Parental Feeding Style and the Intergenerational Transmission of Obesity Risk

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Abstract

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Objective: This study was designed to determine whether a community sample of obese mothers with young children used different feeding styles compared with a matched sample of normal-weight mothers. Four aspects of feeding style were assessed: emotional feeding, instrumental feeding (using food as a reward), prompting/encouragement to eat, and control over eating.

Research Methods and Procedures: Participants were from 214 families with same-sex twins; 100 families in which both parents were overweight or obese and 114 in which both parents were normal weight or lean.

Results: We found that obese mothers were no more likely than normal-weight mothers to offer food to deal with emotional distress, use food as a form of reward, or encourage the child to eat more than was wanted. The obese and normal-weight mothers did differ on "control"; obese mothers reported significantly *less* control over their children's intake, and this was seen for both first-born and second-born twins. Twin analyses showed that these differences were not in response to children's genetic propensities, because monozygotic correlations were no greater than dizygotic correlations for maternal feeding style.

Discussion: These results suggest that the stereotype of the obese mother, who uses food in nonnutritive ways so that her child also becomes obese, is more likely to be myth than fact. However, the results raise the possibility that lack of control of food intake might contribute to the emergence of differences in weight.

Introduction

Family feeding styles have long been assumed to contribute to the intergenerational transmission of obesity. This idea has emerged partly from clinical observations, where adult obese patients in therapy identify their parents' attitudes to food as being at the root of their own maladaptive eating habits (1–4). It has also come from clinicians working in the field of childhood obesity, who have identified the family feeding environment as contributing to the development of obesity (5–8). Four feeding patterns in particular have been under suspicion as contributing to the development of obesity. Feeding in response to emotional distress (emotional feeding) and using food as a reward (instrumen-

weight, so they need to be confirmed by direct investigations of parental behavior, preferably before the onset of the weight problem.

In the scientific literature there have been sporadic attempts to investigate parental feeding styles in relation to children's obesity risk. One approach has been to relate feeding styles in families to the weight of the child, on the assumption that the differing feeding styles could have caused the weight variation. However this has not produced consistent results. Parental prompts and encouragement to eat have been shown to be positively associated with children's weight in some studies (11,12) but not others (13–15). Parental control has been also investigated in a limited number of studies, and again the results have been varied, from finding no differences in controlling behaviors between parents of obese and non-obese children (14) to greater parental control over eating for overweight girls but not boys (16).

Most studies in this area have used data from one child per family, so that each family is designated as the family of an obese child or the family of a normal-weight child. Two studies have used a discordant sib-pair design. One, which had just four families, found that parents gave larger portions to the obese boy (17). The second was based on data from 18 families and found no evidence for different feeding practices for the obese and the non-obese sibling (18).

Cross-sectional associations between children's weight and parental feeding will never provide conclusive evidence relating to causal effects, because although the observed parental behavior might be a cause of the child's overweight, it might equally be responsive to the child's weight (e.g., greater control being exerted in response to the child appearing to be overweight). Alternatively it might simply reflect shared genes in the domains of eating and feeding (19).

An alternative approach is to use parental obesity status as an indicator of risk, because it has been established as a strong early-childhood predictor of adult obesity (20,21). Comparisons of feeding styles in families with obese and non-obese parents might therefore give some indication of the parental behaviors that are associated with the intergenerational transmission of obesity risk. There is strong evidence that genetic factors contribute importantly to familial resemblance for weight and overweight (22,23). Nevertheless, about one-quarter of the variance in weight is caused by environmental factors, and parental feeding style could be part of the environmental influence.

Using parental weight status to index the child's risk of obesity is particularly informative when the child is not yet obese, because then it cannot be argued that the parental feeding style is a response to the child's obesity. One of the few studies to take this approach examined parental control and the use of food as a reward, in relation to maternal adiposity, in a large sample of families with preschool children (24). The mother's adiposity proved to be unrelated to her feeding style, but there were few obese mothers in the sample, and the measures of feeding style had comparatively low reliability, which would limit the power of the study to detect associations. In addition other aspects of feeding style, such as parental encouragement to eat or emotional feeding, were not assessed.

The present study was therefore designed to determine whether a community sample of obese mothers with young children used different feeding styles from a matched sample of normal-weight mothers. Four aspects of feeding style were assessed: emotional feeding, instrumental feeding (using food as a reward), prompting/encouragement to eat, and control over eating. If the clinically derived, feeding-style hypotheses are correct, we would expect to see that obese parents, whose children will have a much higher risk of obesity, would be more likely to feed their children for emotional and instrumental reasons and to encourage and prompt eating more. They might also exert less control over their children's eating, although there has been little agreement in the literature on the role of control. In addition, we examined two other factors that have been hypothesized to be linked with maternal feeding style: the mother's own eating style and the child's weight. Maternal eating style has been linked with maternal feeding style, particularly in relation to dietary restraint, where mothers who are trying to control their own weight seem to be more likely to restrict their child's intake (25). We also looked at associations between children's weight and parental feeding style, because if variation in parental feeding style is causing variation in weight, parents who are more encouraging of eating might have fatter children, whereas if parental feeding style is responsive to weight, then parents would be likely to be more encouraging if their children are relatively thinner. Finally, the children were selected from a large and representative twin sample so that future analyses could assess the extent to which any phenotypic associations between parental feeding style and children's weight are mediated genetically.

Research Methods and Procedures

Participants and Procedures

Participants were from 214 families with same-sex twins: 100 families in which both parents were overweight or obese and 114 in which both parents were normal-weight or lean. The families were drawn from the Twins Early Development Study (TEDS) which includes 10,000 pairs of twins born in England between 1994 and 1995, representing more than one-half of the twins born in those years. The TEDS sample has been shown to be reasonably representative of U.K. families with young children in relation to parental education and occupation (26). Families with overweight and obese parents (called "obese" families) were

selected on the basis that the mother's "reported body mass index (BMI)" (calculated from her reported weight and height)[1] was at least 28.5 kg/m^2 and the father's "reported BMI" was at least 25 kg/m^2. Both parents in the control families (called "lean" families) had reported BMIs ▫ 25 kg/m^2 and were chosen to come from the same areas of the U.K. and to provide an approximate match in terms of social class.

A total of 231 families were contacted by letter and telephone and invited to participate in a study of their children's eating habits. Of those contacted, 214 families (with 428 twin children) agreed to take part. Families were visited in their home, where mothers and children were weighed and measured, and mothers completed questionnaires to assess their feeding and eating styles.

Measures

Demographic Characteristics. Parental age, occupation, and educational level were assessed from the questionnaire sent to the whole TEDS sample in 1997 and 1998. Fathers' occupations were classified according to the Registrar General's Classification of Occupations from Class 1 (professional) to Class V (unskilled manual) (27). For the purposes of matching the lean to the obese families, they were grouped as manual and nonmanual occupations. Mothers' educational level was likewise classified into two groups, representing having achieved no more than the minimal English educational qualifications (no qualifications, CSEs,

family replication. All analyses were conducted using SPSS v10.0 (SPSS Inc., Chicago, IL).

Results

Demographic and Anthropometric Differences

Age, occupation, and educational level of the two groups of parents are shown in Table 1. There were no differences between the groups in the mothers' or fathers' ages, fathers' socioeconomic status, or mothers' educational level. Reported BMIs for the mothers in the two groups differed by more than 3 SDs and for fathers by more than 2 SDs. The mothers' BMIs, calculated from measured weight and height, were substantially higher than their BMIs based on reported weight and height (36.0 vs. 33.7 kg/m^2 for the obese mothers and 23.3 vs. 22.3 kg/m^2 for the normal-weight mothers), although there was a very high correlation between the two values (

weight and BMI were slightly higher in the children from the obese families, although the difference in percentage of body fat was not significant. Significantly more children from the obese families were overweight and obese.

Feeding Style

The feeding style data were analyzed initially to confirm that the scales still had adequate reliability when used with the present sample. Cronbach's α for the four scales were as follows: control over eating (α = 0.81), prompting or encouraging to eat (α = 0.74), instrumental feeding (α = 0.67), and emotional feeding (α = 0.83; see Table 3).

Based on the average scores, most mothers reported com-

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ple of 8-year-olds (39) found no association between parental control and boys' weights, whereas parents of heavier girls reported *less* control.

Parental control can be regarded as protective (i.e., parents restrict food to control the child's weight), but there has also been a view that parental control could prevent the child from learning to regulate its own consumption. Indeed, the finding of a positive correlation between parental control and child weight is interpreted as if parental control has caused the child's weight to increase (16). Some support for this model comes from the work of Fisher and Birch (25,40), which showed that mothers' reported restriction of high-fat and "junk" foods was associated with higher intake of food in a laboratory test. If restriction does prove to be a counter-productive strategy, important issues will be raised regarding feeding advice to parents. However, in the context of the present results, the parents of the high-risk children showed *less*, not more control, so any issues concerning possible adverse effects of excessive control don't seem to be particularly salient in understanding the development of weight problems in children from obese families.

Several studies show that higher social class mothers are more likely to restrict their child's access to fatty and sugary foods and snacks (10,41), and this seems to track into the children eating healthier diets later when they have more choice over what they eat (10). The families in the present study were matched for social class, thus, social class was not the confounder of the findings. Longer-term follow-up studies might usefully examine whether parental control during childhood is a protective influence against overconsumption of high-energy-dense foods and subsequent weight gain. If it is, differences in parental control might contribute to explaining the social-class differences in weight that emerge as children develop.

Whereas the primary question of this study was whether there were feeding-style differences between fat and thin parents, we were also interested in other factors, such as the mother's own eating style or the child's weight, which might shed light on the variation in feeding style. Other research has indicated that parents who are more restrained are more likely to restrict their children's intake (25,35), but in the present study, maternal restraint was not associated with any aspect of feeding style, either for boys or girls, or for the fattest children compared with the other children. However, emotional eating by the mother was associated with emotional feeding of the child, whereas externally cued eating was associated with more instrumental feeding. This may reflect the mother's tendency to treat her children as she treats herself, or more tentatively, it might be mediated by the children of emotionally-eating ing od od wheni.e.,6669u66666(the)-820.1(child)]TJ /F6 1 Tf3.80194 0 TD (')Tj /F9 1 Tf 0.333 0

ronmental or genetic), or whether it merely yields children who do not develop self-control (25).

There are limitations in the design of this study. It was carried out with twin families, and it is possible that they are unusual. However, there is no evidence that associations between parental and child weight are different in twins, and the twin data have been particularly prominent in establishing the role of genetic factors in the familial similarities in weight. In the context of the present study, the twin design