
Education (%)			-	
< Highschool	0.5	-		-
Highschool or GED	14.5	-		-
Associate degree	28.5	-		-
Bachelor’s degree	48.7	-		-
Master’s degree	6.2	-		-
Overweight/obese (%)	44.7	-	43.5	-
Social desirability	6.76 (3.39)	0-13	-	-
Food insecurity	2.21 (3.03)	0-11	-	-

Note. N =193. SSS = Subjective social standing, Div/sep = Divorced or separated, GED = general equivalency diploma, M = mean; SD = standard deviation.

Table 2: Food choice values and definitions

Value	Definition
Convenience	Degree to which food can be easily and quickly prepared and eaten
Accessibility	Degree to which food is easy to access physically (e.g. available at local stores) and financially (e.g. cost)
Tradition	Degree to which food is familiar, recognizable, or considered traditional to one's background or heritage
Comfort	Degree to which food is expected to result in the experience of positive emotions (e.g., happiness) or to alleviate negative emotions (e.g., stress)
Organic	Degree to which food contains natural ingredients, vitamins and nutrients, and has minimal negative impact on the environment
Safety	Degree to which food has been prepared or processed properly and will not cause illness
Sensory appeal	Degree to which food is pleasing to the senses - appearance, taste, and smell
Weight Control/Health	Degree to which food is thought to help one maintain current weight or lose weight

Table 3: Item analysis of the food choice value scale

	Factors										
Items	WC/H	Comfort	Conv.	Organic	Safety	Access.	Tradition	Sensory Appeal	M	SD	I-T
16	.92								2.33	1.07	.75
8	.83								2.63	1.16	.73
12	.59								3.08	1.09	.56
6		.91							1.91	1.14	.83
22		.84							2.30	1.18	.75
7		.80							1.88	1.10	.75
13			.88						3.50	1.07	.81
20			.84						3.44	1.04	.77
19			.82						3.39	1.04	.76
14				.84					3.48	1.07	.74
24				.78					3.33	1.20	.68
11				.71					2.98	1.19	.63
18				.59					3.47	0.97	.51
10					.82				3.76	1.18	.65
23					.78				4.09	1.07	.62
15					.53				3.55	1.10	.45
4						.78			3.82	0.93	.58
25						.60			3.57	1.08	.45
5						.52			4.11	0.90	.35
2							.72		2.01	1.16	.58
9							.68		2.03	1.15	.52
21							.67		2.34	1.10	.55
17								.70	3.56	1.05	.50
3								.59	3.49	1.08	.45
1								.53	4.37	0.79	.39

Note. N =193. WC/H = weight control/.health; Convc. = convenience; Access. = accessibility; M = mean; SD = standard deviation; I-T = Corrected item total correlation; computed only using items within factor. $\lambda < .30$ not shown.

Table 4: Zero-order correlations among primary variables

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. SES	0.00	1.00	-															
FCVs																		
2. Sensory Appeal	3.81	.75	-.00	(.63)														
3. Tradition	2.14	.92	.09	.15*	(.73)													
4. Accessibility	3.82	.75	-.09	.46*	.09	(.64)												
5. WC/Health	2.68	.95	.06	.09	.42*	.19*	(.82)											
6. Organic	3.33	.89	.00	.21*	.21*	.13	.28*	(.81)										
7. Convenience	3.43	.94	.01	.32*	.21*	.39*	.25*	-.07	(.88)									
8. Safety	3.80	.91	-.03	.47*	.12	.43*	.15*	.50*	.13	(.74)								
9. Comfort	1.95	1.01	.05	.07	.65*	.07	.45*	.15*	.25*	.09	(.88)							
HFA																		
10. Dairy	.45	.15	.09	.13	.07	.18*	.07	-.02	.12	.16*	.01	-						
11. Fruits & Vegetables	.48	.18	.13	-.05	.13	.00	.16*	.25*	-.21*	.09	.02	.34*	-					
12. HFHS	.42	.14	.02	.15*	.12	.21*	.00	-.17*	.25*	.06	.09	.57*	.29*	-				
Dietary Intake																		
13. Dairy[a]	3.41	.37	.10	.17*	-.11	.17*	-.00	-.19*	.33*	.01	-.05	.21*	-.14*	.24*	-			
14. F&V[a]	4.07	.32	-.05	-.03	-.03	.06	.05	.07	-.02	.04	-.02	.14	.22*	.06	.31*	-		
15. Sugar[b]	7.17	1.13	-.09	.10	-.04	.10	-.02	-.30*	.30*	-.10	.09	.08	-.35*	.28*	.45*	.13	-	
16. Soda[b]	6.78	1.82	-.12	.09	.05	.15*	.02	-.24*	.31*	-.07	.15*	.09	-.27*	.32*	.38*	.10	.89*	-

Note. $N = 193$. SES = socioeconomic status. FCVs = food choice values. WC/health = Weight control/health. HFA = home food availability. HFHA = high-fat/high-sugar. F&V = fruits and vegetables. SES is a standardized composite score. [a]Dairy and F&V values represent the daily amount consumed in cups. [b]Sugar values represent the daily amount of added sugars consumed in teaspoons. [b] Soda values represent the daily amount of added sugars from soda consumed in teaspoons. $^*p < .05$.

Table 5: *Direct, indirect, and total effects of parental FCVs and HFA on child dietary intake*

	Dairy HFA	FV HFA	HFHS HFA	Dairy Intake	FV Intake	Sugar Intake	Soda Intake
R^2	.07*	.11*	.13*	.15*	.08	.24*	.20*
Accessibility							
Total Effect	*.06*	*.07*	*.07*	*.07*	*.12*	*.04*	*.05*
Direct Effect	.06	.07	.07	.06	.10	.03	.04
Indirect Effect	-	-	-	.01	.02	.01	.01
WC/Health							
Total Effect	*.04*	*.15*	*-.04*	*-.02*	*.07*	*.02*	*.02*
Direct Effect	.04	.15	-.04	.00	.04	.09	.08
Indirect Effect	-	-	-	-.02	.03	-.07	-.06
Organic							
Total Effect	*-.15*	*.13*	*-.25*	*-.18*	*.07*	*-.23*	*-.19*
Direct Effect	-.15	.13	-.25*	-.10	.05	-.09	-.06
Indirect Effect	-	-	-	-.08	.02	-.14	-.13
Convenience							
Total Effect	*.06*	*-.24*	*.19*	*.17*	*.04*	*.16*	*.14*
Direct Effect	.06	-.24*	.19*	.10	-.01	-.00	-.00
Indirect Effect	-	-	-	.07	.05	.16	.14
SA							
Total Effect	*.05*	*-.06*	*.08*	*.13*	*-.02*	*.12*	*.12*
Direct Effect	.05	-.06	.08	.10	-.01	.07	.07
Indirect Effect	-	-	-	.03	-.01	.05	.05

Table 5: (cont'd)

	Dairy HFA	FV HFA	HFHS HFA	Dairy Intake	FV Intake	Sugar Intake	Soda Intake
Safety							
Total Effect	*.21*	*.02*	*.13*	*.03*	*-.05*	*-.03*	*.01*
Direct Effect	.21*	.02	.13	-.02	-.08	-.08	-.03
Indirect Effect	-	-	-	.05	.03	.05	.04
Dairy HFA							
Total Effect	-	-	-	*.19*	*.15*	*.06*	*.01*
Direct Effect	-	-	-	.19*	.15	.06	.01
Indirect Effect	-	-	-	-	-	-	-
FV HFA							
Total Effect	-	-	-	*-.14*	*.20*	*-.37*	*-.31*
Direct Effect	-	-	-	-.14	.20*	-.37*	-.31*
Indirect Effect	-	-	-	-	-	-	-
HFHS HFA	-	-	-				
Total Effect	-	-	-	*.12*	*-.05*	*.35*	*.35*
Direct Effect	-	-	-	.12	-.05	.35*	.35*
Indirect Effect	-	-	-	-	-	-	

Note. N = 193. SES = socioeconomic status; WC/Health = Weight control/health; SA = sensory appeal; Dairy HFA = dairy home food availability; FV HFA = fruit and vegetable home food availability; HFHA HFA = high-fat/ high-sugar home food availability; FV intake = fruit and vegetable intake. SES is a standardized composite score. All effects are shown as standardized regression coefficients. All analyses are controlled for parent age, sex, race, weight status, marital status, household food insecurity, and social desirability and child age, sex, and weight status. R^2 represents the unique amount of variance in the dependent variable accounted for by the set of independent variables. *$p < .05$.

Table 6: Standardized results of the path analysis with SES

	Effects of SES on FCV					
	Accessibility	WC/Health	Organic	Convenience	Sensory Appeal	Safety
R^2	.00	.00	.00	.01	.00	.00
SES						
Total Effect	*-.02*	*.04*	*.05*	*.08*	*.06*	*.00*
Direct Effect	-.02	.04	.05	.08	.06	.00
Indirect Effect	-	-	-	-	-	-

	Effects of SES on HFA & Intake						
	Dairy HFA	FV HFA	HFHS HFA	Dairy Intake	FV Intake	Sugar Intake	Soda Intake
R^2	.07*	.11*	.13*	.15*	.08	.24*	.20*
SES							
Total Effect	*.05*	*.16*	*.01*	*.10*	*-.02*	*-.10*	*-.18*
Direct Effect	.05	.17*	.01	.11	-.06	-.06	-.13
Indirect Effect via FCV	.00	-.01	.00	.00	.00	.01	.00
Indirect Effect via HFA	-	-	-	-.01	.04	-.05	-.05
Indirect Effect via FCV & HFA	-	-	-	.00	.00	.00	.00

Note. N = 193. SES = socioeconomic status; WC/Health = Weight control/health; Dairy HFA = dairy home food availability; FV HFA = fruit and vegetable home food availability; HFHA HFA = high-fat/high-sugar home food availability; FV intake = fruit and vegetable intake. FCV = parental food choice value. SES is a standardized composite score. All effects are shown as standardized regression coefficients. All analyses are controlled for parent age, sex, race, weight status, marital status, household food insecurity, and social desirability and child age, sex, and weight status.
R^2 represents the unique amount of variance in the dependent variable accounted for by the set of independent variables.
*p < .05.

Table 7: Results of the hierarchical multiple regression analysis of SES, parental FCVs, and interactive effects on dairy HFA

Model		*b*	*S.E.*	ΔR^2	*F* for ΔR^2
Stage 1	[set of controls entered]			.06	1.18
Stage 2	(Intercept)	.40*	.03	.07*	2.08**
	SES	.01	.01		
	Accessibility	.01	.02		
	WC/Health	.00	.01		
	Organic	-.03	.02		
	Convenience	.01	.01		
	Sensory Appeal	.01	.02		
	Safety	.04*	.02		
Stage 3					
	SES x Accessibility	.01	.02	.00	0.39
	SES x WC/Health	.01	.01	.00	0.14
	SES x Organic	.02	.01	.01	2.8
	SES x Convenience	.00	.01	.00	0.03
	SES x Sensory Appeal	-.01	.02	.00	0.77
	SES x Safety	.01	.01	.00	0.41

Note. N = 193. SES = socioeconomic status. WC/Health = weight control/health. *b* = unstandardized beta weight. S.E. = standard error. Stage 1 includes the following covariates: parent age, sex, race, weight status, marital status, household food insecurity, and social desirability and child age, sex, and weight status. R^2 represents the unique amount of variance accounted for in a given stage. All variables, including interaction terms are mean centered. Each interaction term was tested in a separate model. *$p < .05$

Table 8: Results of the hierarchical multiple regression analysis of SES, parental FCVs, and interactive effects on fruit and vegetable HFA

Model		*b*	*S.E.*	ΔR^2	*F* for ΔR^2
Stage 1				.11*	2.14
Stage 2	(Intercept)	.48*	.04	.11*	3.40*
	SES	.03	.02		
	Accessibility	.02	.02		
	WC/Health	.03*	.02		
	Organic	.03	.02		
	Convenience	-.05*	.02		
	Sensory Appeal	-.01	.02		
	Safety	.00	.02		
Stage 3					
	SES x Accessibility	-.02	.02	.00	0.89
	SES x WC/Health	-.02	.02	.01	1.17
	SES x Organic	.00	.01	.00	0.00
	SES x Convenience	-.01	.01	.00	0.51
	SES x Sensory Appeal	-.01	.02	.00	0.44
	SES x Safety	.01	.01	.00	0.80

Note. $N = 193$. SES = socioeconomic status. WC/Health = weight control/health. *b* = unstandardized beta weight. S.E. = standard error. Stage 1 includes the following covariates: parent age, sex, race, weight status, marital status, household food insecurity, and social desirability and child age, sex, and weight status. R^2 represents the unique amount of variance accounted for in a given stage. All variables, including interaction terms are mean centered. Each interaction term was tested in a separate model. *$p < .05$

Table 9: Results of the hierarchical multiple regression analysis of SES, parental FCVs, and interactive effects on high-fat/high-sugar HFA

Model		*b*	*S.E.*	ΔR^2	*F* for ΔR^2
Stage 1				.06	1.22
Stage 2	(Intercept)	.40*	.03	.13*	3.86*
	SES	.00	.01		
	Accessibility	.01	.02		
	WC/Health	-.01	.01		
	Organic	-.04*	.01		
	Convenience	.03*	.01		
	Sensory Appeal	.02	.02		
	Safety	.02	.02		
Stage 3					
	SES x Accessibility	-.01	.01	.00	.29
	SES x WC/Health	.01	.01	.00	.29
	SES x Organic	.00	.01	.00	.03
	SES x Convenience	-.00	.01	.00	.13
	SES x Sensory Appeal	.01	.01	.00	.14
	SES x Safety	.00	.01	.00	.07

Note. *N* = 193. SES = socioeconomic status. WC/Health = weight control/health. *b* = unstandardized beta weight. S.E. = standard error. Stage 1 includes the following covariates: parent age, sex, race, weight status, marital status, household food insecurity, and social desirability and child age, sex, and weight status. R^2 represents the unique amount of variance accounted for in a given stage. All variables, including interaction terms are mean centered. Each interaction term was tested in a separate model. *$p < .05$

APPENDIX B: FIGURES

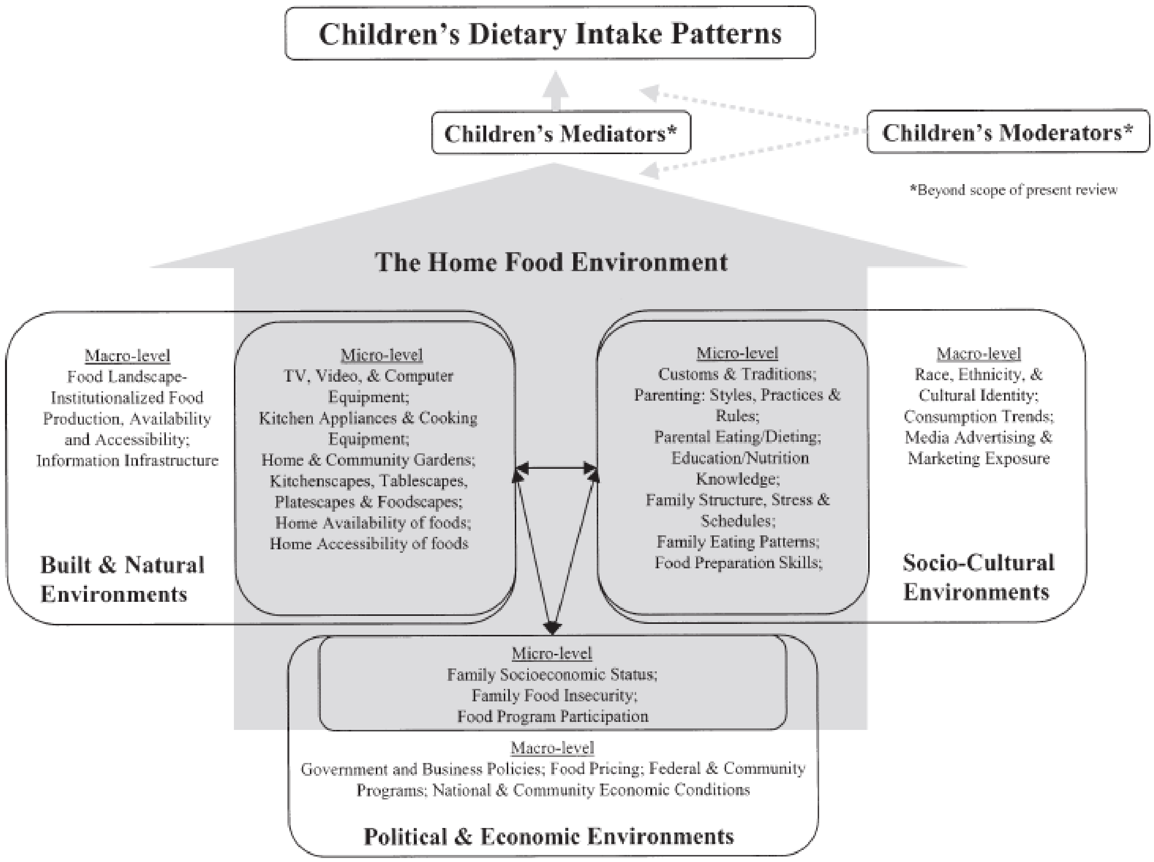

Figure 1: Home food environment model (Rosenkranz & Dzewaltowski, 2008)

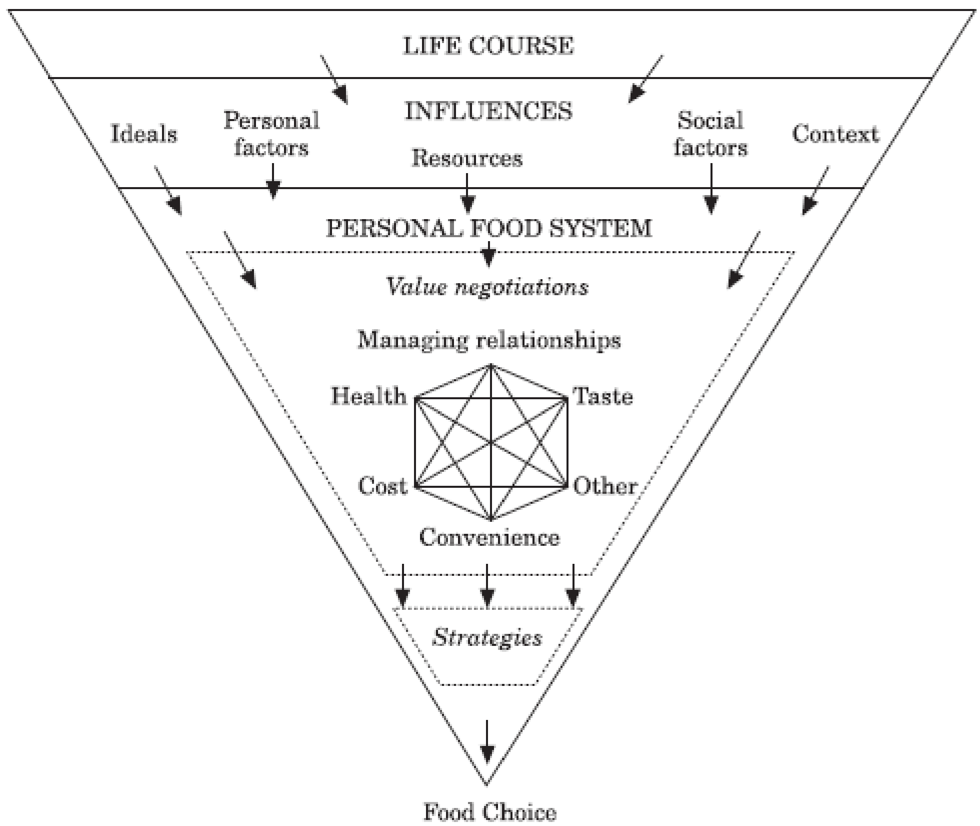

Figure 2: Food choice process model (Conners, Bisogni, Sobal, & Devine, 2001)

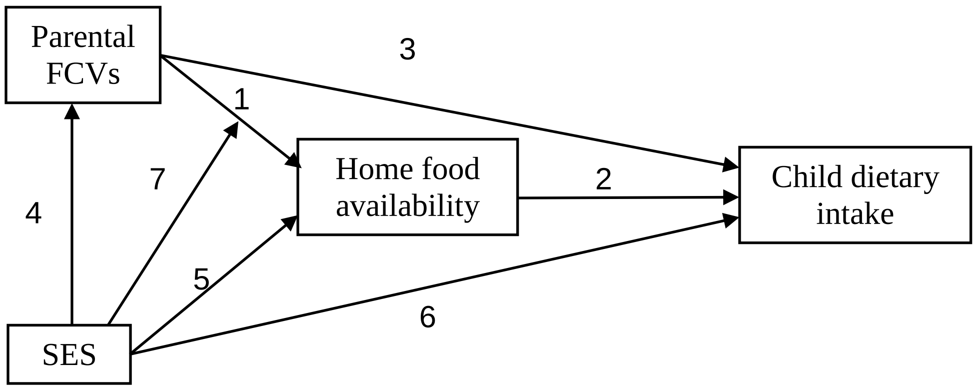

Figure 3: Model of proposed relationships between study variables.

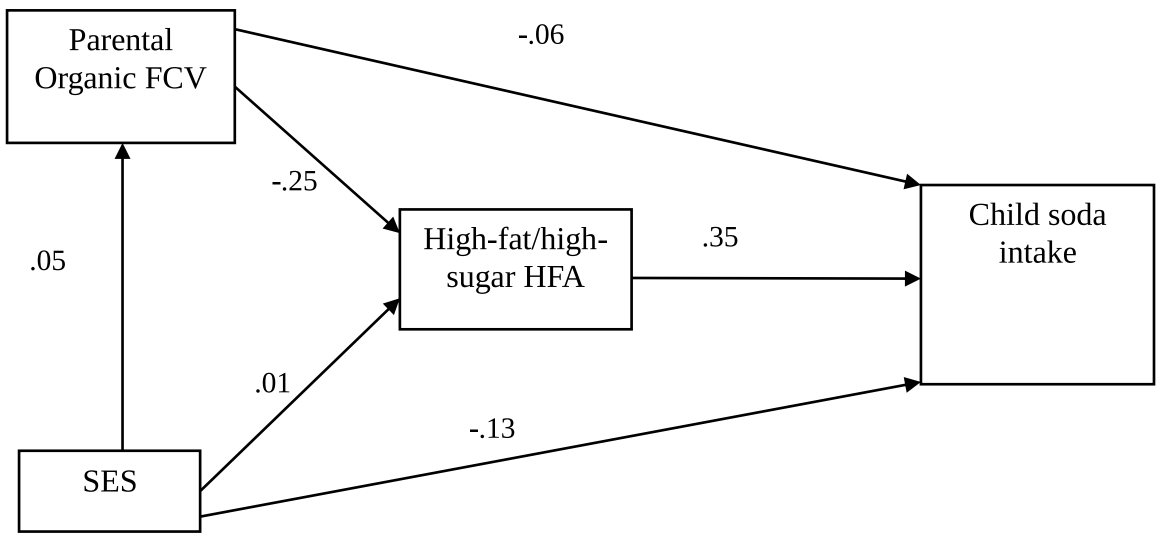

Figure 4: Effects on child soda intake. All path weights are shown as standardized regression coefficients.

APPENDIX C: FOOD CHOICE VALUE SCALE

Food choice values are defined as factors that individuals consider when deciding what foods they want to buy and/or eat. For each of the items below, use the scale provided (1- not at all, 2- a little, 3- moderately, 4- quite a bit, 5- very) to mark the level of importance the item is when deciding what food to buy **for your family**.

When deciding what food to buy and/or eat for your family, how important are each of the following…

Items	1	2	3	4	5
1. How it tastes	❑	❑	❑	❑	❑
2. Whether it is considered a traditional food	❑	❑	❑	❑	❑
3. How it smells	❑	❑	❑	❑	❑
4. Whether it is easily available in shops and supermarkets	❑	❑	❑	❑	❑
5. Whether I think it will help me cope with stress	❑	❑	❑	❑	❑
6. Degree to which it will help me cope with life events	❑	❑	❑	❑	❑
7. How likely it is to help me control my weight	❑	❑	❑	❑	❑
8. Degree to which it reflects my cultural or ethnic traditions	❑	❑	❑	❑	❑
9. Degree to which it is a good value for money	❑	❑	❑	❑	❑
10. Degree to which I can be sure it is not associated with food-borne illness	❑	❑	❑	❑	❑
11. Whether it is grown or produced in an environmentally friendly way	❑	❑	❑	❑	❑
12. The amount of calories in it	❑	❑	❑	❑	❑
13. How easy or difficult it is to prepare	❑	❑	❑	❑	❑
14. Degree to which it contains natural ingredients	❑	❑	❑	❑	❑
15. Degree to which it has been prepared with extreme care and safety	❑	❑	❑	❑	❑
16. Degree to which it will help me lose weight	❑	❑	❑	❑	❑
17. Degree to which it looks good	❑	❑	❑	❑	❑
18. The amount of vitamins and minerals in it	❑	❑	❑	❑	❑
19. Whether it can be cooked very simply	❑	❑	❑	❑	❑
20. How long it takes to prepare	❑	❑	❑	❑	❑
21. How similar it is to the food I ate when I was a child	❑	❑	❑	❑	❑
22. How much it will help me relax	❑	❑	❑	❑	❑
23. Whether I am certain it does not contain harmful bacteria or viruses	❑	❑	❑	❑	❑
24. How many artificial additives it contains	❑	❑	❑	❑	❑
25. Whether it can be bought in shops close to where I live or work	❑	❑	❑	❑	❑

APPENDIX D: MODIFIED HOME FOOD INVENTORY

Look in areas in your home where your household stores food, including the refrigerator, freezer, pantries, cupboards, and other storage areas. Please check "yes" or "no" to each of the food products/items/categories 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	
□	□	Shredded or block cheese (example: American, Cheddar, etc.)
□	□	Sliced cheese (example: American, Cheddar, etc.)
□	□	Ricotta or cottage cheese
□	□	Cream cheese
□	□	Cheez Whiz, Velvetta, canned cheese or other similar cheese

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

Yes	No	
□	□	Skim milk
□	□	1% or 2% low fat milk
□	□	Whole milk
□	□	Half and half, whipping cream or heavy cream
□	□	Sour cream or sour cream/cheese dips
□	□	Chocolate or flavored milk
□	□	Yogurt

3. Butter, margarine and oils

Yes	No	
□	□	Regular butter
□	□	Light butter
□	□	Regular margarine or butter substitute
□	□	Light margarine or butter substitute
□	□	Olive oil
□	□	Vegetable oil (example: canola oil, corn oil)
□	□	See oil (example: sunflower oil, sesame oil)
□	□	Lard or shortening

7. Salad dressing & condiments

Yes	No	
□	□	Salad dressing
□	□	Mayonnaise

8. Vegetables (include fresh, canned, or frozen vegetables)

Yes	No	
□	□	Asparagus
□	□	Beets
□	□	Bell peppers
□	□	Broccoli
□	□	Cabbage
□	□	Cauliflower
□	□	Carrots
□	□	Celery
□	□	Corn
□	□	Cucumbers
□	□	Green beans
□	□	Lettuce (example: romaine, endive, etc.)
□	□	Mushrooms
□	□	Peas
□	□	Potatoes
□	□	Spinach/other greens (example: collards)
□	□	Squash (example: butternut, zucchini, etc.)
□	□	Sweet potatoes
□	□	Tomatoes
□	□	Mixed vegetables

9. Fruits (include fresh, canned, dried, or frozen fruits)

Yes	No	
□	□	Apples
□	□	Apple sauce
□	□	Apricots
□	□	Avocado
□	□	Bananas
□	□	Blueberries
□	□	Cranberries
□	□	Dates
□	□	Grapes
□	□	Grapefruit
□	□	Kiwi
□	□	Lemons or limes
□	□	Mango

Yes	No	
□	□	Melons (example: watermelon)
□	□	Mixed fruit/fruit cocktail
□	□	Nectarines
□	□	Oranges
□	□	Pears
□	□	Peaches
□	□	Pineapple
□	□	Plums
□	□	Prunes
□	□	Raisins
□	□	Raspberries
□	□	Strawberries
□	□	Tangerines/clementines

10. Processed meats

Yes	No	
□	□	Bologna
□	□	Salami, summer sausage, pepperoni
□	□	Bacon, breakfast sausage
□	□	Hot dogs, bratwurst, polish sausage

11. Frozen desserts

Yes	No	
□	□	Ice cream
□	□	Frozen yogurt
□	□	Frozen treats made with ice cream or pudding

12. Microwavable or quick-cook frozen foods

Yes	No	
□	□	Pizza (any flavor)
□	□	Hot pockets (any flavor)
□	□	Pizza rolls or bagel snacks (any flavor)
□	□	Burritos or other Mexican snacks
□	□	Chicken nuggets
□	□	French fries or tater tots
□	□	Egg rolls
□	□	Ramen noodles

13. Prepared desserts

Yes	No	
□	□	Cookies (any flavor/variety)

□	□	Cake/cupcakes (any flavor)
□	□	Muffins (any flavor/variety)
□	□	Brownies/bars (any variety)
□	□	Other snack cakes (any variety)
□	□	Pastry, sweet rolls, donuts

14. Chips, crackers and other snack foods

Yes	No	
□	□	Whole grain snack crackers (example: Triscuit)
□	□	Regular snack crackers (example: Saltines, Wheat Thins)
□	□	Potato chips
□	□	Corn chips (example: Fritos)
□	□	Tortilla chips
□	□	Cheese curls or puffs
□	□	Bagel chips
□	□	Graham crackers
□	□	Pretzels (any kind)
□	□	Popcorn
□	□	Peanuts, cashews, or other nuts
□	□	Granola bars, sport bars

15. Beverages

Yes	No	
□	□	Regular soda (any variety, flavor)
□	□	Prepared iced teas or lemonade (example: Snapple)
□	□	Sports drinks (example: Gatorade)
□	□	100% fruit juice
□	□	Fruit drinks (example: <100% fruit juice, Capri Sun)
□	□	Soy milk, rice milk (any variety, flavor)

16. Candy

Yes	No	
□	□	Chocolate candy (any variety)
□	□	Hard candy
□	□	Gummies
□	□	Fruit roll-ups, fruit snacks or other fruit based candy
□	□	Chewy candy (example: Skittles, caramel)

17. 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	

□	□	Fresh fruit
□	□	Canned or dried fruit
□	□	Fresh vegetables
□	□	Snack crackers, pretzels, chips, popcorn
□	□	Dry cereal
□	□	Bread or rolls
□	□	Soda
□	□	Candy
□	□	Regular cookies, cake, cupcakes, muffins

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

Yes	No	
□	□	Skim milk (any flavor)
□	□	1% or 2% milk (any flavor)
□	□	Whole milk (any flavor)
□	□	100% fruit juice (any flavor)
□	□	Fruit drinks/sports drinks (not 100% juice)
□	□	Soda
□	□	Cheese (any kind)
□	□	Yogurt (any kind)
□	□	Fresh ready-to-eat vegetables
□	□	Fresh ready-to-eat fruits

APPENDIX E: DIETARY SCREENER QUESTIONNAIRE

These questions are about foods your child ate or drank during the past month, that is, the past 30 days. When answering, please include meals and snacks at home, at work or school, in restaurants, and anyplace else.

1. During the past month, how often did your child eat hot or cold cereals?
   - Never
   - 1 time last month
   - 2-3 times last month
   - 1 time per week
   - 2 times per week
   - 3-4 times per week
   - 5-6 times per week
   - 1 time per day
   - 2 or more times per day

2. During the past month, what kind of cereal did your child usually eat (open ended)?

3. If there was another kind of cereal that your child usually ate during the past month, what kind was it (open ended)?

4. During the past month, how often did your child have any milk (either to drink or on cereal)? Include regular milks, chocolate or other flavored milks, lactose-free milk, buttermilk. Do **not** include soy milk or small amounts of milk in coffee or tea.
   - Never
   - 1 time last month
   - 2-3 times last month
   - 1 time per week
   - 2 times per week
   - 3-4 times per week
   - 5-6 times per week
   - 1 time per day
   - 2-3 times per day
   - 4-5 times per day
   - 6 or more times per day

5. During the past month, what kind of milk did your child usually drink?
   - Whole or regular milk
   - 2% fat or reduced-fat milk
   - 1%, ½%, or low-fat milk
   - Fat-free, skim, or nonfat milk
   - Soy milk

Other milk ______________

6. During the past month, how often did your child drink regular soda or pop that contains sugar? Do **not** include diet soda.
   Never
   1 time last month
   2-3 times last month
   1 time per week
   2 times per week
   3-4 times per week
   5-6 times per week
   1 time per day
   2-3 times per day
   4-5 times per day
   6 or more times per day

7. During the past month, how often did your child drink 100% pure fruit juices such as orange, mango, apple, grape and pineapple juices? Do **not** include fruit-flavored drinks with added sugar or fruit juice you made at home and added sugar to.
   Never
   1 time last month
   2-3 times last month
   1 time per week
   2 times per week
   3-4 times per week
   5-6 times per week
   1 time per day
   2-3 times per day
   4-5 times per day
   6 or more times per day

8. During the past month, how often did your child drink coffee or tea that had sugar or honey added to it? Include coffee and tea you sweetened yourself and presweetened tea and coffee drinks such as Arizona Iced Tea and Frappuccino. Do **not** include artificially sweetened coffee or diet tea.
   Never
   1 time last month
   2-3 times last month
   1 time per week
   2 times per week
   3-4 times per week
   5-6 times per week
   1 time per day
   2-3 times per day
   4-5 times per day

6 or more times per day

9. During the past month, how often did your child drink sweetened fruit drinks, sports or energy drinks, such as Kool-Aid, lemonade, Hi-C, cranberry drink, Gatorade, Red Bull or Vitamin Water? Include fruit juices you made at home and added sugar to. Do **not** include diet drinks or artificially sweetened drinks.
   Never
   1 time last month
   2-3 times last month
   1 time per week
   2 times per week
   3-4 times per week
   5-6 times per week
   1 time per day
   2-3 times per day
   4-5 times per day
   6 or more times per day

10. During the past month, how often did your child eat fruit? Include fresh, frozen or canned fruit. Do **not** include juices.
   Never
   1 time last month
   2-3 times last month
   1 time per week
   2 times per week
   3-4 times per week
   5-6 times per week
   1 time per day
   2 or more times per day

11. During the past month, how often did your child eat a green leafy or lettuce sald, with or without other vegetables?
   Never
   1 time last month
   2-3 times last month
   1 time per week
   2 times per week
   3-4 times per week
   5-6 times per week
   1 time per day
   2 or more times per day

12. During the past month, how often did your child eat any kind of fried potatoes, including French fries, home fries, or hash brown potatoes?

Never
1 time last month
2-3 times last month
1 time per week
2 times per week
3-4 times per week
5-6 times per week
1 time per day
2 or more times per day

13. During the past month, how often did your child eat any other kind of potatoes, such as baked, boiled, mashed potatoes, sweet potatoes, or potato salad?
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

14. During the past month, how often did your child eat refried beans, baked beans, beans in soup, pork and beans, or any other type of cooked dried beans? Do **not** include green beans.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

15. During the past month, how often did your child eat brown rice or other cooked whole grains, such as bulgar, cracked wheat, or millet? Do **not** include white rice.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day

2 or more times per day

16. During the past month, not including what you just answered about green salads, potatoes, and cooked dried beans, how often did your child eat other vegetables?
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

17. During the past month, how often did your child have Mexican-type salsa made with tomato?
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

18. During the past month, how often did your child eat pizza? Include frozen pizza, fast food pizza, and homemade pizza.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

19. During the past month, how often did your child have tomato sauces such as with spaghetti or noodles or mixed into foods such as lasagna? Do **not** include tomato sauce on pizza.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week

3-4 times per week
5-6 times per week
1 time per day
2 or more times per day

20. During the past month, how often did your child eat any kind of cheese? Include cheese as a snack, cheese on burgers, sandwiches, and cheese in foods such as lasagna, quesadilla, or casseroles. Do **not** include cheese on pizza.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

21. During the past month, how often did your child eat red meat, such as beef, pork, ham, or sausage? Do **not** include chicken, turkey, or seafood. Include red meat your child had mixed in sandwiches, lasagna, stew, and other mixtures. Red meats may also include veal, lamb, and any lunch meats made with these meats.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

22. During the past month, how often did your child eat processed meat, such as bacon, lunch meats, or hot dogs? Include processed meats your child had in sandwiches, soups, pizza, casseroles, and other mixtures. Processed meats are those preserved by smoking, curing, salting, or by the addition of preservatives. Examples are: ham, bacon, pastrami, salami, sausages, bratwursts, frankfurters, hot dogs, and spam.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week

1 time per day
2 or more times per day

23. During the past month, how often did your child eat whole grain bread including toast, rolls and in sandwiches? Whole grains include whole wheat, rye, oatmeal, and pumpernickel. Do **not** include white bread.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

24. During the past month, how often did your child eat chocolate or any other types of candy? Do **not** include sugar-free candy.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

25. During the past month, how often did your child eat doughnuts, sweet rolls, Danish, muffins, pan dulce, or pop-tarts? Do **not** include sugar free items.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

26. During the past month, how often did your child eat cookies, cake, pie, or brownies? Do **not** include sugar free kinds.
    Never
    1 time last month
    2-3 times last month
    1 time per week

2 times per week
3-4 times per week
5-6 times per week
1 time per day
2 or more times per day

27. During the past month, how often did your child eat ice cream or other frozen desserts? Do **not** include sugar free kinds.
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

28. During the past month, how often did your child eat popcorn?
    Never
    1 time last month
    2-3 times last month
    1 time per week
    2 times per week
    3-4 times per week
    5-6 times per week
    1 time per day
    2 or more times per day

APPENDIX F: MACARTHUR SCALE OF SUBJECTIVE SOCIAL STATUS

Think of this ladder as representing where people stand in their communities.

People define community in different ways; please define it in whatever way is most meaningful to you. At the **top** of the ladder are the people who have the highest standing in their community. At the **bottom** are the people who have the lowest standing in their community.

Where would you place yourself on this ladder?

Please place a large **"X"** on the rung where you think you stand at this time in your life, relative to other people in your community.

APPENDIX G: MARLOW-CROWNE SOCIAL DESIRABILITY SCALE-13 ITEMS, FORM C

Directions: Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is *true* or *false* as it pertains to you personally. It is best to answer the following items with your first judgment without spending too much time thinking over any one question. Please select "True" if the statement is true, and "False" if the statement is false to you personally.

1. It is sometimes hard for me to go on with my work if I am not encouraged.
2. I sometimes feel resentful when I don't get my way.
3. On a few occasions, I have given up doing something because I thought too little of my ability.
4. There have been times when I felt like rebelling against people in authority even though I knew they were right.
5. No matter who I'm talking to, I'm always a good listener.
6. There have been occasions I took advantage of someone.
7. I'm always willing to admit it when I make a mistake.
8. I sometimes try to get even rather than forgive and forget.
9. I am always courteous, even to people who are disagreeable.
10. I have never been irked when people expressed ideas very different from mine.
11. There have been times when I was quite jealous of the good fortune of others.
12. I am sometimes irritated by people who ask favors of me.
13. I have never deliberately said something that hurt someone's feelings.

APPENDIX H: US ADULT FOOD SECURITY MODULE

1. In the last 12 months, I (or my family) worried whether our food would run out before I (or my family) got money to buy more.
   1- Often true
   2- Sometimes true
   3- Never true

2. In the last 12 months, the food that I (or my family) bought just didn't last, and I (or my family) didn't have money to get more.
   1- Often true
   2- Sometimes true
   3- Never true

3. In the last 12 months, I (or my family) couldn't afford to eat balanced meals.
   1- Often true
   2- Sometimes true
   3- Never true

4. In the last 12 months did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?
   1- Yes
   2- No

4a. [IF YES ABOVE, ASK] How often did you or other adults in your household cut the size of your meals or skip meals because there wasn't enough money for food?
   1- Almost every month
   2- Some months but not every month
   3- Only 1 or 2 months

5. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?
   1- Yes
   2- No

6. In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?
   1- Yes
   2-No

7. In the last 12 months, did you lose weight because there wasn't enough money for food?

1- Yes
2- No

8. In the last 12 months, did (you/you or other adults in your household) ever not eat for a whole day because there wasn't enough money for food?

1- Yes
2- No

8a. [IF YES ABOVE, ASK] How often in the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn’t enough money for food?
1- Almost every month
2- Some months but not every month
3- Only 1 or 2 months