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Resemblance in dietary intakes between urban low-income African American adolescents and their mothers: The HEALTH-KIDS Study

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Abstract

Objectives—To examine the association and predictors of dietary intake resemblance between urban low-income African American adolescents and their mothers.

Methods—Detailed dietary data collected from 121 child-parent pairs in Chicago in Fall 2003 were used. The association was assessed using correlation coefficients, kappa, and percentage of agreement, and logistic regression models.

Results—Overall, the association was weak as indicated by correlations and other measures. None of the mother-son correlations for nutrients and food groups were greater than 0.20. Mother-daughter pairs had stronger correlations (0.26 for energy and 0.30 for fat). The association was stronger in normal weight- than overweight or obese mothers. Logistic models showed that mother being a current smoker, giving child more pocket money, and allowing child to eat or purchase snacks without parental permission or presence predicted a higher probability of resemblance in undesirable eating patterns, such as high-energy, high-fat, and high-snack intakes ($p<0.05$).

Conclusions—Mother-child diet association was generally weak, and varied considerably across groups and intake variables in this homogenous population. Some maternal characteristics seem to affect the association.

Keywords

child; adolescent; mother; diet; African American; association; correlation

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INTRODUCTION

Low-income African American (AA) children and women are at higher risk for overweight and obesity compared to other groups (1,2), in part due to their more prevalent unhealthy eating behaviors (3). An association between child and parent dietary intake has been suggested by some studies (4–9) while others found a weak or non-existent correlation (10–12). It is recognized that young people's eating patterns are affected by multiple factors other than parental and family influences (13–15). These may include the school food environment and peer and marketing influences. For example, most American children eat one meal at school, and low-income children frequently eat both breakfast and lunch at school; and eating snack foods is a common practice (16,17). Some studies also reported that low-income and AA families eat family meals together less frequently than other groups (18,19). All these factors may result in a weaker association between the dietary intake patterns of low-income AA adolescents and their parents. To our knowledge, this has not been previously explored using comparable dietary data collected from adolescents and their parents.

The present study examined whether resemblance existed in the dietary intake patterns of low-income AA adolescents and their mothers, using detailed baseline dietary data collected in a school-based childhood obesity prevention study. We also tested possible predictors of the association, including mothers' sociodemographic characteristics, body mass index (BMI) status, food related behaviors associated with either family meals or snacking, some of which may reflect parenting styles, and household participation in food assistance programs (FAP). Findings of this study will help enhance our understanding of the factors that affect young people's dietary intake and provide useful insights for future interventions among low-SES minority groups.

METHODS

Study design

The HEALTH-KIDS ("**H**ealthy **E**ating and **A**ctive **L**ifestyles from school **T**o **H**ome for **KIDS**") Study was a randomized trial to assess the effectiveness of a school-base obesity prevention program targeting low-income AA adolescents. More details about the study design and data collection can be found elsewhere (3,20). The HEALTH-KIDS study enrolled approximately 400 students, but only around half of the parents (predominately mothers) consented to actively participate in the study, and of these only 108 returned the questionnaires that were mailed to their homes. Because some parents had more than one child enrolled in our study, the present analysis includes a total of 121 mother-child pairs. Our analysis showed that these 121 adolescents (10–14 years old) were not statistically different from the others in the original baseline sample in their sociodemographic characteristics and dietary intake variables, except that they had slightly lower proportion of energy derived from fat (30.3% vs 31.4%, $p<0.05$). This study was approved by the Institutional Review Board of the University of Illinois at Chicago and the Johns Hopkins University Bloomberg School of Public Health.

Data collection and measures

Students' anthropometric measures were assessed at the schools through direct measurements conducted by trained research staff following standardized protocols. Other data (including dietary intakes) were collected through assisted, self-administrated questionnaires, carried out in small groups in the classroom. Parental survey questionnaires were mailed to those parents who agreed to participate, and telephone assistance to fill the questionnaires was provided upon request. A pre-paid addressed returning envelope was provided to the mothers.

Dietary intake—Adolescents' eating patterns were assessed using dietary intake questions adapted from the Youth Risk Behavior Surveillance System (YRBSS) and the CATCH study questionnaires, and using a food frequency questionnaire (FFQ) developed by Harvard University---the Youth and Adolescent Questionnaire (YAQ) (21). Similarly, their mothers' eating patterns were assessed using the adult version of the FFQ. YAQ included 152 items and adult FFQ, over 180 items. Both FFQ have been used in nationwide samples including African American groups and were shown to have acceptable validity (21–25). The present study focused on the FFQ data. Both FFQs asked the participants' dietary intake over the past year, and were administered to the children and their parents within approximately 2–3 weeks. Note that it is likely that both FFQs might have overestimated these study group's dietary intakes as they included approximately over 150 items. However, the main purpose of the FFQs is to rank people from high to low intake, but not to estimate their exact intakes. Similarly, our goal is to assess the resemblance between children's and their mothers' intakes, but not their exact intakes. Thus, if the systematic errors (ie, overestimate) are similar between children's and their mothers' intakes, this will not be a threat to our conclusion.

Our analyses focused on the intakes of energy and selected nutrients (fat, fiber and calcium) and food groups (fruits and vegetables, fried food, sweetened beverages, snacks), which were selected as indicators of dietary intakes, and because of their relevance with health outcomes such as obesity and chronic disease.

Anthropometric measures—Height was measured to the nearest 0.1 cm using a portable stadiometer (Shorr Board Stadiometer, Olney, MD). Body weight (in light clothing, without shoes) was measured to the nearest 0.1 kg using the Tanita BWB-800A electronic scale (Tanita Corporation, Japan). The mean of two measurements was used in our analysis. Mothers were asked to report their weight and height in the questionnaire.

Classification of overweight—Body mass index (BMI = weight (kg)/height^2 (m^2)) for each participant was calculated based on weight and height. For adolescents, we used the 2000 CDC growth charts (i.e., the age-sex-specific BMI percentile) to define: a) "at risk of overweight," 85th percentile ≤ BMI < 95th percentile; b) "overweight," BMI≥ 95th percentile; c) "underweight," BMI < 5th percentile; d) all others, "normal weight" (26). Due to the small number of underweight participants, we combined c) and d) and called them the "non-overweight group." For mothers, the BMI cut points of 25 and 30 were used to classify overweight and obesity, respectively (27).

Food assistance programs (FAP) participation—Household FAP participation (yes vs. no) was defined based on mother participants' response to questions regarding participation of FAP such as the Food Stamp Program and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). We chose not to include the students' participation in the school meal programs as the majority of them had free lunch.

Statistical analysis

We first estimated the characteristics and average dietary intakes of adolescents and their mothers. Next, we calculated the correlation coefficients between adolescents' and their mothers' dietary intakes (energy and selected nutrients and food groups) and tested the differences in the correlation coefficients by adolescents' and their mothers' characteristics. We subsequently assessed the agreement between adolescent and maternal dietary intake patterns by creating two different sets of quartiles for adolescents and their mothers for each dietary intake variable, respectively. This allowed us to calculate the percentage of agreement and the kappa statistic, which measures agreement beyond chance. Note that based on considerations of our relatively small sample size, sample distribution, comparability between the cut points used in mothers and children, and common practice in the related literature studying agreement, we chose to use such distribution cut points, but not based on adherence to dietary guidelines.

Further, we conducted logistic regression analysis to study the predictors of the resemblance (eg, when children and mother both had high (based on group-specific quartiles) intake of energy or the selected nutrients and food groups). High intake patterns, but not low intakes, were tested because they either indicated unhealthy diet (high energy) or desirable dietary patterns (eg, high vegetable and fruit). High intakes were defined as in the top group (mother or children)- and sex (only for children)-specific quartile. Odds ratios (ORs) and 95% confidence intervals (95% CI) were calculated. All models controlled for potential confounders such as mothers' age and BMI status, and children's age and gender.

As 17 of the 121 adolescents have one or more siblings enrolled in our study, we conducted sensitivity analyses and our results were almost identical if this cluster effect was considered (e.g., when only one child from each family was randomly selected). We chose to include all the subjects in our main analysis to best use the data and preserve the study's statistical power; also because some of these adolescents had different gender and/or different BMI status, they were in different groups in our analyses stratified by gender and BMI. Data management and analysis were conducted using SAS Version 9.1 (2004, SAS Inc, Cary, NC, USA). P value was set at $p<0.05$ for testing statistical significance, and $p<0.1$ for marginal significance considering our relatively small sample size.

RESULTS

Demographic characteristics and Dietary patterns

Table 1 shows the mothers' demographic characteristics, weight status, and family meal patterns and some food related behaviors associated with either family meals or snacking. Nearly half of these mothers were unemployed and 29.8% were current smokers; near to 60% of these families' annual family income was below $20,000. Based on self-reported weight and height, 71.9% of the mothers were overweight or obese, and 50.4% of the mothers reported trying to lose weight. More of the mothers of those overweight and at-risk for overweight adolescents allowed their children eat snacks without parental permission.

Table 2 shows the dietary intakes of selected nutrients and food groups that were likely to be associated with obesity. Although there were a few gender differences, dietary intakes did not differ significantly by children's or mothers' weight status ($p>0.05$). General information and baseline dietary patterns of this cohort of adolescents were reported elsewhere (3,20).

Association between mother-child dietary patterns

Overall, the associations were weak as shown by correlation coefficients (Table 3), kappa and percentage of agreement (Table 4). Girls generally showed a stronger association than boys. The Spearman correlation coefficients ranged from −0.24 for energy intake in boys to 0.30 for total fat intake in girls. The associations also varied by adolescents' and their mothers' BMI status. Overweight children showed the weakest association compared to other adolescents, while normal weight mothers had the strongest association. For example, of interest, normal weight adolescents and mothers had a relative high correlation in their vegetables and fruits (V&F) intake (0.26 vs. 0.36) as well as fried food consumption (0.21 vs. 0.30).

Table 4 shows the resemblance when assessed using adolescent- and mother-specific quartiles for dietary intake. Consistent with findings in Table 3, in general, the agreement was low. For example, only 4 of the kappa values were greater than 0.2, and 3 of them were for normal weight mothers. Further, our logistic regression models show that with adjustment for maternal age and BMI status, and children's age and gender mother-child resemblance for high intakes (top quartiles) of energy and V&F was significant or marginally significant ($p<0.1$), but not for high intakes of fat, sweetened beverage, or snack (see Appendix A). When mothers had a high energy intake or high-V&F diet, their children were more likely to have such diets: the OR and 95% CI were 4.82 (1.10, 21.06) for energy and 3.43 ((0.91, 12.90), $p<0.1$) for V&F.

Correlates of mother-child resemblance in dietary patterns

We examined the effects of maternal characteristics on the correlation of dietary patterns (Table 5). Working mothers had a stronger correlation in energy intake compared to those unemployed. There was also a stronger correlation for V&F consumption when vegetables were served with dinner at least three times per week (r=0.43), but only for mother-son pairs. Correlations for several intake variables were also stronger for children who were allowed to eat snacks without parental permission.

Our logistic regression models show that current maternal smoking, giving their children more pocket money, and allowing their children to eat or purchase snack foods without parental permission or presence, all predicted a higher risk of resemblance in undesirable eating patterns, such as high-energy, high-fat, and high-snack food intakes (Table 6). Especially, mother being a current smoker was a strong predictor for all the 4 unhealthy eating patterns we examined.

Our additional analysis also shows that mothers being a current smoker was a strong predictor of these unhealthy eating behaviors by their children except for sweetened beverage consumption (Appendix A): the OR and 95%CI was 3.96 (1.10, 14.30) for high-energy intake, 6.20 (1.56, 24.73) for high-fat intake, and 3.15 ([0.86, 11.57], $p<0.1$) for high-snack intake. All these models controlled for mothers' age and BMI status, and children's age and gender.

We also tested the influence of household participation in food assistance programs (FAP, see Appendix B and C). We used intakes of total energy, calcium and fiber as the indicators. Over half (61.2%) of the mothers reported household FAP participation. In general, the resemblance did not significantly differ by FAP participation, although it was slightly stronger among non-participants than participants for daughters' energy intake. No difference was observed for boys because in general the mother-son pair resemblance was weak. In general, the mothers who participated in FAP consumed more energy, fat, fiber and calcium ($p<0.05$) and their children consumed significantly higher percentage of energy from fat than their counterparts ($p<0.05$), but their other intakes were not significantly different. Thus, the possible benefits (e.g., increased calcium and fiber intakes) of FAP seemed not being distributed within the family, while our results indicate some adverse effects of FAP (e.g., increased fat and energy intakes).

DISCUSSION

Using detailed dietary data collected concurrently in low-income AA mothers and their adolescent offsprings, we found that the association between their dietary patterns was generally weak, and varied considerably across groups of various baseline characteristics and across dietary intake variables. None of the mother-son correlations were greater than 0.2. Mother-daughter pairs had stronger correlations, but the largest were only 0.26 for energy and 0.30 for absolute amount of total fat intake. In general, our findings are consistent with a number of previous studies in US populations, although the correlations seem to be weaker than findings in some other groups. For example, Stanton et al studied 404 rural 12–15 years old adolescents and their mothers (28% were AA), and reported a correlation for fat intake of 0.22 for pooled mother-child pairs, 0.30 for mother-daughter, and 0.11 ($p>0.05$) for mother-son (28). The association was stronger in white dyads (0.23) vs. AA dyads (0.18, $p>0.05$). In another recent study of 173 white girls and their mothers selected in central Pennsylvania, three 24-hour food recalls were collected from mothers when their daughters were 7 and again when the girls were 9 years old. The mother-daughter correlation for V&F consumption (servings) was 0.36 (29). It is likely that the correlation could be stronger if the dietary data were collected concurrently. In our study, the correlation between these low-income AA adolescents' and mothers' VF consumption was 0.15 ($p>0.05$). We investigated low-income AA adolescents and most of them depended on food assistance programs (FAP, e.g., School Lunch and School Breakfast Programs) to provide a large portion of their dietary intakes, especially during the school days; and many of these families (61%) participated in other FAP such as the Women, Infants and Children (WIC) and food stamp programs as well. Thus, similarities in this population may differ from other studies that investigated higher income populations. Nevertheless, we have recently shown that these adolescents tracked their dietary intake patterns over a one year period (30).

Differences in eating behaviors and other related characteristics between mothers and their offspring may have contributed to the weak resemblance we found. Adolescents are prone to skipping meals, snacking, and inappropriate dieting practice. Some mothers might have changed their own eating behaviors as well as the meals they prepared for their family due to their own health conditions (see below). Nevertheless, the weak resemblance found in ours and others' studies suggest that other factors beyond the family- parental influence play a more important role in affecting adolescents' dietary intakes.

The stronger resemblance with their mothers of daughters compared to sons may be explained by a number of sex-differences in biological-, psychosocial-, and behavioral factors. Depending on the age of the population, boys and girls could be in different stages of development and have different biological needs of energy and nutrients. For example, male adolescents may be going through growth spurt while some females have already reached adult height; and boys may be more physically active than girls. In addition, parental and peer influences regarding dietary intake may differ for boys and girls. These all may help explain the differences between resemblance of mom-son and mom-daughter.

Our findings also underscore the influence of maternal characteristics on the association, which was stronger in mother-child pairs with normal weight- than in overweight mothers. This phenomenon may reflect dietary changes in mothers responding to their overweight status, or the fact that normal weight mothers might be more health-conscious and play a stronger role on their children' eating patterns. As an example, we found that the correlation for fat intake (grams) was 0.40 in normal weight mothers vs. −0.08 in overweight or obese mothers; and that for V&F, 0.36 vs.−0.04 to 0.09. However, none of the differences in these mothers' and their children's fat and V&F intakes were statistically significant by mothers' weight status. Our logistic regression models show that mother being a current smoker, giving her child more pocket money, and allowing her child to eat or purchase snack foods without parent permission or presence predicted a higher risk of resemblance in undesirable eating patterns, such as high-energy, high-fat, and high-snack food intakes. Mother being a current smoker was also a strong predictor of these unhealthy eating behaviors by their children. Therefore, maternal characteristics can be used to help identify adolescents who are at high risk of unhealthy eating and their mothers need be targeted as well to promote desirable changes in eating behaviors.

Over half (61.2%) of the mothers in our study reported household FAP participation. Food insecurity may have a greater impact on parental intakes than on their children's. Gatekeepers (mostly females) in low-income households may manage food resources by limiting their own intakes to give their children better access to foods. In general, the resemblance was not significantly different by FAP participation. This may because the vast majority of children in this study had free school lunch, which contributed to a large proportion of their daily dietary intakes, and this part unlikely would be affected by food consumed at home. It seems that the possible beneficial effects (e.g., increased calcium and fiber intakes) of FAP observed among mothers were not transferred to children in this low-income urban population group. On the other hand, our results indicate some adverse effects of household FAP participation (e.g., increased fat) might affect the children. This is of concern as the prevalence of overweight is high in the study population.

A number of previous studies have linked poverty, food insecurity, and FAP with increased risk of obesity, particularly in low-income women (31–34), but the available findings in children are mixed (35–37). One earlier study reported that participation in the Food Stamp Program in each of the previous five years compared to no participation was associated with a 21% increase in the predicted risk of current obesity based on data from the National Longitudinal Survey of Youth 1979 (33). A recent study examined the relationship between children's body weight status and FAP between 1976 and 2002 based on data from multiple waves of the National Health and Nutrition Examination Surveys (NHANES), but did not find evidence of a consistent relationship between childhood obesity and participation in the FSP or WIC programs (37). In an earlier study the same research group showed that FAP adult participants were more likely to be overweight than those who were eligible but did not participate, particularly true among white women, but the association has weakened over the past three decades (34).

Future research needs to confirm the effect of FAP on children's risk of developing overweight and test its impact on the parent-child resemblance in dietary intakes. Jones et al. (36) studied the association between FAP participation and overweight in children aged 5–12 years using the 1997 Panel Study of Income Dynamics Child Development Supplement (PSID-CDS) data. They found that FAP participation seemed to play a protective role in girls compared to low-SES non-participants--the OR was 0.32 (0.12–0.77) for those who participated in all the three food stamps and school lunch and breakfast programs, however, there was no association in boys. Another prospective cohort study showed that compared to the non-participants, long-term participation of Food Stamp Program over a 5-year period had a differential impact on overweight in young girls and boys aged 5–11 years ($P<0.05$), but had no effect in adolescents aged 12 or over. There was positive association in young girls (a 43% increase in the risk, $p=0.048$) while a negative relationship in young boys (a 29% decrease, $p=0.100$) (35). The longitudinal data collected between 1986 and 1994 for National Longitudinal Survey of Youth 1979 Child Sample were used in this study. In addition, this data set also shows that long-term Food Stamp Program participation is positively related to simultaneous overweight in young daughters and obesity in mothers (38). These studies indicate considerable gender- and age-differences in the associations.

Previous studies have attempted to examine whether and how parental and peer norms may influence a variety of eating habits in American adolescents (39–42). For example, a recent large study based on data collected in 31 middle and high schools in ethnically and socioeconomically diverse communities in Minnesota, and suggest that that social norms, particularly from within one's peer group, but also at the larger school level might influence adolescent girls' unhealthy weight-control behaviors such as self-induced vomiting, laxatives, diet pills, or fasting, particularly for average weight girls (41). A local study among adolescents in Los Angeles found that perceived behavioral control and subjective norm were among the strongest predictors of their soft drink consumption (42). Another recent study also indicated that perceived peer influences in weight-related attitudes and behaviors were predictive of individual young adolescent girls' level of body image concern, dieting, extreme weight loss behaviors and binge eating (40). In general, the available evidence supports a strong peer influence on adolescents' eating behaviors, especially among adolescent females and those body weight related eating behaviors. This helps provide a possible explain to our findings of a week association between adolescents and their mothers' dietary intakes. Thus, ours and findings from other studies may argue that healthy eating promotion efforts among adolescents should include both their parents and friends, at least among females, and in particular, it is important to develop supportive school social norms and environment.

The present study has several strengths compared to previous studies on the same topic. Dietary intake of mother-child pairs were assessed concurrently and using comparable comprehensive FFQs developed by the Harvard group. In addition, we examined the differences in the association by maternal and adolescents' characteristics. Our sample size, while relatively small, was comparable to other similar studies (5,43). Our results, on the other hand, cannot be generalized to the US population, since our study included a quite homogenous group from underserved minority communities. The limitations of dietary assessment methods, including the FFQs used in our study, are also well recognized (44–46). Future studies will need to explore the resemblance of multiple healthy lifestyle factors, including multiple dietary measures as well as other factors such as physical activity and smoking.

CONCLUSIONS

Our findings do not support the notion of a strong association between parental and child dietary patterns in the target urban low-income AA population group in the U.S. This weak association suggests that external factors (e.g., meals consumed away from home, school food environment, peer and marketing pressure, etc) are likely to play a significant role in shaping adolescents' eating patterns. A corollary of our findings is that parental influence on children's dietary choices may not be as strong as some have believed, at least in the population studied. The daily constraints that low-income minority parents face in providing their children with the guidance, support, and resources are evident (47). Near to half of the mothers in our study were unemployed, and 72% of them were overweight or obese. Over half of these families had an annual income below $20,000. Our results also suggest that some maternal characteristics such as smoking, and food-related behaviors associated with family meals and child snacking result in a closer resemblance in unhealthy dietary patterns.. Further studies with larger sample size and diverse ethnic participants are needed to help fully understand the resemblance in children and their parents' eating patterns and to test how the patterns may vary across groups in the U.S. and may change over time. Meanwhile, our findings further support the recent growing argument that more emphasize should be given to address the broader social environment factors to promote health eating.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Demographic and eating characteristics of African-American mothers by their children's gender and BMI status*

		Child gender ‡		Child BMI status ¶		
African-American mothers	**All (n=121)**	**Boys (n=53)**	**Girls (n=68)**	**BMI<85th percentile (n=78)**	**85th≤BMI<95th percentile (n=20)**	**BMI≥95th percentile (n=23)**
Sociodemographics						
Age in years (mean (SD))	40.6 (10.1)	39.1 (8.8)	41.8 (10.8)	42.6 (11.1)	35.7 (6.1)	38.3 (6.9)¶
Education (%)						
high-school or below	35.0	35.9	34.3	33.8	35	39.1
Employment status (%)						
full-time	47.9	52.8	44.1	52.6	25.0	52.2
part-time	8.3	7.6	8.8	9.0	5.0	8.7
unemployed	43.8	39.6	47.1	38.5	70.0	39.1
Household annual income < $20,000	56.4	59.6	53.7	50.0	68.8	65.2
Current smoker (%)	29.8	26.4	32.4	28.2	30.0	34.8
Weight status						
BMI (mean (SD))	30.9 (7.5)	32.0 (7.5)	30.0 (7.4)	29.7 (6.8)	32.2 (7.1)	34.3 (9.0)¶
overweight (25.0≤BMI≤29.9), %	23.1	18.9	26.5	28.2	5.0	21.7
obesity (BMI≥30), %	48.8	60.4	39.7‡	41.0	75.0	52.2¶
Trying to lose weight (%)	50.4	54.7	47.1	46.2	50.0	65.2
Food related behaviors associated with either family meals or snacking †						
Serving vegetables with dinner						
(times/week) (mean (SD))	2.8 (1.1)	2.7 (1.1)	2.9 (1.2)	2.9 (1.1)	2.5 (1.1)	2.6 (1.1)
Meals eaten out per week (mean (SD))	2.2 (3.3)	2.5 (3.7)	2.0 (3.0)	2.8 (3.9)	1.1 (1.1)	1.2 (1.2)¶
Allowing child eating snacks without permission (≥often) (%)	21.5	28.3	16.2	12.8	40.0	34.8 ¶
Allowing child purchasing snacks without parent being present (≥often) (%)	14.1	18.9	10.3	12.8	25.0	8.7
Pocket money given to child (dollars/day) ((mean (SD))						
	1.4 (2.0)	1.6 (2.2)	1.2 (1.9)	1.4 (2.0)	1.8 (2.5)	1.0 (1.5)

* Child's BMI status was assessed using the BMI percentiles from the 2000 CDC Growth Charts. Between group differences were tested using χ^2 test for categorical variables and ANOVA for continuous variables, respectively.

‡ Gender-difference was significant, $p<0.05$.

¶ Difference across BMI status groups was significant, $p<0.05$.

† The provided answer choices for the questions related to family meal patterns and snakcing were: (1) Serving vegetables with dinner in an average week: 0 times, 1 time, 2 times, 3 times, 4–5 times, every day; (2) Meals eaten out per week: open-ended; Allowing child eating snacks without permission: never, rarely, sometimes, often, always; (3) Allowing child purchasing snacks without parent being present: never, rarely, sometimes, often, always; and (4) Pocket money given to child daily on average: open-ended.

Table 2

Baseline dietary intakes of mothers and their children by children's gender and children's and mothers' BMI status (Mean (SD)) *

		Child gender		Children's BMI category ¶			Mothers' BMI category		
	All (n=121)	**Males (n=53)**	**Females (n=68)**	**BMI<85th percentile (n=78)**	**85th≤BMI<95th percentile (n=20)**	**BMI≥95th percentile (n=23)**	**Normal (BMI<25) (n=34)**	**Overweight (25≤BMI< 30) (n=28)**	**Obesity (BMI≥30) (n=59)**
Children's dietary intakes *Nutrients*									
Energy (kcal)	3499.9 (1891.2)	3793.9 (1974.9)	3270.8 (1804.9)	3585.6 (1813.3)	3750.6 (2070.12)	2991.2 (1986.7)	3535.0 (1917.5)	3033.8 (1638.2)	3700.9 (1977.9)
Total fat (g)	118.0 (63.2)	125.4 (66.1)	112.2 (60.7)	121.9 (60.1)	124.2 (68.4)	99.3 (67.9)	117.7 (65.0)	102.7 (52.7)	125.5 (66.2)
% energy from fat	30.6 (4.1)	29.7 (4.7)	31.2 ‡ (3.4)	30.9 (3.9)	30.1 (3.9)	29.7 (4.9)	30.0 (4.6)	31.1 (3.8)	30.6 (3.9)
Fiber (g)	27.7 (18.1)	30.4 (18.7)	25.7 (17.5)	28.3 (17.5)	29.0 (17.19)	24.7 (21.0)	28.7 (19.6)	22.5 (13.9)	29.7 (18.7)
Calcium (mg)	1409.0 (796.0)	1537.5 (801.3)	1309.0 (783.1)	1425.9 (745.1)	1545.4 (1000.2)	1233.2 (773.8)	1416.8 (704.2)	1356.3 (818.5)	1429.6 (845.6)
Food groups (servings/day)									
Fruits and vegetables	5.7 (4.5)	6.3 (4.7)	5.3 (4.4)	5.6 (4.4)	5.8 (3.9)	5.8 (5.4)	6.1 (4.8)	4.3 (3.5)	6.1 (4.7)
Fried food	1.5 (1.0)	1.6 (1.1)	1.4 (0.9)	1.5 (1.0)	1.6 (1.1)	1.2 (1.0)	1.7 (1.1)	1.2 (0.8)	1.5 (1.0)
Sweetened beverages	1.6 (1.2)	1.6 (1.2)	1.6 (1.2)	1.6 (1.2)	1.8 (1.4)	1.6 (1.1)	1.8 (1.4)	1.7 (1.3)	1.5 (1.1)
Snack	5.9 (4.9)	6.5 (5.7)	5.5 (4.2)	6.1 (4.9)	6.7 (5.6)	4.7 (4.6)	5.7 (4.8)	4.5 (3.8)	6.7 (5.4)
Mothers' dietary intakes *Nutrients*									
Energy (kcal)	2661.8 (1746.5)	2520.5 (1747.7)	2771.9 (1750.6)	2604.9 (1555.5)	3039.7 (2364.7)	2526.0 (1783.1)	2605.9 (1735.8)	2454.7 (1345.3)	2792.3 (1927.2)
Total fat (g)	92.6 (66.7)	85.1 (65.2)	98.4 (67.7)	90.2 (59.7)	104.9 (89.6)	89.9 (68.6)	91.9 (63.3)	83.5 (50.1)	97.3 (75.4)
% energy from fat	30.8 (5.1)	29.7 (4.6)	31.6 ‡ (5.3)	30.7 (5.3)	30.2 (3.7)	31.3 (5.4)	31.6 (6.5)	30.7 (4.6)	30.3 (4.4)
Fiber (g)	23.6 (16.0)	21.5 (14.3)	25.2 (17.1)	23.9 (15.4)	22.2 (17.5)	23.7 (17.4)	22.1 (16.6)	23.3 (13.3)	24.6 (16.9)
Calcium (mg)	918.7 (549.2)	872.2 (537.0)	955.0 (550.0)	939.2 (532.7)	892.8 (628.0)	871.6 (554.4)	905.2 (546.6)	879.5 (491.0)	945.0 (583.4)
Food groups (servings/day)									
Fruits and vegetables	3.6 (2.2)	3.2 (2.0)	3.9 (2.3)	3.7 (2.2)	3.0 (1.9)	3.7 (2.6)	3.4 (2.1)	3.6 (1.8)	3.7 (2.4)
Fried food	0.5 (0.5)	0.5 (0.5)	0.4 (0.4)	0.4 (0.4)	0.7 (0.6)	0.5 (0.5)	0.4 (0.5)	0.4 (0.4)	0.6 (0.5)
Sweetened beverages	0.3 (0.5)	0.3 (0.5)	0.3 (0.5)	0.3 (0.5)	0.3 (0.6)	0.3 (0.5)	0.3 (0.4)	0.3 (0.6)	0.3 (0.5)
Snack	1.9 (1.9)	2.0 (2.1)	1.8 (1.7)	1.8 (1.8)	2.4 (2.1)	1.9 (2.0)	1.9 (1.7)	1.2 (0.7)	2.3 § (2.2)

* Children's BMI status was assessed based on age-sex-specific percentiles in the 2000 CDC Growth Charts;

‡ t-test: the gender difference was statistically significant, P<0.05;

¶ None of the difference was statistically significant based on ANOVA, all p>0.05.

[§]Difference was significant based on ANOVA, $p<0.05$.

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Table 3

Spearman's rank correlation coefficients between children's and their mothers' dietary intakes by children's gender and BMI status and their mothers' BMI status* †

		Child gender		Children's BMI status †			Mothers' BMI status		
	All (n=121)	Boys (n=53)	Girls (n=68)	BMI<85th percentile (n=78)	85th≤BMI<95th percentile (n=20)	BMI≥95th percentile (n=23)	Normal, BMI<25 (n=34)	Overweight, 25<=BMI<<30 (n=28)	Obesity, BMI>=30 (n=59)
Nutrients									
Energy (kcal)	0.04 (−0.14, 0.22)	−0.24 ‡ (−0.48, 0.04)	0.26 ¶ (0.02, 0.47)	0.14 (−0.09, 0.35)	−0.18 (−0.59, 0.30)	−0.08 (−0.49, 0.37)	0.32 ‡ (−0.03, 0.60)	−0.04 (−0.41, 0.35)	−0.11 (−0.36, 0.15)
Total fat (g)	0.07 (−0.11, 0.24)	−0.21 (−0.45, 0.086)	0.30 ¶ (0.06, 0.50)	0.18 (−0.04, 0.39)	−0.06 (−0.50, 0.41)	−0.10 (−0.51, 0.34)	0.40 ¶ (0.05, 0.65)	−0.08 (−0.45, 0.31)	−0.08 (−0.33, 0.18)
% energy from fat	0.16 ‡ (−0.02, 0.33)	0.19 (−0.09, 0.45)	0.11 (−0.14, 0.34)	0.10 (−0.13, 0.31)	0.42 ‡ (−0.04, 0.73)	0.10 (−0.34, 0.51)	0.09 (−0.26, 0.43)	0.16 (−0.24, 0.51)	0.15 (−0.11, 0.40)
Fiber (g)	0.02 (−0.16, 0.20)	−0.08 (−0.35, 0.20)	0.12 (−0.13, 0.35)	0.09 (−0.14, 0.30)	−0.11 (−0.54, 0.36)	−0.07 (−0.49, 0.37)	0.34 ‡ (−0.01, 0.61)	−0.20 (−0.54, 0.19)	−0.04 (−0.30, 0.22)
Calcium (mg)	0.02 (−0.16, 0.20)	−0.19 ‡ (−0.45, 0.09)	0.19 ‡ (−0.06, 0.41)	0.07 (−0.16, 0.29)	−0.02 (−0.47, 0.44)	−0.24 (−0.61, 0.21)	0.25 (−0.11, 0.55)	0.03 (−0.36, 0.40)	−0.06 (−0.32, 0.20)
Food groups (servings/day)									
Fruits and vegetables	0.14 (−0.04, 0.31)	0.06 (−0.223, 0.33)	0.15 (−0.10, 0.37)	0.26 ¶ (0.03, 0.45)	0.02 (−0.45, 0.48)	−0.17 (−0.56, 0.28)	0.36 ¶ (0.02, 0.63)	−0.04 (−0.42, 0.34)	0.09 (−0.17, 0.34)
Fried food	0.07 (−0.11, 0.25)	0.05 (−0.23, 0.32)	0.12 (−0.12, 0.35)	0.21 ‡ (−0.01, 0.42)	−0.16 (−0.57, 0.31)	−0.09 (−0.51, 0.35)	0.30 ‡ (−0.05, 0.59)	−0.18 (−0.21, 0.53)	−0.08 (−0.33, 0.18)
Sweetened beverages	−0.05 (−0.23, 0.13)	0.01 (−0.27, 0.28)	−0.09 (−0.33, 0.15)	−0.17 (−0.38, 0.06)	0.45 ¶ (0.00, 0.75)	−0.06 (−0.48, 0.38)	−0.15 (−0.48, 0.21)	−0.16 (−0.51, 0.23)	0.04 (−0.22, 0.30)
Snack	0.07 (−0.12, 0.24)	−0.08 (−0.35, 0.20)	0.17 (−0.07, 0.40)	0.15 (−0.07, 0.36)	0.09 (−0.38, 0.53)	−0.16 (−0.56, 0.29)	0.27 (−0.09, 0.56)	0.04 (−0.35, 0.41)	−0.08 (−0.33, 0.18)

* Spearman's rank correlation coefficient is a nonparametric measure. It is calculated as the order correlation of the ranks of individual's repeated dietary intakes, adjusted by mothers' age. Pearson correlation coefficient is calculated by using individual's dietary intakes as continuous variable. Pearson correlation coefficient showed consistent tracking patterns with Spearman's rank correlation coefficient (results were not presented);

† Children's BMI status was classified based on the BMI percentiles in the 2000 CDC Growth Chart;

¶ Statistically significant under null hypothesis of r=0, P<0.05;

‡ Marginally statistically significant under null hypothesis of r=0, P<0.10.

Table 4

Agreement between children's and their mothers' dietary intake patterns based quartiles, by child gender and mothers' weight status (n=121) *

Table 4a

	Boys and girls						Boys					
	Proportion of agreement †				Total agreement	Weighted kappa ¶	Proportion of agreement †				Total agreement	Weighted kappa ¶
	Q1 (low)	Q2	Q3	Q4 (high)	(95% CI)	(95% CI)	Q1 (low)	Q2	Q3	Q4 (high)	(95% CI)	(95% CI)
Nutrients												
Energy (kcal)	23.3	30.0	25.8	33.3	28.1 (20.1–36.1)	0.03 (−0.10, 0.16)	15.4	30.0	16.7	27.8	22.6 (11.4–33.9)	−0.08 (−0.27, 0.10)
Total fat (g)	20.0	33.3	25.8	33.3	28.1 (20.1–36.1)	0.03 (−0.10, 0.16)	15.4	11.1	26.7	25.0	20.8 (9.8–31.7)	−0.09 (−0.30, 0.09)
% energy from fat	33.3	33.3	38.7	33.3	34.7 (26.2–43.2)	0.15 (0.02, 0.28)	31.3	50.0	50.0	36.4	41.5 (28.2–54.8)	0.20 (−0.01, 0.42)
Fiber (g)	20.0	33.3	22.6	26.7	25.6 (17.8–33.4)	0.00 (−0.12, 0.13)	11.1	40.0	0.0	25.0	22.6 (11.3–33.9)	−0.05 (−0.22, 0.13)
Calcium (mg)	30.0	26.7	6.5	10.0	18.2 (11.3–25.1)	−0.01 (−0.12, 0.11)	22.2	26.7	0.0	6.3	13.2 (4.1–22.3)	−0.16 (−0.33, 0.00)
Food groups (servings/day)												
Fruits and vegetables	30.0	26.7	29.0	40.0	31.4 (23.1–39.7)	0.15 (0.02, 0.28)	18.2	38.5	8.3	41.2	28.3 (16.2–40.4)	0.13 (−0.05, 0.31)
Fried food	33.3	16.7	22.6	23.3	24.0 (16.4–31.6)	0.01 (−0.11, 0.14)	35.7	9.1	23.1	26.7	24.5 (12.9–36.1)	−0.02 (−0.22, 0.18)
Sweetened beverages	36.7	20.0	3.3	32.3	23.1 (15.6–30.7)	−0.04 (−0.17, 0.09)	42.9	25.0	0.0	33.3	26.4 (14.6–38.3)	0.01 (−0.20, 0.21)
Snack	26.7	30.0	9.7	33.3	24.8 (17.1–32.5)	0.04 (−0.09, 0.17)	23.1	40.0	0.0	23.5	24.5 (12.9–36.1)	−0.04 (−0.24, 0.15)

Table 4b

	Girls					
	Proportion of agreement †				Total agreement	Weighted kappa ¶
	Q1 (low)	Q2	Q3	Q4 (high)	(95% CI)	(95% CI)
Nutrients						
Energy (kcal)	29.4	30.0	31.6	41.7	32.4 (21.2–43.5)	0.14 (−0.02, 0.31)
Total fat (g)	23.5	42.9	25.0	42.9	33.8 (22.6–45.1)	0.15 (−0.02, 0.32)
% energy from fat	35.7	18.8	31.6	31.6	29.4 (18.6–40.2)	0.09 (−0.09, 0.26)
Fiber (g)	23.8	26.7	31.8	30.0	27.9 (17.3–38.6)	0.07 (−0.10, 0.23)

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Table 4b

	Girls					
	Proportion of agreement †				Total agreement	Weighted kappa ¶
	Q1 (low)	Q2	Q3	Q4 (high)	(95% CI)	(95% CI)
Calcium (mg)	33.3	26.7	11.1	14.3	22.1 (12.2–31.9)	0.12 (−0.03, 0.27)
Food groups (servings/day)						
Fruits and vegetables	36.8	17.7	42.1	38.5	33.8 (22.6–45.1)	0.19 (0.02, 0.35)
Fried food	31.3	21.1	22.2	20.0	23.5 (13.5–33.6)	0.03 (−0.13, 0.209)
Sweetened beverages	31.3	16.7	5.6	31.3	20.6 (11.0–30.2)	−0.07 (−0.24, 0.10)
Snack	29.4	20.0	13.0	46.2	25.0 (14.7–35.3)	0.11 (0.06, 0.29)

Table 4c

	Normal weight mothers						Overweight or obese mothers					
	Proportion of agreement †				Overall proportion of tracking	Weighted kappa ¶	Proportion of agreement †				Overall proportion of tracking	Weighted kappa ¶
	Q1 (low)	Q2	Q3	Q4 (high)	(95% CI)	(95% CI)	Q1 (low)	Q2	Q3	Q4 (high)	(95% CI)	(95% CI)
Nutrients												
Energy (kcal)	57.1	37.5	23.1	50.0	38.2 (21.9–54.6)	0.25 (0.01, 0.49)	13.0	27.3	27.8	29.2	24.1 (15.2–33.1)	−0.05 (−0.20, 0.10)
Total fat (g)	42.9	27.3	25.0	50.0	35.3 (19.2–51.3)	0.22 (−0.01, 0.46)	13.0	36.8	26.1	27.3	25.3 (16.2–34.4)	−0.04 (−0.19, 0.11)
% energy from fat	37.5	14.3	25.0	42.9	29.4 (14.1–44.7)	0.14 (−0.10, 0.38)	31.8	39.1	47.4	30.4	36.8 (26.76–46.9)	0.16 (−0.00, 0.32)
Fiber (g)	33.3	40.0	18.2	28.6	29.4 (14.1–44.7)	0.16 (−0.06, 0.39)	16.7	30.0	25.0	26.1	24.1 (15.2–33.1)	−0.05 (−0.20, 0.10)
Calcium (mg)	60.0	30.0	16.7	0.0	23.5 (9.3–37.8)	0.16 (−0.04, 0.36)	24.0	25.0	0.0	13.0	16.1 (8.4–23.8)	−0.06 (−0.21, 0.08)
Food groups (servings/day)												
Fruits and vegetables	33.3	36.4	44.4	25.0	35.3 (19.2–51.4)	0.24 (0.02, 0.46)	29.2	21.1	22.7	45.5	29.9 (20.3–39.5)	0.12 (−0.04, 0.28)
Fried food	57.1	0.0	20.0	27.3	26.5 (11.6–41.3)	0.10 (−0.12, 0.33)	26.1	20.8	23.8	21.1	23.0 (14.2–31.8)	−0.01 (−0.16, 0.14)
Sweetened beverages	40.0	20.0	0.0	33.3	23.5 (9.3–37.8)	−0.10 (−0.35, 0.15)	35.0	20.0	5.0	31.8	23.0 (14.2–31.8)	−0.02 (−0.17, 0.13)
Snack	50.0	25.0	0.0	50.0	26.5 (11.6–41.3)	0.19 (−0.02, 0.40)	20.8	33.3	14.3	29.2	24.1 (15.2–33.1)	−0.01 (−0.16, 0.15)

Table 4c

	Normal weight mothers						Overweight or obese mothers					
	Proportion of agreement [†]				Overall proportion of tracking	Weighted kappa [¶]	Proportion of agreement [†]				Overall proportion of tracking	Weighted kappa [¶]
	Q1 (low)	Q2	Q3	Q4 (high)	(95% CI)	(95% CI)	Q1 (low)	Q2	Q3	Q4 (high)	(95% CI)	(95% CI)

[*] Agreement was defined as if the dietary intake of a child and his or her mother's was in the same quartile, e.g., both were in the top quartile.

[†] The % of agreement by chance (random) was 25%.

[¶] Kappa measured the agreement based on quartile positions beyond that by chance; $k>0.2$ suggests agreement; and $k>0.4$ suggests moderate agreement.

Table 5

Spearman's rank correlation coefficients between children's and their mothers' dietary intakes by children's gender and maternal characteristics*

Table 5a

	Boys					
Mother's characteristics	**Energy (kcal)**	**% energy from fat**	**Fiber (g)**	**Calcium (mg)**	**Fruits and vegetables (servings/day)**	**Snack (servings/day)**
Employment						
employed	−0.30¶ (−0.53, −0.02)	0.29¶ (0.00, 0.52)	−0.11 (−0.38, 0.17)	−0.27‡ (−0.51, 0.02)	0.03 (−0.25, 0.31)	−0.10 (−0.37, 0.19)
unemployed	0.17 (−0.95, 0.97)	−0.34 (−0.98, 0.92)	0.17 (−0.95, 0.97)	0.75 (−0.76, 0.99)	0.34 (−0.92, 0.98)	0.34 (−0.92, 0.98)
Smoking						
current smoker	−0.04 (−0.56, 0.50)	0.40 (−0.17, 0.77)	0.03 (−0.51, 0.55)	−0.04 (−0.56, 0.50)	0.04 (−0.50, 0.56)	0.28 (−0.30, 0.71)
non smoker	−0.43¶ (−0.66, −0.14)	0.14 (−0.18, 0.44)	−0.19 (−0.47, 0.14)	−0.29‡ (−0.55, 0.03)	0.12 (−0.21, 0.42)	−0.27‡ (−0.54, 0.05)
Trying to lose weight						
yes	−0.20 (−0.52, 0.18)	−0.03 (−0.39, 0.34)	−0.03 (−0.39, 0.34)	−0.22 (−0.54, 0.16)	0.08 (−0.30, 0.43)	−0.19 (−0.52, 0.19)
no	−0.25 (−0.59, 0.17)	0.50¶ (0.12, 0.75)	−0.24 (−0.59, 0.18)	−0.24 (−0.59, 0.18)	−0.04 (−0.44, 0.37)	0.15 (−0.27, 0.52)
Serving vegetables with dinner						
≥ 3 times/week	0.00 (−0.40, 0.41)	0.39‡ (−0.02, 0.68)	0.30 (−0.12, 0.63)	−0.15 (−0.52, 0.27)	0.43¶ (0.03, 0.71)	0.27 (−0.15, 0.60)
< 3 times/week	−0.38¶ (−0.65, −0.01)	0.05 (−0.33, 0.41)	−0.42¶ (−0.68, −0.06)	−0.33‡ (−0.62, 0.04)	−0.17 (−0.51, 0.21)	−0.39¶ (−0.66, −0.03)
Family eating out						
≥ 2 meals/week	−0.37‡ (−0.67, 0.03)	0.24 (−0.17, 0.58)	−0.40¶ (−0.69, −0.01)	−0.27 (−0.60, 0.14)	−0.26 (−0.59, 0.15)	−0.20 (−0.55, 0.21)
< 2 meals/week	−0.07 (−0.44, 0.31)	0.21 (−0.17, 0.54)	0.21 (−0.17, 0.54)	−0.18 (−0.51, 0.21)	0.48¶ (0.13, 0.72)	0.12 (−0.26, 0.47)
Child was allowed to eat snacks without parent's permission						
often or always	0.20 (−0.34, 0.65)	−0.25 (−0.67, 0.30)	0.51¶ (−0.01, 0.81)	0.23 (−0.32, 0.66)	0.21 (−0.34, 0.65)	0.31 (−0.24, 0.71)
never or sometimes	−0.43¶ (−0.66, −0.13)	0.29‡ (−0.03, 0.56)	−0.25 (−0.53, 0.08)	−0.04 (−0.35, 0.28)	−0.04 (−0.35, 0.28)	−0.29‡ (−0.56, 0.03)

Table 5b

Mother's demographic and eating characteristics	Girls					
	Energy (kcal)	**% energy from fat**	**Fiber (g)**	**Calcium (mg)**	**Fruits and vegetables (servings/day)**	**Snack (servings/day)**
Employment						
employed	0.25¶ (0.00, 0.47)	0.07 (−0.18, 0.31)	0.15 (−0.10, 0.39)	0.22‡ (−0.03, 0.45)	0.20 (−0.05, 0.43)	0.17 (−0.08, 0.40)
unemployed	0.39 (−0.61, 0.91)	0.45 (−0.57, 0.92)	−0.18 (−0.87, 0.74)	−0.23 (−0.88, 0.71)	−0.08 (−0.84, 0.78)	0.56 (−0.46, 0.94)
Smoking						
current smoker	0.04 (−0.39, 0.45)	−0.10 (−0.50, 0.34)	−0.10 (−0.50, 0.33)	0.05 (−0.38, 0.46)	0.17 (−0.28, 0.55)	0.39‡ (−0.04, 0.70)
non smoker	0.28‡ (−0.01, 0.53)	0.08 (−0.21, 0.36)	0.23 (−0.07, 0.48)	0.22 (−0.08, 0.48)	0.15 (−0.14, 0.42)	0.01 (−0.28, 0.30)
Trying to lose weight						
yes	0.40¶ (0.06, 0.66)	0.21 (−0.15, 0.52)	0.33‡ (−0.02, 0.61)	0.27 (−0.09, 0.57)	0.21 (−0.15, 0.52)	0.05 (−0.30, 0.39)
no	0.14 (−0.20, 0.45)	−0.05 (−0.37, 0.28)	−0.01 (−0.34, 0.32)	0.13 (−0.21, 0.44)	0.17 (−0.17, 0.47)	0.26 (−0.07, 0.54)
Serving vegetables with dinner						
≥ 3 times/week	0.17 (−0.18, 0.48)	0.16 (−0.19, 0.47)	0.06 (−0.29, 0.39)	0.11 (−0.24, 0.43)	0.11 (−0.24, 0.43)	0.24 (−0.10, 0.53)
< 3 times/week	0.34¶ (0.00, 0.61)	0.04 (−0.30, 0.38)	0.26 (−0.09, 0.55)	0.23 (−0.12, 0.52)	0.21 (−0.13, 0.52)	0.15 (−0.19, 0.47)
Family eating out						
≥ 2 meals/week	0.00 (−0.39, 0.40)	−0.04 (−0.43, 0.36)	0.06 (−0.29, 0.39)	0.19 (−0.22, 0.54)	0.08 (−0.33, 0.46)	−0.13 (−0.50, 0.28)
< 2 meals/week	0.34¶ (0.04, 0.58)	0.17 (−0.14, 0.45)	0.26 (−0.09, 0.55)	0.20 (−0.10, 0.48)	0.29‡ (−0.01, 0.54)	0.33¶ (0.04, 0.58)
Child was allowed to eat snacks without parent's permission						
often or always	0.78¶ (0.35, 0.94)	−0.42 (−0.81, 0.24)	0.71¶ (0.19, 0.92)	0.52‡ (−0.11, 0.86)	0.59¶ (−0.02, 0.88)	0.51‡ (−0.13, 0.85)
never or sometimes	0.18 (−0.08, 0.42)	0.14 (−0.12, 0.39)	0.05 (−0.21, 0.31)	0.14 (−0.12, 0.39)	0.08 (−0.19, 0.33)	0.08 (−0.18, 0.34)

¶ Statistically significant under null hypothesis of r=0, P<0.05;

‡ Marginally statistically significant under null hypothesis of r=0, P<0.10.

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Table 6

Predictors of dietary intake resemblance between low-SES African-American adolescents and their mothers (OR, 95%CI): logistic regression models*

Predictors	both had high energy intake	both had high fat intake	both had high fruit and vegetable intake	both had high sweetened beverage intake	both had high snack food intake
Model 1: mothers being current smokers vs not	12.09 ¶ (2.38, 61.57)	6.64 ¶ (1.58, 27.93)	1.39 (0.37, 5.15)	4.30 ¶ (1.08, 17.08)	4.84 ¶ (1.21, 19.40)
Model 2: give children pocket money of ≥2dollars/day vs <2$/day	2.45 (0.58, 10.41)	3.86 ‡ (0.93, 16.05)	1.31 (0.30, 5.79)	1.57 (0.39, 6.33)	2.10 (0.51, 8.65)
Model 3: allowing child eating snacks without permission vs not	4.52 ¶ (1.10, 18.63)	2.81 (0.68, 11.65)	0.73 (0.14, 3.84)	0.62 (0.12, 3.34)	4.79 ¶ (1.15, 20.04)
Model 4: allowing child purchasing snacks without parent being present vs not	3.06 (0.66, 14.18)	5.35 ¶ (1.25, 22.88)	1.34 (0.25, 7.33)	2.39 (0.52, 10.89)	2.83 (0.62, 12.85)

* High intakes were defined as in the top group (mother or children)- and sex (only for children)-specific quartile; note that high fat intake was assessed as absolute grams of dietary fat intake. Separate models were fit for each dietary pattern outcome, but all models were adjusted for mothers' age and BMI status, and children's age and gender. Low dietary intake was treated as the reference group;

¶ OR 95% CI did not include 1.0, $p<0.05$;

‡ Marginally statistically significant, $p<0.10$.

Appendix A

Predictors of dietary intake pattern among low-SES African-American adolescents (OR, 95%CI): logistic regression model[*]

Predictors (baseline characteristics)	High energy	High fat	High fruits and vegetables	High sweetened beverage intake	High snack intake
Model 1: mothers are current smokers	3.96[¶] (1.10, 14.30)	6.20[¶] (1.56, 24.73)	0.66 (0.19, 2.22)	1.21 (0.39, 3.70)	3.15[‡] (0.86, 11.57)
Model 2: pocket (≥ 2dollars/day)	0.76 (0.17, 3.33)	2.81 (0.68, 11.65)	0.68 (0.15, 3.16)	0.52 (0.15, 1.82)	1.01 (0.24, 4.30)
Model 3: serving vegs with dinner (≥3times/week)	1.24 (0.36, 4.23)	0.67 (0.20, 2.28)	0.61 (0.18, 2.00)	2.10 (0.68, 6.47)	0.65 (0.21, 2.04)
Model 4: allowing child eating snacks without permission	0.66 (0.17, 2.63)	0.63 (0.16, 2.53)	0.50 (0.12, 2.02)	0.83 (0.24, 2.86)	0.74 (0.20, 2.66)
Model 5: if mothers had the same dietary pattern	4.82[¶] (1.10, 21.06)	1.99 (0.59, 6.71)	3.43[‡] (0.91, 12.90)	0.62 (0.20, 1.89)	1.72 (0.50, 5.85)

[*] High intakes were defined as in the top group (mother or children)- and sex (only for children)-specific quartile; note that high fat intake was assessed as absolute grams of dietary fat intake. Separate models were fit for each dietary pattern outcome, but all models were adjusted for mothers' age and BMI status, and children's age and gender.

Low dietary intake was treated as the reference group;

[¶] OR 95% CI did not include 1.0, $p<0.05$;

[‡] Marginally statistically significant, $p<0.10$.

Appendix B

The influence of household participation in food assistance programs on child-mother resemblance in dietary intakes: Spearman's rank correlation coefficients*

	Energy (kcal)	Calcium (mg)	Fruits and vegetables (servings/day)
Boys			
Participation	−0.27 (−0.57, 0.10)	−0.34 (−0.62, 0.02)	0.07 (−0.29, 0.41)
Non-participation	−0.32 (−0.65, 0.12)	−0.16 (−0.54, 0.28)	0.13 (−0.31, 0.52)
Girls			
Participation	0.13 (−0.18, 0.41)	0.10 (−0.21, 0.39)	0.09 (−0.22, 0.38)
Non-participation	0.49¶ (0.12, 0.74)	0.35 (−0.05, 0.65)	0.22 (−0.19, 0.57)

* Spearman's rank correlation coefficient is a nonparametric measure. It is calculated between the ranks of children's dietary intakes against those of their mothers'. Pearson correlation coefficients were similar (not presented).

¶ Statistically significant under null hypothesis of r=0 (P<0.05).

Appendix C

Influence of household participation in food assistance programs on mothers' and children's daily average dietary intakes (Mean (SD)) *

	All (n=121)	Participation (n=74)	Non-participation (n=47)	Diff
Mothers' dietary intakes				
Energy (kcal)	2661.8 (1746.5)	2935.6 (1964.8)	2230.7 (1232.8)	*
Total fat (g)	92.6 (66.7)	102.8 (74.3)	76.5 (49.3)	*
Calcium (mg)	918.7 (549.2)	986.7 (574.1)	811.6 (494.8)	
Fruits and vegetables (servings)	3.6 (2.2)	3.6 (2.4)	3.5 (1.9)	
Fried food (servings)	0.5 (0.5)	0.5 (0.5)	0.4 (0.4)	
Children's dietary intakes				
Energy (kcal)	3499.9 (1891.2)	3582.6 (1858.8)	3369.7 (1954.4)	
Total fat (g)	118.0 (63.2)	122.5 (61.5)	110.9 (65.7)	
Calcium (mg)	1409.0 (796.0)	1501.8 (861.8)	1263.0 (662.3)	
Fruits and vegetables (servings)	5.7 (4.5)	5.2 (4.0)	6.4 (5.2)	
Fried food (servings)	1.5 (1.0)	1.4 (1.0)	1.6 (1.1)	

* t-test: the between-group difference was statistically significant, $P<0.05$;