Parental feeding practices in the United States and in France: relationships with child's characteristics and parent's eating behavior

Blandine De Lauzon-Guillain, Dara Musher-Eizenman, Emeline Leporc, Shayla Holub, Marie Aline Charles

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de Lauzon-Guillain B.[1], Musher-Eizenman D.[2], Leporc E [1], Holub S.[2], Charles MA [1]

[1]: INSERM, IFR69, U780,
16 avenue Paul-Vaillant Couturier
Villejuif, France

[2]: Psychology department,
Bowling Green State University,
Bowling Green, United States

Corresponding author: Blandine de Lauzon - Guillain
blandine.delauzon@inserm.fr

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Abstract

Given the role of parental feeding practices in establishing children's eating habits, understanding sources of individual differences in feeding practices is important. This study examined the role of several psychological variables (i.e., parental perceived responsibility for child's eating, parental perceptions of the child's weight, and parents' own eating patterns) in individual differences in a variety of feeding practices. Parents of preschool age children completed surveys in a cross-sectional study. Two cultural contexts (i.e., US, n = 97 parents; and France, n = 122 parents) were included to assess the cross-cultural generalizability of the findings. Monitoring was associated with parental perceived responsibility for child's eating, parental restrained eating and parents' desire for their child to be thinner, especially in France.

Restriction for weight reasons was more prevalent in the US and was associated with parents' perceived responsibility for child's eating, perception of child's body weight and parental restrained eating. Parental use of foods for non-nutritive purposes was more prevalent in the US and was associated with parental uncontrolled or emotional eating. Finally, parents' perceived responsibility for child's eating was strongly related to child control over feeding, teaching about nutrition, encouragement of balance and variety and modeling.

These associations between psychological variables and parental feeding practices shed light on the sources of individual differences in feeding practices and suggest possible opportunities for intervention when feeding practices are sub-optimal.

Introduction

The familial aggregation of obesity is partly explained by common genes (1). Other contributing familial factors, which unlike genes are modifiable, deserve particular attention. For young children, the family provides a major context for early eating experience, through which attitudes about the body or food develop (2).

Parents influence the eating behaviors of children in a variety of ways, especially through their child-feeding practices (3, 4). Parents determine what foods the child is offered, when and where they are eaten, which foods are forbidden, and the emotional tone of eating occasions (5, 6 , 7). Some research has examined factors that are associated with parents' feeding practices. We previously found that parental feeding practices were not clearly related to sociodemographic characteristics of either parent or child (8). In contrast, parents' attitudes toward their own body shape and their own eating have been linked to their child feeding practices (9, 10). Fisher and Birch (11) found that mothers' own restrained eating was associated with greater restriction of their daughters' access to snack foods.

While most of the work in this area has been done with American samples, considerable differences exist between French and American adults in their attitudes toward food (12). Similarly, we found large differences in feeding practices between French and American parents (8). Our goal was therefore to explore some of the potential motivators of parental feeding practices for their children such as parental perception of child's weight or parental own eating behavior in both a French and an American samples.

Methods

Study design

Families participated in a cross-sectional study on children's eating behavior, which

took place in the United States (US) and in France to explore transcultural differences. The US sample was recruited (May 2004 – August 2004) from preschools in a mid-sized Midwestern city and surrounding towns. The French sample was recruited (October 2005 – January 2005) from schools in a large city and a small town in the Ile-de-France and Picardy regions, respectively. French preschools were chosen to have similar median family income in both samples. The US sample comprised 68 children (3.7 to 6.8 years). The French sample comprised 72 children (4.0 to 6.8 years). One or both parents of each child participated in the study. The detailed procedure was described previously (8). The Human Subjects Review Boards of Bowling Green State University approved the data collection in both samples.

Measures

Parents in each of the samples completed the same set of questionnaires, except for an additional eating behavior questionnaire filled out only by the French parents.

Anthropometric data. Parents reported their own weight and height, from which Body Mass Index (weight/(height)^2, BMI) was calculated. A trained investigator measured child's weight (to the nearest 0.1 kg) and height (to the nearest 5 mm) at the child's school.

Parental eating behavior. Restrained eating was assessed by the restraint scale of the Dutch Eating Behavior Questionnaire (13) in both US and France. An additional questionnaire, a revised version of the Three-Factor Eating Questionnaire, was included in France to assess other dimensions of eating behavior: uncontrolled eating (tendency to eat more than usual due to a loss of control) and emotional eating (overeating during dysphoric mood states, i.e. when feeling lonely or anxious) (14).

Parental feeding practices. Nine aspects of parental feeding behavior were measured by the Comprehensive Feeding Practices Questionnaire (15): monitoring child food intake, using food to regulate the child's emotions, using food as a reward, child control over feeding,

teaching about nutrition, encouraging balance and variety, restricting child's food intake for weight reasons, restricting child's intake for health reasons, and modeling healthy eating habits. The applicability of this questionnaire has been demonstrated in both US (15) and French samples (8).

Parents also responded to three questions about the extent to which they perceive that they are responsible for their child's eating behaviors.

Parental perception of child's body. Concern for child's overweight was derived from the Child Feeding Questionnaire subscale (5). Using body silhouettes of children (16), parents were also asked to indicate which of the seven figures they felt most closely resembled their child and then rate the figure they would most like their child to resemble. The desire of parents for their child to be thinner (or heavier) was calculated from the difference between the figures representing the current and desired silhouettes for their child.

Statistical analysis

To understand how parental characteristics were related to parental feeding practices, linear regressions were run, with feeding practices as the dependant variables. To account for correlations between parents, a family variable was introduced as a random effect at the level of the intercept, and the other variables were fixed effects (proc Mixed, SAS 9.1.3, SAS Institute, Cary, NC). First, each parental feeding practice was related to parent's gender, country, explicative variable (perceived responsibility, perception of child's body, and parental eating behavior; each in a separate model) and interaction term between country and the explicative variable. Second, as several explicative variables could be associated with a given parental feeding practices, multiple linear regressions were conducted with all significant ($p<0.05$) explicative variables.

All analyses were also run adjusting for child's age and BMI, parent's age, BMI, and

education level and for familial income but these adjustments did not change the results (data not shown).

Results and discussion

Participant characteristics

Familial income was roughly comparable between the samples (Table 1): the median yearly income was $75,000-$90,000 in the US and 60,000€-70,000€ in France. However, French parents reported a higher education level. In both samples, the population was mostly Caucasian (97% in the US sample and 89% of the French parents were born in France and 78% reported that both of their parents had been born in France as well). The French children were slightly older than the American children, but children's BMI did not differ across the two samples, even after adjustment for children's age (p=0.8). The American parents reported higher BMI's than did the French. Monitoring child eating and restriction of child eating for weight control were more common in France than in the US (Table 1), whereas non-nutritive uses of food, child control over food intake and teaching about nutrition were more common in the US. US parents expressed a stronger desire for their child to be thinner relative to the French parents, but there was no difference neither for parental concern for child overweight nor for parental perceived responsibility for child's eating.

Perceived responsibility for child's eating

Parents' perceived responsibility toward their child's eating was a good predictor of parental feeding practices (Table 2), as described in previous studies (17) for parental restrictive practices. Interestingly, it was also related to higher teaching about nutrition, higher modeling healthy eating habits, higher encouragement of balance and variety and lower child control over feeding, especially in France. The associations between parental perceived

responsibility for child's eating and parental feeding practices remained significant in multivariate models. It has been shown that, although mothers report being more motivated by the long-term health value when they choose food for their children than when they choose food for themselves, they in fact feed their children in less healthy ways than they feed themselves (18). Parental investment in the eating habits of their child may then be one way to modify this discrepancy.

Parental perception of child's body weight

Furthermore, restrictive feeding was related to parental perception of child's body weight (10, 19, 20). In fact, parental desire for the child to be thinner was related to higher monitoring, especially in France, and higher restriction of child's eating for weight reasons, especially in France but the interaction with country was no more significant in the multivariate model ($p=0.48$). Parental concern for child's overweight was related to higher restriction of child's eating for weight or health reasons. Given the stigma attached to being fat in most Western societies (21), it is not surprising that parents who perceived their children as overweight or at risk for future overweight were more likely to control the child's food intake. However, previous studies did not distinguish between child's real overweight and parental perception in the association with restrictive feeding. Here, restrictive feeding practices remained associated with parental perception of child's body weight even after adjustment for measured child's BMI (data not shown), supporting the importance of considering perceptions, not just actual BMI.

Parental desire fore the child to be thinner was also related to lower use of food to regulate child's emotion, especially in France, lower child control over feeding (but this association became non significant in the multivariate model) and lower encouragement of balance and variety.

Parents' own eating behavior

Parental feeding practices appeared to be in part a reflection of parents' own eating behavior. Consistent with previous studies (10, 19, 20), the current study found that parental restrictive practices were positively related to parents' own restrained eating. Wardle and colleagues (9) found that mothers tend to feed their children in the same way that they eat themselves: mothers who offered food to deal with their child's emotional distress were more likely to have a high level of emotional eating, and those who used food as a reward were more likely to present high levels of external eating. Similarly, even if parents' uncontrolled or emotional eating was estimated only in the French sample, we found an association between parents' uncontrolled or emotional eating and their use of food for non-nutritive purpose.

Cross-cultural differences

In multivariate models, some parental feeding practices remained significantly more prevalent in the US than in France (8): restriction for weight reasons (US vs. France: 0.24±0.08, $p=0.003$), use of food to regulate child's emotions (US vs. France: 0.37±0.07, $p<0.001$) or as a reward (US vs. France: 0.82±0.12, $p<0.001$) and teaching about nutrition (US vs. France: 0.32±0.09, $p<0.001$). Despite these differences in levels, associations with other parental characteristics did not differ by country: the only interactions were for parental desire for their child to be thinner, which had a greater influence on feeding practices in France than in the US, and for perceived responsibility for child's eating, which had a greater impact on child control over feeding in France than in the US. Insofar as parental feeding practices impact the development of child's overweight, it would be important to underline that socio-cultural environment could determine levels of parental feeding practices but not their associations with the other variables we studied.

Limitations

Although a great deal of the literature in this area has taken the theoretical perspective that parental feeding practices, especially restrictive practices, influence weight gain and eating behavior in young children (22), we need more prospective studies to confirm a causal link. Furthermore, a limitation in the current study is that parents were mostly Caucasian, highly educated, had a high family income, and self-reported their weight and height. These results need therefore to be confirmed longitudinally in lower socioeconomic status populations, and with a larger sample.

Conclusion

In sum, the current findings emphasize the association between parents' attitudes, beliefs and behaviors and how they feed their children. Given the potential medical and psychological risks associated with unhealthy eating habits and overweight in children, research that identifies the factors associated with specific feeding practices may help practitioners to better understand and prevent negative outcomes.

References

1. Sorensen TI, Holst C, Stunkard AJ, Skovgaard LT. Correlations of body mass index of adult adoptees and their biological and adoptive relatives. *Int J Obes Relat Metab Disord.* 1992;16:227-36.
2. Fulkerson JA, McGuire MT, Neumark-Sztainer D, Story M, French SA, Perry CL. Weight-related attitudes and behaviors of adolescent boys and girls who are encouraged to diet by their mothers. *Int J Obes Relat Metab Disord.* 2002;26:1579-87.
3. Birch LL, Fisher JO. Development of eating behaviors among children and

adolescents. *Pediatrics.* 1998;101:539-49.

4. Benton D. Role of parents in the determination of the food preferences of children and the development of obesity. *Int J Obes Relat Metab Disord.* 2004;28:858-69.
5. Birch LL, Fisher JO, Grimm-Thomas K, Markey CN, Sawyer R, Johnson SL. Confirmatory factor analysis of the Child Feeding Questionnaire: a measure of parental attitudes, beliefs and practices about child feeding and obesity proneness. *Appetite.* 2001;36:201-10.
6. Story M, Neumark-Sztainer D, French S. Individual and environmental influences on adolescent eating behaviors. *J Am Diet Assoc.* 2002;102:S40-51.
7. Tibbs T, Haire-Joshu D, Schechtman KB, et al. The relationship between parental modeling, eating patterns, and dietary intake among African-American parents. *J Am Diet Assoc.* 2001;101:535-41.
8. Musher-Eizenman DR, de Lauzon Guillain B, Holub S, Leporc E, Charles MA. Child and parent characteristics related to parental feeding practices: A cross-cultural examination in the US and France *Appetite.* 2008;in press.
9. Wardle J, Sanderson S, Guthrie CA, Rapoport L, Plomin R. Parental feeding style and the inter-generational transmission of obesity risk. *Obes Res.* 2002;10:453-62.
10. Birch LL, Fisher JO. Mothers' child-feeding practices influence daughters' eating and weight. *Am J Clin Nutr.* 2000;71:1054-61.
11. Fisher JO, Birch LL. Restricting access to foods and children's eating. *Appetite.* 1999;32:405-19.
12. Rozin P, Fischler C, Imada S, Sarubin A, Wrzesniewski A. Attitudes to food and the role of food in life in the U.S.A., Japan, Flemish Belgium and France: possible implications for the diet-health debate. *Appetite.* 1999;33:163-80.

13. van Strien T, Frijters JER, Bergers GPA, Defares PB. The Dutch Eating Behavior Questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behavior. *Int J Eat Disord.* 1986;5:295-315.

14. de Lauzon B, Romon M, Deschamps V, et al. The Three-Factor Eating Questionnaire-R18 Is Able to Distinguish among Different Eating Patterns in a General Population. *J Nutr.* 2004;134:2372-80.

15. Musher-Eizenman D, Holub S. Comprehensive Feeding Practices Questionnaire: validation of a new measure of parental feeding practices. *J Pediatr Psychol.* 2007;32:960-72.

16. Collins ME. Body figure perceptions and preferences among preadolescent children. *International Journal of Eating Disorders.* 1991;10:199-208.

17. Spruijt-Metz D, Lindquist CH, Birch LL, Fisher JO, Goran MI. Relation between mothers' child-feeding practices and children's adiposity. *Am J Clin Nutr.* 2002;75:581-6.

18. St John Alderson T, Ogden J. What do mothers feed their children and why? *Health Educ Res.* 1999;14:717-27.

19. Francis LA, Hofer SM, Birch LL. Predictors of maternal child-feeding style: maternal and child characteristics. *Appetite.* 2001;37:231-43.

20. Tiggemann M, Lowes J. Predictors of maternal control over children's eating behaviour. *Appetite.* 2002;39:1-7.

21. Crandall CS, Martinez R. Culture, ideology, and antifat attitudes. *Personality and Social Psychology Bulletin.* 1996;22:1165-1176.

22. Faith MS, Scanlon KS, Birch LL, Francis LA, Sherry B. Parent-child feeding strategies and their relationships to child eating and weight status. *Obes Res.*

2004;12:1711-22.

Table 1. Comparison of American and French samples

	United States	France	
CHILD			
Boys	27 (40%)	35 (49%)	
Age (y)	5.0 (0.8)	5.5 (0.8)	**
BMI (kg/m²)			
Familial income			
<40,000€ / <$55,000	17 (29%)	24 (34%)	
40,000-70,000€ / $55,000-$95,000	22 (37%)	17 (24%)	
>70,000€ / >$95,000	20 (34%)	29 (41%)	
PARENT			
Father			
Age (y)	36.4 (5.3)	37.8 (5.8)	
BMI (kg/m²)	25.6 (4.7)	22.6 (3.5)	***
Education level			***
High school or less	14 (15%)	30 (25%)	
College	65 (68%)	39 (33%)	
Graduate degree or more	17 (18%)	51 (43%)	
Parental feeding practices			
Restrictive practices			
Monitoring (0-5 scale)	3.6 (0.8)	4.0 (0.8)	***
Restriction for weight control (0-5 scale)	1.8 (0.6)	2.3 (0.7)	***
Restriction for health (0-5 scale)	3.2 (1.0)	3.1 (0.8)	
Non-nutritive uses of food			

Emotion regulation (0-5 scale)	1.7 (0.6)	1.3 (0.5)	***
Food as reward (0-5 scale)	2.5 (1.1)	1.7 (0.7)	***
Other feeding practices			
Child control (0-5 scale)	2.8 (0.5)	2.1 (0.6)	***
Teaching about nutrition (0-5 scale)	4.0 (0.7)	3.8 (0.7)	**
Positive habits (0-5 scale)	4.2 (0.6)	4.1 (0.7)	
Modeling (0-5 scale)	3.5 (1.0)	3.7 (0.8)	
Responsibility (0-5 scale)	4.2 (0.7)	4.4 (0.5)	
Perception of child body weight			
Concern for child's overweight (0-5 scale)	1.5 (0.6)	1.6 (0.8)	
Desire for child to be thinner	-0.2 (0.6)	0.1 (0.6)	**
Eating behavior			
Restrained eating (DEBQ[a], 0-5 scale)	2.6 (0.8)	2.5 (0.9)	
Uncontrolled eating (TFEQ-R21[b], 0-100 scale)		25 (17)	
Emotional eating (TFEQ-R21[b], 0-100 scale)		31 (26)	

Mean (SD). Statistically different (Chi-2 and Student's t-test) from United States value: *p<0.05, **p<0.01, ***p<0.001

[a] DEBQ : Dutch Eating Behavior Questionnaire; [b] TFEQ-R21: Three-Factor Eating Questionnaire – revised 21 items.

Table 2. Association between parental characteristics and parental feeding practices, tested by linear regressions

	Restrictive practices			Non-nutritive use of food		Other feeding practices			
	Monitoring	Restriction for weight	Restriction for health	Emotion regulation	Food as reward	Child control	Teaching nutrition	Balance & variety	Modeling
Perceived responsiblity									
Parent's gender [a]	-0.1 ± 0.1	0.2 ± 0.1 *	0.1 ± 0.1	0.1 ± 0.1	0.2 ± 0.1	0.0 ± 0.1	-0.3 ± 0.1 **	-0.1 ± 0.1	-0.2 ± 0.1
Country [b]	0.4 ± 0.7	0.6 ± 0.6	-0.5 ± 0.9	1.2 ± 0.5 *	0.5 ± 0.9	-0.5 ± 0.5	1.3 ± 0.6 *	0.9 ± 0.6	-0.3 ± 0.8
Perceived responsibility	0.6 ± 0.1 ***	0.4 ± 0.1 **	0.1 ± 0.2	0.0 ± 0.1	0.1 ± 0.2	-0.4 ± 0.1 ***	0.5 ± 0.1 ***	0.4 ± 0.1 ***	0.6 ± 0.1 ***
Interaction term	-0.2 ± 0.2	-0.3 ± 0.1	0.1 ± 0.2	-0.2 ± 0.1	0.1 ± 0.2	0.2 ± 0.1 *	-0.2 ± 0.1	-0.2 ± 0.1	0.0 ± 0.2
Perception of child's body									
Concern for overweight									
Parent's gender [a]	-0.1 ± 0.1	0.2 ± 0.1 *	0.0 ± 0.1	0.2 ± 0.1 *	0.1 ± 0.1	0.0 ± 0.1	-0.3 ± 0.1 **	-0.1 ± 0.1	*-0.3 ± 0.1* *
Country [b]	-0.1 ± 0.3	-0.5 ± 0.2 **	0.3 ± 0.3	0.3 ± 0.2	0.6 ± 0.3	*0.6 ± 0.2* **	0.4 ± 0.2	0.0 ± 0.2	0.2 ± 0.3
Concern for overweight	0.2 ± 0.1	0.4 ± 0.1 ***	0.4 ± 0.1 ***	0.0 ± 0.1	0.0 ± 0.1	0.0 ± 0.1	-0.1 ± 0.1	-0.1 ± 0.1	0.0 ± 0.1
Interaction term	-0.2 ± 0.2	0.1 ± 0.1	-0.1 ± 0.2	0.1 ± 0.1	0.2 ± 0.2	0.0 ± 0.1	-0.1 ± 0.1	0.1 ± 0.1	-0.3 ± 0.2
Desire thinner child									
Parent's gender [a]	-0.1 ± 0.1	0.2 ± 0.1 **	0.0 ± 0.1	0.2 ± 0.1 *	0.1 ± 0.1	0.0 ± 0.1	-0.3 ± 0.1 **	-0.1 ± 0.1	*-0.3 ± 0.1* *

Country [b]	*-0.4 ± 0.1* ***	-0.4 ± 0.1 ***	0.1 ± 0.1	0.4 ± 0.1 ***	0.9 ± 0.1 ***	*0.6 ± 0.1* ***	0.2 ± 0.1 *	0.1 ± 0.1	*-0.3 ± 0.1* *
Desire thinner child	0.4 ± 0.1 ***	0.6 ± 0.1 ***	0.3 ± 0.1	-0.2 ± 0.1 *	-0.1 ± 0.1	*-0.2 ± 0.1* *	-0.1 ± 0.1	-0.2 ± 0.1 *	0.0 ± 0.1
Interaction term	-0.4 ± 0.2 *	*-0.3 ± 0.1* *	0.0 ± 0.2	0.3 ± 0.1 *	0.3 ± 0.2	0.2 ± 0.1	0.1 ± 0.2	0.1 ± 0.1	-0.2 ± 0.2
Parental eating behavior									
Restrained eating									
Parent's gender [a]	-0.1 ± 0.1	0.2 ± 0.1 **	0.0 ± 0.1	0.1 ± 0.1 *	0.1 ± 0.1	0.0 ± 0.1	-0.3 ± 0.1 **	-0.1 ± 0.1	*-0.3 ± 0.1* *
Country [b]	-0.2 ± 0.4	-0.4 ± 0.3	0.1 ± 0.4	0.8 ± 0.2 **	1.5 ± 0.4 ***	0.4 ± 0.3	0.5 ± 0.3	0.1 ± 0.3	-0.2 ± 0.4
Restrained eating	0.3 ± 0.1 **	0.2 ± 0.1 ***	0.0 ± 0.1	0.0 ± 0.1	0.1 ± 0.1	0.0 ± 0.1	0.1 ± 0.1	0.0 ± 0.1	*0.2 ± 0.1* *
Interaction term	-0.1 ± 0.1	0.0 ± 0.1	0.0 ± 0.2	-0.2 ± 0.1	-0.3 ± 0.2	0.1 ± 0.1	-0.1 ± 0.1	0.0 ± 0.1	0.0 ± 0.1
Uncontrolled eating [c]									
Parent's gender [a]	-0.3 ± 3.2 ***	3.2 ± 2.6	-2.1 ± 3.1	1.4 ± 1.7	1.9 ± 2.4	0.5 ± 2.3	-0.6 ± 2.7	1.3 ± 2.5	-1.0 ± 2.9
Uncontrolled eating	0.0 ± 0.1	0.1 ± 0.1	0.3 ± 0.1 ***	0.2 ± 0.0 ***	*0.3 ± 0.1* ***	0.0 ± 0.1	0.0 ± 0.1	-0.1 ± 0.1 *	0.0 ± 0.1
Emotional eating [c]									
Parent's gender [a]	-0.3 ± 3.3	4.2 ± 2.7	0.3 ± 3.3	2.9 ± 1.8	5.2 ± 2.4	1.1 ± 2.4	-1.4 ± 2.8	0.2 ± 2.6	-1.4 ± 3.0
Emotional eating	0.0 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	*0.1 ± 0.0* *	0.2 ± 0.0 ***	0.0 ± 0.0	-0.1 ± 0.1	-0.1 ± 0.1	0.0 ± 0.1

β ± SE; * p<0.05, ** p<0.01, *** p<0.001; Underlined results remained significant in the multivariate models.

[a] Parent's gender: Father vs mother;

[b] Country: US vs France

[c] Uncontrolled and emotional eating scores were multiplied by 20. These analyses were conducted only in France (the data were not available in the US sample).