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Directive and non-directive food-related parenting practices: Associations between an expanded conceptualization of food-related parenting practices and child dietary intake and weight outcomes

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Abstract

This study examines associations between an expanded conceptualization of food-related parenting practices, specifically, directive and non-directive control, and child weight (BMI z-score) and dietary outcomes [Healthy Eating Index (HEI) 2010, daily servings fruits/vegetables] within a sample of parent-child dyads (8–12 years old; n=160). Baseline data from the Healthy Home Offerings via the Mealtime Environment (HOME Plus) randomized controlled trial was used to test associations between directive and non-directive control and child dietary outcomes and weight using multiple regression analyses adjusted for parental education. Overall variance explained by directive and non-directive control constructs was also calculated. Markers of directive control included pressure-to-eat and food restriction, assessed using subscales from the Child Feeding Questionnaire; markers of non-directive control were assessed with a parental role modeling scale and a home food availability inventory in which an obesogenic home food environment score was assigned based on the types and number of unhealthful foods available within the child's home food environment.

Directive control—Food restriction and pressure-to-eat were positively and negatively associated with BMI z-scores, respectively, but not with dietary outcomes.

Non-directive control—An obesogenic home food environment was inversely associated with both dietary outcomes; parental role modeling of healthful eating was positively associated with both dietary outcomes. Neither non-directive behavioral construct was significantly associated with BMI z-scores.

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Total Variance—Greater total variance in BMI-z was explained by directive control; greater total variance in dietary outcomes was explained by non-directive control. Including a construct of food-related parenting practices with separate markers for directive and non-directive control should be considered for future research. These concepts address different forms of parental control and, in the present study, yielded unique associations with child dietary and weight outcomes.

In recent years, identification of modifiable determinants of childhood obesity has become a public health priority. Research has highlighted the role of the food environment in the development of obesity, including the food industry, the availability of energy dense foods and a physical environment that has been designed to promote a sedentary lifestyle.[1] More recently, researchers have explored the important role of the home food environment; parents have the opportunity to positively influence their children's weight status and dietary intake by providing healthful foods at home and modeling healthful food choices.[2–8] Food-related parenting practices, including encouraging children to eat healthful foods and restricting intake of palatable snack foods, have also been identified as potentially significant determinants of children's dietary intake and weight status.[9–12]

Research has shown that parents often adopt controlling food-related parenting practices (e.g., food restriction and pressure-to-eat) in response to concern about their child's weight status or dietary intake patterns;[9,11,12] for example, parents who are worried about their child gaining weight might place restrictions on the amount of sweets consumed by that child, and parents concerned about children's picky eating patterns might respond by requiring them to eat all of the food on their plate at mealtime. Unfortunately, while parents likely engage in these controlling behaviors in an effort to improve their children's dietary intake or weight status, the results associated with the impact of these behaviors on child outcomes are mixed. Laboratory, cross-sectional and prospective research suggests children exposed to higher levels of controlling food-related parenting practices (e.g. high food restriction, high pressure-to-eat) are more likely to engage in unhealthful eating behaviors (e.g. emotional eating, eating in the absence of hunger),[7,13–17] and have overall less healthful dietary intake (e.g. more frequent consumption of palatable snack foods, less frequent consumption of fruits and vegetables).[14,16,18–20] Further, studies have revealed controlling food-related parenting practices are significantly and positively associated with child weight status.[10,21–25] Based on these study findings, it would seem that controlling food-related parenting practices have a detrimental effect on child weight and dietary intake patterns. However, several studies have suggested parental control might actually lead to improved dietary intake and reduce unhealthy weight gain over time [9,26–28] and other studies have found no significant associations between food-related parenting practices and child weight and dietary intake outcomes.[27,29,30]

Thus, while healthcare professionals are generally encouraged to teach parents to avoid controlling food-related parenting practices (pressure to eat, food restriction) to promote healthy dietary intake and weight among children,[31–33] the evidence for this recommendation has not been entirely consistent [20,34,35] More recently, it has been suggested that both level (e.g. high vs low) and type (e.g. restriction, pressure, modeling, home food environment) of control, as well as how apparent (e.g. directive vs non-directive)

the efforts at control are to the child, may differentially impact child outcomes and that perhaps this previously overlooked nuance might serve to explain inconsistent results to-date.[11,34–41] Specifically, it has been posited that perhaps control itself does not lead to poor diet and weight-related outcomes, rather it is the method of control that influences these outcomes. [11,34–41] Several research groups have explored the use and impact of expanded conceptualizations on child outcomes. [11,34–41] For example, in 2006, Ogden and colleagues proposed an expanded conceptualization of food-related parenting practices; their study explored markers of *overt control* (detectable by the child) and markers of *covert control* (not detectable by the child).[34] Examples of overt control included pressure-to-eat, food restriction, and use of food as a reward; examples of covert control included limiting non-healthful foods within the home environment and avoiding places that serve primarily unhealthful foods when eating out. These two distinct types of control were associated with different eating-related outcomes in children; covert control was associated with less unhealthful snacking while overt control was associated with greater healthful snack food intake. Another, slightly different conceptualization of food-related parenting practices was proposed in a study by Murashima and colleagues; the authors explored *directive* and *non-directive* feeding control.[35] Pressure-to-eat, food restriction, and use of food as a reward were included in their study as markers of directive control. Markers of non-directive control included role modeling of healthy eating, maintenance of primarily healthy food items within the home, and encouragement to eat healthful food items during meals or as snacks. Study results showed non-directive control was positively associated with consumption of nutrient-dense foods and was negatively associated with energy-dense foods. Several other studies have explored the use and impact of broadened conceptualizations of controlling food-related parenting practices, although terminology (covert vs overt; directive vs. non directive; negative vs positive vs benign; restriction vs structure) and associated measures have differed widely. [11,34–41] It is also worth noting that these studies join, and expand upon, a much larger body of work that has long considered the important impact of the broad home food environment on child weight status and dietary intake.[2,42–47]

Generally, results from studies utilizing more complex conceptualizations of parental control suggest that perhaps the disparate findings in the child feeding practices literature with regard to control stem, at least in part, from the oversimplification of a multi-dimensional and complex construct. Thus, the goal of the current study is to add to this emerging body of literature by exploring associations between a broader conceptualization of food-related parenting practices, including markers of “non-directive control” and markers of “directive control” and child weight and dietary intake outcomes within a sample of school-aged children. Within this study non-directive control is defined as practices where parents interact with the child or influence the child’s environment with the goal of helping him or her eat a healthy diet by internalizing the goal, and markers include home food availability and parental modeling; directive control is defined as practices where parents put external pressure on the child to eat a healthy diet and markers include food restriction and pressure-to-eat. Findings from this study will help add to this new and ongoing conversation about the different forms of parental food-related control and the potentially different impact these varied forms of control have on child dietary and weight-related outcomes. Further, given that the bulk of research examining expanded conceptualizations of food-related parenting

practices has been conducted within toddlers, preschoolers, and early-elementary school aged children,[35–38,40,48] examining associations within a sample of late-elementary school aged children and their parents, will yield unique insight into the use and impact of food-related parenting practices within an older, less frequently explored age-group of young people. A better understanding of the impact of different forms of food-related parenting practices on child outcomes may be utilized to inform the anticipatory guidance provided by health care providers who work with parents of school-aged children.

Methods

Study design

For the present study, data were drawn from the baseline measurement of the Healthy Home Offerings via the Mealtime Environment (HOME) Plus study.[49–51] HOME Plus was a randomized controlled trial designed to prevent childhood obesity via a family-focused, community-based program that encouraged families to eat healthy meals and snacks together and limit screen time.[49] The main meal-preparing parent and one 8–12-year-old child per household were recruited to participate through events and flyers at Minneapolis Park and Recreation centers where the intervention program was held. Families were ineligible to participate if parents or children did not speak English, children had health conditions that prevented them from participating in the intervention, or children had an age- and gender adjusted body mass index (BMI) below the 50th percentile.[51] Baseline surveys were completed by 160 parent–child dyads in their homes during the summers of 2011 and 2012 (two cohorts).[50] All adults and children provided written consent and assent, respectively. Families received a $75 gift card for participating in baseline data collection. The study was approved by the University of Minnesota's Institutional Review Board.

Measures

At baseline, parents and children completed psychosocial surveys, study staff measured height and weight to calculated standardized BMI z-scores, and children completed multiple 24-hour dietary recalls. The psychosocial surveys assessed a variety of topics, including measures of overt and covert control and demographic characteristics. Trained research staff ensured parents and children completed their surveys independently. Cronbach's alphas described below were calculated using the data collected from Home Plus study participants.

Directive Control—Two separate subscales (*i.e., pressure-to-eat and food restriction*) from the Child Feeding Questionnaire (CFQ) [52,53] were utilized to assess markers of directive control. *Pressure-to-eat* was assessed by asking parents to complete the full 4-item CFQ Pressure-to-Eat Subscale, which was designed to measure the degree to which a parent encourages a child to eat more food (Cronbach's $\alpha = 0.72$). For example, parents were asked to rate their agreement with this statement, "My child should always eat all of the food on his/her plate" using a 5-point Likert scale, with each point on the scale represented by a word anchor. *Food restriction* was measured using the 8-item CFQ Restriction Subscale, which was designed to measure a parent's attempt to control a child's eating by restricting access to palatable foods (Cronbach's $\alpha = 0.78$). For example, parents were asked to rate their agreement with this statement, "I have to be sure that my child does not eat too many

sweets" using a 5-point Likert scale, with each point on the scale represented by a word anchor. *Overall scale scores* were created by averaging responses across each measure (4-item and 8-item, respectively).

Non-directive Control—Two measures were utilized to assess markers of non-directive control; *parental role modeling of healthy food intake* and an *obesogenic home food environment* score. *Parental role modeling of healthy food intake* was assessed on the parent survey using a 6-item parent role modeling scale (Cronbach's $\alpha = 0.67$). This measure was designed to expand on two previously well-validated measures of parental role modeling that exist in the literature;[54,55] our expanded measure includes specific questions about role modeling in front of the child and captures information on meal- and food-specific role modeling behaviors. Two items on our survey assessed parental role modeling while snacking ("When you eat a snack in front of your child, how often do you:… eat fruit as a snack? … eat vegetables as a snack?"), and four items assessed parenting role modeling while eating dinner ("When you are with your child, how often do you:… eat fruit at dinner? … eat vegetables at dinner? … eat green salad at dinner? … fill ½ your plate with fruits and vegetables at dinner?… drink water? … drink sugar-sweetened beverages, like soda pop?"). Responses for role modeling of healthful foods at both snack and dinner were on a 4-point scale: "Usually/ Always," "Sometimes," "Hardly ever," and "Never." Responses for individual items were summed to create a parental role modeling score, with higher scores indicating greater positive parental role modeling behaviors (scale range 8–32). *Obesogenic home food environment* was measured with the Home Food Inventory.[56] Parents completed this validated instrument to document foods and beverages available in their homes. The inventory includes 13 major food categories (e.g., fruits, sweetened beverages) and two ready-access categories (i.e., in the kitchen and in refridgerator). The obesogenic score represents a total count of the number of regular-fat versions of cheese, milk, yogurt, other dairy, frozen desserts, prepared desserts, savory snacks, added fats; regular-sugar beverages; processed meat; high-fat quick, microwavable foods; candy; and access to unhealthful foods in refrigerator and kitchen. A higher obesogenic score reflects more readily available unhealthful foods at home.

Dietary outcomes—The two dietary outcomes used for analysis were average daily servings of fruits and vegetables and Healthy Eating Index (HEI) - 2010 score. Dietary data were collected with dietary recalls, which are considered valid for collecting food intake data with children [57,58] and were completed with all children at baseline. Daily servings of fruits and vegetables consumed were averaged over the nonconsecutive day recalls (two weekdays and one weekend day). The first recall was completed in-person during the baseline data collection and the other two were completed over the phone with trained research staff within two weeks. Of note, of the 160 participants, 133 completed all three recalls (83%), 22 completed only two recalls (14%) and five only complete one recall (3%). For the current study we averaged all completed recalls to create our dietary intake variables. Fried vegetables (e.g. French fries) were not included as a serving of fruit or vegetable while 100% fruit/vegetable juice was included. Dietary recalls were collected using Nutrition Data System for Research (NDSR) software version 2011 and 2012 and analyzed with version 2012 (Nutrition Coordinating Center University of Minnesota). The Healthy Eating Index

(HEI)-2010 total dietary quality scores compare diet quality to the 2010 Dietary Guidelines for Americans.[59,60] Each child's diet quality score was calculated using dietary recall data by summing 12 dietary component scores: nine assessing meeting adequate intake and three assessing intake moderation. Higher dietary quality scores indicate more healthful dietary intake.

Anthropometric Measures—Trained study staff utilized standardized procedures to measure the heights and weights of all study participants.[61] Using these numbers, Body Mass Index (BMI; weight (kg) / height $(cm)^2$ was calculated for study participants, and age- and gender-adjusted BMI z-scores were calculated using the CDC's growth charts parameters.

Demographic Characteristics—Parents completed demographic items including information about their birth date (to assess age), ethnicity/race (American Indian/Alaskan Native, Asian, African American, White, or more than one race), gender and receipt of economic assistance (e.g., free- or reduced-price lunch, Supplemental Nutrition Assistance Program benefits), as well as their child's birth date and race. Children reported on their own gender. Parent participants were primarily white (77%) and mothers (95%) with a mean age of 41.4 years (SD = 7.70). Of the parent sample, 59% had completed at least a four-year college degree. Thirty-eight percent of parents reported that their family received some form of economic assistance (i.e., public assistance or free/reduced lunch). Child participants were split almost evenly between male and female with a mean age of 10.4 years (SD = 1.40). Table 1 provides further information regarding participant demographic characteristics.

Statistical Analysis

Multiple linear regression models were used to test the associations between markers of directive control (pressure-to-eat, food restriction) and non-directive control (parental role modeling of healthful eating, home food availability) and each of our research outcomes of interest (fruit and vegetable intake, HEI-2010 dietary quality score, child BMI z-scores). Because level of parental education is known to be associated with predictor variables as well as the research outcomes of interest, we included parental education as a covariate in all models. Beta values, standard errors and associated p-values are reported. Finally, to address our aims, overall variance explained by directive and non-directive control constructs was also calculated, both with and without parental education in the models. R^2 and 95% confidence intervals are reported. A p-value of 0.05 or less was considered to be statistically significant. All analyses were performed in Stata v13 (College Station, TX: StataCorp LP).

Results

Directive control

Pressure-to-eat was inversely associated with child BMI z-scores (β=-0.04; SE=0.02; $p<0.01$) while food restriction was positively associated with child BMI z-scores (β=0.02; SE=0.01; p=0.01). Neither pressure-to-eat nor food restriction were significantly associated

with the assessed child dietary outcomes (HEI-2010 diet quality score and daily fruit and vegetable consumption) (Table 2).

Together, markers of directive control (pressure-to-eat and food restriction) explained 2% (95% CI= −0.03, 0.07) and 1% (95% CI= −0.03, 0.05) of the total variance in average daily fruit and vegetable consumption and HEI-2010 diet quality scores, respectively. Markers of directive control explained 6% (95% CI = −0.02, −0.15) of the total variance in child BMI z-score. Total variance explained increased with the addition of parental education to models: directive control and parental education explained 6% (95% CI= −0.02, 0.14) and 7% (95% CI= 0=0.01, 0.15) of the total variance in average daily fruit and vegetable consumption and HEI-2010 diet quality scores, respectively. Markers of directive control and parental education explained 15% (95% CI = 0.05, 0.25) of the total variance in child BMI z-score.

Non-directive control

Positive parental role modeling of healthful food intake was positively associated with average daily servings of fruits and vegetables and HEI-2010 diet quality scores (β=0.11; SE=0.04; p<0.01 and β=0.60; SE=0.26; p=0.02, respectively). An obesogenic home food environment was inversely associated with average daily servings of fruits and vegetables and HEI-2010 diet quality scores (β = −0.04; SE=0.02; p=0.05 and β =−0.23; SE=0.11; p=0.05, respectively; Table 2). No associations were observed between positive parental modeling or an obesogenic home food environment and child BMI z-score.

Together, markers of non-directive control (positive parental modeling and obesogenic home food environment) explained 8 percent (95% CI = −0.00, 0.16) and 8 percent (95% CI= 0.01, 0.16) of the total variance in average daily fruit and vegetable consumption and HEI-2010 diet quality scores, respectively. Markers of non-directive control explained 3 percent (95% CI=-0.02, 0.09) of the total variance in child BMI z-score. Total variance explained increased with the addition of parental education to models: non-directive control and parental education explained 11 percent (95% CI = 0.02, 0.21) and 14 percent (95% CI= 0.04, 0.24) of the total variance in average daily fruit and vegetable consumption and HEI-2010 diet quality scores, respectively. Markers of non-directive control and parental education explained 8 percent (95% CI=−0.01, 0.17) of the total variance in child BMI z-score.

Discussion

The present study aimed to explore associations between a broad conceptualization of food-related parenting practices, including markers of non-directive control (i.e. home food availability and parental role modeling) and markers of directive control (i.e. food restriction and pressure-to-eat) and child dietary intake and weight outcomes. This study joins a small number of previously published papers that attempted to examine food-related parenting practices and markers of the home food environment together in a way that paints a more comprehensive picture of parental influence. [20,34,35] It has been suggested that both level (e.g. high vs low) and type (e.g. restriction, pressure, modeling) of control, as well as how apparent (e.g. directive vs non-directive) the efforts at control are to the child, may differentially impact child outcomes and that perhaps this previously overlooked nuance

might serve to explain inconsistent results to-date.[11,34–41] The present study explored this hypothesis by separately examining associations between level and type of control, as well as by how apparent the efforts of control are to the child, and child dietary intake and weight outcomes.

In the present study, markers of directive control (food restriction and pressure-to-eat) were found to be significantly associated with child BMI z-score, but not with child dietary outcomes. Study findings reveal pressure-to-eat food-related parenting practices were significantly and inversely associated with BMI z-scores, whereas food restriction practices were found to be significantly and positively associated with BMI z-scores. These cross-sectional findings, align with previously conducted cross-sectional and prospective research.[9] Unfortunately, there is accumulating evidence for the detrimental effects of pressure-to-eat and food restriction food-related parenting practices on children's food preferences and ability to self-regulate energy intake.[9] For example, laboratory studies have shown that a child, who is pressured to consume a particular food (e.g. vegetables) at meals, shows a decrease in preference for and intake of that particular food item long-term.[18,62] With regard to food restriction, both laboratory and prospective studies have demonstrated that children whose parents restrict or limit the consumption of particular food items, are more likely to seek out and overconsume the restricted food item when given the opportunity (e.g. at school or a friend's home).[13–16,63–69] Further, the present study demonstrated no cross-sectional associations with food restriction or pressure-to-eat and better dietary intake outcomes. Thus, while parents likely adopt directive forms of control with the goal of improving their child's dietary intake or weight status, findings from the present study, in combination with previous studies exploring the impact of food restriction and pressure-to-eat on child outcomes,[9,10] suggest these forms of control might yield unintended results.

When interpreting the present study's cross-sectional findings, temporal direction of these observed relationships remains unclear. In fact, research suggests the relationship between parental food restriction and pressure-to-eat and child weight-related outcomes is likely to be bidirectional;[9] for example, whereas high levels of food restriction have been shown to lead to an increase in child weight, parents of overweight and obese children are more likely to adopt restrictive parenting practices in an effort to help curb their child's food intake. Results from a small number of studies indicate that parental restriction often precedes excess weight in young children, [7,14,15] suggesting that the bidirectional path begins with parental use of controlling feeding practices; this exposure then leads to a child's weight gain over time and creates a feedback cycle in which both food-related parenting practices and the child's excess weight gain persist across time.

Although more research is necessary to establish whether it is parental restriction or pressure-to-eat that initiates what is likely a complex, lifelong interaction between food-related parenting practices and child weight-related outcomes, it is recommended that parents engage in behaviors known to promote child healthful eating behaviors and weight management, including making nutritious food items readily available within the home, and modeling healthful food choices. In the expanded conceptualization of food-related parenting practices explored within the present paper, we defined these types of parenting behaviors (positive parental role modeling and provision of a healthy home food

environment) as markers of non-directive control; non-directive control reflects a form of parental behavior that does not utilize external pressure, but rather relies upon the parent making changes to the behaviors they are modeling or child's home or social environment. Consistent with previous research findings, positive parent modeling was found to be positively associated with average daily servings of fruits and vegetables consumed by children, as well as HEI-2010 diet quality scores;[70] an obesogenic home food environment was found to be negatively associated with average daily servings of fruits and vegetables consumed by children, as well as HEI-2010 diet quality scores. These cross-sectional findings, lend support to the idea that parents can promote their children's healthful dietary intake through the provision of a physical (home food availability) and social (parental modeling) environment conducive to making healthy choices. However, in the present study these non-directive behaviors were not associated with BMI z-scores. These nonsignificant associations with BMI z-scores could indicate the associations between non-directive behaviors and improved eating patterns are not strong enough to yield improved weight outcomes in young people. Conversely, it might be that these non-directive behaviors associated with improved eating patterns in the short term, overtime may also be associated improved weight status. Future, longitudinal, research is needed to understand the long-term impact of these non-directive forms of parental control on both child dietary intake and weight outcomes.

This study has limitations and strengths and all results presented should be interpreted with these in mind. A primary limitation includes the lack of a validated tool via parental report that captures parental role modeling of specific foods and at specific eating events (meals versus snacks). However, without validated measures in the literature, we adapted validated questions from Cullen et al.[71] for parent self-report of role modeling for these specific foods and eating behaviors. Further research should be conducted to validate questionnaires on parent self-report of role modeling. Another potential limitation stems from our exclusion of children with an age-and gender matched BMI below the 50th percentile; by excluding children in the lower half of the BMI percentiles (which includes both normal and underweight children) it is possible we biased the direction and/or magnitude of our study findings, as well as limiting the generalizability of study findings to only children with an age- and gender-matched BMI at or above the 50th percentile. Nevertheless, our findings may apply to many youth given the current prevalence of overweight/obesity. Finally, the current sample utilized was fairly homogenous with regard to ethnicity as well as level of parental education. Given that several studies to date have illuminated the influence of parental culture on feeding,[9,11,72–74] the homogeneity of this sample should be considered a limitation.

This study is also marked by several notable strengths. The measures of dietary intake were obtained via the gold standard approach of 24-hour dietary recalls collected by NDSR software and trained staff. Use of the well-validated CFQ subscales and Healthy Eating Index-2010 scales as well as measured heights and weights to calculate child BMI z-score, strengthen the validity of study findings. Finally, although our sample was not particularly large, it was adequate for the analyses conducted and allowed for examination of associations within an under-explored age group. Previous work exploring food-related parenting practices has been conducted primarily in samples of toddlers, preschoolers, and

early-elementary school aged children,[35–38,40,48] with some more recent work exploring the impact of these practices on adolescents;[10,20,25,74,75] thus we were able to fill a gap in the literature by examining associations within a population of late-elementary school children.

Conclusions

The present study aimed to add to the literature by exploring associations between a broadened conceptualization of food-related parenting practices and child dietary intake and weight outcomes within a sample of late-elementary school children and their parents. This study aimed to complement and add to the body of literature that has considered broadened conceptualizations of food-related parental control among younger children, and may provide some clarity for the confusing and contradictory results in the existing literature. Results of the present indicate that future research in this area should include a construct of food-related parenting practices with separate markers for directive and non-directive control behaviors. These concepts address distinct forms of parental control and appear to yield unique associations with child dietary and weight outcomes. Future, longitudinal, studies are needed to help establish long-term associations with child dietary and weight-related outcomes.

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Table 1

HOME Plus participant demographic characteristics

Participant Characteristics	Total	
	%	n
Parent gender		
Male	5%	8
Female	95%	152
Child Gender		
Male	53%	85
Female	47%	75
Parent race		
Other [a]	3%	5
White	77%	123
Child race		
Other[a]	9%	15
White	68%	109
Parent Education		
Less than a bachelor's degree	41%	64
Bachelor's degree or higher	59%	91
Income		
Less than $35,000	31%	49
$35,000 to $74,000	23%	36
$75,000 or more	47%	74
Receives Economic Assistance[b]		
Yes	39	62
No	61	98
	Mean (SD)	
Age of adults	41.38 (7.71)	
Age of children	10.37 (1.40)	

[a] American Indian or Alaskan Native, Asian, Black or African American, Native Hawaiian or Pacific Islander, Other, or More than one race.

[b] Examples of economic assistance include free- or reduced-price lunch, Supplemental Nutrition Assistance Program benefits, etc.

Table 2

Adjusted associations between markers of parental directive and non-directive control and child fruit and vegetable intake, Healthy Eating Index (HEI-2010) diet quality score, and body mass index (BMI) z-scores

	Markers of Directive Control					**Markers of Non-Directive Control**			
	Pressure-to-Eat (Range: 4–20)		**Food Restriction (Range: 9–40)**			**Positive Parental Role Modeling (Range: 12–35)**		**Obesogenic Home Food Environment (Range: 5–51)**	
Mean Score (SD)	**8.84 (3.85)**		**26.97 (6.88)**			**27.4 (3.43)**		**22.23 (7.77)**	
	B (SE)	**P-value**	**B (SE)**	**P-value**		**B (SE)**	**P-value**	**B (SE)**	**P-value**
Average daily servings of Fruits/Vegetables	−0.04 (0.04)	0.31	−0.02 (0.02)	0.29	Average daily servings of Fruits/Vegetables	**0.11 (0.04)**	**0.01**	**−0.04 (0.02)**	**0.05**
Total R^2 for Directive Control	0.06 (−0.02, 0.14)				Total R^2 for Non-directive Control	**0.11 (0.02, 0.21)**			
HEI-2010 diet quality scores	0.03 (0.23)	0.91	−0.11 (0.13)	0.39	HEI-2010 diet quality scores	**0.60 (0.26)**	**0.02**	**−0.23 (0.11)**	**0.05**
Total R^2 for Directive Control	0.07 (−0.01, 0.15)				Total R^2 for Non-directive Control	**0.14 (0.04, 0.24)**			
BMI z-score	**−0.04 (0.02)**	**<0.01**	**0.02 (0.01)**	**0.01**	BMI z-score	−0.02 (0.02)	0.15	−0.01 (0.01)	0.10
Total R^2 for Directive Control	**0.15 (0.05, 0.25)**				Total R^2 for Non-directive Control	0.08 (−0.01, 0.17)			

Notes: 1) All models (including Total R^2) include adjustment for level of parent educational attainment; 2) Bolding indicates significance at p≤0.05.