ORIGINAL ARTICLE

Does your past define you? How weight histories are associated with child eating-disorder psychopathology

Janet A. Lydecker[1] · Ella T. Rossa[2] · Carlos M. Grilo[1]

Abstract

Purpose To examine how parents' and adolescents' weight histories were associated with parents' approach to eating/weight-related parenting and children's eating-disorder behaviors.

Methods Participants were 502 parents (69.3% mothers, 30.7% fathers) of children 12–16 years old who completed an online survey. Parents reported their own and their child's weight status during childhood and adolescence. Parents' and children's weight histories were categorized as "weight loss," "weight stability," or "weight gain" and were examined in relation to feeding practices and eating-disorder psychopathology.

Results Parents with a history of weight gain had greater personal eating-disorder psychopathology and more concerns about their child's weight than parents with weight stability or loss. They also reported greater parental overvaluation (judgment of themselves as parents according to their child's weight/shape). Children with a history of weight loss or gain were more likely to have eating-disorder behaviors than those with stable weight. Analyses revealed that results largely persisted after adjusting for child BMI-z.

Conclusions Both parent and child weight gain between childhood and adolescence were associated with eating-disorder psychopathology, eating/weight-related parenting, and feeding practices. Pediatricians and clinicians should assess weight history when considering risk for eating disorders and obesity.

Level of evidence Level III, Evidence obtained from well-designed cohort or case–controlled analytic studies

Keywords Parenting · Weight · Eating disorder · Parent–child interactions · Eating behavior · Body image · Binge eating · Obesity

Introduction

Parents are key stakeholders in children's health, shaping the home environment and providing access to health care. As children develop, parents shape their attitudes and behaviors related to food, eating habits, and body image, which is especially important as children become adolescents and begin to establish their own health behavior patterns. Parents teach both overtly, providing guidelines and information, and indirectly through modeling attitudes and behaviors [1–3]. As youth obesity and disordered eating present major public

health concerns [4, 5], understanding potential contributing factors, such as parenting practices, is a key first step in prevention and treatment. Research has shown well-established links between obesity, disordered eating, and specific parental feeding practices, including restriction of the child's diet [6–9]. Dietary restriction by the parent is associated with children's poorer self-regulation and disordered eating behaviors [6, 10, 11]. However, little is known about how parents' weight history could contribute to feeding practices.

Personal experiences with weight and eating are associated with health behaviors that individuals model. For example, medical students' weight loss histories influence attitudes and beliefs about obesity, as well as the care they provide for patients with obesity [12]. Likewise, parents' personal experiences also contribute to their own attitudes and behaviors related to eating and weight, which children can observe, and which can contribute both directly and indirectly to their parenting practices (e.g., 2). Past work has

✉ Janet A. Lydecker
janet.lydecker@yale.edu

[1] Department of Psychiatry, Yale School of Medicine, 301 Cedar Street, New Haven, CT 06519, USA

[2] Amherst College, Amherst, MA, USA

shown that the children of parents with eating disorders have more eating-disorder behaviors [13–15], children of parents who diet are more likely to diet themselves [9, 16, 17], and children of parents with obesity have higher weight [14]. Notably, parents express a desire to interrupt this cycle and *not* pass on eating-disordered attitudes and behaviors to their children [2, 18, 19]. However, parents with eating disorders report greater concern about their child's weight than parents with non-eating-disordered obesity [13, 14], who in turn are more concerned than parents with healthy weight [20].

Several factors have been shown to have associations with dietary restriction and monitoring of the child's diet: parents' concern about their child's weight [16, 17, 21], parents' history of overweight [20], and parents' personal body dissatisfaction [17, 22]. Other work has shown that dietary restriction is associated with child disordered eating behaviors, including binge eating [13]. The direction of causation, however, is unknown. Restrictive feeding practices may be a *reaction to* perceived child weight or child weight change, they may *produce* weight change [21], or, both may be the case, operating in an unhealthy feedback loop. It is also unknown whether feeding practices parallel parents' personal eating behaviors (i.e., modeling restriction and restricting child's diet) or are in reaction to concern about child weight status or weight gain (i.e., restricting child's diet after noticing or becoming concerned about weight gain). For example, one study found that when mothers encouraged their daughters to lose weight, daughters had more frequent weight-loss attempts and more body dissatisfaction [23]. Additionally, mothers' personal body dissatisfaction and eating-disorder behaviors were associated with daughters' eating-disorder behaviors [23]. In a study of parents enrolled in a pediatric obesity intervention focused on modeling, researchers found that parental concern about child weight decreased over the course of the intervention while monitoring their child's eating behaviors increased. This suggests that modeling and direct teaching are malleable and appear interrelated, although associations with weight change and disordered eating remain unknown [24].

Past research suggests the importance of parents' personal eating-disorder history and present weight and eating-disorder psychopathology. Research also shows consistent associations of parental dietary restriction with child disordered eating. An important remaining gap in the literature is to understand how parents' weight history influences their feeding practices. We examined whether parental weight history (childhood to adolescence) was associated with feeding practices or eating-disorder psychopathology. We hypothesized that parent history of weight stability would be associated with less restriction of the child's diet and less personal eating-disorder psychopathology, compared with weight gain and loss. We also examined whether child weight history (childhood to adolescence) was associated with parents' feeding practices or eating-disorder psychopathology. We also explored relations between child BMI-z and parent weight history. We hypothesized that child weight stability would be associated with less restriction from parents, less likely child eating-disorder behaviors, and lower BMI-z, than child history of gain and loss.

Methods

Participants

Participants were 502 parents of adolescents recruited from the Mechanical Turk recruitment platform to complete an online survey on "parents' opinions about weight and eating." Parents were not recruited from the same household. Mechanical Turk provides data that have psychometric properties just as reliable and valid as data from more traditional recruitment methods [25], in part because it allows for multiple forms of validity checking, including platform-wide approval rate and study-specific items testing attention and response style. Mechanical Turk yields samples with greater geographic and demographic diversity when compared to undergraduate samples [25–27], and has been utilized in both psychological and psychiatric research [28], including eating and weight research [29]. Parents were asked to answer items about one child. Parents who were primary caregivers for their child (age 12–16) were eligible and included in the current study. Parents had to pass validity checks in the survey to have their data included.

Parent and child demographic characteristics are summarized in Table 1. Participants were mothers ($n = 346$, 69.3%) and fathers ($n = 153$, 30.7%, $n = 3$ gender not reported) with average age of 41.7 years (SD = 7.91). Parents self-identified as White ($n = 427$, 85.9%), Asian ($n = 13$, 2.6%), Black ($n = 41$, 8.2%), or Other ($n = 16$, 3.2%, $n = 5$ race not reported). A minority of parents self-identified their ethnicity as Hispanic/Latinx ($n = 24$, 4.9%). Parents reported their educational attainment as high school or less ($n = 74$, 14.8%), some college ($n = 211$, 42.1%), or college or more ($n = 216$, 43.1%, $n = 1$ not reported). Parents' children were aged 12–16 ($M = 13.5$, $SD = 1.14$) and were daughters ($n = 259$, 52.3%) and sons ($n = 236$, 47.7%, $n = 7$ not reported). This study was approved by Yale's institutional review board; all participants provided informed consent electronically prior to surveys. Data are available upon reasonable request from the corresponding author.

Table 1 Demographic characteristics of parents and children

	Overall	Parent weight history					Child weight history				
		Weight loss	Weight stable	Weight gain	Test statistic	Pairs	Weight loss	Weight stable	Weight gain	Test statistic	Pairs
	(N=502)	n=44	n=381	n=77			n=41	n=372	n=89		
Parent Gender					4.19 (p=.12)					0.02 (p=.99)	
Father, n (%)	153 (30.7%)	19 (44.2%)	110 (29%)	24 (31.2%)		n/a	12 (30.0%)	114 (30.8%)	27 (30.3%)		n/a
Mother, n (%)	346 (69.3%)	24 (55.8%)	269 (71%)	53 (68.8%)		n/a	28 (70.0%)	256 (69.2%)	62 (69.7%)		n/a
Parent age, M (SD)	41.74 (7.91)	41.66 (8.71)	41.69 (7.9)	42.04 (7.58)	0.07 (p=.94)	n/a	41.98 (9.45)	41.7 (7.67)	41.78 (8.23)	0.02 (p=.98)	n/a
Parent race					10.20 (p=.12)					**13.27 (p=.04)**	
White, n (%)	427 (85.9%)	42 (95.5%)	322 (85.6%)	63 (81.8%)		n/a	32 (80.0%)	321 (87.2%)	74 (83.1%)		none
Black, n (%)	41 (8.2%)	2 (4.5%)	34 (9.0%)	5 (6.5%)		n/a	3 (7.5%)	25 (6.8%)	13 (14.6%)		S<G
Asian, n (%)	13 (2.6%)	0 (0%)	8 (2.1%)	5 (6.5%)		n/a	3 (7.5%)	8 (2.2%)	2 (2.2%)		S<L
Other, n (%)	16 (3.2%)	0 (0%)	12 (3.2%)	4 (5.2%)		n/a	2 (5.0%)	14 (3.8%)	0 (0%)		G<L
Parent ethnicity					3.86 (p=.15)					2.26 (p=.32)	
Latinx/hispanic, n (%)	24 (4.9%)	0 (0%)	22 (5.9%)	2 (2.7%)		n/a	4 (9.8%)	16 (4.4%)	4 (4.6%)		n/a
Parent education					**10.45 (p=.03)**					3.96 (p=.41)	
High school, n (%)	74 (14.8%)	13 (29.5%)	52 (13.7%)	9 (11.7%)		S,G<L	8 (19.5%)	56 (15.1%)	10 (11.2%)		n/a
Some college, n (%)	211 (42.1%)	12 (27.3%)	162 (42.6%)	37 (48.1%)		L<S,G	12 (29.3%)	159 (42.9%)	40 (44.9%)		n/a
College, n (%)	216 (43.1%)	19 (43.2%)	166 (43.7%)	31 (40.3%)		none	21 (51.2%)	156 (42.0%)	39 (43.8%)		n/a
Child age, M (SD)	13.51 (1.14)	13.41 (1.09)	13.54 (1.13)	13.44 (1.25)	0.42 (p=.66)	n/a	13.51 (1.08)	13.49 (1.17)	13.61 (1.05)	0.38 (p=.68)	n/a
Child gender					3.28 (p=.19)					3.13 (p=.21)	
Son, n (%)	236 (47.7%)	25 (56.8%)	181 (48.1%)	30 (40%)		n/a	23 (56.1%)	177 (48.5%)	36 (40.4%)		n/a
Daughter, n (%)	259 (52.3%)	19 (43.2%)	195 (51.9%)	45 (60%)		n/a	18 (43.9%)	188 (51.5%)	53 (59.6%)		n/a

Some parents chose not to reported demographic data: parent gender $n=3$ not reported; race $n=5$ not reported; ethnicity $n=13$ not reported; education $n=1$ not reported; child gender $n=7$ not reported, Significant findings are bolded

Measures

Body Mass Index (BMI)

Parents reported their height and weight and their child's height and weight. These were used to calculate parent BMI and child BMI-z (sex/age-normed).

Eating Disorder Examination Questionnaire (EDE-Q)

The Eating Disorder Examination Questionnaire (EDE-Q) measures eating-disorder psychopathology over the past 4 weeks [30]. We used a brief seven-item version that has demonstrated superior psychometric properties to the original scale in non-clinical [31] and clinical [32, 33] populations. Each item is scored on a seven-point scale and subscales (Restraint [three items], Overvaluation [two items], Dissatisfaction [two items]) were internally consistent in past work, $\alpha = 0.89–0.92$ [31], and in the current study, $\alpha = 0.88–0.91$. In addition, EDE-Q items were adapted (changed "you" to your child") to assess parents' restraint of their child's diet, parents' overvaluation of themselves according to their child's weight/shape, and parents' dissatisfaction with their child's weight/shape (EDE-Q-PV, $\alpha = 0.88$). Parents also reported how often their child engaged in overeating, binge eating, secretive eating and purging (vomiting, laxative misuse, and/or excessive exercise). These child behavior variables were coded to reflect the presence (≥ 4 episodes per month) or absence (< 4 episodes per month) of regular behaviors. Parental overvaluation is a novel construct [34] describing the extent to which parents judge themselves based on their child's weight or shape.

Child Feeding Questionnaire (CFQ)

The CFQ measures parental feeding practices [35] with evidence of construct validity [36], test–retest reliability [37], and internal consistency [17, 36, 38, 39] amongst parents of adolescents. Responses were scored following the Anderson model [40], which showed superior fit to the original factor structure in diverse community samples [24, 40]. Subscale (Perceived Responsibility, Concerns about Child Weight, Restriction, Pressure to Eat, and Monitoring) scores were internally consistent in the development sample, $\alpha = 0.70–0.92$ [35], and the current study $\alpha = 0.76–94$.

Weight-history groups

Parents reported their own and their child's weight status at different developmental periods as part of the full CFQ

[35]; these items are not included in the Anderson scoring method. These items are linked to specific developmental eras and thus are retrospective reports. All other variables in the current study reflect current attitudes and behaviors. Response options ranged from "markedly underweight" to "markedly overweight." Participants who moved from perceived "markedly underweight" or "underweight" to "normal weight" (and vice versa) or from "markedly underweight" to "underweight" (and vice versa) were not included in current analyses. This analytic choice allows the focus of the current work to be on perceptions of higher weight status. Parent weight history compared perceived parent weight in childhood and perceived parent weight in adolescence. Child weight history used perceived child weight in childhood (grade 3–5) and present (adolescence).

Statistical analyses

Analyses of Variance (ANOVAs) and chi-square tests compared parent and child demographic characteristics across parent and child weight-history groups. ANOVAs compared parent BMI, child BMI-z, parents' personal eating-disorder psychopathology, parental feeding practices and eating/weight-related parenting across parent and child weight-history groups. Logistic regressions examined the association between parent and child weight history (reference groups: weight stability) and regular eating-disorder behaviors (overeating, binge eating, secretive eating, purging). Post hoc tests examined pairwise differences using a Tukey correction for multiple comparisons. Parallel analyses compared the same outcomes across parent and child weight-history groups while adjusting for child BMI-z; pairwise comparisons used a Bonferroni correction for ANOVAs.

Results

Parent and child characteristics

Table 1 summarizes demographic characteristics and statistical comparisons across study groups. Parental education level differed significantly by parent weight history: more parents with a high school (or less) education reported a history of weight loss than weight stability or gain. Parent race differed significantly by child weight history: more parents identifying as Black reported child weight gain than weight stability, more parents identifying as Asian reported child weight loss than weight stability, and more parents identifying as Other race reported child weight loss than weight gain. No other demographic differences were statistically significant.

Table 2 depicts child weight-history groups by parent weight-history groups; proportions varied significantly

Table 2 Parent and child weight history

	Parent weight history				Total
	Weight loss	Weight stable	Weight gain		
Child weight history					
Weight loss	11 (2.2%)	18 (3.6%)	12 (2.4%)	=	41
Weight stable	29 (5.8%)	293 (58.4%)	50 (10.0%)	=	372
Weight gain	4 (0.8%)	70 (13.9%)	15 (3.0%)	=	89
	=	=	=		
Total	44	381	77		

$(\chi^2(4, N = 502) = 29.73, p < 0.001, \varphi = 0.243)$. The highest proportion of parents (58.4%) reported both personal and child weight stability.

Parent weight history

Table 3 summarizes eating and weight variables across parent weight-history groups. As expected, parent BMI differed significantly by parent weight-history group ($F_{2,495} = 6.62$, $p = 0.001$, $\eta_p^2 = 0.026$). Parents with history of weight gain between childhood and adolescence had higher BMI at present than parents with history of weight stability. Other pairwise comparisons were not significant. Child BMI-z also differed significantly by parent weight-history group ($F_{2,491} = 9.92$, $p < 0.001$, $\eta_p^2 = 0.039$). Parents with history of weight stability had children with lower BMI-z than those with history of weight gain. Other pairwise comparisons were not significant.

Consistent with hypotheses, parents' personal eating-disorder psychopathology differed by parent weight-history group: personal dietary restraint ($F_{2,485} = 3.12$, $p = 0.045$, $\eta_p^2 = 0.013$), personal overvaluation of shape/weight ($F_{2,485} = 9.57$, $p < 0.001$, $\eta_p^2 = 0.038$) and personal body dissatisfaction ($F_{2,485} = 6.38$, $p = 0.002$, $\eta_p^2 = 0.026$). Parents with history of weight stability had lower personal eating-disorder psychopathology (all scales) than parents who gained weight from childhood to adolescence. In addition, parents with history of weight loss had higher personal overvaluation than parents with history of weight stability. The pattern of significant findings remained similar in ANCOVAs adjusting for child BMI-z, except that personal dietary restraint was no longer significant.

Also consistent with our hypothesis that restriction of the child's diet would be associated with parent weight history, eating/weight-related parenting concerns differed significantly by parent weight history: restraint of the child's diet ($F_{2,495} = 4.22$, $p = 0.02$, $\eta_p^2 = 0.017$), parental overvaluation ($F_{2,495} = 8.33$, $p < 0.001$, $\eta_p^2 = 0.033$), and dissatisfaction

Table 3 Comparison of BMI, eating-disorder psychopathology, eating/weight-related parenting, and feeding practices by parent weight history

	Parent weight history			ANOVA		ANCOVA	
	Weight loss	Weight stable	Weight gain	F (p)	Pairs	F (p)	Pairs
	$n = 44$	$n = 381$	$n = 77$				
EDE-Q (Personal)							
Dietary restraint, M (SD)	2.75 (1.88)	2.73 (2.18)	3.39 (2.08)	**3.12 (p = 0.05)**	S < G	2.66 ($p = 0.07$)	n/a
Overvaluation, M (SD)	3.79 (1.74)	2.95 (2.03)	3.88 (1.75)	**9.57 (p < .001)**	S < L,G	**7.73 (p < .001)**	S < L,G
Body dissatisfaction, M (SD)	4.02 (1.59)	3.52 (1.98)	4.33 (1.75)	**6.38 (p = 0.002)**	S < G	**3.98 (p = 0.02)**	S < G
EDE-Q (parenting concerns)							
Dietary restraint, M (SD)	0.68 (1.23)	0.60 (1.11)	1.02 (1.42)	**4.22 (p = 0.02)**	S < G	1.71 ($p = 0.18$)	n/a
Overvaluation, M (SD)	0.90 (1.47)	1.05 (1.62)	1.89 (2.23)	**8.33 (p < .001)**	L,S < G	**5.49 (p = 0.004)**	L,S < G
Body dissatisfaction, M (SD)	1.02 (1.56)	0.98 (1.66)	1.67 (2.00)	**5.24 (p = 0.006)**	S < G	2.22 ($p = 0.11$)	n/a
CFQ (feeding practices)							
Perceived responsibility, M (SD)	3.36 (0.92)	3.73 (0.86)	3.74 (0.79)	**3.97 (p = 0.02)**	L < S,G	**3.69 (p = 0.03)**	L < S,G
Concern about child weight, M (SD)	2.04 (1.12)	1.98 (1.26)	2.61 (1.43)	**7.75 (p < .001)**	L < S,G	**3.12 (p = 0.05)**	none
Restriction, M (SD)	3.43 (1.22)	3.31 (1.36)	3.58 (1.23)	1.32 ($p = 0.27$)	n/a	0.04 ($p = 0.96$)	n/a
Pressure to eat, M (SD)	2.12 (1.05)	2.18 (1.02)	2.06 (1.01)	0.42 ($p = 0.66$)	n/a	0.03 ($p = 0.97$)	n/a
Monitoring, M (SD)	3.22 (0.96)	3.10 (1.18)	3.36 (0.90)	1.85 ($p = 0.16$)	n/a	0.36 ($p = 0.70$)	n/a
Weight							
Parent BMI, M (SD)	31.52 (5.79)	29.51 (8.2)	33.01 (8.24)	**6.62 (p = 0.001)**	S < G		
Child BMI-z, M (SD)	0.94 (0.95)	0.55 (1.24)	1.18 (1.07)	**9.92 (p < .001)**	S < G		

$N = 502$. ANCOVAs co-varied for child BMI z-score

EDE-Q Eating Disorder Examination Questionnaire; *CFQ* Child Feeding Questionnaire; *BMI* body mass index; *L* history of weight loss; *S* history of weight stability; *G* history of weight gain, Significant findings are bolded

with their child's weight or shape ($F_{2,495} = 5.24$, $p = 0.006$, $\eta_p^2 = 0.021$). Parents with history of weight gain had higher eating/weight-related parenting scores (all scales) than parents with history of weight stability. In addition, parents with history of weight loss had lower parental overvaluation than parents with history of weight gain. Restraint of the child's diet and dissatisfaction with the child's weight and shape were no longer significant in ANCOVAs adjusting for child BMI-z. Parental overvaluation remained significant; parents with history of weight gain had higher parental overvaluation than those with history of weight loss or stability.

In partial support of our hypotheses, some parental feeding practices differed by parent weight history, but not all. Parents' perceived responsibility for feeding ($F_{2,498} = 3.97$, $p = 0.02$, $\eta_p^2 = 0.016$) and parents' concern about their child's weight ($F_{2,498} = 7.75$, $p < 0.001$, $\eta_p^2 = 0.030$) differed significantly. Parents with history of weight loss felt less responsible for their child's feeding compared with parents with history of weight stability and weight gain. Parents with history of weight gain had greater concern about their child's weight compared to parents with history of weight stability and weight loss. Other pairwise comparisons and subscales (restrictive feeding practices, pressure to eat, monitoring) were not significant. ANCOVAs adjusting for child BMI-z maintained the same pattern of significant results (see Table 3).

Some child eating behaviors differed by parent weight history (see Table 4). Parents who, themselves, had gained weight between childhood and adolescence were more likely to report that their child engaged in regular binge eating compared to those with history of weight stability ($\chi^2(2) = 10.29$, $p = 0.006$, $R^2 = 0.034$, OR = 2.47 [95%

CI 1.41–4.35], $p = 0.002$). Other associations with parent weight history were not significant. When models included child BMI-z, no child eating-disorder behavior was associated significantly with parent weight history.

Child weight history

Table 5 summarizes eating and weight variables across child weight history (change from childhood to present adolescence) groups.

Parent BMI differed significantly by child weight-history group ($F_{2,495} = 4.20$, $p = 0.02$, $\eta_p^2 = 0.017$). Parents whose children had gained weight between childhood and adolescence had a higher BMI than parents whose children had stable weight. Other pairwise comparisons were not significant. As expected, child BMI-z also differed significantly by child weight-history group ($F_{2,491} = 50.75$, $p < 0.001$, $\eta_p^2 = 0.171$). Children who maintained weight had significantly lower BMI-zs than those who lost weight, who in turn had significantly lower BMI-zs than those who had gained weight.

Parents' personal eating-disorder psychopathology differed by child weight-history group: personal overvaluation ($F_{2,485} = 4.42$, $p = 0.01$, $\eta_p^2 = 0.018$) and personal body dissatisfaction ($F_{2,485} = 9.39$, $p < 0.001$, $\eta_p^2 = 0.037$), but not personal dietary restraint ($F_{2,485} = 0.59$, $p = 0.55$, $\eta_p^2 = 0.002$). Parents whose children had stayed the same weight from childhood to adolescence had lower personal overvaluation and personal body dissatisfaction than parents whose children had gained weight. Other pairwise comparisons were not significant. After adjusting for child BMI-z, only parental body dissatisfaction differed significantly by child weight-history group.

Table 4 Comparison of children's regular eating-disorder behaviors by parent and child weight history

	Model p	Weight loss OR (95% CI)	Weight gain OR (95% CI)	Weight loss (adj. child BMI-z) OR (95% CI)	Weight gain (adj. child BMI-z) OR (95% CI)
Parent weight history					
OOEs	0.19	1.20 (0.59–2.42)	1.72 (1.02–2.91)	0.97 (0.46–2.01)	1.24 (0.71–2.17)
OBEs	**0.006**	0.74 (0.28–1.97)	**2.47** (1.41–4.35)	0.58 (0.21–1.57)	1.73 (0.94–3.18)
Secretive eating	0.06	**2.41*** (0.98–5.89)	2.04 (0.97–4.28)	2.19 (0.89–5.38)	1.76 (0.82–3.78)
Purging	0.90	0.83 (0.28–2.44)	1.10 (0.51–2.36)	0.75 (0.25–2.22)	0.93 (0.42–2.05)
Child weight history					
OOEs	<.001	**3.47*** (1.76–6.84)	**6.29*** (3.82–10.35)	**2.76** (1.38–5.53)	**3.58*** (2.07–6.19)
OBEs	<.001	**4.77*** (2.26–10.08)	**7.65*** (4.41–13.29)	**3.73*** (1.72–8.07)	**3.77*** (2.05–6.93)
Secretive eating	<.001	2.49 (0.88–7.03)	**5.80*** (3.00–11.22)	2.45 (0.85–7.06)	**5.77*** (2.66–12.52)
Purging	<.001	**5.51*** (2.52–12.04)	**2.92** (1.49–5.71)	**5.10*** (2.30–11.32)	**2.36*** (1.10–5.05)

Reference group: weight stability

OOE objective overeating episode; *OBE* object binge-eating episode; *OR* odds ratio; *CI* confidence interview; *BMI-z* child BMI z-score

*$p \leq .05$

**$p < .01$

***$p < .001$, Significant findings are bolded

Table 5 Comparison of BMI, eating-disorder psychopathology, eating/weight-related parenting, and feeding practices by parent weight history

	Child weight history			ANOVA		ANCOVA	
	Weight loss $n=41$	Weight stable $n=372$	Weight gain $n=89$	F (p)	Pairs	F (p)	Pairs
EDE-Q (personal)							
Dietary restraint, M (SD)	2.97 (2.26)	2.77 (2.16)	3.03 (2.06)	0.59 ($p=0.55$)	n/a	0.04 ($p=0.96$)	n/a
Overvaluation, M (SD)	3.52 (1.97)	3.01 (1.98)	3.65 (1.99)	**4.42 (p=0.01)**	S < G	2.20 ($p=0.11$)	n/a
Body dissatisfaction, M (SD)	3.91 (1.72)	3.48 (1.96)	4.45 (1.76)	**9.39 (p < .001)**	S < G	**4.39 (p=0.01)**	S < G
EDE-Q (parenting concerns)							
Dietary restraint, M (SD)	0.85 (1.08)	0.45 (0.98)	1.53 (1.56)	**34.09 (p < .001)**	S,L < G	**16.47 (p < .001)**	S,L < G
Overvaluation, M (SD)	1.50 (1.99)	0.78 (1.45)	2.63 (1.94)	**48.12 (p < .001)**	S < L < G	**25.42 (p < .001)**	S,L < G
Body dissatisfaction, M (SD)	0.90 (1.16)	0.72 (1.45)	2.77 (1.98)	**63.07 (p < .001)**	S,L < G	**34.34 (p < .001)**	S,L < G
CFQ (feeding practices)							
Perceived responsibility, M (SD)	3.53 (0.82)	3.73 (0.88)	3.69 (0.80)	1.00 ($p=0.37$)	n/a	0.76 ($p=0.47$)	n/a
Concern about child weight, M (SD)	2.39 (1.27)	1.74 (1.09)	3.36 (1.27)	**74.97 (p < .001)**	S < L < G	**38.21 (p < .001)**	S < L < G
Restriction, M (SD)	3.49 (1.37)	3.15 (1.32)	4.19 (0.99)	**24.48 (p < .001)**	S,L < G	**8.17 (p < .001)**	S < G
Pressure to Eat, M (SD)	2.35 (1.08)	2.20 (1.03)	1.89 (0.93)	**4.13 (p=0.02)**	G < S,L	1.68 ($p=0.19$)	n/a
Monitoring, M (SD)	3.34 (1.07)	2.99 (1.12)	3.73 (0.96)	**17.39 (p < .001)**	S < G	**8.08 (p < .001)**	S < G
Weight							
Parent BMI, M (SD)	29.99 (7.26)	29.70 (8.02)	32.46 (8.61)	**4.20 (p=0.02)**	S < G		
Child BMI-z, M (SD)	0.99 (0.83)	0.39 (1.2)	1.69 (0.77)	**50.75 (p < .001)**	S < L < G		

ANCOVAs co-varied for child BMI z-score

EDE-Q Eating Disorder Examination Questionnaire; *CFQ* Child Feeding Questionnaire; *BMI* body mass index; *L* history of weight loss; *S* history of weight stability; *G* history of weight gain. Significant findings are bolded

We hypothesized that child weight stability would be associated with less restriction from parents. In support of this hypothesis, eating/weight-related parenting concerns differed significantly by child weight history: restraint of the child's diet ($F_{2,495}=34.09$, $p<0.001$, $\eta_p^2=0.121$), parental overvaluation ($F_{2,495}=48.12$, $p<0.001$, $\eta_p^2=0.163$), and dissatisfaction with their child's weight or shape ($F_{2,495}=63.07$, $p<0.001$, $\eta_p^2=0.203$). Parents whose children had gained weight reported significantly more restraint of their child's diet than those whose children had lost and maintained weight. Dissatisfaction followed the same pattern. Parental overvaluation was higher among parents whose children had gained weight than those whose children lost weight, who in turn reported significantly higher parental overvaluation than those whose children had stayed the same weight. In ANCOVAs adjusting for child BMI-z, the significance pattern was the same. Across all parenting concern scales, parents whose children had gained weight reported higher levels than those whose children had lost or maintained weight.

As hypothesized, parental feeding practices also differed by child weight history. Parents' concern about their child's weight ($F_{2,498}=74.97$, $p<0.001$, $\eta_p^2=0.231$), restrictive feeding ($F_{2,498}=24.48$, $p<0.001$, $\eta_p^2=0.090$), pressure to eat ($F_{2,498}=4.13$, $p=0.02$, $\eta_p^2=0.016$), and monitoring ($F_{2,498}=17.39$, $p<0.001$, $\eta_p^2=0.065$) differed

significantly. Parents' perceived responsibility for feeding ($F_{2,498}=1.00$, $p=0.37$, $\eta_p^2=0.004$) did not differ significantly by child weight history. Parents whose children had history of weight stability had less concern about their child's weight, engaged in less dietary restriction, and monitored their children's eating less than parents whose children had gained weight. In addition, parents whose children had lost weight reported significantly more concern about their child's weight than those whose children had maintained weight, but significantly less concern than those whose children had gained weight. Parents whose children had lost weight also engaged in less restriction than those whose children gained weight. Parents whose children had gained weight reported significantly less pressure to eat than those whose children had lost or maintained weight. ANCOVAs adjusting for child BMI-z maintained the same pattern of significant overall results, except that pressure to eat no longer differed significantly.

As hypothesized, all child eating behaviors differed by child weight history (see Table 4): overeating ($\chi^2(2)=58.19$, $p<0.001$, $R^2=0.161$), binge eating ($\chi^2(2)=57.88$, $p<0.001$, $R^2=0.183$), secretive eating ($\chi^2(2)=26.40$, $p<0.001$, $R^2=0.111$), and compensatory behaviors ($\chi^2(2)=20.85$, $p<0.001$, $R^2=0.082$. Results remained largely the same in models that included child BMI-z; all child eating behaviors differed significantly by child weight history.

Discussion

Results suggest that both parent weight history (change in perceived weight status from childhood to adolescence) and child weight history (parent-reported change in perceived weight status from childhood to present) were associated significantly with differences in parents' personal eating-disorder psychopathology, eating/weight-related parenting concerns, and parental feeding practices. This was consistent with hypotheses that child weight stability would be associated with less psychopathology, compared with history of loss or gain. However, contrary to our hypotheses, parent weight history was not associated with behavioral restriction of the child's diet (on the CFQ), even though it was associated with cognitive restraint of the child's diet (on the EDE-Q; this item assesses intent to restrict). Additionally, significant associations of child eating behaviors (including overeating, binge eating, secretive eating, and purging) occurred more often with child weight history than parent weight history, which only partially supported our hypothesis that both parent and child weight stability would be associated with less likelihood of child disordered eating. The pattern of significant associations remained largely the same when analyses accounted for child BMI-z.

In the literature, both parental modeling and feeding practices have been conceptualized as possible pathways by which parents influence their child's eating and weight. The current study adds to this literature by suggesting that parent weight history could be an important historical factor associated with parents' concerns about their children's eating and weight. Indeed, parents with history of weight gain had higher personal eating-disorder psychopathology than those with history of weight stability. Conceptually, parents' own experiences during their transition from childhood to adolescence could influence their approach to parenting their children around eating and body image. Parents with history of weight gain felt more responsible for their child's feeding, were more concerned about their child's weight, and were more dissatisfied with their child's weight or shape than those who had history of weight stability or loss. Moreover, parents with history of weight gain reported that they evaluated their own parenting based on their child's weight or shape to a greater extent than those who had a personal history of weight loss or weight stability. Conceptually, they could perceive their parenting as a "do-over" attempting to ensure their child does not experience the same weight gain and related health and stigma consequences that they might have experienced themselves. Additionally, parents with history of weight gain could have a heightened sensitivity to the possibility of their child gaining weight, which could lead to heightened concern and attempts to prevent gain.

The existing literature is predominantly cross-sectional, and therefore unclear about whether parental feeding practices are in response to weight changes or whether they produce weight changes. The current study added another dimension to this discussion by examining parents' recollection of their child's weight history (i.e., change between childhood and present adolescence). As hypothesized, child weight stability was associated with less restrictive feeding practices than child weight gain. Specifically, parents who perceived that their child had gained weight engaged in more restraint of their child's diet and monitoring of their child's eating than parents who perceived that their child's weight was stable. Parents of children who gained weight reported more concern about child weight and more dissatisfaction with child weight than parents of children with stable weight. In addition, parents of children who gained weight reported more emphasis on their child's weight or shape in terms of how they judge themselves as parents than parents whose children had history of weight loss or stability. Importantly, these results remained after adjusting for child BMI-z, suggesting that eating/weight attitudes persist across BMIs and are *not* better explained by a health-related need to lose weight.

As hypothesized, child weight history was associated significantly with child eating-disorder behaviors. Compared to parents of children who had maintained their weight status, parents of children who had lost *or* gained were more likely to report that their child engaged in regular overeating, binge eating, secretive eating, and purging, even after adjusting for child BMI-z. This suggests that when parents perceive changed child weight status, perhaps particularly during the important transition between childhood and adolescence, children are also engaging in disordered eating. Pediatricians should consider assessment of eating-disorder psychopathology and referral to mental health when parents report a change in their child's weight status. Contrary to our hypotheses, parent weight history was broadly not associated with child eating-disorder behaviors. It is possible that other adults besides parents in children's lives contributed to the development of disordered eating, such as pediatricians, teachers, or coaches; future studies should examine sources of modeled and taught attitudes about weight with a more comprehensive scope.

There are several limitations to this study, including lack of diversity. Most parents in this study identified as White and had at least some college education. Replication of these findings in more diverse samples is an important next step. Additionally, this study looked at perceived weight status of parents and their children rather than looking at measured weight trajectories. There was a bias towards reporting weight stability (both parent's personal history and their child's weight history), which could reflect recall bias, a bias towards reporting a perceived norm, or could merely reflect

an overall pattern where the majority of individuals neither experience weight loss nor gain. Perceived weight status, rather than retrospectively reported weight, has the advantage of accounting for children's proportions, but is a subjective assessment and can be misperceived by parents [41]. Comparing our findings, which used perceived weight status change, with findings tied to *measured* weight trajectories in future studies would help clarify potential sources of bias.

Restrictive feeding practices are associated with challenges in children's self-regulation of eating, which has been shown to contribute to obesity and could be helped by mindfulness and intuitive eating interventions [6, 10, 11]. Restrictive feeding practices are also associated with children's disordered eating behaviors [6, 42], as is parental eating-disorder psychopathology [13, 14]. Understanding that weight history—parent and child—is associated with current eating and weight-related parenting attitudes could help identify families who are at-risk for encouraging unhealthy weight-control practices or dieting and children who are at-risk for developing obesity. Importantly, health care providers' weight history could also influence how they perceive and treat youth eating and weight concerns, and these associations should be examined in future studies. Based on our findings, pediatricians should consider asking parents about their weight history, as well as asking about children's weight history, when assessing for eating disorders and obesity. In addition, family- and parent-based pediatric obesity interventions might consider a parent's own history and experience with weight, as well as their perceptions of their child's weight, when they discuss weight-related thoughts, parent–child interactions, and potential disordered eating behaviors. Findings suggest that clinicians should have compassion for parents with histories of weight gain, as they might have personal eating-disorder psychopathology, be deeply invested in their child's weight as a way in which they judge themselves as parents, and be deeply concerned about their child's weight. Compassion is particularly important for clinicians to keep in mind given the well-established ubiquity of weight stigma and internalized weight bias in society. Pediatric obesity and eating-disorder psychopathology are complex biopsychosocial conditions. Understanding family schemas and preconceptions about weight change could help clinicians facilitate insight into factors that maintain disordered eating and unhelpful parental feeding practices.

What is already known on this subject?

Parents' and children's eating and weight attitudes and behaviors are similar. Parents shape their children's eating and weight through modeling and parenting practices.

What does this study add?

Parents with a history of weight gain had the most concern about their child's weight. Children with a history of weight stability had the least disordered eating.

Data Availability Data are available upon reasonable request from the corresponding author.

Declarations

Conflict of interest The authors have no conflicts of interest relevant to this article to disclose.

Ethics Approval This study was approved by Yale's institutional review board.

Informed consent All participants provided informed consent electronically prior to surveys.

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