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Are food restriction and pressure-to-eat parenting practices associated with adolescent disordered eating behaviors?

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Abstract

Objective—To examine associations between parental pressure-to-eat and food restriction and adolescent disordered eating behaviors, within a sample of parent-adolescent pairs.

Method—Adolescents (N=2231) and their parents (N=3431) participated in two, coordinated, population-based studies designed to examine factors associated with weight and weight-related behaviors in adolescents.

Results—Overall, higher levels of pressure-to-eat or food restriction was significantly and positively associated with use of disordered eating behaviors among boys. For every one unit increase [Scale Range: 1-(low control) to 4 – (high control)] in mothers' food restriction, boys were twice as likely to engage in extreme weight control behaviors ($p < 0.01$). Examination of the association between food-related parenting practices and disordered eating behaviors among girls revealed fewer significant associations. However, analyses did reveal that for every one unit increase in mothers' food restriction, girls were 1.33 times more likely to engage in extreme weight control behaviors ($p=0.04$).

Discussion—Study findings provide evidence of an association between controlling food-related parenting practices and adolescent disordered eating behaviors, particularly in boys. Future longitudinal research is needed to establish directionality of observed associations.

INTRODUCTION

Disordered eating behaviors are of great concern for adolescent health given their high prevalence and harmful consequences (1). Thus, it is important to identify potentially modifiable factors that contribute to the development of disordered eating behaviors in adolescents. There is a growing body of evidence that many parental behaviors and other factors within the family environment are significant predictors of adolescent disordered eating behaviors. Research demonstrates parental weight-related attitudes and behaviors (2,3), specific family traditions(4,5), family norms around weight-based teasing and weight and body talk (6,7), have been shown to be associated with an adolescents engagement with disordered eating behaviors. Although a number of family factors have been associated with the use of disordered eating behaviors among adolescents, questions remain with regard to

the identification of specific familial factors that can have an impact on youth and are potentially amenable to change via brief interventions.

Controlling food-related parenting practices, including pressuring children to eat and restricting intake of palatable foods, have been associated with children's inability to regulate their own food intake (8–13), as well as the development of harmful eating patterns and cognitions in young girls (8,10,13–15). Pressure-to-eat has been found to be associated with girls' emotional disinhibition, reports of dietary restraint, and disruption of innate self-regulation mechanisms (10,11,16). Food restriction has been found to be associated with disinhibition in the presence of palatable food, increased eating in the absence of hunger, as well as girls' reports of negative emotions (e.g. shame, guilt) in response to eating restricted foods (8,10,13,15,16).

The bulk of research to date on the use and impact of controlling food-related parenting practices has been conducted within samples of young children leaving a gap in our understanding of the relationship between food-related parenting practices and disordered eating behaviors among adolescents. The current study aims to fill this important gap in the adolescent literature by being the first, to our knowledge, to examine associations between food restriction and pressure-to-eat and adolescent disordered eating behaviors within a large population-based sample of parent-adolescent dyads.

METHODS

Study Design and Population

Data for this analysis were drawn from two coordinated, population-based studies: EAT 2010 (Eating and Activity in Teens) was a population-based study of 2,793 adolescents and Project F-EAT (Families and Eating and Activity Among Teens) was a study of parents ($n=3,709$) of the adolescents in EAT 2010. Additional details on the study can be found elsewhere (17,18). All study procedures were approved by the University of Minnesota's Institutional Review Board Human Subjects Committee and participating school districts. The current analytic sample includes EAT 2010 participants who had at least one parent that they lived with at least 50% of the time respond to the Project F-EAT questionnaire. The final sample consisted of 2231 adolescents and 3431 parents. Two parents were included for 67% of the adolescent sample (Table 1).

Measures

Two separate constructs of *food-related parenting practices* (e.g. *food restriction and pressure-to-eat*) were assessed by asking parents ten items from the Child Feeding Questionnaire (CFQ) (19). *Food restriction* was measured using six items (of eight) from the CFQ Restriction Subscale which was designed to measure a parent's attempt to control a child's eating by restricting access to palatable foods. *Pressure-to-eat* was assessed using the full CFQ Pressure-to-Eat Subscale which was designed to measure the degree to which the parent encourages their child to eat more food. Response options were modified slightly from the original CFQ by dropping the 'neutral' response option. *Overall scale scores* were created by averaging responses across each construct (6-item and 4-item, respectively). [Range: 1 (low control) to 4 (high control); Restriction: $r=0.72$, $\alpha=0.86$; Pressure-to-eat: $r=0.73$, $\alpha=0.70$].

To assess *unhealthy and extreme weight control behaviors* participants reported whether they had utilized unhealthy (e.g. fasted, ate very little food, used a food substitute, skipped meals, and smoked more cigarettes) or extreme (e.g. took diet pills, made myself vomit, used laxatives, and used diuretics) weight control behaviors during the past year (Test-retest

agreement = 85% [unhealthy behaviors] and 96% [extreme behaviors]) (6). Participants were classified as engaging in *binge eating* if they responded affirmatively to two questions (20): “In the past year, have you ever eaten so much food in a short period of time that you would be embarrassed if others saw you (binge eating)?” “During the times when you ate this way, did you feel you couldn’t stop eating or control what or how much you were eating” (Test-retest agreement = 90% [first question] and 75% [second question]). *Dieting* was assessed with the question: “How often have you gone on a diet during the last year?” (6). (Test-retest agreement [non-dieter versus dieter] = 82%).

Race/ethnicity, household income level, and parent BMI were based on self-report. *Adolescent weight status* was calculated by using anthropometric data measured by trained research staff.

Statistical Analysis

Poisson regression models with robust variance estimates were fit to estimate the association between each continuous predictor (e.g. pressure-to-eat or restriction) and categorical outcome variable (e.g. dieting, unhealthy and extreme weight control behaviors, and binge eating). Interactions by parent and adolescent sex were examined; subsequently, analyses were stratified by parent and adolescent sex. Prevalence ratios (PRs) and 95% confidence intervals were calculated for all models. Models also included adjustment for potential confounders, including parent race/ethnicity and weight status, household income and adolescent weight status. Analyses were conducted using SAS 9.2 (Cary, NC).

RESULTS

Boys

Overall, adjusted regression analyses indicated that adolescent boys exposed to higher levels of pressure-to-eat or food restriction were significantly more likely to engage in disordered eating behaviors, including dieting and unhealthy and extreme weight control behaviors, compared to boys exposed to lower levels of pressure-to-eat or food restriction (Table 2). For example, for every one unit increase in mothers’ food restriction reported [on a scale ranging from 1 (low restriction) to 4 (high restriction)], boys were 2.07 times more likely to engage in extreme weight control behaviors respectively ($p < 0.01$). Pressure-to-eat by both mothers and fathers was also found to be significantly and positively associated with use of unhealthy and extreme weight control behaviors among boys (all $p < 0.01$).

Girls

Regression analyses only revealed one statistically significant association between food-related parenting practices and disordered eating behaviors in adolescent girls (Table 2). Results showed that for every one unit [scale range 1 (low restriction) – 4 (high restriction)] increase in mothers’ food restriction reported, girls were at 1.33 times more likely to engage in extreme weight control behaviors ($p = 0.04$).

Role of sex in the association between food-related parenting practices and adolescent disordered eating behaviors

Results indicate that adolescent sex significantly modifies the relationship between food-related parenting practices and adolescent report of dieting, unhealthy and extreme weight control behaviors. For example, exposure to high levels of food restriction was associated with an increased risk of engaging in extreme weight control behaviors for both boys and girls (p value: boys < 0.01 , girls $= 0.04$), but the increased risk was generally significantly higher for boys compared to girls ($p < 0.01$). Adolescent sex did not modify the association

between food-related parenting practices and adolescent binge eating. No significant interactions were seen by parent sex.

DISCUSSION

Study findings provide initial evidence of an association between controlling food-related parenting practices and disordered eating behaviors among adolescents, particularly boys. The current study found that parental food restriction and pressure-to-eat were positively associated with adolescent boys' use of dieting and unhealthy and extreme weight control behaviors. It is noteworthy that for girls, the majority of associations between food-related parenting practices and disordered eating behaviors were nonsignificant. However, analyses did reveal a significant, positive association between mothers' food restriction and girls' extreme weight control behaviors. Results also indicate that adolescent sex modifies the relationship between food-related parenting practices and adolescent disordered eating behaviors, with boys at greater risk.

The potential bidirectional nature of the association between food-related parenting practices and adolescent disordered eating outcomes cannot be overlooked when interpreting these study findings. While previous longitudinal work by Birch found that highly controlling food-related parenting practices preceded the development of harmful eating patterns and cognitions within a sample of young, primarily white, high income girls (8,12,19), temporality of associations cannot be established within the current cross-sectional study. For example, it might be that exposure to parental pressure-to-eat leads to the development of disordered eating behaviors among young men, or it might be that parents who suspect their son is engaging in disordered eating behaviors react by increasing their use of pressure-to-eat feeding practices.

The current study findings for adolescent boys are similar to the previous research findings of Birch and colleagues who found parental use of highly controlling food-related parenting practices to be longitudinally associated with dietary disinhibition, negative self-evaluation of food and eating and the disruption of innate self-regulation mechanisms within a sample of young, primarily white, high income girls (8,12,19). Birch theorized that exposure to a highly controlled food environment resulted in children losing the ability to self-regulate food intake and also internalizing feelings regarding the "goodness" and "badness" of foods consumed, resulting in feelings of guilt or shame if they strayed from parental control (8,19). While the cross-sectional nature of the current study design prohibits conclusions about temporality of observed associations or causality, findings from the current study can be useful in the generation of new hypotheses to be tested in future research studies. Along these lines, the current findings lend preliminary support to an extension of Birch's theory on the negative impact of highly controlling food-related parenting practices to include adolescent boys from racially/ethnically and socioeconomically diverse backgrounds.

The overall trend of null findings among girls in the current study stands in contrast to Birch's findings among younger girls. The apparent discrepancy between the findings from the work of Birch and colleagues and the current study will be an important subject for future research to clarify. Differences between the sample Birch and colleagues utilized for their research and the sample utilized in the current study are important to consider when interpreting the current study findings within the context of the broader literature; understanding these sample differences can serve to guide the development of future research. Birch and colleague's conducted research on the relationship between food-related parenting practices and use of harmful eating patterns and related cognitions in a sample of white, high income, mother-daughter dyads (8,9) as compared to the racially/ethnically and socioeconomically diverse population-based sample utilized in the current study. Further,

Birch and colleagues examined these associations within a sample of school-aged girls, a significantly younger age group than was examined in the current study on adolescents. The demographic (racial/ethnic, socioeconomic and age) differences between these two samples may have played a role in the disparate outcomes. The novelty of the current study findings, in combination with the complexity of the issues involved, indicates a need for further research on the association between food restriction and use of disordered eating behaviors among both adolescent boys and girls.

Conclusion

While it is important to confirm these novel study findings in additional adolescent populations, study findings provide preliminary evidence of an association between controlling food-related parenting practices and use of disordered eating behaviors among adolescents, particularly boys. Future research should include an in-depth exploration of sex differences and should be longitudinal in nature to establish directionality of observed associations.

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Table 1

Characteristics of the EAT 2010 and Project F-EAT Samples

	EAT 2010 Adolescents (N=2231)	Project F-EAT Parents/Caregivers (N=3431)
	Mean (SD)	Mean (SD)
Age		
	14.4 (2.0)	42.3 (8.6)
	N (Mean)	N (Mean)
Gender		
Male	1045 (46.8)	1282 (37.4)
Female	1186 (53.2)	2149 (62.6)
	N (%)	N (%)
Race		
White	448 (20.1)	979 (29.8)
African American	611 (27.4)	823 (25.1)
Hispanic	392 (17.6)	595 (18.1)
Asian American	455 (20.4)	717 (21.8)
Mixed race/other	325 (15.6)	169 (5.2)
Family Income Level		
Less than \$20,000	--	1041 (31.3)
\$20,000 – \$34,999	--	726 (21.6)
\$35,000 – \$49,999	--	522 (15.6)
\$50,000 – \$74,999	--	413 (12.4)
\$75,000 +	--	641(19.1)
Weight Status		
Underweight	130 (6.4)	223 (6.5)
Normal Weight	1102 (54.1)	966 (28.0)
Overweight	359 (17.6)	1191 (34.6)
Obese	446 (21.9)	1066 (30.9)

Table 2
Adolescent disordered eating behaviors by parental report of pressure-to-eat and food restriction

		Girls											
		Dieting			Unhealthy weight control behaviors			Extreme weight control behaviors			Binge eating		
		PR	CI	P	PR	CI	P	PR	CI	P	PR	CI	P
Pressure-to-eat													
Moms		0.96	0.87,1.05	0.36	1.03	0.95,1.13	0.46	0.84	0.59,1.19	0.33	0.89	0.29,1.18	0.41
Dads		1.04	0.93,1.16	0.52	1.07	0.96,1.19	0.24	1.04	0.62,1.73	0.89	1.12	0.81,1.53	0.49
Food Restriction													
Moms		33333	0.98,1.15	0.14	1.03	0.96,1.12	0.37	1.33	1.02,1.74	0.04	0.91	0.72,1.15	0.43
Dads		1.05	0.95, 1.17	0.31	1.06	0.97,1.17	0.27	0.88	0.66,1.16	0.36	0.81	0.79,1.08	0.16
		Boys											
		PR	CI	P	PR	CI	P	PR	CI	P	PR	CI	P
Pressure-to-eat													
Moms		1.24	1.09,1.41	<0.01	1.23	1.10,1.38	<0.01	1.76	1.03, 3.00	0.04	1.09	0.74,1.61	0.66
Dads		1.05	0.90, 1.23	0.54	1.19	1.03,1.37	0.02	2.16	1.46,3.22	<0.01	1.43	0.93,2.19	0.10
Food Restriction													
Moms		1.16	1.03,1.30	0.01	1.16	1.04,1.29	<0.01	2.07	1.27,3.39	<0.01	1.43	0.98,2.08	0.06
Dads		1.05	0.90,1.22	0.56	1.15	0.99,1.33	0.06	1.67	1.05,2.65	0.03	1.38	0.79, 2.42	0.26

Notes:

* Models include adjustment for parent race/ethnicity and BMI, household income and adolescent BMI.

N's may be different because of missing data among self-reported behaviors.