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FAMILIAL FACTORS AND RELATIVE WEIGHT IN CHILDREN

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Ninety-five French-Canadian children and their parents took part in this study of the relationship between selected familial variables and children's relative weight. Results of a backstep regression analysis showed that socioeconomic status was the best single predictor for girls, whereas maternal rejection/ hostility, duration of breast-feeding, and socioeconomic status were significant predictors for boys.

Keywords: familial variables, relative weight, children, socioeconomic status, maternal rejection, maternal hostility, breast-feeding duration.

Excess weight is a relatively common condition among pediatric patients, and may lead to both sociopsychological and physical problems, thereby giving rise to mild feelings of inferiority, exposure to negative social feedback, or interference with normal social activity. In addition, it carries an increased risk for developing diabetes, hypertension, and coronary heart disease. Crisp, Douglas, Ross, and Stonehill (1970), and Vilhjalmsdottir, Ferris, Beal, and Pellett (1979) have also suggested that overweight children may be predisposed to having weight problems in later life. Because of the potential immediate and long-term consequences, it is important to identify the determinants of weight variation in children, particularly those that are open to modification, so that preventive strategies may be developed.

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Hartz, Giefer, and Rimm (1977) evaluated the relative effect of family environment and heredity on children's weight, and found that while family environment—comprising variables such as parental example and child-rearing techniques—is not equivalent to total environment, it does represent a major set of influences, accounting for 32%–39% of the variation in obesity, as compared to 11% for heredity. In the present study, I built on this suggestion by focusing on the possible contributions of the familial variables of maternal control and maternal hostility/rejection.

De Man (1982) observed that, at the sociopsychological level, children are exposed to a variety of forms of interpersonal contact, usually beginning with parents and direct family, and gradually extending to others. Family interactions—particularly with parents—must be regarded as a crucial developmental influence. They are the first, and often only, contact children have on a continuing basis, particularly in the early years.

Observation of parent–child relationships reveals that such interaction is a complex process with many variables. Nevertheless, Milton (1958), Nichols (1962), Slater (1962), Roe and Siegelman (1963), Becker (1964), Schaefer (1965), and Siegelman (1965) found evidence for two main factors: *parental control*, which reflects variations in restrictions placed by parents on the behavior of their children, and *parental warmth/hostility*, which reflects the affectional aspect of the parent–child relationship.

Sims and Morris (1974) noted that authoritarian, versus egalitarian, attitudes toward child-rearing were associated with higher caloric intakes and weight in relation to height of preschool children. Valentine and Valentine (1972), on the other hand, found that a permissive attitude toward feeding was associated with overweight babies. Controlling mothers may insist that their children eat regularly and empty their plates, rather than letting them self-regulate their intake. Alternatively, autonomy-granting mothers may allow their children to skip meals if they so wish. This can lead to weight increase, based on Fábry et al.'s (1966) finding that low meal frequency and overweight are associated in schoolchildren. Therefore, I postulated two hypotheses with respect to maternal control:

Hypothesis 1: High weight levels in children will be associated with a controlling maternal attitude.

Hypothesis 2: High weight levels in children will be related to an autonomy-oriented attitude.

Bruch (1961, 1973) suggested that developmental overweight is a response to parental rejection or other severe disturbance in the parent–child relationship. Supposedly, parents overcompensate for their rejecting attitude by overfeeding their children. Because these mothers respond to all signs of distress by feeding their children, children who are exposed to this kind of treatment never learn to distinguish different internal signs,

thus leading to a lack of awareness of satiation when enough food has been ingested. Therefore, I formed the following hypothesis:

Hypothesis 3: There will be a positive relationship between maternal hostility/rejection and overweight in children.

Of course, mothers who differ in their child-rearing practices also differ in other respects that might themselves be related to variation in weight. Therefore, the following variables were regarded as relevant to the present study and taken into consideration: age of mother, socioeconomic status of the family (SES), mother's perception of ideal infant body habitus (IBH), duration of breast-feeding, timing of introduction of solid food, present eating practices, and weight of parents.

During the past decades there has been a shift in child-rearing practices from restrictive to more permissive control (De Man, 1982). Thus, older mothers may be relatively more controlling in their child-rearing. Moreover, Kramer, Barr, Leduc, Boisjoly, and Pless (1983) found that older mothers preferred leaner infants.

Bronfenbrenner (1961) and Hess (1970) proposed that social classes differ in kind and timing of parental control. Sims and Morris (1974) observed that authoritarian attitudes were more prevalent at the lower socioeconomic levels. Stunkard, d'Aquili, Fox, and Filion (1972) and Garn et al. (1976) reported a relationship between SES and weight in children, and Kramer et al. (1983) found that higher SES mothers preferred leaner infants.

Taitz (1971), Shukla, Forsyth, Anderson, and Marwah (1972), Sveger, Lindberg, Weibull, and Olsson (1975), Davies, Gray, Elwood, Hopkinson, and Smith (1977), Saarinen and Siimes (1979), and Kramer (1981) found relationships between infantile feeding practices (introduction of solid foods, bottle feeding) and weight in young children. Further, Kramer et al. (1983) found that breast-feeding mothers preferred leaner infants.

Sears, Maccoby, and Levin (1957) and Becker (1964) noted that, even though mothers may be more permissive or restrictive in some areas than in others, there is statistical evidence for a strong tendency for mothers who are controlling in one area of child-rearing to be so in others. Therefore, maternal control may express itself in present feeding practices.

Finally, Guthrie (1971), Garn, Bailey, and Cole (1976), Garn, Bailey, and Higgins (1976), and Garn, Cole, and Bailey (1977) found a relationship between weight of parents and weight of children.

Method

Participants

Participants were 95 French-Canadian children (48 girls, 47 boys; age range = 7–11 years) and their parents. Children were randomly selected

from among a group of 500 who had been part of a longitudinal study since birth. The study, which involves monthly evaluations of the children and their families, and immediate recording of relevant events when these take place, has produced an extensive data bank.

Participants resided in a circumscribed geographical area, and did not include children living in institutions (welfare, health) or in treatment for chronic diseases, such as epilepsy, diabetes, or cystic fibrosis.

Materials

Information was gathered during home visits or from the data bank. Use of the latter made it possible to circumvent problems normally associated with information based on retrospective accounts by parents.

A brief demographic description of the family was obtained, including age and level of education of the mother, gross family income, and occupation of the main earner. The latter three variables were used to determine SES according to Green's (1970) three-factor index.

The French version (De Man, Balkou, & Vobecky, 1985) of the Parental Attitude Research Instrument (PARI; Schaefer & Bell, 1958) was used to assess maternal control and hostility/rejection. The PARI consists of 23 five-item subscales, each measuring an attitude of importance in child-rearing. Mothers respond on a 4-point scale ranging from 1 = *agree* to 4 = *disagree*. Total hostility/rejection and control scores are obtained by summing selected scales.

The data bank provided information about duration of breast-feeding, and age at which any solid food (excluding juices) was introduced.

Information on nutrient intake (present eating practices) was obtained by 7-day dietary record. Mean calories per kg of body weight was calculated.

Maternal perception of IBH was assessed using Kramer et al.'s (1983) measure, consisting of a set of four drawings of infants with body habiti ranging from very lean (–10) to very chubby (+10). Mothers rank the pictures by preference. Separate drawings are used for males and females.

Relative weight of the individual child was established by comparing actual weight with expected weight for age and height. As a reference, I used data from the 1971–1974 National Health and Nutrition Examination Survey I (Hamill, Drizd, Johnson, Reed, & Roche, 1977). Relative weight of the respective parents was calculated as a ratio of actual weight and expected weight for height.

Results and Discussion

I performed a backstep regression analysis with the potential predictors of relative weight as the dependent variable for boys and girls combined.

Socioeconomic status emerged as the best single predictor, accounting for 8.56% of the variance, $F(1, 93) = 8.71$, $p < .005$. This indicates that relative weight rises with SES, congruent with Garn et al.'s (1976) finding that there is a consistent effect of socioeconomic class on weight. The percentage of variance accounted for significantly increased to 14.09%, $F(2, 92) = 7.54$, $p < .001$, by including sex of participant in the predictive equation. Further, boys tended to have a higher relative weight than girls. Finally, the correlation matrix revealed that maternal hostility/rejection was positively related to relative weight ($r = .22$, $p < .05$) but did not contribute significantly to the regression. Therefore, the relationship between the two variables was determined to be an indirect result of the interrelationships among SES, sex of participant, and relative weight.

Because of the sex of participant finding, separate backstep regression analyses were performed for boys and girls. For girls, SES emerged as the best single predictor, accounting for 10% of the variance, $F(1, 45) = 5.11$, $p < .05$. Inclusion of the other variables did not result in significant increments. Subsequent semipartial correlational analyses showed that none of the variables other than SES was significantly related to variation in relative weight. Thus, there must be factors associated with SES but not addressed in this study that contribute to variation in girls' weight.

A backstep regression analysis of boys' data showed that maternal hostility/rejection was the best single predictor of relative weight, accounting for 11.1% of the latter's variance, $F(1, 44) = 5.17$, $p < .05$. The variance accounted for significantly increased to 24.67%, $F(2, 44) = 7.21$, $p < .05$, and 32.66%, $F(3, 43) = 6.95$, $p < .01$, respectively, by including duration of breast-feeding and SES in the equation. Maternal rejection was positively related to relative weight, congruent with our hypotheses and Bruch's (1961, 1973) suggestion. Extended breast-feeding and higher SES were associated with higher relative weight. Subsequent semipartial correlational analyses of all variables revealed that, of the three predictors, only maternal hostility/rejection ($spr = .33$, $p < .025$) and duration of breast-feeding ($spr = .32$, $p < .025$) maintained significance. Moreover, an examination of bivariate and partial correlations revealed an interaction between these two variables. The bivariate correlation between hostility/rejection and relative weight was .33, whereas the partial correlation with the effect of breast-feeding partialled out was .45. This positive change may be explained by the fact that breast-feeding and maternal hostility/rejection were negatively related ($r = -.34$).

In summary, I found that the relational patterns between familial variables and relative weight are not necessarily the same for boys and girls. SES was a significant variable for both sexes. Of the two child-rearing factors, maternal hostility/rejection was related to weight in boys

only. Further, a similar sex difference was found for the association between breast-feeding and weight.

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