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Eat this, not that! Parental demographic correlates of food-related parenting practices

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Abstract

To understand how parents of adolescents attempt to regulate their children's eating behaviors, the prevalence of specific food-related parenting practices (restriction, pressure-to-eat) by sociodemographic characteristics (parent gender, race/ethnicity, education level, employment status, and household income) were examined within a population-based sample of parents (n=3709) of adolescents. Linear regression models were fit to estimate the association between parent sociodemographic characteristics and parental report of food restriction and pressure-to-eat. Overall, findings suggest that use of controlling food-related parenting practices, such as pressuring children to eat and restricting children's intake, is common among parents of adolescents, particularly among parents in racial/ethnic minority subgroups, parents with less than a high school education, and parents with a low household income. Results indicate that that social or cultural traditions, as well as parental access to economic resources, may contribute to a parent's decision to utilize specific food-related parenting practices. Given that previous research has found that restriction and pressure-to-eat food-related parenting practices can negatively impact children's current and future dietary intake, differences in use of these practices by sociodemographic characteristics may contribute, in part, to the disparities that exist in the prevalence of overweight and obesity among adolescents by their race/ethnicity and socioeconomic status.

Keywords

Parenting practices; feeding practices; feeding strategies; parents; adolescents; restriction; pressure-to-eat; socio-demographics; cross-sectional study

Introduction

Food-related parenting practices, or the techniques that parents use to influence children's eating, have been identified as a potentially significant correlate of child weight and dietary intake patterns¹. Food-related parenting practices (often referred to as parental feeding practices within research conducted on infants and toddlers) consist of a wide range of behaviors including encouraging children to eat, or not eat, specific foods; requiring children

to clean their plate at mealtimes; rewarding behaviors with favorite foods; and restricting the intake of particular foods (both healthy and unhealthy)². Use of food-related parenting practices such as pressuring children to eat and restricting children's intake is believed to have a harmful impact on children's current and future dietary intake in that this encouragement overrides children's innate, internal hunger and satiety cues. Instead, these food-related parenting practices encourage children to eat in response to external cues including factors in the social environment (e.g. eating at specific times) and the size of food portions offered to them (e.g. cleaning one's plate) (Birch, 1998; Birch, 1999; Faith, Scanlon, Birch, Francis, & Sherry, 2004; Galloway, Fiorito, Francis, & Birch, 2006; Savage, Fisher, & Birch, 2007). Alternatively, an "appropriate division of responsibility" is often proposed as a more appropriate approach to food-related parenting⁷⁻¹⁰. In this approach the parent controls which foods are made available and offered to the child, who in turn decides whether and how much to eat.

Although the use of appropriate food-related parenting practices is increasingly supported as a method to promote healthful dietary intake and weight among young people^{6,11}, evidence of the association between food-related parenting practices and child eating and weight status remains equivocal with a number of studies reporting no association¹²⁻¹⁴. Further, the bulk of research examining these practices has been conducted with parents of toddlers and young children limiting the scope of our understanding to parents of the very young¹. On one hand, young children are an appropriate target population for initial exploration of food-related parenting practices given that children at this age are primed for learning new behaviors and are primarily influenced by their parents. However, parents *do* influence adolescent dietary intake patterns and dietary behaviors established during adolescence often become lifelong in nature¹⁵. Given the high prevalence of weight-related problems in adolescents¹⁶ and the difficulty parents can encounter in providing a balance of structure and autonomy for their adolescent children, additional research is needed to explore what specific types of food-related parenting practices are being utilized by parents of adolescents.

Additionally, few studies of food-related parenting practices have been conducted with diverse samples of children and adolescents¹. Preliminary research suggests that both the extent to which parents adopt a controlling approach to child feeding and the role that level of control within feeding strategies plays in child dietary patterns and weight status may differ across families, specifically with regard to race/ethnicity, parental education, or socioeconomic differences^{14,17-20}. A small study which included both white and African American children with an average age of 11, found that African American mothers reported higher levels of restriction, pressure-to-eat, and monitoring of their child's food intake compared to white mothers²¹. Interestingly though, controlling feeding practices were not found to be associated with higher BMI for African-American children whereas they were for white children. Higher education level and SES have also been positively associated with the use of restrictive food-related parenting practices and negatively associated with the use of pressure-to-eat practices within samples of young children²²⁻²⁶. These findings suggest that social (e.g. race, sex) and economic (e.g. education, income) influences may be associated with the types of food-related parenting practices utilized by parents as well as the impact of these feeding practices on child dietary patterns and weight status. However, research exploring these associations is limited and has yielded inconsistent findings suggesting that this is an area of research that requires continued exploration¹.

Moreover, few studies of food-related parenting practices have included separate assessments of these behaviors by mothers and fathers limiting the ability to explore potential associations between parent gender and use of specific food-related parenting practices. Thus far, results have been inconclusive²⁷⁻²⁹. For example, Brann and colleagues

concluded that fathers used higher levels of restriction and pressure-to-eat techniques than mothers²⁸. On the other hand, two other studies, one by Johansson and colleagues and the other by Blissett and colleagues, found no notable differences in strategies utilized by parent gender^{27,29}. Clarification of the association between gender and food-related parenting practices with their children is needed in order to gain a clearer picture of the home food environment and how parental gender may play a role in adolescent eating patterns.

The current study aims to address the question: How do food-related parenting practices, specifically restriction and pressure-to-eat among parents of adolescents, differ across sociodemographic characteristics, including parent gender, race/ethnicity, education level, employment status, and household income? This study will fill an important gap in the literature by being the first study, to our knowledge, to examine specific food-related parenting practices utilized by parents of adolescents and differences across sociodemographic characteristics.

Methods

Study Population and Design

Data for the current study were drawn from Project FEAT (Families and Eating and Activity Among Teens), a population-based study of parents of adolescents. Project F-EAT surveys were completed by a sample of 3,709 parents or guardians of the adolescents enrolled in EAT 2010 (Eating and Activity in Teens). The EAT 2010 study population included 2,793 adolescents from 20 public middle and high schools in the Minneapolis/St Paul metropolitan area of Minnesota. Adolescent participants completed surveys during the 2009-2010 school year and as a part of this survey process, each participant was asked to provide contact information for up to two parents or guardians whom they perceived to be their main caregivers. Approximately 30% of the adolescents provided contact information for one parent/guardian and 70% provided information for two parents/guardians. The response rate among parents was high; 85% of the adolescents had at least one parent respond and 68% of the adolescents who provided information on two parents had both parents respond. The vast majority (95.1%) of respondents (henceforth referred to as parents) were parents or stepparents of the adolescent, with the remaining participants (4.9%) reporting they were "other female or male guardians".

Parent respondents had a mean age of 42.3 years (SD=8.6) and approximately 62% were mothers or other female guardians. The Project F-EAT parent sample is ethnically and socioeconomically diverse. Specifically, the sample was 29.7% white, 26.1% African American, 21.4% Asian American (primarily Hmong), 17.4% Hispanic, and 5.4% mixed or other race/ethnicity. The sample was well distributed across categories of household income: 32% of households earning less than \$20,000 annually, 22% earning between \$20,000 – \$34,999, 17% earning between \$35,000 - \$49,000, 14% earning between \$50,000 - \$74,000, and 15% earning \$75,000 or more. Additional details on the parent sample can be found in Table 1.

Data Collection

Parents were initially mailed an invitation letter describing the Project F-EAT study and a phone number to call if they preferred to complete the survey over the telephone. A follow-up mailing included the Project F-EAT survey, a consent form, and a postage-paid return envelope. To enhance participant response, parents were mailed a reminder postcard after two weeks and a second copy of the survey if they did not respond within one month. Additionally, up to eight attempts were made by trained interview staff to contact nonresponders so they might complete the survey by phone. To meet the needs of the

diverse sample, both mailed surveys and phone interviews were available in English, Spanish, Hmong, and Somali, and the phone interview was additionally offered in Oromo, Amharic, and Karen. The majority of parent surveys were completed by mail (78%) and in English (84%). Data collection ran from October 2009- October 2010 and was conducted by the Wilder Research Foundation in St. Paul, Minnesota (www.wilderresearch.org). The University of Minnesota Institutional Review Board approved all study procedures.

Survey Development

The Project F-EAT survey was designed to gather information on adolescents' family and home environments with relevance to dietary intake, physical activity, and weight-related health. Survey items were drawn from several sources, including a previous Project EAT parent survey³⁰, corresponding measures from the EAT 2010 student survey (Dianne Neumark-Sztainer et al., 2012), and existing surveys from the scientific literature. New questions were also developed by the research team as needed to address the study aims.

After a draft of the Project F-EAT survey was prepared, several steps were undertaken to ensure the questions were appropriate for the intended audience and to minimize participant burden. Initially, content area experts reviewed the survey to ensure that key constructs relevant to adolescent weight-related behaviors and outcomes were included. Further, survey appropriateness for the major cultural groups participating in the study (i.e., Native American, Hmong, Latino, Somali and African American groups) was addressed by having bi-cultural staff from the Wilder Research Foundation review the survey and provide feedback on the appropriateness and relevance of the survey items. Next, three focus groups were conducted to pre-test an initial draft of the Project F-EAT survey. Feedback from 28 socioeconomically and ethnically/racially diverse parent participants was used to reword or eliminate problematic survey items and expand on topic areas of perceived importance (e.g., family meals, conversations about weight at home). An additional sample of 102 parents completed the Project F-EAT survey twice in a two-week time period to examine test-retest reliability of survey questions. Finally, scale psychometric properties were examined within the full Project F-EAT sample.

Once a final version of the survey was developed in English, the written survey was professionally translated into Spanish, Somali and Hmong. Following translation, bilingual staff members from the Wilder Research Foundation reviewed the translated survey, adjustments to translation were made when appropriate, and the updated surveys were returned to the original translators for final review and approval.

Measures

Specific food-related parenting practices were self-reported by parents using ten questions drawn from Child Feeding Questionnaire (CFQ) developed by Birch and colleagues³² which was designed to assess what is often referred to within the extant literature as parental feeding practices. The term food-related parenting practices was developed for, and utilized throughout, this manuscript in an effort to better reflect the relationship between parent and adolescent with regard to food and feeding, whereby the parent does not actually engage in "feeding" as they might with a toddler or young child.

Restrictive food-related parenting practices were measured using six items from the eight-item Restriction Subscale of the CFQ, a subscale designed to measure a parent's attempt to control a child's eating by restricting access to palatable foods. Two items from the subscale were dropped based on recommendations from a validation study conducted within a diverse adolescent population³³. The six self-report items included: 1) "I have to be sure that my child does not eat too many high fat foods," 2) "I have to be sure that my child does not eat

too many sweets (candy, ice cream, cake or pastries),” 3) “I have to be sure that my child does not eat too much of his/her favorite foods,” 4) “If I did not guide or regulate my child’s eating, he/she would eat too much of his/her favorite foods,” 5) “I intentionally keep some foods out of my child’s reach,” and 6) “If I did not guide or regulate my child’s eating, he/she would eat too many junk foods.” Individual items were measured using a 4-point Likert scale, with each point on the scale represented by a word anchor (disagree, slightly disagree, slightly agree, and agree). For the current analyses, parent agreement with a particular statement was defined as a response of slightly agree or agree. An *overall parental restriction* scale was created by averaging responses to each of these six questions to assign an overall restriction score ranging from 1 (low restriction) to 4 (high restriction). (Test-retest $r = 0.72$, Cronbach’s $\alpha = 0.86$).

Pressure-to-eat food-related parenting practices were measured using all four items from the Pressure-to-Eat Subscale of the CFQ, a subscale designed to measure the degree to which the parent encourages their child to eat more food, typically at mealtimes³². Self-report items included: 1) “My child should always eat all the food on his/her plate,” 2) “I have to be especially careful to make sure my child eats enough,” 3) “If my child says, ‘I’m not hungry,’ I try to get him/her to eat anyway,” and 4) “If I did not guide or regulate my child’s eating, my child would eat much less than he/she should.” Individual items were measured using a 4-point Likert scale, with each point on the scale represented by a word anchor (disagree, slightly disagree, slightly agree, and agree). For the current analyses, parent agreement with a particular statement was defined as a response of slightly agree or agree. An *overall parental pressure-to-eat* scale was created by averaging responses to each of these four questions to assign an overall pressure score ranging from 1 (low pressure) to 4 (high pressure). (Test-retest $r = 0.73$, Cronbach’s $\alpha = 0.70$).

Sociodemographic characteristics were assessed by self-report. *Educational attainment* was assessed with the question: “What is the highest grade or year of school that you have completed?” (Test-retest $r = 0.84$). Response options included ‘Did not finish high school’, ‘Finished high school or got GED’, ‘Some college or training after high school’, ‘Finished college’, and ‘Advanced degree’. Due to small sample size, ‘finished college’ and ‘advanced degree’ categories were collapsed for analysis. *Household income level* was assessed with the question: “What was the total income of your household before taxes in the past year?” (Test-retest $r = 0.94$). Six response option categories were offered: ‘less than \$20,000’, ‘\$20,000 to \$34,999’, ‘\$35,000-\$49,000’, ‘\$50,000 to \$74,999’, ‘\$75,000 - \$99,999’, and ‘\$100,000 or more’. Due to small sample size, the top two income response options were collapsed for analysis. *Race/ethnicity* was assessed with the question: “Do you think of yourself as 1) white, 2) black or African-American, 3) Hispanic or Latino, 4) Asian-American, 5) Hawaiian or Pacific Islander, 6) American Indian or Native American and 7) Mixed or Other Race” and respondents were asked to check all that apply (Test-retest percent agreement = 92%). Hawaiian/Pacific Islander and American Indian/Native American were also categorized as ‘mixed/other race,’ due to small numbers. *Employment status* was assessed with the question: “Which of the following best describes your current work situation?” (Test retest $r = 0.82$). Response options included: ‘working full-time’; ‘working part-time’; ‘stay-at-home caregiver’; ‘currently unemployed but actively seeking work’; and ‘not working for pay’. For the current analyses the final two categories were collapsed to form an “unemployed” category.

Other covariates—To assess *adolescent weight status* students’ heights and weights were measured by trained research staff using standardized equipment and procedures. *Parent weight status* was calculated from self-reported height and weight. Body Mass Index (BMI) was calculated using the formula weight in kilograms divided by height in meters squared. *Parent and child gender* were self-reported.

Statistical Analysis

Simple frequencies for each of the ten specific food-related parenting practices were calculated across parent sociodemographic characteristics. Chi-square tests were used to examine whether the proportion of parents who slightly agreed/agreed with each statement varied by sociodemographic subgroups. Separate general linear regression models were fit to estimate the association between parent demographic characteristics (the independent variable) and parental report of overall level of restriction and pressure-to-eat (the dependent variables). Regression models were estimated for each of the outcomes: models included all socio-demographic characteristics simultaneously entered into each model to obtain the independent association between the demographic variable of interest and parent feeding practice component. Further, this second regression model included adjustment for parent and adolescent body mass index as well as adolescent gender. In order to account for potential clustering of parent responses when two parents of the same child responded to the survey, we used a robust variance estimator to correct for within cluster variance (Williams, 2000). In the mutually adjusted model, adjusted means and difference in means were calculated for each level of the demographic characteristics. If the overall F-statistic was found to be significant, post-hoc pairwise contrast tests were used to highlight sources of differences between adjusted means; superscripts are utilized to identify groups that differ significantly. Analyses were conducted using SAS 9.2 (Cary, NC).

Results

Specific food-related parenting practices by sociodemographic characteristics

Findings suggest that many parents report exercising some level of control over their adolescent with regard to how much food to eat, as well as what types of foods the adolescent should avoid (Table 1). However, the percentage of parents self-reporting agreement (full or slight) with particular food-related parenting practices varied considerably by parent sociodemographic characteristics. For example, parental agreement with the statement that “My child should always eat all food on his/her plate”, differed significantly by parent gender, race/ethnicity, education, employment status and household income. Specifically, 70.0% of Hispanic/Latino and Asian American parents reported agreement regarding requiring children to eat all the food on their plate at mealtimes, whereas 58.2% of African American parents, 55.2% of mixed race parents, and 34.5% of white parents agreed that children should eat all the food on their plates. Parental agreement with the statement, “I intentionally keep some foods out of my child’s reach,” differed significantly by race/ethnicity, education, employment status and household income. For example, 37.5% of parents in the lowest household income bracket reported agreeing that they kept some foods out of reach of their adolescent, as compared to 35.7% of parents in the low-middle income bracket, 33.9% of parents in the middle income bracket, 28.3% in the mid-high income bracket and 24.7% of parents in the high income bracket.

Parent report of restriction and pressure-to-eat: Associations with sociodemographic characteristics

The mean level of *overall parental restriction* reported by parents was 2.51 [(scale range: 1 (strongly disagree) to 4 (strongly agree)] indicating that, on average, parents within the sample reported engaging in a moderate level of overall restriction with their adolescent children. Level of restrictive feeding was found to differ significantly by both race/ethnicity and household income after adjustment for other sociodemographic characteristics (Table 2). Non-white parents utilized significantly higher levels of restriction compared to white parents. Specifically, post-hoc pairwise contrast tests revealed that Asian American parents reported the highest level of restriction, followed by African American and Hispanic/Latino parents. A significant decreasing trend was found between household income and parent

report of restrictive feeding practices with parents who reported earning more than \$50,000 per year reporting the lowest use of restriction. No significant differences were seen in parent self-report of restrictive feeding practices by parent gender, education level or employment status.

The mean level of *overall pressure-to-eat* reported by parents was 2.21 [(scale range: 1 (strongly disagree) to 4 (strongly agree))] indicating that on average, parents within the sample reported using a low-to-moderate level of pressure-to-eat with their adolescent child. Parental report of pressure-to-eat feeding strategies varied significantly by parent gender, race/ethnicity, parental education level and employment status and household income after adjustment for other sociodemographic characteristics (Table 2). Fathers reported significantly higher levels of pressure-to-eat than mothers. Non-white parents utilized significantly higher levels of pressure-to-eat compared to white parents. Post-hoc pairwise contrast tests revealed that Asian American parents utilized the highest level of pressure-to-eat followed by Hispanic/Latino parents and African American parents. A significant decreasing trend was found between level of parental education and use of pressure-to-eat strategies with parents reporting at least some college education reporting the lowest use of this strategy. Employment status was significantly associated with mean parent report of pressure-to-eat with parents that reported full-time employment reporting the lowest level of pressure-to-eat behaviors compared to parents who worked part-time, worked as stay-at-home caregivers, or were unemployed. Household income was also negatively associated with level of pressure-to-eat with parents earning more than \$50,000 per year reporting the lowest use of pressure-to-eat behaviors. No significant differences were seen in parent self-report of pressured feeding practices by employment status.

Discussion

This study examined the prevalence of several food-related parenting practices across sociodemographic characteristics of parents of adolescents. Findings suggest that use of controlling food-related parenting practices, such as pressuring children to eat and restricting children's intake, is common among parents of adolescents, particularly among parents in racial/ethnic minority subgroups, parents with less than a high school education, and parents with a low household income. Results indicate that that social or cultural traditions, as well as parental access to economic resources, may contribute to a parent's decision to utilize specific feeding practices. Further, given that previous research has found that the use of controlling food-related parenting practices can negatively impact children's current and future dietary intake¹ differences in use of these practices by sociodemographic characteristics may contribute, in part, to the disparities that exist in the prevalence of overweight and obesity among adolescents by their race/ethnicity and socioeconomic status (Ogden et al., 2010).

To our knowledge, this is the first research study to explore the specific types of food-related parenting practices utilized by parents to influence the dietary patterns of their adolescent children. Given the high prevalence of overweight in adolescents and the delicate balance parents of adolescents often encounter in providing structure versus freedom for their adolescent children as their children deal with issues of personal growth and autonomy, it is important to explore the food-related parenting practices within this population. A particularly interesting finding is that higher levels of both overall parental restriction and pressure-to-eat coexist within certain population subgroups. For example, non-white parents were found to have the highest levels of both overall restriction and pressure-to-eat. High levels of both pressure-to-eat and restriction were also reported by parents with the lowest household income and the lowest educational attainment. While at first it might seem counterintuitive that parents would engage in high levels of both of these seemingly

conflicting feeding practices, a closer look at the individual items that compose the restriction and pressure-to-eat scale can provide clarity to what food-related parenting might look like in a home where high levels of both practices coexist. Parents in these homes appear to exhibit a great deal of overall control with regard to their adolescents' eating behaviors, both by pressuring them to eat at certain times (e.g. cleaning their plate at a meal, asking them to eat after they have said they are full) and by restricting their access to, or consumption of, particular foods at other times (e.g. keeping certain foods out of reach, regulating the consumption of particular foods). While these food-related parenting practices may represent well-intentioned efforts to help adolescents achieve and maintain health stemming from parental concern about a child's weight³⁴, previous research conducted with young children suggests that the use of controlling food-related parenting practices may have unintended adverse effects^{1,7,24,35,36}. In particular, it may diminish the extent children rely on their own hunger and satiety cues to initiate and terminate eating, resulting in the overconsumption of calories throughout the day^{1,4,23,24,37}. This type of dietary disinhibition is particularly concerning given that the prevalence of these pressure-to-eat behaviors was highest among sub-groups of parents whose adolescents are most vulnerable to weight-related problems, including adolescents in racial/ethnic minority and low income subgroups. The current findings suggest that future research should seek to understand the impact of controlling food-related parenting practices during adolescence, particularly within populations who report the highest use of these behaviors.

Results of the present study suggest that parental access to socio-economic resources (e.g. income, education, employment status) plays a role in a parent's decision to utilize specific food-related parenting practices. Specifically, parents with greater access to economic resources (higher income, more education, full-time employment) reported less controlling food-related parenting practices compared to parents of lower socio-economic status. While the mechanisms underlying the influence of particular economic resources on food-related parenting practices were not examined within the present study, a close examination of the individual food-related parenting practices endorsed by parents helps to shed light on why a parent's socioeconomic status might motivate the use of particular feeding strategies. For example, a surprising number of parents reported concern about their adolescent child not eating enough food. This concern was most prevalent among parents in racial/ethnic minority subgroups and those parents with less access to economic resources. Parents' actions may reflect their concern about their adolescent not eating enough in that it was also common for parents to report requiring their child to eat all of the food on their plate at mealtimes or encouraging their child to keep eating even when they were not hungry. A small qualitative study of parents conducted by Sherry and colleagues revealed similar concerns and feeding behaviors among low income mothers lending support to the idea that exposure to economic hardship, and possibly food insecurity, may alter food-related parenting practices such that parents who face these struggles are more likely to utilize pressure-to-eat and restriction techniques. Researchers posit that in families where low income results in constant or periodic food insecurity, parents feel added pressure to encourage food consumption when food is readily available and simultaneously may restrict access to certain "unhealthy" desired foods to ensure that their child is sufficiently hungry to eat food of higher nutritional quality³⁸⁻⁴⁴. Future research aimed at clarifying the association between socioeconomic status, and specifically exposure to food insecurity, and food-related parenting practices within a population-based sample of parents of adolescents is warranted.

We found that parents from ethnic/racial minority groups reported significantly higher levels of both restriction and pressure-to-eat relative to white parents. Specifically, Asian American parents (primarily Hmong in this sample) reported the highest level of both behaviors. This finding is novel, and may reflect cultural experiences unique to this ethnic

group. Parenting practices are thought to reflect, in part, parents' responses to perceived environmental threats to goals they have for their children^{3,4,6}. While many parental goals for children are universal (e.g. health and wellbeing) perceived threats can differ by racial/ethnic background and circumstances⁶. For example, many of the Asian American parents in our sample are first or second generation immigrants to the country and therefore the increased level of control they aim to exert over their adolescents' eating patterns might stem from a real or perceived threat (e.g. food scarcity) related to their immigration experience, or the immigration experience of their parents or grandparents⁴⁵. Because feeding practices are a part of culture and tradition, they do not easily change and parents tend to continue to use traditional feeding practices routinely and automatically even in the face of dramatic changes to their food environment^{4,6}. Levels of overall pressure-to-eat and restriction were also high among African American, Hispanic, and mixed race parents compared to white parents, even after adjustment for other sociodemographic characteristics, indicating that more research on the use of specific food-related parenting practices across different ethnic groups would be of interest and should include an in-depth exploration of parents' motivation for use of specific food-related parenting practices.

Study strengths and limitations should be taken into account when interpreting our study findings. Our use of a large and diverse sample from a large metropolitan area is a study strength. Minneapolis – St Paul has large communities of Hmong and Somali immigrants, who were included in the sample, providing an opportunity to learn about these population groups. An additional study strength was the use a widely accepted and well-validated measurement tool to assess food-related parenting practices, the Child Feeding Questionnaire³². Other strengths include: the high response rate of participating parents and the inclusion of data from fathers in addition to mothers. The current study also has several limitations and findings should be interpreted with these limitations in mind. First, because of the observational study design, we cannot exclude residual confounding by imperfectly measured or unmeasured confounders. For example, while mutually adjusted analyses allowed us to reduce issues of confounding due to the correlation that often exists between race/ethnicity and socioeconomic status within the United States, this issue may not have been entirely eliminated and residual confounding may still exist. Further, measurement limitations include the potential for differential self-report bias by sociodemographic characteristics (e.g., one group may over-report behaviors that they perceive to be desirable compared to another group.) Furthermore, the study utilized an incomplete assessment of parental feeding strategies. The Child Feeding Questionnaire includes three subscales (monitoring, pressure-to-eat, and restriction) which measure parental use of specific feeding strategies to maintain control over a child's eating. However, to date, research has not revealed significant associations between parental monitoring and child weight or other weight-related outcomes and thus, to reduce participant burden and promote a good response rate, only the pressure-to-eat and restriction subscales were included in the Project F-EAT survey given to parents.

Conclusions

Findings from the current study suggest that use of controlling food-related parenting practices, such as pressuring children to eat and restricting children's intake, is common among parents of adolescents, particularly among parents in racial/ethnic minority subgroups, parents with less than a high school education, and parents with a low household income. Given that previous research has found that the use of controlling food-related parenting practices can negatively impact children's current and future dietary intake¹ differences in use of these practices by sociodemographic characteristics may contribute, in part, to the disparities that exist in the prevalence of overweight and obesity among adolescents by their race/ethnicity and socioeconomic status¹⁶. Future research aimed at

exploring the association between food-related parenting practices and adolescent weight-related outcomes within population-based samples is needed and should include an exploration of potential interactions by sociodemographic characteristics. Dietitians, physicians, and other health care providers working with parents of adolescents should take time to explore the types of food-related parenting practices utilized within the home as well as the motivation behind the feeding practices prior to making clinical recommendations. For example, it might be important for practitioners working with adolescents and their parents to ask about the level of food security within the home and the role that the availability of food has on a parent's decision to exert control over their adolescents eating behaviors.

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Table 1

Parent endorsement (%) of specific food-related parenting practices by parental demographic characteristics

Demographic Characteristics		Pressure-to-eat behaviors Parent Agree *, %			Restriction behaviors Parent Agree *, %			I intentionally keep some foods out of my child's reach.			
		My child should always eat all of the food on his/her plate;	I have to be especially careful to make sure my child eats enough.	If my child says, "I am not hungry," I try to get him/her to eat anyway.	If I did not guide or regulate my child's eating, my child would eat much less than he/she should.	I have to be sure that my child does not eat too many high fat foods.	I have to be sure that my child does not eat too many sweets.		I have to be sure that my child does not eat too many of his/her favorite foods.	If I did not guide or regulate my child's eating he/she would eat too much of his/her favorite foods.	If I did not guide or regulate my child's eating he/she would eat too many junk foods.
Parent gender											
Male	1210	61.0	47.0	40.3	29.2	61.1	71.5	49.8	51.2	58.1	32.7
Female	1915	51.0	43.3	40.7	25.7	60.3	71.0	48.3	50.5	57.3	33.6
		<0.01	0.04	0.85	0.03	0.65	0.78	0.43	0.74	0.65	0.60
Race/ethnicity											
White	991	34.5	18.5	31.6	13.9	46.2	59.4	35.8	41.8	54.8	27.0
African American	806	58.2	63.8	42.4	21.5	61.4	76.6	49.1	50.5	58.3	37.7
Hispanic/Latino	526	70.0	51.0	43.0	34.8	49.1	70.0	51.5	54.0	55.1	17.9
Asian American	656	69.4	77.1	49.2	49.1	79.1	83.5	68.0	63.9	63.3	36.6
Mixed/other	146	55.5	35.6	43.2	19.9	61.0	70.5	40.4	43.2	56.2	37.0
		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Education											
No high school	872	70.0	66.1	50.1	42.1	69.5	77.4	58.3	61.0	59.6	36.5
High school	687	57.9	51.1	40.0	29.0	62.6	73.2	49.5	48.8	57.4	33.8
Some college	834	51.0	34.2	39.1	20.4	56.7	69.8	46.3	50.1	60.2	34.2
Finished college	732	38.4	25.4	31.3	14.9	52.5	63.5	40.0	41.3	52.5	28.0
		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Employment status											
Full-time	1676	50.4	38.2	36.9	23.7	57.5	68.3	47.0	49.2	56.1	31.1
Part-time	465	56.1	44.1	43.0	26.5	63.0	72.9	49.9	49.9	55.1	34.2
At-home caregiver	306	65.0	58.8	43.5	31.7	62.1	71.2	52.0	52.3	62.4	37.6
Unemployed	678	60.6	55.0	46.5	33.5	65.9	77.1	51.5	54.7	60.9	36.0

[illegible]

* Parent agreement with a particular statement was defined as a response of slightly agree or agree.

Table 2

Overall pressure-to-eat and restriction by parent demographic characteristics

	N	Parental Pressure-to-eat Score Scale range: 1(low) to 4 (high)	Difference in Means <i>t</i>	Mutually Adj. Means	Parental Restriction Score Scale range: 1(low) to 4 (high)	Difference in Means <i>t</i>
Parent gender						
Male	1254	2.30 ^a (2.25, 2.34)	Referent	2.53(2.49, 2.58)	Referent	
Female	2018	2.16 ^b (2.12, 2.20)	0.14 (0.09, 0.18)	2.51 (2.47, 2.55)	0.02 (−0.02, 0.07)	
<i>p-value</i>			<0.01			0.38
Race/ethnicity						
White	1007	1.88 ^a (1.82, 1.94)	Referent	2.33 ^a (2.26, 2.40)	Referent	
African American	852	2.20 ^b (2.14, 2.27)	−0.33 (−0.41, −0.24)	2.55 ^b (2.47, 2.62)	−0.22 (−0.31, −0.12)	
Hispanic/Latino	575	2.32 ^c (2.24, 2.40)	−0.44 (−0.54, −0.34)	2.45 ^b (2.36, 2.55)	−0.12 (−0.23, −0.01)	
Asian American	685	2.61 ^d (2.54, 2.68)	−0.73 (−0.82, −0.64)	2.84 ^c (2.75, 2.91)	−0.51 (−0.61, −0.40)	
Mixed/other	153	2.13 ^b (2.01, 2.26)	−0.26 (−0.39, −0.13)	2.41 ^{ab} (2.26, 2.56)	−0.08 (−0.24, 0.08)	
<i>p-value</i>			<0.01			<0.01
Education						
No high school	946	2.38 ^a (2.32, 2.45)	Referent	2.54(2.47, 2.61)	Referent	
High school	717	2.26 ^b (2.19, 2.33)	0.12 (0.05, 0.20)	2.51 (2.43, 2.58)	0.03 (−0.05, 0.12)	
Some college	859	2.17 ^c (2.11, 2.24)	0.21 (0.13, 0.29)	2.53 (2.46, 2.60)	0.01 (−0.07, 0.10)	
Finished college	750	2.09 ^d (2.03, 2.16)	0.29 (0.20, 0.38)	2.49(2.40, 2.56)	0.06 (−0.04, 0.15)	
<i>p-value</i>			<0.01			0.26
Employment Status						
Full-time	1742	2.17 ^a (2.13, 2.22)	Referent	2.49 (2.43, 2.54)	Referent	
Part-time	490	2.21 ^{ab} (2.14, 2.28)	−0.04 (−0.11, 0.03)	2.55 (2.47, 2.63)	−0.06 (−0.15, 0.02)	
At-home caregiver	324	2.26 ^b (2.17, 2.34)	−0.09 (−0.19, −0.00)	2.50 (2.40, 2.60)	−0.01 (−0.12, 0.09)	
Unemployed	716	2.24 ^b (2.18, 2.31)	−0.07 (−0.15, −0.00)	2.52 (2.44, 2.59)	−0.03 (−0.11, 0.05)	
<i>p-value</i>			0.04			0.45
Household income						
< \$20,000	1077	2.39 ^a (2.33, 2.44)	Referent	2.58 ^a (2.51, 2.65)	Referent	

	Parental Pressure-to-eat Score Scale range: 1(low) to 4 (high)		Parental Restriction Score Scale range: 1(low) to 4 (high)	
	N	Mutually Adj. Means ¹ Difference in Means	Mutually Adj. Means ¹ Difference in Means	Difference in Means
\$20,000 – \$34,999	725	2.3 ^a (2.25, 2.38)	2.59 ^a (2.51, 2.66)	–0.01 (–0.10, 0.09)
\$35,000 – \$49,999	547	2.22 ^b (2.15, 2.30)	2.55 ^a (2.46, 2.64)	0.03 (–0.08, 0.13)
\$50,000 – \$74,999	434	2.13 ^c (2.04, 2.22)	2.41 ^b (2.32, 2.51)	0.16 (0.05, 0.28)
\$75,000 or more	489	2.09 ^d (2.00, 2.19)	2.45 ^b (2.34, 2.56)	0.13 (0.00, 0.26)
<i>p-value</i>		<0.01		0.03

¹ Means and *P*-values are mutually adjusted for demographic characteristics (gender, race/ethnicity, education, employment status, household income) and parent and adolescent weight.

² Means with different alphabetical superscripts are statistically different at an alpha level of *p*<0.05.