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## Father Involvement in Feeding Interactions with Their Young Children

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### Abstract

**Objective**—To examine the associations of father-child feeding and physical interactions with dietary practices and weight status in children.

**Methods**—A nationally representative sample of children, mothers, and fathers who participated in the Early Childhood Longitudinal Study Birth cohort study (N = 2441) was used to explore the relationship of father-child feeding and physical activity interactions with child dietary practices and weight status. Logistic multivariable regression analyses were adjusted for child, father, mother, and socio-demographic characteristics.

**Results**—Approximately 40% of fathers reported having a great deal of influence on their preschool child's nutrition and about 50% reported daily involvement in preparing food for their child and assisting their child with eating. Children had over 2 times the odds of consuming fast food at least once a week if fathers reported eating out with their child a few times a week compared to fathers who reported rarely or never eating out with their child (OR, 2.89; 95% CI, 1.94–4.29), adjusting for all covariates. Whether fathers reported eating out with their children was also significantly associated with children's sweetened beverage intake.

**Conclusions**—Potentially modifiable behaviors that support healthy dietary practices in children may be supported by targeting fathers.

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#### Human Subjects Approval

This study was reviewed and approved by the University of California, Los Angeles Institutional Review Board.

#### Conflict of Interest

All authors have approved the manuscript as submitted and none of the authors have conflict of interest to declare for the past 3 years dating from the month of this submission.

## Keywords

fathers; early childhood; child feeding practices; pre-school children

A growing body of literature highlights the important role and influence that fathers can have in shaping eating and physical activity patterns of their children. Paternal practices and parenting styles have been shown to be associated with highly controlling feeding practices and overweight status in children.<sup>1,2</sup> Alternatively, encouragement and modeling of healthy behaviors by fathers has been associated with a lower BMI among their adolescent daughters.<sup>3</sup> Fathers' use of fast food restaurants also has been associated with school-aged children's use of fast food restaurants.<sup>4</sup> There is overwhelming evidence that parents play a critical role in shaping early dietary and sedentary and physical activity patterns in their young children<sup>5-10</sup> through their own behaviors, role-modeling, parenting styles, and feeding practices.<sup>11-13</sup> Much of this knowledge, however, has been learned by largely studying mothers and their young children. There is a need for more research on fathers as previous studies involving fathers and children have grouped multiple child age groups together such as preschoolers, school-aged children, and adolescents; moreover, studies too often are limited by the small and non-representative samples of fathers in the United States (US).

Determining the extent of involvement and influence that fathers have in their young children's feeding and sedentary and physical activity patterns is important because early childhood represents a key developmental window to shape healthy behaviors into late childhood and adulthood.<sup>14-17</sup> Furthermore, the high and increasing prevalence of overweight and obesity among US men, currently estimated at 60% and 30% respectively,<sup>18</sup> makes this knowledge crucial as overweight and obese men place their young children at increased risk for unhealthy weight outcomes through a genetic susceptibility and exposure to obesity-promoting behaviors and environments.<sup>3,19,20</sup> In addition, furthering the knowledge on the relationships between fathers and their young children can provide critical information about an often overlooked group of care-givers and offer new strategies to promote healthy weight in children. To that end, the focus of this study was to (1) use a nationally representative sample of US households to describe paternal involvement in the following eating and physical activity practices with their young children: preparation of food with child; playing outside with child; eating out with child; assisting child to eat; eating breakfast or dinner with child; and perceived influence over child's nutrition; and (2) examine the relationship of these paternal practices with child intake of fruits, vegetables, sweetened beverages, and fast food; child patterns of daily physical activity and television viewing; and the frequency of family meals.

## METHODS

### Sample

This study used data from the Early Childhood Longitudinal Study Birth cohort (ECLS-B) conducted by the National Center for Education Statistics. The ECLS-B, which included 10,700 children, used a complex survey design that oversampled certain populations such as

low birth weight infants, twins, American Indians, and Asian/Pacific Islanders to provide a nationally representative sample of children born in the US in 2001. Data sources included birth certificates, parent interviews, and direct child assessments from home visits. Children were followed from birth through kindergarten entry and home visits were fielded when the focal child was approximately 9, 24, 48, 60, and 72 months of age. Birth certificates provided data on prenatal and neonatal characteristics of the child at the time of birth. Parent interviews were usually reported by mothers and provided data regarding socio-demographic characteristics, maternal education and employment, feeding practices, and children's physical and sedentary activities. An additional and separate father questionnaire was given to resident and non-resident fathers that provided data regarding fathers' attitudes and participation in activities with the focal child at 9, 24, and 48 months of age with some overlapping of items across the questionnaires.

The father questionnaire when the focal child was 24 months of age provides the richest items related to feeding and physical activity interactions between father and child. The parent/child questionnaire at 48 months of age, however, provides the richest child dietary practices such as juice, vegetable, fruit, and fast-food intake. Given the focus of our analysis, father-child feeding and physical activity interactions, we restricted our analytic sample to children who lived with both their biological mother and father at 24 and 48 months of age, did not have any serious birth defects, and did not have missing data on the dependent variables, father variables of interest, and independent variables. Our final analytical sample included 2441 children, with pooled data from both the 24-month and 48-month waves of data collection. This approach was necessary as only a few items about fathers' involvement with their children's nutrition, feeding practices, and physical activity were collected with the 48-month data collection wave. Therefore, father variables were drawn from the 24-month data, and child dietary outcomes were drawn from 48-month data for this study.

## Measures

**Dependent child variables**—Multiple outcomes were of interest in this analysis including child's weight status, dietary behaviors, and physical and sedentary activities that were collected with the 48-month data collection wave. Child's dietary and sedentary behaviors were assessed from the 48-month parent interviews. Sweetened beverage intake was assessed by asking the primary caregiver: "How often in the following 7 days did your child drink Soda pop, sports drink, or fruit drinks that are not 100% fruit juice?" Fast food consumption was assessed by asking the primary caregiver: "During the past 7 days how many times did your child eat at a meal or snack from a fast food restaurant with no wait service such as McDonalds, Pizza Hut, Burger King, Taco Bell, Wendy's and so on?" Daily fruit and vegetable consumption was assessed based on responses from the following stem question: "During the past 7 days, how many times did your child eat [vegetables or fresh fruit]" Responses for all of these items included one time per day, 2-times per day, 3-times per day, 4-times per day, one to 3 times during past 7 days, 4 to 6 times during past 7 days, or child did not have any during the past 7 days. Categories for all outcomes were collapsed to approximate the dietary practices recommended by the 2007 Expert Committee Recommendations regarding childhood prevention and management, the literature on fast food intake and family meals, and ease of interpretation.<sup>21–25</sup> Children's body mass index

(BMI) was calculated from children's height and weight, which were measured by trained field workers during home visits when the focal child was 48 months old. Using the US Centers for Disease Control and Prevention's (CDC) national growth reference data, sex-specific, BMI-for-age was calculated. Overweight is defined as a BMI between the 85th to 95th percentile and obesity as a BMI at or above the 95% for age and sex.

**Independent father variables**—The primary regressors of interest were taken from the 24-month ECLS-B Father Self-Administered Questionnaire and included items that captured fathers' involvement with their children's nutrition, feeding practices, and physical activity. These specific items were only asked at the 24-month data collection wave and not asked during the collection of the 48-month ECLS-B Father Self-Administered Questionnaire. To assess the role fathers felt they had over their child's nutrition, fathers were asked: "How much influence do you feel you have in making major decisions about [your child's] nutrition?" The possible responses for this item were no influence, some influence, or a great deal of influence. Given the interest in examining the associations with fathers who reported a great deal of influence on their child's nutrition, the other 2 response categories were collapsed into one single category (no/some influence). Fathers also were asked to assess the frequency they prepared meals for their child ("In the past month how often did you prepare meals for your child?"), walked or played outside with child ("In the past month how often did you take your child outside for a walk or to play in the yard, a park, or playground?"), assisted child with eating ("In the past month how often did you assist your child with eating?"), and eat out with child ("In the past month how often did you go to a restaurant or out to eat with your child?"). For these measures fathers responded as more than once a day, at least once a day, a few times a week, a few times a month, rarely, or not at all. For this analysis the variables were categorized as rarely/never, a few times a month, a few times a week, and at least once a day based on the general pattern of response frequencies. Fathers also were asked to report the number of days during a typical week that they had breakfast and dinner with their child. Frequencies of fathers having breakfast or dinner with their child in a typical week were treated as continuous variables in the analysis.

**Covariates**—Independent variables for this study included child characteristics, paternal attributes, and maternal attributes all taken from the 48-month ECLS-B data collection wave. Child characteristics included child's age, sex, birth weight, whether or not the child was ever breast-fed, and age at which the child was introduced to solid food. Paternal attributes included father's employment status, father's education, father's race, and father's age. Maternal and household attributes included maternal depression score, maternal education, maternal age, maternal BMI, number of adults over 18 in the household, primary language in the household, household income, and overlapping items about their involvement with their child's nutrition and feeding practices (ie, fast food, breakfast and dinner with child). The Census poverty thresholds and imputed values for any missing household income were used to establish federal poverty threshold for a family of 4 in 2007 and categorized as 100%, 130%, and 180% of the federal poverty threshold.

## Statistical Analyses

All analyses were completed using Stata software version 11. Descriptive characteristics of the study population were generated. Logistic regressions were performed to assess any statistically significant associations between every combination of primary regressor and outcome variable (unadjusted odds ratios). Pairs that showed statistical significance were then put into a full logistic regression model, controlling for all of the child characteristics, paternal attributes, and maternal characteristics. Survey weights were applied to all of our analyses to relatively underweight the groups that were oversampled in ECLS-B and to represent the population of non-institutionalized US children.

## RESULTS

### Sample

The analytic sample included 2441 father child dyads. Among children, the mean age was 52 months ( $SD=3.9$ ), and over two-thirds had child care arrangements involving a center-based program (Table 1). The average age of children in this study was slightly older than 48 months due to the challenges of fielding a large number of home visits at the 48-month assessment time point (skewness 0.11). One-third of children were overweight and approximately 16% of children were obese. Close to three-fourths of children were found to eat fast food at least once a week, and over 60% of children consumed at least one sugar sweetened beverage per week. The majority of children (80%) were found to have regular family dinners 5 or more times a week.

Close to 50% of fathers reported having a great deal of influence on their preschool child's nutrition, and just about 50% of fathers reported daily involvement in preparing food for their child and assisting their child with eating. About one-third of fathers reported playing outside with their child daily, and about one-third of fathers reported eating out with their preschool child a few times a week (Table 2). The majority of fathers were white, and the mean age of fathers was approximately 35 years ( $SD=6.4$ ). The majority of fathers were employed, and approximately 40% reported earning at minimum a 4-year college degree. A small percentage of households (11%) in our sample were living under the federal poverty level (Table 1).

### Unadjusted Odds Ratios

Fathers' reports of eating out with their child was found to be significantly and positively associated with children's fast food and sweetened beverage consumption in a gradient manner (Figure 1). The more frequently fathers reported having breakfast with their child was associated with a higher odds ratio of children's overweight status. However, no other associations with children's weight status were found. In addition, children had a lower odds ratio of consuming sweetened beverages if fathers reported eating breakfast more frequently with their children. Reports of fathers having a great deal of influence on their child's nutrition, providing daily assistance with their child's eating, and providing daily meal preparations were not found to be significantly associated with the child's weight status, fruit or vegetable intake, fast food intake, or sweetened beverage consumption

## Multivariable Analysis

For those bivariate associations that were statistically significant, full multivariable models were analyzed. Fathers who reported eating out with their child a few times a week, (compared to fathers who reported rarely or never eating out with their child) had children with over 2 times the odds of consuming fast food at least once a week (OR, 2.89; 95% CI, 1.94–4.29), adjusting for father, maternal, child, and household characteristics (Table 3). In addition, fathers who reported eating out with their child at least a few times a week (compared to fathers who reported rarely or never eating out with their child) had children with almost twice the odds of consuming artificially sweetened beverages at least once a week (OR, 1.62; 95% CI, 1.20–2.19), adjusting for all covariates. We also found that for every additional day fathers had breakfast with their young child there was an associated 9% increase in the odds of childhood overweight (OR, 1.09; 95% CI, 1.03–1.16) and a 7% decrease in the odds ratio of children drinking sweetened beverages (Table 4). Paternal education also was associated with dietary behaviors in children. Whether fathers had a post-high school education was associated with a lower odds ratio of child fast food and sweetened beverage intake compared to fathers with less than a high school degree.

## Sensitivity Analysis

A sensitivity analysis was completed including the maternal variables of eating out and frequency of regular breakfast and dinner with the child. This sensitivity analysis was done to examine whether our findings were overestimating the relationship between fathers and the outcomes of interest. When separate multivariable analyses were completed, excluding the maternal reports of eating out with the child and maternal reports of eating breakfast and dinner with the child, all other covariates and outcomes of interest remained the same. The sensitivity analysis generated minor changes. The main change was a gradient trend in fast food and sweetened beverage intake associated with fathers eating out with their child. In other words, eating out monthly and weekly was significantly associated with a gradient increase in consumption of fast food and sweetened beverages. When the maternal variable of eating out was included in the models, only one (rather than 2) of the categories related to frequency of eating out was found to be statistically significant with fast food and sweetened beverage intake. None of the other variables changed in direction or in statistical significance. The other minor change when maternal variables of eating out or eating breakfast and dinner were not included was the observed magnitude of the odds ratio for fast food and sweetened beverage intake. For example, when the maternal variable of eating out was included in the regression model, fathers who reported eating out once a week (compared to fathers who rarely or never did) had a 2.3 odds ratio associated with children's fast food intake compared to a 2.89 odds ratio when the maternal eating out variable was excluded.

## DISCUSSION

To our knowledge, this is the first study that examines the involvement of US fathers in feeding activities of young children and their association with dietary patterns and weight status in preschool children. Close to half of all US fathers report having a great deal of influence on their child's nutrition. In addition, almost 50% of fathers reported daily



involvement in preparing food for their young child and assisting their child with eating. About one-fourth of fathers reported eating out with their young child a few times per week and this eating activity had a significant statistical association with children's fast food and sugar-sweetened beverage intake even after adjusting for father, maternal, and child characteristics. In addition, fathers who reported eating breakfast more often with their young child was associated with children's overweight status and sweetened beverage consumption.

Our study shows that there is an association of fathers' involvement in their young children's eating activities, particularly those most likely to occur outside the home. Compared with fathers who rarely or never reported eating out with their child, fathers who reported eating out with their child weekly or a few times a month resulted in a higher odds ratio of young children consuming fast food. This finding in our multivariable and sensitivity analyses, which adjusted for maternal reports of eating out with a child, suggests that fathers may influence the frequency of children's fast food consumption. Smaller studies have shown that approximately 50% of families report eating at least one meal away from home per week.<sup>26</sup> In addition, studies have shown a parallel association between fathers' use of and time spent in full service and fast food restaurants with their children's use of and time spent in these types of restaurants.<sup>4</sup> Although these studies examined older children, these studies and ours collectively suggest that fathers likely play a role in children's consumption of fast food. Because our study focused on preschool children, our results suggest that the development of food preferences and food behaviors that promote highly-calorie and low-nutrient-density food consumption starts early and may be supported through father-child interactions. Therefore, targeting these dietary behaviors away from the home should start early and incorporate fathers, as fast food and other unhealthy dietary behaviors have been shown to track from childhood into young adulthood.<sup>27,28</sup>

In our study, children's sweetened beverage intake was associated with fathers' reports of eating out with their child. Few studies have examined father-child dyad nutritional intake data; however, a US nationally representative study demonstrated moderate resemblance between father-daughter soda intake<sup>29</sup> and a smaller study examining Australian fathers and children found a positive relationship between father-child intake of fruit juice.<sup>30</sup> These studies suggest that role modeling and father behaviors are influencing children's consumption of juice and other sugary beverages.

Our study did not include measures of fathers' dietary intake, but the association of fathers' eating out with their child and sweetened beverage intake of children highlight the need for additional studies that evaluate whether fathers may be providing high-calorie and artificially sweetened beverages, such as soda, to young children when they are eating out. The need to monitor this relationship is particularly important given the strong association of juice, soda, and other sweetened beverage consumption with unhealthy weight status.<sup>6,31,32</sup>

Our findings related to fathers' reports of eating out with their children and their associations with children's intake of fast food and sweetened beverages offer potential strategies to target early obesogenic behaviors. Practitioners and researchers can provide targeted advice to fathers about eating meals away from home and consumption of sweetened beverages by



tailoring the anticipatory guidance of these topics for fathers. Practitioners and researchers also can develop strategies to address scenarios when fathers are not accompanying their children by developing specific parent handouts for fathers such as ones that provide healthier food and beverage alternatives from fast food restaurants. These and other strategies should be explored, given the role that fathers appear to have in shaping dietary patterns when eating out. These strategies also are supported by the fact that many individuals, including fathers, are unable to identify foods with the fewest calories, the least salt, and the most fat that appear on typical fast food and restaurant menus.<sup>33,34</sup>

Our results also suggest that fathers who report eating breakfast regularly with their child have a lower odds of drinking sweetened beverages and higher odds of being overweight. Several studies have shown that daily breakfast consumption may prevent overweight and obesity in children but that breakfast consumption away from the home may predict greater increases in BMI during childhood as well as in adulthood.<sup>35–39</sup> Fathers in our study reported eating breakfast with their child an average of 3 times per week. Our review of the literature did not find any studies on fathers' involvement in young children's breakfast patterns but our findings show an association between father-child breakfast frequency and children's overweight status. The ECLS-B study assessed the frequency in which fathers ate breakfast with their child but did not assess whether breakfast was happening at home or outside of the home. It is possible that fathers may influence breakfast patterns outside of the home or rely on ready-to-eat breakfast cereals and foods in the home that may not offer the protective health benefits for children's weight. Further studies are needed to investigate the type of foods fathers generally provide their young children during breakfast and whether there are specific mechanisms by which fathers may influence children's dietary intake during breakfast. Such knowledge can provide targeted strategies for fathers to support healthy eating behaviors and weight status among children.

Our study has several limitations. First paternal BMI was not available and it is known to be a strong predictor of child weight status. Therefore, the lack of paternal BMI can be a confounder for some of our results. In addition, all of the father variables relied on paternal reports, which may alter results based on parent recall bias. Another limitation is that data for fathers were taken when children were 24 months of age, whereas the child dependent variables were taken when children were 48 months of age. This approach was necessary as only a few items about father's involvement with their children's nutrition, feeding practices, and physical activity were collected with the 48-month data collection wave. Our population study size was also limited by missing father data; therefore, our results about the role that fathers play may be overestimated. The study only included fathers who lived with their children and our results may not be generalizable to non-residential fathers or families with different living arrangements. In addition, the limited sample size and small number of minority fathers prevented a stratified analysis by specific racial and ethnic groups of fathers and our results may have differed if more minority fathers were included. However, study population weights were used to adjust for any under-sampling or over-sampling of families. Unlike many other studies that focus on children, however, fathers were included in household data wave collections of the ECLS-B providing a unique opportunity to examine their beliefs, practices, and behaviors.

## Summary

Most fathers report having a great deal of influence on their young children's nutrition. In general we found that fathers are greatly involved in food preparation, daily play, and assisting their child with eating. About one-fourth of fathers reported eating out with their young child a few times a week and this eating activity was statistically associated with children's fast food and artificially sweetened beverage consumption, even after adjusting for father, maternal, child, and home characteristics. In addition, whether fathers reported eating breakfast more often with their young child was associated with a decrease in sweetened beverage consumption and a higher odds ratio of being overweight among children. These findings provide the knowledge that there are potentially modifiable behaviors that can be supported by fathers, particularly around eating out and family meals. These areas warrant further attention and may be critical components of pediatric weight management interventions both in clinical and in community settings.

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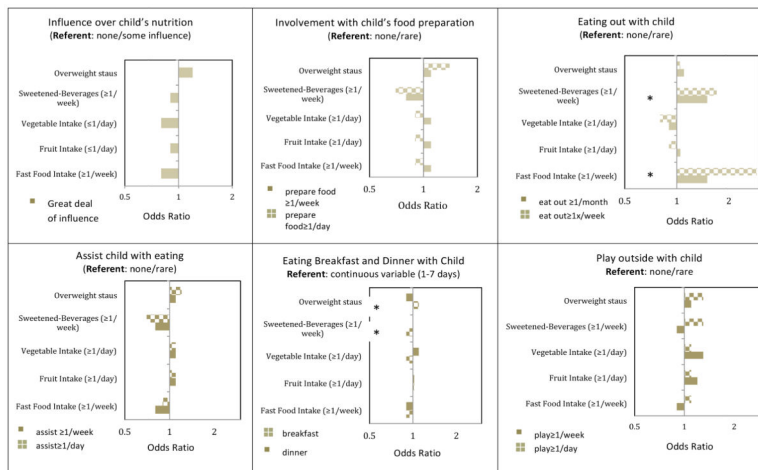
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## References

1. Wake M, Nicholson JM, Hardy P, Smith K. Preschooler obesity and parenting styles of mothers and fathers: Australian national population study. *Pediatrics*. 2007; 120(6):e1520–e1527. [PubMed: 18055667]
2. Haycraft E, Blissett J. Predictors of paternal and maternal controlling feeding practices with 2- to 5-year-old children. *J Nutr Educ Behav*. 2012; 44(5):390–397. [PubMed: 21371945]
3. Berge JM, Wall M, Bauer KW, Neumark-Sztainer D. Parenting characteristics in the home environment and adolescent overweight: a latent class analysis. *Obesity (Silver Spring)*. 2010; 18(4):818–825. [PubMed: 19816417]
4. McIntosh A, Kubena KS, Tolle G, et al. Determinants of children's use of and time spent in fast-food and full-service restaurants. *J Nutr Educ Behav*. 2011; 43(3):142–149. [PubMed: 21550531]
5. Birch LL, Fisher JO, Grimm-Thomas K, et al. Confirmatory factor analysis of the Child Feeding Questionnaire: a measure of parental attitudes, beliefs and practices about child feeding and obesity proneness. *Appetite*. 2001; 36(3):201–210. [PubMed: 11358344]
6. Faith MS, Scanlon KS, Birch LL, et al. Parent-child feeding strategies and their relationships to child eating and weight status. *Obes Res*. 2004; 12(11):1711–1722. [PubMed: 15601964]
7. Johannsen DL, Johannsen NM, Specker BL. Influence of parents' eating behaviors and child feeding practices on children's weight status. *Obesity (Silver Spring)*. 2006; 14(3):431–439. [PubMed: 16648614]
8. Fuemmeler BF, Anderson CB, Masse LC. Parent-child relationship of directly measured physical activity. *Int J Behav Nutr Phys Act*. 2011; 8:17. [PubMed: 21385455]
9. Davison KK, Francis LA, Birch LL. Links between parents' and girls' television viewing behaviors: a longitudinal examination. *J Pediatr*. 2005; 147(4):436–442. [PubMed: 16227026]
10. Skinner JD, Carruth BR, Wendy B, Ziegler PJ. Children's food preferences: a longitudinal analysis. *J Am Diet Assoc*. 2002; 102(11):1638–1647. [PubMed: 12449287]
11. Davison KK, Birch LL. Childhood overweight: a contextual model and recommendations for future research. *Obes Rev*. 2001; 2(3):159–171. [PubMed: 12120101]
12. Enten RS, Golan M. Parenting styles and weight-related symptoms and behaviors with recommendations for practice. *Nutr Rev*. 2008; 66(2):65–75. [PubMed: 18254872]

13. Patrick H, Nicklas TA. A review of family and social determinants of children's eating patterns and diet quality. *J Am Coll Nutr.* 2005; 24(2):83–92. [PubMed: 15798074]
14. Rolland-Cachera MF, Deheeger M, Maillot M, Bellisle F. Early adiposity rebound: causes and consequences for obesity in children and adults. *Int J Obes (Lond).* 2006; 30(Suppl 4):S11–S17. [PubMed: 17133230]
15. Dietz WH. Periods of risk in childhood for the development of adult obesity – what do we need to learn? *J Nutr.* 1997; 127(9):1884S–1886S. [PubMed: 9278575]
16. Dietz WH, Gortmaker SL. Preventing obesity in children and adolescents. *Annu Rev Public Health.* 2001; 22:337–353. [PubMed: 11274525]
17. Nader PR, O'Brien M, Houts R, et al. Identifying risk for obesity in early childhood. *Pediatrics.* 2006; 118(3):e594–e601. [PubMed: 16950951]
18. Wyatt SB, Winters KP, Dubbert PM. Overweight and obesity: prevalence, consequences, and causes of a growing public health problem. *Am J Med Sci.* 2006; 331(4):166–174. [PubMed: 16617231]
19. Davison KK, Birch LL. Obesogenic families: parents' physical activity and dietary intake patterns predict girls' risk of overweight. *Int J Obes Relat Metab Disord.* 2002; 26(9):1186–1193. [PubMed: 12187395]
20. Burke V, Beilin LJ, Dunbar D. Family lifestyle and parental body mass index as predictors of body mass index in Australian children: a longitudinal study. *Int J Obes Relat Metab Disord.* 2001; 25(2):147–157. [PubMed: 11410813]
21. Barlow SE. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. *Pediatrics.* 2007; 120(Suppl 4):S164–S192. [PubMed: 18055651]
22. Nago ES, Lachat CK, Dossa RA, Kolsteren PW. Association of out-of-home eating with anthropometric changes: a systematic review of prospective studies. *Crit Rev Food Sci Nutr.* 2014; 54(9):1103–1116. [PubMed: 24499144]
23. Powell LM, Nguyen BT. Fast-food and full-service restaurant consumption among children and adolescents: effect on energy, beverage, and nutrient intake. *JAMA Pediatrics.* 2013; 167(1):14–20. [PubMed: 23128151]
24. Videon TM, Manning CK. Influences on adolescent eating patterns: the importance of family meals. *J Adolesc Health.* 2003; 32(5):365–373. [PubMed: 12729986]
25. Gillman MW, Rifas-Shiman SL, Frazier AL, et al. Family dinner and diet quality among older children and adolescents. *Arch Fam Med.* 2000; 9(3):235–240. [PubMed: 10728109]
26. Chan JC, Sobal J. Family meals and body weight. Analysis of multiple family members in family units. *Appetite.* 2011; 57(2):517–524. [PubMed: 21763740]
27. Niemeier HM, Raynor HA, Lloyd-Richardson EE, et al. Fast food consumption and breakfast skipping: predictors of weight gain from adolescence to adulthood in a nationally representative sample. *J Adolesc Health.* 2006; 39(6):842–849. [PubMed: 17116514]
28. Bjelland M, Brantsaeter AL, Haugen M, et al. Changes and tracking of fruit, vegetables and sugar-sweetened beverages intake from 18 months to 7 years in the Norwegian Mother and Child Cohort Study. *BMC Public Health.* 2013; 13:793. [PubMed: 24103398]
29. Beydoun MA, Wang Y. Parent-child dietary intake resemblance in the United States: evidence from a large representative survey. *Soc Sci Med.* 2009; 68(12):2137–2144. [PubMed: 19375837]
30. Hall L, Collins CE, Morgan PJ, et al. Children's intake of fruit and selected energy-dense nutrient-poor foods is associated with fathers' intake. *J Am Diet Assoc.* 2011; 111(7):1039–1044. [PubMed: 21703382]
31. Lim S, Zoellner JM, Lee JM, et al. Obesity and sugar-sweetened beverages in African-American preschool children: a longitudinal study. *Obesity (Silver Spring).* 2009; 17(6):1262–1268. [PubMed: 19197261]
32. Warner ML, Harley K, Bradman A, et al. Soda consumption and overweight status of 2-year-old Mexican- American children in California. *Obesity (Silver Spring).* 2006; 14(11):1966–1974. [PubMed: 17135613]
33. Elbel B. Consumer estimation of recommended and actual calories at fast food restaurants. *Obesity (Silver Spring).* 2011; 19(10):1971–1978. [PubMed: 21779085]

34. California Center for Public Health Policy. [Accessed October 20, 2014] Two thirds of Californians fail every question on fast food nutrition quiz. Sweeping support for restaurant nutritional labeling. Available at: <http://www.publichealthadvocacy.org/PDFs/menupressrelease.pdf>
35. Gleason PM, Dodd AH. School breakfast program but not school lunch program participation is associated with lower body mass index. *J Am Diet Assoc.* 2009; 109(2 Suppl):S118–S128. [PubMed: 19166666]
36. Dubois L, Girard M, Potvin KM. Breakfast eating and overweight in a pre-school population: is there a link? *Public Health Nutr.* 2006; 9(4):436–442. [PubMed: 16870015]
37. Tin SP, Ho SY, Mak KH, et al. Location of breakfast consumption predicts body mass index change in young Hong Kong children. *Int J Obes (Lond).* 2012; 36(7):925–930. [PubMed: 22234278]
38. Deshmukh-Taskar PR, Nicklas TA, O’Neil CE, et al. The relationship of breakfast skipping and type of breakfast consumption with nutrient intake and weight status in children and adolescents: the National Health and Nutrition Examination Survey 1999–2006. *J Am Diet Assoc.* 2010; 110(6):869–878. [PubMed: 20497776]
39. Ma Y, Bertone ER, Stanek EJ, et al. Association between eating patterns and obesity in a free-living US adult population. *Am J Epidemiol.* 2003; 158(1):85–92. [PubMed: 12835290]



**Figure 1.**  
 Unadjusted Odds Ratios of Father Involvement with Children’s Dietary Practices and Weight Status

\* Significant odds ratios, based on 95% confidence intervals

**Table 1**

Selected Demographic Characteristics of US Children at 48 Months

Variables	Percentage or Mean
<b><i>Child Characteristics</i></b>	
<b>Sample size: 2441</b>	
<b>Child fast food intake</b>	
Never	23.9
At least once a week	76.1
<b>Child fruit intake</b>	
Less than once a day	27.5
At least once a day	72.5
<b>Child vegetable intake</b>	
Less than once a day	32
At least once a day	68
<b>Child sweet beverage intake</b>	
Never	31.7
At least once a week	68.3
<b>Obese</b>	16.1
<b>Overweight</b>	31.5
<b>Age at solid food</b>	
6 months or earlier	93.7
After 6 months	6.3
<b>Ever breastfed</b>	78.7
<b>Female</b>	47.9
<b>Age (months)<sup>a</sup></b>	52
<b>Birthweight</b>	
Normal	94.4
Moderately low	4.8
Very low	0.9
<b><i>Household Characteristics</i></b>	
<b>Child care</b>	
Parent	19.4
Relative	8.2
Nonrelative	8.8
Center-based programs	61.9
Multiple care arrangements	1.7

Variables	Percentage or Mean
<b>Primary language in household</b>	
English	83.9
Spanish	12.5
Other	3.6
<b>Poverty</b>	
Under FPL (100%)	11.1

Note.

<sup>a</sup>Continuous variables

Data from 48-month data wave collection

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**Table 2**

## Selected Demographic Characteristics of US Fathers

Variables	Percentage or Mean
<b><i>Father Characteristics</i></b>	
<b>Influence on nutrition</b>	
No/Some Influence	56.8
Great Deal of Influence	43.2
<b>Prepare food with child</b>	
A few times a month or less	21.5
A few times a week	30.6
At least once day	47.9
<b>Play outside with child</b>	
A few times a month or less	22.3
A few times a week	46.2
At least once day	31.5
<b>Eat out with child</b>	
Rarely/Never	14.2
A few times a month	55.6
A few times a week or more	30.2
<b>Assist child with eating</b>	
A few times a month or less	18
A few times a week	28
At least once day	54
<b>Breakfast/week with child<sup>a</sup></b>	3.2
<b>Dinner/week with child<sup>a</sup></b>	5.7
<b>Father's employment</b>	
Unemployed	4
Less than 35 hours	3.5
35 or more hours	92.5
<b>Father's education</b>	
< High School	13.6
High School	23.8
College	24.9
>= Bachelor's	37.7
<b>Father's race</b>	
White	70.5
Black	5.2

Variables	Percentage or Mean
Hispanic	19.7
Asian	3
Other	1.6
<hr/>	
<b>Father's age (years)<sup>a</sup></b>	35.6

Note.

<sup>a</sup>Continuous variables

Data from 24-month data wave collection

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**Table 3**

Adjusted Odds Ratios and 95% Confidence Intervals for Child Fast Food and Sweetened Beverage Consumption and Eating out with Fathers

Total Sample Size N = 2441	Fast Food Intake	Sweetened Beverage
	OR (95 % CI)	OR (95 % CI)
<b><i>Father Variables</i></b>		
<b>Eating out</b>		
Rarely/Never	Reference	Reference
A few times a month	1.51 (1.05 – 2.16) <sup>*s</sup>	1.62 (1.20 – 2.19) <sup>*s</sup>
At least once a week or more	2.89 (1.94 – 4.29) <sup>*s</sup>	1.67 (1.12 – 4.46) <sup>*s</sup>
<b><i>Covariates</i></b>		
<b>Father's employment</b>		
Unemployed	Reference	Reference
Less than 35 hours	0.43 (0.17 – 1.13)	1.09 (0.44 – 2.69)
35 or more hours	0.86 (0.42 – 1.73)	0.88 (0.54 – 1.44)
<b>Father's education</b>		
< High School	Reference	Reference
High School	0.73 (0.39 – 1.34)	0.83 (0.46 – 1.51)
College	0.51 (0.27 – 0.94) <sup>*s</sup>	0.62 (0.35 – 1.09)
>= Bachelor's	0.50 (0.26 – 0.96) <sup>*s</sup>	0.43 (0.25 – 0.76)
<b>Father's race</b>		
White	Reference	Reference
Black	1.24 (0.59 – 2.59)	0.74 (0.42 – 1.32)
Hispanic	1.17 (0.57 – 2.41)	0.98 (0.54 – 1.77)
Asian	1.21 (0.67 – 2.23)	0.75 (0.44 – 1.27)
<b>Father's age <sup>a</sup></b>	1.00 (0.97 – 1.04)	1.02 (0.98 – 1.05)

Note

<sup>a</sup>Continuous variables

<sup>\*s</sup>Significant odds ratios, based on 95% CI

Results have been adjusted for: child sex, child's age, child's birth weight status, child care arrangement, child ever breastfed, child age at introduction of solid foods, mother's weight status, mother's depression score, mother's education, mother's age, number of adults in household over 18, primary language in household, and poverty indicator.

**Table 4**

Adjusted Odds Ratios and 95% Confidence Intervals for Child Sweetened-Beverage Consumption and Overweight Status and Eating out with Fathers

Total Sample Size N = 2441	Sweetened Beverage	Child Overweight
	OR (95 % CI)	(OR 95 % CI)
<b><i>Father Variables</i></b>		
Breakfast with father <sup>a</sup>	0.93 (0.87–0.99) <sup>*s</sup>	1.09 (1.03 – 1.16) <sup>*s</sup>
<b><i>Covariates</i></b>		
<b>Father's employment</b>		
Unemployed	Reference	Reference
Less than 35 hours	1.01 (0.39 – 2.56)	1.12 (0.49 – 2.55)
35 or more hours	0.83 (0.49 – 1.38)	1.08 (0.58 – 2.01)
<b>Father's education</b>		
< High School	Reference	Reference
High School	0.82 (0.45 – 1.48)	0.97 (0.61 – 1.54)
College	0.63 (0.35 – 1.09)	0.67 (0.38 – 1.18)
>= Bachelor's	0.45 (0.26 – 0.77) <sup>*s</sup>	0.65 (0.38 – 1.11)
<b>Father's race</b>		
White	Reference	Reference
Black	0.77 (0.44 – 1.35)	2.14 (1.26 – 3.63) <sup>*s</sup>
Hispanic	1.02 (0.57 – 1.82)	0.81 (0.47 – 1.41)
Asian	0.76 (0.45 – 1.28)	0.8 (0.44 – 1.52)
<b>Father's age<sup>a</sup></b>	1.02 (0.99 – 1.05)	1.01 (0.98 – 1.04)

Note.

<sup>a</sup>Continuous variables

<sup>\*s</sup>Significant odds ratios, based on 95% CI

Results have been adjusted for: child sex, child's age, child's birth weight status, child care arrangement, child ever breastfed, child age at introduction of solid foods, mother's weight status, mother's depression score, mother's education, mother's age, number of adults in household over 18, primary language in household, and poverty indicator.