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Parenting Style and Family Meals: Cross-Sectional and 5-year Longitudinal Associations

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Abstract

Background—Research on family meals in the last decade has shown a positive association between family meal frequency and adolescent healthy dietary intake. However, less is known about factors within the home environment, such as parenting style, which may be associated with family meal patterns.

Objective—The purpose of this study is to test cross-sectional and five-year longitudinal associations between parenting styles (authoritative, authoritarian, permissive, neglectful) and the frequency of family meals among adolescents.

Study Design—Data were from Project EAT (Eating Among Teens), a population-based study comprised of youth from diverse ethnic/racial and socioeconomic backgrounds. Two cohorts of adolescents (middle school, high school) completed in-class surveys in 1999 (Time 1) and mailed surveys in 2004 (Time 2). Multiple linear regression models were used to predict mean frequency of family meals at Time 1 and Time 2 from adolescent report of parenting style (both mother and father) at Time 1. Cross-sectional analyses included both adolescent cohorts ($n = 4,746$) and longitudinal analyses included only the younger cohort ($n = 806$) because family meal frequency was not assessed in the older cohort at Time 2.

Results—Cross-sectional results for adolescent girls indicated a positive association between maternal and paternal authoritative parenting style and frequency of family meals. For adolescent boys, maternal authoritative parenting style was associated with more frequent family meals. Longitudinal results indicated that authoritative parenting style predicted higher frequency of family meals five years later, but only between opposite sex parent/adolescent dyads.

Conclusions—Future research should identify additional factors within the home environment that are associated with family meal frequency in order to develop effective interventions that result in increased family meals for youth. Also, future research should investigate the mealtime behaviors of authoritative parents and identify specific behaviors that dietitians and other health care providers could share with parents of adolescents to help them increase family meal frequency.

The last decade of research has suggested that family meals play an important role in promoting healthy dietary intake in youth (1-6). Cross-sectional and longitudinal research on adolescent boys and girls from diverse ethnic/racial backgrounds suggest that family meals

are associated with increased fruit and vegetable intake (1-4), lower levels of extreme weight control behaviors (5-6), and better psychosocial health (7-8). There is also some evidence that family meals may be protective against obesity (9-12), although findings have been inconsistent across studies (9-12). However, less research has focused on familial factors associated with frequency of family meals in the homes of adolescents. Research is needed to identify factors within the home environment that increase the occurrence of family meals, in order for more youth to benefit from the protective nature of family meals.

Parents play a central role in the affective environment of the home and in organizing family meals (13-14). The structure (e.g., collaboration vs. control), expectations (e.g., rules and clear boundaries), and warmth (e.g., affective responsiveness) a parent provides in the home may contribute to whether family meals occur (13,15). Although there has been some research looking at associations between parental feeding styles (e.g., control/restriction) and practices, these studies have been primarily focused on young children and their mothers (15-17). Investigating the relationship between parenting styles (authoritative, authoritarian, permissive, neglectful) and the frequency of family meals may be a first step in understanding familial factors within the home environment that may influence the occurrence of family meals with adolescents (13-14).

Parenting style is considered a characteristic of the parent that is relatively stable over time and constitutes the daily environmental and emotional context for child rearing (18). The four classic parenting styles are: authoritative, authoritarian, permissive, and neglectful (18-19). Parenting style typologies are based on two dimensions: (a) the degree to which parents respond to their children (i.e., “responsiveness”) and (b) the degree to which parents make demands of their children (i.e., “demandingness”) (see Figure 1). Responsiveness is the extent to which a parent fosters individuality, self-regulation, and self-assertion in their child by being attuned and supportive of their child's needs and demands (18-19). Demandingness is the extent to which parents cultivate self-control and responsibility in their child through parental supervision, rules/structure and disciplinary efforts (18-19). Parenting style establishes a framework against which an adolescent can predictably interpret parenting behaviors. Studies in the general field of parenting related to adolescent behavior indicate that regardless of adolescents' sex, ethnicity/race, or family socioeconomic status, authoritative parenting style is related to adolescent self-confidence, competency, self-reliance, avoidance of delinquent activity, and self-regulation of mood and behavior (20). Therefore, parenting style may have the potential to impact and shape other aspects of adolescents' lives such as, eating behaviors, self-regulation of physical activity, and ultimately the risk for overweight.

An authoritative parenting style, characterized by high responsiveness and high demandingness, may be most likely to provide the structure and support needed for family meals to occur. Several cross-sectional studies in youth have found an association between authoritative parenting style and lower body mass index (BMI) and healthier dietary intake (12,14,20-25). One longitudinal study found that children of authoritarian parents (high demandingness, low responsiveness) had almost a fivefold increase in odds of being overweight (13). Although previous studies have begun to investigate the association between parenting style and adolescent health behaviors, no previous studies have looked at parenting styles and the frequency of family meals specifically.

The current study builds upon and adds to the extant literature on adolescent health and parenting style by investigating the relationship between parenting style and the frequency of family meals in families with adolescents as a first step in understanding what factors within the family home environment are associated with family meals. This paper will address the following research questions: (a) Is parenting style associated with the frequency

of family meals; (b) Does parenting style predict the frequency of family meals longitudinally? (c) Which specific parenting styles (authoritative, authoritarian, permissive, neglectful) serve as risk factors or protective factors in relation to the frequency of family meals?

Methods

Study Design and Population

Data for the present study were drawn from Project EAT (Eating Among Teens), a large population-based, longitudinal study of nutrition and weight-related behaviors in adolescents. At Time 1, in EAT-I (1998-1999), 1,608 middle school and 3,074 high school students in 31 Minnesota schools completed in-class surveys and anthropometric measures; all students in selected classrooms were eligible to participate. At Time 1, the mean age ($\pm$ standard deviation) was 12.8 ± 0.8 years for the younger and 15.8 ± 0.8 years for the older cohort. Participants were equally divided by sex (50.2% male adolescents, 49.8% female adolescents). The racial/ethnic proportions were: 48.5% white, 19.0% African American, 19.2% Asian, 5.8% Hispanic, 3.5% Native American, and 3.9% mixed or other race. EAT-II (2003-2004) re-surveyed participants by mail five years later (Time 2) as the younger cohort progressed from early adolescence (middle school) to mid-adolescence (high school), and the older cohort progressed from mid- to late adolescence (high school to post-high school). The University of Minnesota's Institutional Review Board approved all study protocols used. Passive or active consent procedures were followed in accordance with the requirements of the participating schools' research boards. Detailed study procedures are described elsewhere (26).

For the present study, longitudinal analyses included only members of the younger cohort who were in middle school at Time 1 because family meal frequency was not assessed in the older cohort at Time 2. Of the original middle school cohort, 448 participants were lost to follow-up, primarily due to missing contact information. Surveys were completed by 806 participants of the remaining cohort ($n=1,160$ participants), representing 50% of the original middle school cohort and 70% of those contacted in EAT-II.

Survey Development and Measures

The development of the Project EAT survey was guided by Social Cognitive Theory (27), a review of existing instruments, reviews by experts in nutrition and adolescent health, focus groups with adolescents (28), and several pilot tests of the survey (26).

Parenting Style Variables—Four parenting variables (authoritative, authoritarian, permissive and neglectful) were created to represent the four parenting styles as conceptualized by Baumrind (18) and Maccoby (19). Adolescents' self-reports of parenting responsiveness and demandingness from the Project EAT survey data at Time 1 were used to define the parenting variables. Parent responsiveness was measured by adolescents' responses to two items assessing “caring” and “communication” (29). The caring item asked, separately for mothers and fathers, “How much do you feel your mother/father cares about you?” The communication item asked, separately for mothers and fathers, “How much do you feel you can talk to your mother/father about your problems?” Both questions had response options ranging from “not at all” to “very much” on a five-point Likert scale. Students' responses to these two questions for each parent were separately averaged and then dichotomized such that an average response of four or higher was considered “high responsiveness” and less than four considered “low responsiveness.” Test-retest values for these items ranged from Spearman $r = 0.69$ (for both items for fathers) to Spearman $r = 0.82$ (for both items for mothers).

Parent demandingness was measured by adolescents' responses to a single item. The demandingness item asked, separately for mothers and fathers, "Compared to other mothers/fathers, how strict would you say your mother/father is?" (30). Response options ranged from "much less strict" to "much more strict" on a five-point Likert scale with the pivot value of three anchored at "about the same." Adolescent responses of three or higher were coded as "high demandingness" and less than three were "low demandingness". The test-retest value for this item was Spearman $r = 0.71$ for fathers and Spearman $r = 0.74$ for mothers.

Parental style categories were then defined by the data as follows: authoritative was high responsiveness and high demandingness, authoritarian was low responsiveness and high demandingness, permissive was high responsiveness and low demandingness and neglectful was low responsiveness and low demandingness. Although it would be preferable to have more items to measure parent demandingness and responsiveness, multi-item scales are often not feasible in large surveys. Other large survey studies within the family and parenting research field have similar methodology to operationalize relational constructs such as parenting style (31-33).

Family Meals—To assess family meal frequency, students were asked, "During the past seven days, how many times did all, or most, of your family living in your house eat a meal together?" Response options included: never, one to two times, three to four times, five to six times, seven times, and more than seven times and were coded numerically as 0, 1.5, 3.5, 5.5 and 7 respectively (where seven times and more than seven times were collapsed).

Demographic Characteristics—Students self-reported their ethnicity/race and family socioeconomic status (SES) in EAT-I. Ethnicity/race was assessed with the question, "Do you think of yourself as: (a) White, (b) Black/African-American, (c) Hispanic or Latino, (d) Asian-American, (e) Hawaiian/Pacific Islander, (f) American Indian/Native American. Respondents could choose multiple responses; the race/ethnicity for youth reporting more than one response (other than white) was coded as "mixed/other." As few youth participants identified their background as "Hawaiian or Pacific Islander" these youth were also included in the category "mixed/other." SES was estimated by an algorithm that included education, employment, and poverty indicators. Classification tree methodology (34) was used to generate five levels of SES (26). The prime determinant of SES was the higher education level of either parent. Subsidiary variables were family eligibility for free/reduced lunch, family receipt of public assistance, and parent employment status.

Statistical Analysis

Descriptive analyses of adolescents' reports of paternal and maternal parenting style were examined using chi-square tests. Differences across adolescent age and gender were tested for significance. Two multiple regression models were run to examine the relationships between parenting style and family meal frequency, including: (a) cross-sectional baseline associations at Time 1 between parenting style and family meal frequency (model one) stratified by adolescent gender and cohort, and (b) longitudinal associations within the younger adolescent cohort between parenting style at Time 1 and family meal frequency at Time 2 (model two) stratified by adolescent gender. Both models were adjusted for demographic characteristics (age, race/ethnicity, SES) to control for potential confounders. In order to account for the reciprocal effects each parent may have on the other's parenting style, maternal and paternal parenting style were included in all analyses simultaneously to allow them to control for one another. Mutually adjusting for parenting style allows for the detection of an association between gender specific parenting styles and the frequency of family meals above and beyond the effect of the opposite parent's influence. Estimated least

squares regression means of family meal frequencies were obtained for each of the four parenting styles for both mothers and fathers.

When the three degree of freedom F-test for the main effect of each parenting style effect was found to be significant at the .05 level, post hoc analyses were conducted. To identify specific mean differences in family meal frequency by style, post-hoc mean difference tests used the more conservative .01 significance level in light of multiple comparisons. Effect sizes capturing the differences in family meal frequencies were calculated for those post-hoc comparisons found to be statistically significant. Effect sizes were calculated as the difference in least square regression means divided by an overall estimate of the standard deviation of the family meal frequencies. Effect sizes of .20 and less are considered small effect sizes, effect sizes of .50 are considered medium effect sizes, and effect sizes of .80 and above are considered large (35-36).

Attrition from Time 1 to Time 2 did not occur completely at random. Project EAT-II participants were more likely to be female, white, and of higher SES than participants in EAT-I. Thus, in the longitudinal analyses the data are weighted to adjust for differential rates using the response propensity method (26,37). Weighting resulted in estimates representative of a random sample of the Time 1 middle school cohort. A full description of the propensity-weighting method can be found elsewhere (26). The weighted racial/ethnic proportions in the middle school cohort at Time 2 were: 33.2% white, 24.2% African American, 22.9% Asian, 6.5% Hispanic, 6.6% Native American, and 6.5% mixed or other race. All analyses were conducted using SAS (version 9.1.3, 2006, SAS Institute Inc, Cary, NC).

Results

Descriptive Analysis of Parenting Style by Adolescent Gender and Age

Maternal Parenting Style at Time 1—Maternal authoritative style (high responsiveness/high demandingness) was the most common parenting style across gender and cohort (see Figure 2a). For both the younger ($p = .418$) and older ($p = .877$) cohorts, maternal parenting style did not differ between boys and girls. The prevalence of maternal parenting styles at Time 1 did not differ ($p = .499$) between younger and older sons. In contrast, significant differences were found between younger and older girls. Younger girls more often reported a maternal authoritative parenting style than did older girls ($p = .041$).

Paternal Parenting Style at Time 1—For both the younger ($p < .001$) and older ($p < .001$) cohorts, paternal parenting style differed between boys and girls (Figure 2b). Paternal authoritarian parenting style (low responsiveness/high demandingness) was the most common among girls and paternal authoritative parenting style was the most common among boys. The prevalence of paternal parenting styles at Time 1 did not differ ($p = .086$) between younger and older girls. In contrast, significant differences were found between younger and older boys. Older boys more often reported a paternal authoritative parenting style than did younger boys ($p < .001$). As previously reported, probabilities of parenting style also differed by SES and race/ethnicity (24).

Cross-sectional associations between parenting style and frequency of family meals

For all comparisons in the text, authoritative parenting style served as the referent group, while Table 1 presents comparisons between all four parenting styles. For adolescent girls in both cohorts (younger and older), daughters of authoritative (high responsiveness/high demandingness) mothers had the most frequent family meals, and daughters of neglectful (low responsiveness/low demandingness) mothers reported the fewest family meals ($p < .01$;

effect size younger cohort = .38; older cohort = .42). For example, younger adolescent girls with authoritative mothers were having 5.1 family meals per week, whereas younger adolescent girls of neglectful mothers were having 4.2 family meals a week.

For adolescent girls in both cohorts (younger and older), daughters of authoritative fathers had the most frequent meals, and daughters of neglectful fathers had the fewest ($p < .01$; effect size younger cohort = .32, older cohort = .50). For example, older adolescent girls with authoritative fathers were having 3.8 family meals per week, whereas older adolescent girls of neglectful fathers were having 2.6 family meals a week.

For adolescent boys in both cohorts (younger and older), sons of authoritative mothers had the most frequent meals, and sons of neglectful mothers had the fewest family meals ($p < .01$; effect size younger cohort = .38; older cohort = .66). For example, older adolescent boys with authoritative mothers were having 4.3 family meals per week, whereas older adolescent boys of neglectful mothers were having 2.7 family meals a week. There were no significant findings for adolescent boys in both cohorts (younger and older) between paternal authoritative parenting style and frequency of family meals.

Longitudinal associations between parenting style and frequency of family meals

There were significant findings for opposite sex parent/adolescent dyads in five year longitudinal analyses examining associations between parenting style at Time 1 and frequency of family meals in the younger cohort at Time 2 (see Table 2). Paternal authoritative parenting style predicted more frequent family meals for daughters compared to neglectful paternal parenting style ($p < .01$; effect size = .57). Specifically, daughters of authoritative fathers were having an average of 3.5 family meals a week, whereas, daughters of neglectful fathers were having 2.1 family meals a week. Thus, daughters of authoritative fathers were having at least one more family meal a week than daughters of neglectful fathers. Maternal authoritative parenting style predicted more frequent family meals for sons compared to neglectful parenting style ($p < .01$; effect size = .48). Specifically, sons of authoritative mothers were having an average of 2.8 family meals a week, whereas, sons of neglectful mothers were having 1.7 family meals a week at follow-up. Thus, sons of authoritative mothers were having at least one more family meal a week than sons of neglectful mothers. There were no significant findings for same sex parent/adolescent dyads (mothers/daughters; fathers/sons) in longitudinal analyses examining the association between parenting style at Time 1 and frequency of family meals at Time 2.

Discussion

The purpose of this paper was to examine cross-sectional and longitudinal associations between parenting style and the frequency of family meals. Cross-sectional results indicated that there is an association between parenting style and the frequency of family meals for both sons and daughters, even after accounting for potential confounding variables (age, SES, race/ethnicity) and the reciprocal effect each parent may have on the other's parenting style. Maternal and paternal authoritative parenting style (high responsiveness/high demandingness) was associated with the highest occurrence of family meals per week for both younger and older cohorts of daughters. Maternal authoritative parenting style, but not paternal, was associated with the highest occurrence of family meals for younger and older sons. One possible mechanism of effect may be that creating a home environment with parental expectations, structure and warmth may promote the occurrence of family meals versus a home environment with less parental structure and low responsiveness. It may also be the case that the occurrence of family meals is a marker of authoritative parenting style. In the parenting and family literature, family meals have been hypothesized to be a proxy variable for measuring family connectedness/functioning. The organizing, preparing and

eating of a family meal may be a stress-inducing event and families that have more organized and structured homes with responsive family members may be more able to successfully carry out family meals (38-39).

Longitudinal results indicated that parenting style predicted the frequency of family meals five years later, but only between opposite sex parent/adolescent dyads. Mothers' authoritative parenting style predicted more frequent family meals at Time 2 for sons, compared to neglectful maternal parenting styles. Thus, for sons, having a mother who provides more rules and expectations, structure and warmth in the home environment may create a protective environment where family meals are more likely to occur. In contrast, having a mother who is more rigid, has less structure, and provides less warmth may create a home environment that is less likely to have frequent family meals. Fathers' authoritative parenting style predicted more frequent family meals at Time 2 for daughters, compared to neglectful paternal parenting style. Thus, for daughters, having a father who is more structured, has higher expectations and provides more warmth may create a home environment that is protective for family meals compared to a father who provides low levels of warmth and less structure.

These sex-specific (mother/son; father/daughter) associations found between parenting style and the frequency of family meals are of particular interest. The current findings add support to previous studies indicating that the opposite sex parent plays a unique role in influencing adolescent health behaviors. Other studies have found, albeit not consistently, that paternal encouragement to diet is positively associated with weight control behaviors and restriction of food intake among daughters (40-41). Also, intervention studies have shown greater weight loss in opposite sex parent/child dyads (42-43). In one family-based obesity weight loss intervention study, father/daughter dyads lost more weight than mother/son dyads or mother/daughter dyads. Taken together, these results suggest that the opposite sex parent may play a unique role in influencing adolescent health behaviors. The sex-specific results are important findings that future research, both qualitative and quantitative, should investigate further in order to identify underlying causal mechanisms.

The current study had several strengths, including the use of a large, diverse, population-based sample, adjustments for possible third variable confounding of results (age, SES, race/ethnicity), and the use of longitudinal data. There were limitations to this study that should be taken into account when interpreting the study's findings. One limitation was the inability to use a standardized measure of parenting style. Because of the comprehensive nature of Project EAT, many of the items included in the survey are brief and clinical measures were not included. Because this study did not use a standardized measure of parenting style, results here should be viewed cautiously and future research should examine the relationship between parenting style and family meals frequency with more comprehensive measures. The use of adolescent report of parenting behaviors may also be viewed as a study limitation, although adolescent perceptions of parental weight-related behaviors have been found to be a stronger predictor of adolescent weight-related outcomes than parent reports of their own behaviors (44). Future research should include both youths' and parents' own perception of parenting style. A further limitation was attrition from the original population. To help address this limitation, analyses were weighted such that the analytic sample reflects the baseline study population.

Conclusions

Authoritative parenting style was found to be associated with, and predicted, the frequency of family meals for adolescents. Future research should continue to look at factors within the home environment that are associated with the frequency of family meals in order to identify

variables that should be taken into account in interventions aimed at increasing the frequency of family meals. For example, research should examine specific behaviors that authoritative parents use during mealtimes. Given findings from the current study showing parenting style is associated with family meals, and previous findings in which both parenting style and family meals have been found to be associated with various health-related outcomes in adolescents (13,15-16,24-25), it seems worthwhile to explore whether family meals mediate the effects of authoritative parenting style on these outcomes, are a proxy measure for parenting style, or whether family meals influence adolescent outcomes above and beyond any effect of parenting style. Additionally, it is important to investigate how parenting style is related to the quality of family meals (e.g. enjoyable, healthy foods served). Finally, it is of interest to examine further the relationship between opposite sex parent/adolescent dyads in relation to factors that may influence the occurrence of family meals.

Although further research is needed, results suggest that it is important for dietitians and other health care providers to reinforce authoritative parenting styles in order to increase the likelihood of occurrence of family meals. Health providers can play an important role in reinforcing the benefits of authoritative parenting style, helping parents set realistic goals for family meals, exploring ways to enhance parenting skills during family meals, discussing strategies to help parents be more authoritative, and making referrals for parents who are in need of further parenting skills training. In recommending family meals, it is important for dietitians and other health care providers to take broader parenting styles into account. Family meals may be easier for families with authoritative parenting styles, whereas challenges for other families will require more time to address.

References

1. Fulkerson JA, Neumark-Sztainer D, Story M. Adolescent and parent views of family meals. *Journal of the American Dietetic Association* 2006;106(4):526–532. [PubMed: 16567147]
2. Videon TM, Manning CK. Influences on adolescent eating patterns: The importance of family meals. *Journal of Adolescent Health* 2003;32:365–373. [PubMed: 12729986]
3. Gillman MW, Rifas-Shiman SL, Frazier AL, Rockett HRH, Camargo CA, Field AE, Berkley CS, Colditz GA. Family dinner and diet quality among older children and adolescents. *Archives of Family Medicine* 2008;9:235–240. [PubMed: 10728109]
4. Neumark-Sztainer D, Hannan PJ, Story M, Croll J. Family meal patterns: Associations with sociodemographic characteristics and improved dietary intake among adolescents. *Journal of the American Dietetic Association* 2003;103:317–322. [PubMed: 12616252]
5. Neumark-Sztainer D, Wall M, Story M, Fulkerson JA. Are family meal patterns associated with disordered eating behaviors among adolescents? *Journal of Adolescent Health* 2004;35:350–359. [PubMed: 15488428]
6. Neumark-Sztainer D, Eisenberg ME, Fulkerson JA, Story M, Larson NI. Family meals and disordered eating in adolescents: Longitudinal findings from Project EAT. *Archives of Pediatrics and Adolescent Medicine* 2008;162:17–22. [PubMed: 18180407]
7. Eisenberg ME, Olson RE, Neumark-Sztainer D, Story M, Bearinger LH. Correlations between family meals and psychosocial well-being among adolescents. *Arch Pediatr Adolesc Med* 2004;158:792–796. [PubMed: 15289253]
8. Fulkerson JA, Story M, Mellin A, Leffert N, Neumark-Sztainer D, French SA. Family dinner meal frequency and adolescent development: Relationships with developmental assets and high-risk behaviors. *Journal of Adolescent Health* 2006;39:337–34. [PubMed: 16919794]
9. Campbell KJ, Crawford DA, Ball K. Family food environment and dietary behaviors likely to promote fatness in 5-6 year-old children. *International Journal of Obesity* 2006;30:1272–1280. [PubMed: 16491108]

10. Fulkerson JA, Neumark-Sztainer D, Hannan PJ, Story M. Family meal frequency and weight status among adolescents: Cross-sectional and five-year longitudinal associations. *Obesity* 2008;16:2529–2534. [PubMed: 18719674]
11. Sen B. Frequency of family dinner and adolescent body weight status: evidence from the national longitudinal survey of youth, 1997. *Obesity* 2006;14:2266–2276. [PubMed: 17189555]
12. Moens E, Braet C, Soetens B. Observation of family functioning at mealtime: A comparison between families of children with and without overweight. *Journal of Pediatric Psychology* 2007;32(1):52–63. [PubMed: 16801324]
13. Rhee KE, Lumeng JC, Appugliese DP, Kaciroti N, Bradley RH. Parenting styles and overweight status in first grade. *Pediatrics* 2006;117:2047–2054. [PubMed: 16740847]
14. Zeller MH, Reiter-Purtill J, Modi AC, Gutzwiller J, Vannatta K, Davies WH. Controlled study of critical parent and family factors on the obesigenic environment. *Obesity* 2007;15:126–136. [PubMed: 17228040]
15. Vereecken C, Legiest E, De Bourdeaudhuij I, Maes L. Associations between general parenting styles and specific food-related parenting practices and children's food consumption. *American Journal of Health Promotion* 2009;23(4):233–240. [PubMed: 19288844]
16. Francis LA, Hofer SM, Birch L. Predictors of maternal child-feeding style: maternal and child characteristics. *Appetite* 2001;37:231–243. [PubMed: 11895324]
17. Birch LL, Fisher JO. Mothers' child-feeding practices influence daughters' eating and weight. *American Journal of Clinical Nutrition* 2000;71:1054–61. [PubMed: 10799366]
18. Baumrind, D. Rearing competent children. In: Damon, editor. *Child development today and tomorrow*. San Francisco: Josey-Bass; 1989. p. 349–378.
19. Maccoby EE. Parenting and its effects on children: On reading and misreading behavior genetics. *Annual Reviews of Psychology* 2000;51:1–27.
20. Gray M, Steinberg L. Unpacking authoritative parenting style: Reassessing a multidimensional construct. *Journal of Marriage and the Family* 1999;61:574–587.
21. Chen J, Kennedy C. Family functioning, parenting style, and Chinese children's weight status. *Journal of Family Nursing* 2004;10:262–279.
22. Kremers SPJ, Brug J, deVries H, Engels RCME. Parenting style and adolescent fruit consumption. *Appetite* 2003;41:43–50. [PubMed: 12880620]
23. Mellin AE, Neumark-Sztainer D, Story M, Ireland M, Resnick MD. Unhealthy behaviors and psychosocial difficulties among overweight adolescents: The potential impact of familial factors. *Journal of Adolescent Health* 2002;31:145–153. [PubMed: 12127384]
24. Berge J, Wall M, Bauer K, Neumark-Sztainer D. Parenting Characteristics in the Home Environment and Adolescent Overweight: A Latent Class Analysis. *Obesity*. October;2009 advance online publication. 10.1038/oby.2009.324
25. Berge J, Wall M, Loth K, Neumark-Sztainer. Parenting Style as a Predictor of Adolescent Weight and Weight-Related Behaviors. *Journal of Adolescent Health*. In Press.
26. Neumark-Sztainer D, Wall M, Guo J, Story M, Haines J, Eisenberg M. Obesity, disordered eating, and eating disorders in a longitudinal study of adolescents: How do dieters fare five years later? *Journal of the American Dietetic Association* 2006;106:559–568. [PubMed: 16567152]
27. Bandura, A. *Social Learning Theory*. Prentice-Hall International Inc; Englewood Cliffs, NJ: 1977.
28. Neumark-Sztainer D, Story M, Perry C, Casey MA. Factors influencing food choices of adolescents: Findings from focus-groups discussions with adolescents. *Journal of American Dietetic Association* 1999;99(8):929–937.
29. Resnick M, Harris L, Blum R. The impact of caring and connectedness on adolescent health and well being. *Journal of Paediatrics and Child Health* 1993;29(suppl1):S3–9. [PubMed: 8268019]
30. Chassin L, Presson CC, Sherman SJ. Cognitive and social influence factors in adolescent smoking cessation. *Addictive Behaviors* 1984;9:383–390. [PubMed: 6532145]
31. Atkins D, Kessel D. Religiousness and infidelity: Attendance, but not faith and prayer predict marital fidelity. *Journal of Marriage and Family* 2008;70(2):407–418.
32. King V. The Antecedents and consequences of adolescents' relationship with stepfathers and nonresident fathers. *Journal of Marriage and Family* 2006;68(4):910–928. [PubMed: 18270551]

33. Aquilino W. The noncustodial father-child relationship from adolescence into young adulthood. *Journal of Marriage and the Family* 2006;68(4):929–946.
34. Breiman, L.; Friedman, J.; Olshen, R.; Stone, C. *Classification and Regression Trees*. Belmont, CA: Wadsworth International Group; 1984.
35. Cohen, J. *Statistical power for the behavioral sciences*. 2nd. Hillsdale, NJ: Erlbaum;
36. Rosenthal R, Rubin DB. A simple, general purpose display of magnitude of experimental effect. *Journal of Educational Psychology* 1982;74:166–169.
37. Little R. Survey nonresponse adjustments for estimates of means. *International Statistical Review* 1986;54:137–139.
38. Kitzman KM, Dalton WT, Buscemi J. Beyond parenting practices: Family context and the treatment of pediatric obesity. *Family Relations* 2008;57:13–23.
39. Lindsay AC, Sussner KM, Kim J, Gortmaker S. The role of parents in preventing childhood obesity. *Future Child* 2006;16(1):169–186. [PubMed: 16532663]
40. Thelen MH, Cormier JF. Desire to be thinner and weight control among children and their parents. *Behavior Therapy* 1995;26:85–99.
41. Dixon RS, Gill JM, Adair VA. Exploring paternal influences on the dieting behaviors of adolescent girls. *Eating Disorders* 2003;11:39–50. [PubMed: 16864286]
42. Epstein LH, Valoski A, Wing RR, McCurley J. Ten-year outcomes of behavioral family-based treatment for childhood obesity. *Health Psychology* 1994;13:373–383.
43. Temple JL, Wrotniak BH, Paluch RA, Roemmich JN, Epstein LH. Relationship between sex of parent and child on weight loss and maintenance in a family-based obesity treatment program. *International Journal of Obesity* 2006;30:1260–1264. [PubMed: 16491111]
44. Keery H, Eisenberg ME, Boutelle K, Neumark-Sztainer D, Story M. Relationships between maternal and adolescent weight-related behaviors and concerns: The role of perception. *Journal of Psychosomatic Research* 2006;61:105–111. [PubMed: 16813852]

	High Demandingness	Low Demandingness
High Responsiveness	<p>Authoritative Empathic and respectful of child's opinions, but maintains clear boundaries/expectations</p>	<p>Permissive Empathic, but Indulgent without discipline.</p>
Low Responsiveness	<p>Authoritarian Low warmth and strict discipline</p>	<p>Neglectful Emotionally uninvolved and does not set rules or have expectations</p>

Figure 1. Parenting Styles*

*Table adapted from: (a) Baumrind D. Rearing competent children. In Damon (Ed.), *Child development today and tomorrow*. San Francisco: Josey-Bass; 1989, pp.349-378 and (b) Rhee KE, Lumeng JC, Appugliese DP, Kaciroti N, Bradley RH. Parenting styles and overweight status in first grade. *Pediatrics*. 2006;117:2047-2054.

Figure 2a

Figure 2b

Figure 2. Probabilities of Parenting style by Gender and Age in Project EAT

Figure 2a: Maternal Parenting Style

Figure 2b: Paternal Parenting Style

Table 1
Cross-Sectional Regression Models of Parenting Style and Frequency of Family Meals in Project EAT

Frequency of Family Meals Cross-Sectional Analyses (Model 1) ⁺		Parenting Style			
Degrees of Freedom	P Value	Authoritative	Authoritarian	Permissive	Neglectful
DAUGHTERS					
<i>Mother's Parenting Style & Mean Frequency of Family Meals per Week</i>					
Younger Cohort (n = 777)	.010	5.15 ^a	4.48 ^b	4.78 ^{a,b}	4.23 ^b
Older Cohort (n = 1473)	<.001	3.68 ^a	2.95 ^{b,c}	3.42 ^{a,b}	2.64 ^c
<i>Father's Parenting Style & Mean Frequency of Family Meals per Week</i>					
Younger Cohort (n = 727)	.010	4.99 ^a	4.46 ^{a,b}	4.99 ^{a,b}	4.20 ^b
Older Cohort (n = 1381)	<.001	3.82 ^a	2.83 ^b	3.45 ^a	2.60 ^b
SONS					
<i>Mother's Parenting Style & Mean Frequency of Family Meals per Week</i>					
Younger Cohort (n = 766)	<.001	4.74 ^{a,b}	4.19 ^{a,c}	5.07 ^b	3.81 ^c
Older Cohort (n = 1495)	<.001	4.32 ^a	3.50 ^b	3.55 ^b	2.70 ^c
<i>Father's Parenting Style & Mean Frequency of Family Meals per Week</i>					
Younger Cohort (n = 723)	.023	4.73 ^{a,b}	4.06 ^a	4.79 ^b	4.23 ^{a,b}
Older Cohort (n = 1420)	<.001	3.83 ^a	3.48 ^a	3.83 ^a	2.93 ^b

Key:

⁺ All models adjusted for Age, Ethnicity/Race and SES

Letter superscripts^{a,b,c} indicate results of post-hoc comparison of means. Means with **different** letters are significantly different at $p < .01$. For all means, higher values indicate higher frequency of family meals.

Table 2
Longitudinal Regression Models of Parenting Style and Frequency of Family Meals in Younger Project EAT (1998-1999) Cohort[†]

Frequency of Family Meals Longitudinal Analyses (Model 2) ⁺					
Degrees of Freedom	P Value	Parenting Style	Mean Frequency of Family Meals per Week		
		Authoritative	Authoritarian	Permissive	Neglectful
<i>DAUGHTERS (n = 438)</i>					
Frequency of Family Meals & Mothers' Parenting Style;	3	.135	3.12	2.80	3.01
Frequency of Family Meals & Fathers' Parenting Style;	3	<.001	3.52 ^a	2.75 ^{a,b}	2.67 ^{a,b}
<i>SONS (n = 362)</i>					
Frequency of Family Meals & Mothers' Parenting Style;	3	.039	2.84 ^a	2.38 ^{a,b}	2.72 ^{a,b}
Frequency of Family Meals & Fathers' Parenting Style;	3	.441	2.70	2.38	2.48

Key:

⁺ All models adjusted for Age, Ethnicity/Race and SES

[†] Longitudinal analyses only run in younger cohort because family meals question was not asked of older cohort at T2

Letter superscripts^{a,b} indicate results of post-hoc comparison of means. Means with **different** letters are significantly different at $p < .01$. For all means, higher values indicate higher frequency of family meals.