

Problematic Eating and Feeding Behaviors of 36-Month-Old Children

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ABSTRACT

Objective: We incorporated selected items from several existing instruments to create a comprehensive multifactorial instrument to measure problematic eating behaviors in young children and to examine the prevalences and correlates of these behaviors.

Method: A community sample of young mothers ($N = 93$) completed the inventory of problematic eating behaviors for their 36-month-old children.

Results: The most common child problems reported by mothers were the spitting out of food during feedings and becoming upset when food was restricted. A four-factor solution identified pickiness (e.g., child eats a limited variety of food), food refusal (e.g., child refuses to eat specific foods), struggle for control (e.g., frequent struggles with child over food), and positive parental

behavior (e.g., praising child about his/her food intake) domains. Internal consistency was moderate to good for all factors. Only the struggle for control factor was related to other problematic behaviors as measured by the Child Behavior Check List (CBCL). The food refusal factor was related to mothers' lifetime history of any psychopathology. The pickiness factor was related to mothers' lifetime history of alcohol dependence.

Conclusion: Findings suggest that child clinicians should be sensitive to the quality of mother-child interactions during feeding. © 2005 by Wiley Periodicals, Inc.

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Introduction

Feeding problems of childhood are common concerns encountered in pediatric practice (Manikam & Perman, 2000). These "troublesome eating behaviors" (Marchi & Cohen, 1990, p. 112) include picky and highly selective eating, food refusal, manifestation of negative affect and negativistic behavior during eating, exceedingly slow eating, and having tantrums or angry outbursts during mealtimes. Coolbear and Benoit (1999) estimated that 25% of normally developing infants manifest these types of problems. Chatoor, Ganiban, Harrison, and Hirsch (2001) reported that one in four parents who brought in their child for a routine

pediatric checkup was concerned about their child's eating, and Forsythe (2001) found that one third of mothers believed their infants experienced feeding difficulties, such as excessive spitting and excessive crying, during their first 4 months of life.

Although far more common than the clinical syndromes captured in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, American Psychiatric Association [APA], 1994) under Feeding and Eating Disorders of Infancy or Early Childhood (FEDIEC; i.e., pica and rumination disorder), and despite a recent upsurge in interest in research on children's feeding and eating problems (Chatoor, 2002; Manikam & Perman, 2000; Nicholls, Chater, & Lask, 2000), little is known about the incidence of troublesome eating behaviors in community samples of children or about the extent to which they change (qualitatively and quantitatively) as a function of the child's developmental level. To be sure, there are exceptions (e.g., Pelchat & Pliner, 1986), but as Crist and Napier-Phillips (2001) have stated, the study of feeding difficulties in young children has been hampered by a general lack of knowledge of feeding behaviors in healthy, normally developing children. One of the goals of our investigation is to contribute to knowledge about the relative prevalence of, and to pilot an

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instrument with which to assess, these kinds of problems in a community sample of 3-year-old children.

Experts have focused on feeding problem behaviors as risk factors for eating and weight disorders. For example, Marchi and Cohen (1990) found that "picky eating" in childhood was associated with adolescent anorexia nervosa. Similarly, Kotler, Cohen, Davies, and Pine (2001) suggested that the occurrence of eating conflicts, struggles with food, and unpleasant meals during childhood predict the later development of eating disorders. The results reported by Graber, Brooks-Gunn, Paikof, and Warren (1994) and Attie and Brooks-Gunn (1989) also suggest that early-onset eating problems lead to more serious problems later in life. Troublesome eating behaviors are also important because they are sources of concern for parents, and prolonged difficulty in feeding can lead to severe weight loss or failure to gain weight, stunted growth, and cognitive and developmental delays (Chatoor, Egan, Geston, Menveille, & O'Donnell, 1988; Wright and Birks, 2000). Interest in early childhood eating patterns also is stimulated by the growing concern over childhood obesity that has prompted calls for an improved understanding of its early behavioral antecedents (e.g., Stice, Agras, & Hammer, 1999). Finally, parents inadvertently may contribute to their children's feeding problems by reinforcing maladaptive behaviors (Manikam & Perman, 2000) and research is needed to better understand the role of parents' behaviors during feeding. Hence, systematic measurement of problematic eating behaviors early in life may be useful for early identification and intervention.

There have been several previous attempts to measure problematic eating behaviors in very young children ranging from very brief (e.g., four to six items: Agras, Hammer, & McNicholas, 1999; Marchi & Cohen, 1990) to longer (e.g., Crist & Napier-Phillips, 2001; Fisher & Birch, 2001; Galloway, Lee, & Birch, 2003; Johnson & Birch, 1994; Pelchat & Pliner, 1986; Wardle, Sanderson, Gibson, & Rapoport, 2001; Whelan & Cooper, 2000) questionnaires. Some investigators have relied on observation-based assessments (e.g., Carruth & Skinner, 2000; Carruth et al., 1998; Chatoor et al., 1997). Even though there have been attempts to measure problematic eating behaviors in children and problematic attitudes and behaviors of parents, little systematic data on the psychometric properties of these devices for use with very young, normally developing children are available. Therefore, we sought to evaluate the psychometric properties of a questionnaire instrument designed to measure a broad range of problematic eating behaviors and to examine the dimensional structure of troublesome eating and feeding behaviors.

On the basis of previous studies (Agras et al., 1999; Jacobi, Agras, Bryson, & Hammer, 2003; Manikam & Perman, 2000; Marchi & Cohen, 1990; Pelchat & Pliner, 1986; Wardle, Guthrie, Sanderson, & Rapoport, 2001), four dimensions are currently of interest: picky eating (e.g., Does your child eat a limited variety of foods?); refusal to eat (e.g., Does your child refuse to eat any of the following foods?); positive and negative behaviors of parent (e.g., Do you force feed into a child's mouth?); and struggle for control (e.g., Do you have frequent struggles with your child about food?). As part of our ongoing studies to follow the probands and the children of the Oregon Adolescent Depression Project (OADP; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993), we developed an eating and feeding-related questionnaire to be administered to the mothers of 36-month-old infants of our probands. In creating this measure, we drew on scales and items generated by the authors mentioned above (Agras et al., 1999; Chatoor et al., 1997; Crist & Napier-Phillips, 2001).

We expected that the feeding problems encompassed by the newly constructed scale would cluster into conceptually meaningful dimensions, including picky eating, refusal to eat, positive or negative behaviors of parents, and struggle for control. We also investigated whether these kinds of problems are interrelated sufficiently to conclude that they all reflect a single (general) factor that can be used to represent a given child's level of problematic behaviors. We present the results of an exploratory factor analysis that examined the relationships between items and scales.

Although it is possible that children with these problematic eating behaviors only experience mild and transient pathologic conditions, it is important to determine whether such symptoms are embedded in the context of other concurrent psychopathology. Thus, another goal of our study was to examine the extent to which the presence of troublesome eating behaviors early in life is associated with other signs of psychopathology and, perhaps, even developmental delays, such as reduced competence and functioning. In the current study, these constructs were measured with the Child Behavior Check List (CBCL; Achenbach, 1992) and the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984).

We also were interested in examining the relationship of maternal psychopathology, including eating disorders and obesity, with childhood troublesome eating behaviors. A few studies have explored the relationship of maternal eating disorders and eating behavior in their offspring. These studies (Stein, Woolley, Cooper, & Fairburn, 1994;

Stein, Woolley, & McPherson, 1999) have shown that mothers with an eating disorder (current or past) more frequently expressed negative emotions during mealtimes, engaged more often in conflict with their child during mealtime than control mothers (Stein et al., 1994), and were less likely to make positive comments during mealtimes (Wagh & Bulik, 1999) than mothers without a history of an eating disorder. Given these findings, we expected the children of mothers with eating disorders-related problematic behaviors and attitudes would have children with elevated levels of troublesome eating behaviors. Because most of the previous literature on these topics has been almost exclusively on maternal psychopathology, and because most of the current data are based on reports by mothers, we focused on the relationship of childhood eating problems and maternal variables (instead of examining its relationship to paternal variables, as well).

Methods

Participants and Procedure

The initial pool of participants was selected randomly in three cohorts from nine senior high schools and participated in three assessments from 1987 to 1999 as part of the OADP. Detailed descriptions pertaining to recruitment, sampling, and participation rates at each assessment have been documented elsewhere (Lewinsohn et al., 1993; Lewinsohn, Rohde, Klein, & Seeley, 1999).

During the period of 1997 to 2002, those OADP participants who had a newborn infant, became pregnant or whose partner became pregnant over a 3-year recruitment period, lived in Oregon, and wished to participate, were recruited. Participation rates for eligible families was 83% and demographic differences between those who did and those who did not participate were small. (For a more detailed description of the sample, see Forbes, Cohn, Allen, & Lewinsohn, in press.) Families were originally recruited to bring their children in at ages 3, 6, 12, and 24 months to fill out questionnaires, complete diagnostic interviews, and participate with their children in laboratory assessments. After the 24-month assessment, participants were invited to continue in an additional assessment at 36 months. Like the initial assessment, the 36-month assessment involved filling out questionnaires, completing diagnostic interviews, and participating with their children in laboratory assessments. Data collected at the 36-month assessment are the focus of this study. Due to budgetary constraints, the 36-month assessment was terminated. At termination, 106 families were eligible for the 36-month assessment,

of which 93 (87.7%) participated. The 93 mothers in this sample were 29.3 ($SD = 2.4$) years old. The majority of them were White (95.7%), with 1.1% Black, 2.2% Asian, 1.1% Native American, and 1.1% other. All the mothers had graduated from high school and 28.0% had received a bachelors degree or higher. The majority of couples raising the infant (84.8%) were married at the time of the 36-month assessment, 5.5% never married, and 9.7% were divorced or separated. All mothers and fathers in the study raising the child were biologic parents.

Most of the infants were female (59.1%). If either biologic parent had a minority status, then the infant was given that status. If both biologic parents had a minority status, then the infant was given the mother's minority status. The minority makeup of the infants was 2.2% Black, 7.5% Hispanic, 3.2% Native American, 2.2% Asian, and 2.2% other. The average age (adjusted for prematurity) at the 36-month assessment was 36.5 ($SD = 1.3$) and 37.1 ($SD = 1.9$) months for girls and boys, respectively.

Height and weight data were available by self-report for 81 (87.1%) of the 93 mothers, and per mother's report for 72 (77.4%) of the infants in the study. The mother's average height was 1.66 m. ($SD = 0.7$ m), weight was 77.0 kg ($SD = 21.9$ kg), and body mass index (BMI) was 27.8 ($SD = 7.5$). The infant's average height was .96 m. ($SD = 0.8$ m), weight was 15.6 kg ($SD = 2.1$ kg), and BMI was 16.9 ($SD = 2.7$).

Boys and girls were tested for any significant demographic and overall personal and social sufficiency differences. Personal and social sufficiency was assessed with the Vineland Adaptive Behavior Scales (a full description of these measures is provided below). No significant gender differences were found. See Table 1 for means and standard deviations of the children's variables.

Diagnostic Interviews

To assess parents' current and lifetime psychopathology, a version of the Structured Clinical Interview for Axis I DSM-IV Disorders-Patient Edition (First, Spitzer, Gibbon, & Williams, 1994) was used (First, Gibbon, Spitzer, & Williams, 1996). Follow-up assessments were supplemented with the Longitudinal Interval Follow-Up Evaluation (LIFE; Keller et al., 1987), which elicited detailed information about the course of psychiatric symptoms and disorders since the previous interview. Diagnoses were made using criteria described in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (APA, 1994).

Diagnostic interviewers were selected carefully and trained. Before conducting interviews, all interviewers were required to demonstrate a minimum kappa value of .80 for all symptoms across two consecutive interviews and on one videotaped interview of a participant with evidence of psychopathology. Based on a randomly selected subsample (25%) at the 3-month assessment period, interrater

TABLE 1. Rotated factor loadings and eigenvalues from Oblimin analysis from 36-month sample^{1a}

Item	Factor 1	Factor 2	Factor 3	Factor 4
Does your child eat a limited variety of foods	.67	-.10	.46	-.08
Will s/he eat favorite foods only if prepared a very specific way?	.52	.01	.31	-.24
Does your child accept new foods readily?	-.78	-.14	-.45	-.08
Do you think your child is a picky eater?	.70	-.05	.46	.09
Does your child refuse fish?	.60	.32	.19	-.12
Does your child refuse soups?	.62	.36	.24	-.23
Does your child refuse vegetables?	.67	.24	.15	.19
Does your child refuse squash?	.60	-.07	-.05	.11
Does your child refuse meats?	.41	.53	.18	-.17
Does your child refuse eggs?	.22	.37	.24	.22
Does your child refuse cheese?	.02	.56	.26	-.25
Does your child refuse milk?	.27	.67	-.10	-.14
Does your child refuse yogurt?	-.12	.39	.18	-.05
Does your child refuse potatoes, rice, pasta?	.21	.47	.07	.12
Does your child refuse breads?	.04	.87	.22	.02
Does your child refuse cereals?	.06	.64	-.03	-.05
Does your child refuse chips?	.07	.69	.27	.12
Do you feel stressed during your child's feeding time?	.26	.22	.50	.01
Do you have to coax your child to eat?	.19	.12	.68	.15
Is your child difficult and stubborn during feedings?	.20	.19	.59	.29
Do you have frequent struggles with your child about food?	.37	.21	.56	.17
Does your child accept food one day but reject it on another?	.31	.09	.56	.12
Does your child refuse to open his/her mouth when you are trying to feed him/her?	.13	.04	.45	-.27
Does your child turn away from food?	.14	.15	.62	.20
Does your child push food away or throw food on the floor?	.19	.02	.54	-.13
Do you praise child about his/her food intake?	.03	-.09	-.01	.48
Do you praise child about his/her feeding skills?	.01	.23	.08	.54
Eigenvalues	6.69	3.67	2.56	2.12

^a Factor loadings highlighted represent "on factor" loadings (i.e., loadings of items on factors on which they are hypothesized to load), whereas factor loadings not highlighted represent "off factor" loadings (i.e., loadings of items on factors on which they are hypothesized *not* to load).

reliability was moderate to excellent for eating disorders ($\kappa = .88$), major depressive disorder (MDD; $\kappa = .71$), anxiety disorders ($\kappa = .69$), alcohol abuse/dependence ($\kappa = .86$), and drug abuse/dependence ($\kappa = .85$).

Laboratory Assessments

To assess personal and social sufficiency of the child, the Vineland Adaptive Behavior Scales survey form was used (Sparrow et al., 1984). The 297 items of this semistructured interview obtains norm-referenced data to measure sufficiency in the areas of communication, daily living skills, socialization, and motor skills. It was administered to the parents by a trained interviewer at the 36-month assessment. Before conducting assessments, all assessors were required to demonstrate a minimum kappa value of .80 for all items across two consecutive administrations of the Vineland and on one videotaped administration. A random subsample (15%) was selected, and the interrater reliability across all items was excellent ($\kappa = .84$).

Measures

Eating Disorders Symptoms Questionnaire (EDSQ). The EDSQ, a 32-item questionnaire designed to assess proble-

matic behaviors and thoughts that are part of the DSM-IV description of symptomatology for anorexia nervosa and bulimia nervosa (APA, 1994), was administered to both parents at 36 months. The items are scored such that five domains of problematic behavior are identified: drive for thinness, bulimia, body dissatisfaction, compulsive behavior, and excessive exercise. For more information on the psychometric properties of this questionnaire, see Lewinsohn, Seeley, Moerk, and Striegel-Moore (2002).

CBCL. At the 24-month assessment, children's internalizing/externalizing behavioral and emotional problems were assessed with the CBCL (Achenbach, 1991). Scores can be used to describe two empirically derived broadband syndromes of internalizing and externalizing problems, as well as total behavior problems. Due to limited resources, CBCL data were not available for the 36-month assessment. There is evidence, however, to the relative stability of the total problem, internalizing, and externalizing scores in preschool children (Achenbach & Rescorla, 2000).

Oregon Research Institute Child Eating Behavior Inventory (ORI-CEBI). Several existing instruments were com-

bined to create a comprehensive 89-item questionnaire for parents to complete about their child's feeding/eating behavior (Table 2), which was administered at the 36-month assessment. Parents were instructed to think about their child's behavior during the past month. The questionnaire addresses the following constructs: dyadic interactions during the child's feeding/meal times, the child's and parent's affect during feeding, refusal to eat, selective eating, restrictive eating, overeating, and potential medical influences of problematic feeding/eating behavior. An item pool was generated from the following sources: Chatoor et al., 1997 (18 items); Crist and Napier-Phillips, 2001 (10 items); and Agras et al., 1999 (23 items). In addition, 38 items that had been used in the assessment of the constructs mentioned above but not linked to a particular study (e.g., Is your child calm while eating?) were added to the pool. Given the number of different sources from which these items originated, the scaling across items was quite inconsistent. For example, the 10 items selected from Crist and Napier-Phillips (2001) used a 5-point Likert-type scale (*never to always*) whereas the 18 items selected from Chatoor et al. (1997) used a 4-point Likert-type scale (*none to very much*). Given the inconsistency in the scales across studies, the ORI-CEBI used a dichotomous scale to probe for the presence or absence of each item.

Demographic measures were assessed by questionnaires annually and included years of education, educational degree attainment, income, employment status, marital status, age, race, height, and weight. In addition, data gathered as part of the T₁ assessment were used to determine whether the proband was living with both biologic parents during adolescence.

Statistical Analyses

Exploratory factor analysis (EFA) was used with a subset of items from the ORI-CEBI to determine the dimensional structure. As dichotomous variables are not ideal for traditional factor analytic models, results were compared with a weighted least-squares approach (Woods, 2002). Any differences in structure or magnitude of loadings were reported. To assess the consistency of the factors derived from the EFA, reliability analysis was conducted. Reports of internal consistency were given for each factor. The most and least common eating behavior problems were reported. Finally, a correlational analysis was used to determine what relationship, and to what magnitude, exists between the ORI-CEBI factors with child development and functioning measures as well as problems related to maternal psychopathology, obesity, and problem eating attitudes and behaviors.

This research was reviewed and approved by an institutional review board.

Results

EFA Findings

Because only slightly more than one half of the children's fathers participated in the current study ($n = 55$), only maternal responses on the ORI-CEBI were used in the EFA. Initially, all 89 items on the ORI-CEBI were considered for inclusion in the EFA. Because of their severe skewness, however, 27 items could not be included, suggesting these items may be inappropriate for use with 36-month-olds. An additional two items were excluded from factor analyses, as they provide interesting information as stand-alone items (e.g., How much does your child weigh? What is your child's height?), whereas eight were excluded because they pertain primarily to medical conditions (e.g., Has your doctor indicated that your child has a medical condition that affects his/her feeding?). Due to our relatively small sample size, we sought to eliminate approximately one half of the remaining 52 items (see Gorsuch, 1983, for a discussion of sample size considerations in factor analysis) based on a rational approach. As a result, 27 items were included in the EFA. Table 1 displays a complete list of these items, factor loadings, and eigenvalues.

The factors were extracted using an Oblimin oblique rotation method, as we anticipated that the emerging factors would be correlated to some extent. Eigenvalues greater than 1.0 were apparent for nine factors. No evidence of a general, higher-order factor was apparent. The scree plot suggested that either a four or six-factor solution was most defensible. The first three factors were consistent, nonredundant, and interpretable regardless of whether four or six factors were extracted. These factors were named pickiness, refusal, and struggle for control, respectively. When considering a four-factor solution, the final factor to emerge consisted of two items that suggested parental-positive behaviors (such as praising the child during mealtime). The six-factor solution included factors that were redundant and did not provide incremental information gain. Therefore, the four-factor solution was chosen as most parsimonious and descriptive of the factor space. However, it should be noted that some items load moderately on more than one factor (e.g., Does your child refuse meats? loads moderately on both Factor 1 (.41) and Factor 2 (.53). When the EFA results were compared with those of a weighted least-squares approach, no differences in factorial structure were found.

The four factors that emerged correspond closely to those we expected. Factor 1 is indicative of pickiness (Kudar-Richardson-20 = .85), Factor 2 captures food refusal (KR-20 = .83), Factor 3 represents struggle for control (KR-20 = .79), and Factor 4 signifies

TABLE 2. Items are recommended for future use if they have greater than 5% variance for either the boys or girls

	Total (N = 93) (%)	Girls (n = 55) (%)	Boys (n = 38) (%)
Item recommend for future use			
Do you praise your child about his/her food intake?	96.8	98.2	94.7
Do you force food into his/her mouth?	16.1	16.4	15.8
Do you insist that your child eat more than s/he wants to?	57.0	61.8	50.0
Do you feel stressed out during your child's feeding time?	68.1	65.5	73.7
Does your child spit food out?	78.5	80.0	76.3
Does your child choke while eating?	37.6	36.4	39.5
Does your child vomit during or after eating?	5.4	5.5	5.3
Does your child appear angry during feeding time?	22.6	18.2	28.9
Does your child appear distressed during feeding time?	28.0	21.8	36.8
Are you concerned about your child's messiness?	55.9	56.4	55.3
Is your child calm while eating?	92.5	90.9	94.7
Is your child irritable while eating?	3.2	1.8	5.3
Does your child accept food from some caretakers while refusing it from others?	15.1	14.5	15.8
In your opinion, does your child eat enough food?	84.9	92.7*	73.7
Does your child have a good appetite?	83.9	90.9*	73.7
Do you have to coax your child to eat more?	36.6	32.7	42.1
Is your child difficult and stubborn during feedings?	20.4	16.4	26.3
Does your child eat a limited variety of foods?	32.3	30.9	34.2
Will s/he eat favorite foods only if prepared in a very specific way?	18.3	18.2	18.4
Does your child let you know that s/he is hungry?	96.8	98.2	94.7
If s/he wants something to eat and you say no (for any reason), does s/he become upset?	71.0	70.9	71.1
Has your child ever had a tantrum because you refused him/her food?	49.5	50.9	47.4
Has your child ever had a tantrum because you insisted that s/he eat something?	30.1	27.3	34.2
Does your child accept new foods readily?	63.4	63.6	63.2
Does s/he have strong likes with regard to food?	77.4	78.2	76.3
Is it hard to feed your child?	18.3	12.7	26.3
Do you have frequent struggles with your child about food?	24.7	21.8	28.9
Is your child a fast eater?	21.5	18.2	26.3
Is your child a slow eater?	38.7	45.5	28.9
Do you think your child is a picky eater?	29.0	25.5	34.2
When eating a meal or snack, does your child finish whatever s/he have been given?	53.8	47.3	63.2
Do you worry about your child becoming overweight?	11.8	16.4**	5.3
Do you worry about your child being underweight?	9.7	1.8	21.1
Is your child's appetite poor?	9.7	5.5	15.8
Is your child's appetite good?	84.9	85.5	84.2
Does your child accept food one day but reject it on another?	45.2	43.6	47.4
Does your child ever chew food but refuse to swallow?	11.8	5.5*	21.1
Does your child ever allow food to dribble out of his/her mouth?	29.0	27.3	31.6
Does your child currently get fed finger foods by a caretaker?	23.7	20.0	28.9
Does your child currently feed him/herself with fingers?	77.4	70.9	86.8
Does your child currently use a knife?	16.1	14.5	18.4
Does your child pour his/her own drink?	22.6	18.2	28.9
Does your child prepare his/her own snacks?	10.8	10.9	10.5
Does your child fall asleep while eating?	6.5	9.1	2.7
Does your child refuse to open his/her mouth when you are trying to feed him/her?	9.7	5.5	15.8
Does your child turn away from food?	35.5	32.7	39.5
Does your child push food away or throw food?	35.5	30.9	42.1
Does your child refuse meats?	14.0	12.7	15.8
Does your child refuse fish?	20.4	16.4	26.3

TABLE 2. continued

	Total (N = 93) (%)	Girls (n = 55) (%)	Boys (n = 38) (%)
Does your child refuse eggs?	10.8	9.1	13.2
Does your child refuse cheese?	4.3	7.3	0.0
Does your child refuse milk?	7.5	5.5	10.5
Does your child refuse yogurt?	9.7	9.1	10.5
Does your child refuse soups?	19.4	18.2	21.1
Does your child refuse vegetables?	25.8	25.5	26.3
Does your child refuse potatoes/rice/pasta?	10.8	7.3	15.8
Does your child refuse cereal?	4.3	7.3	0.0
Does your child refuse fruit?	9.7	9.1	10.5
Does your child refuse puddings?	14.1	14.5	15.8
Does your child refuse squash?	47.3	50.9	42.1
Do you limit the amount of food your child eats?	19.4	21.8	16.2
Do you feed your child calorie-reduced foods, such as low-fat milk, fat-free yogurt, or sugar-free treats?	22.6	23.6	21.1
Do you and your child's other parent ever disagree about any aspect of your child's eating behaviors?	11.8	3.6**	23.7
Do you restrict your child's diet due to a food allergy or intolerance concerns?	4.3	5.5	2.6
Have you been told by your doctor to restrict your child's diet due to allergy or intolerance?	4.3	7.3	0.0
Does your child complain of stomach pain?	19.4	21.8	15.8
Does your child have problems with constipation?	11.8	12.7	10.5
Does your child have problems with diarrhea?	5.4	7.3	2.6
Do you talk to your child while s/he is eating?	100.0	100.0	100.0
Do you praise your child about his/her feeding skills?	100.0	100.0	100.0
Do you feel relaxed during your child's feeding time?	100.0	100.0	100.0
Does your child appear cheerful while eating?	96.8	96.4	97.4
Does your child let you know when s/he is full?	98.9	100.0	97.4
Is your child able to feed him/herself without assistance?	100.0	100.0	100.0
Does your child seem to be shy or inhibited about eating with you or others in comparison to eating alone?	1.1	1.8	0.0
Does your child currently get spoon fed by a caretaker?	1.1	0.0	2.6
Does your child currently drink from a cup or glass?	100.0	100.0	100.0
Does your child currently drink from a straw?	97.8	96.4	100.0
Does your child currently feed him/herself with a spoon?	98.9	98.2	100.0
Does your child currently feed him/herself with a fork?	97.8	96.4	100.0
Does your child ever eat or drink so much that s/he gets sick to the stomach or vomits?	1.1	0.0	2.6
Does your child enjoy eating certain foods so much that it appears that s/he has difficulty stopping?	3.2	3.6	2.6
Does your child cry when food is offered?	2.2	1.8	2.6
Does your child refuse sweets/chocolate?	3.2	3.6	2.6
Does your child refuse breads?	2.2	3.6	0.0
Does your child refuse chips?	3.2	3.6	2.6
Is there a physical condition that might have resulted in a feed problem?	1.1	1.8	0.0
Has your pediatrician ever felt that your child had a feeding problem?	3.2	3.6	2.6
Has your doctor indicated that your child has a medical condition that affects his/her feeding?	1.1	1.8	0.0

* $p < .05$. ** $p < .01$.

positive parental behaviors (KR-20 = .65). Picky eaters appeared to be those who would consume common foods (e.g., bread, cheese) but would not eat foods more uncommon to some children's diet (e.g., fish, squash). Analyses revealed that there was a significant correlation between struggle for control and pickiness ($r = .44, p < .001$), struggle for control and refusal ($r = .36, p < .001$), and between pickiness and refusal ($r = .28, p < .01$) at 36 months. Table 3 shows the means (and standard deviations) for the four ORI-CEBI factors.

No gender differences were found when comparing the factor scores for boys and girls. (A more detailed examination of gender differences at the individual item level is the subject of a separate report.)

Most and Least Common Feeding/Eating Problems

The most common problem of 36-month-old children is spitting food out during feedings (78.5%). Children are also likely to become upset

TABLE 3. Child measures at the 36-month old assessment^a

	Children (N = 93)	
	M	SD
Body mass index	16.9	2.7
Vineland Adaptive Behavior Score	89.1	12.9
CBCL		
Total problem behaviors	19.6	12.2
Internalizing	3.6	2.9
Externalizing	8.6	5.6
ORI-CEBI		
Factor 1 (pickiness)	2.3	2.5
Factor 2 (refusal)	0.7	1.5
Factor 3 (struggle for control)	2.8	2.3
Factor 4 (parental positive behavior)	0.0	0.2

Note: CBCL = Child Behavior Checklist; ORI-CEBI = Oregon Research Institute Child Eating Behavior Inventory.

^aThe CBCL was administered during the 24-month assessment. See the Methods section for explanation.

when they want something to eat and are told “no” (71.0%). Other common behavior problems among children are throwing tantrums when they are refused food (49.5%), accepting food one day but rejecting it on another (45.2%), choking while eating (37.6%), turning away from food (35.5%), and pushing food away or throwing food (35.5%).

Very few children are shier when eating around others as compared with when eating alone (1.1%). Children are also unlikely to eat/drink so much that they become sick or vomit (1.1%). Other rare behaviors are crying when food is offered (2.2%), enjoying certain foods so much that they cannot stop eating (3.2%), or being irritable while eating (3.2%).

Medical Problems

Most eating-related medical problems, such as food allergies and gastroesophageal reflux, were extremely rare in this community sample. However, mothers reported that 19.4% of their children experienced stomach aches, 11.8% constipation, and 5.4% diarrhea on a relatively regular basis. None of these medical problems were significantly correlated with any factor scores. Only 1 parent said that his/her child, as indicated by a pediatrician, had a medical problem that may affect the child’s feeding.

Correlations of the ORI-CEBI with Child Development and Functioning Scores at 36 Months

Table 4 shows the child and maternal variables hypothesized to be associated with childhood eating problems. Correlations were examined to assess the magnitude of the relationship between a child’s level of development and social functioning and the ORI-CEBI factor scores as derived from

TABLE 4. Correlations of ORI-CEBI factor scores with child and maternal measures

	Pickiness	Refusal	Struggle for Control	Positive Parental Behaviors
Child measures				
BMI	.03	-.03	.28*	.21
Vineland	-.07	-.04	-.16	-.14
CBCL				
Total score	.07	-.16	.27**	-.03
Internalizing	.05	-.12	.18	.06
Externalizing	.07	-.15	.24*	-.06
Maternal measures				
BMI	-.10	.07	-.09	-.01
EDSQ total score	.00	-.20	-.04	-.01
Lifetime history of any Axis I disorder	-.08	-.23*	.10	-.08
Eating disorder	.05	-.06	.11	.06
MDD/dysthymia	-.05	-.08	.09	-.11
Anxiety	.01	-.12	.16	.08
Alcohol abuse	-.09	-.10	.15	-.02
Alcohol dependence	.22*	-.04	-.03	.13
Drug abuse	-.11	-.07	.05	.10
Drug dependence	.00	-.15	.03	.00

Note: ORI-CEBI = Oregon Research Institute Child Eating Behavior Inventory.; BMI = body mass index; CBCL = Child Behavior Checklist; EDSQ = Eating Disorder Symptoms Questionnaire; MDD = major depressive disorder.

* $p < .05$. ** $p < .01$.

the factor analysis. No significant correlations were found between the Vineland Adaptive Behavior Scale and the ORI-CEBI factor scores (pickiness: $r = -.07$, not significant [ns]; food refusal: $r = -.04$, ns; struggle for control: $r = -.16$, ns; and positive parental behaviors: $r = -.14$, ns).

Problematic behaviors as measured by the CBCL (Achenbach, 1991) were significantly associated with the struggle for control factor ($r = .27$, $p < .01$), indicating that children who manifest more overall problematic behaviors also tend to struggle for control as it pertains to eating behaviors. Because the struggle for control scores were significantly correlated with the overall problem scores on the CBCL, further analyses were conducted to determine which, if any, specific CBCL domains were most strongly related to mealtime control struggles. Significant relationships between the struggle for control factor and externalizing behavior ($r = .24$, $p < .05$), withdrawal ($r = .22$, $p < .05$), aggression ($r = .26$, $p < .05$), and destructive behaviors ($r = .21$, $p < .05$), as measured by the CBCL, were observed. Correlations between the struggle for control factor and the internalizing scale were not significant.

Child’s BMI was significantly correlated ($r = .28$, $p < .05$) with the struggle for control factor, indicating that the higher a child’s BMI, the more conflict between the child and the mother during feeding times. When examined separately by gender, this correlation was

significant for female children ($r = .47, p < .01$), but not for male children ($r = .02, p = ns$).

No relationships between factor scores and physical diseases and/or related health problems were found.

Eating and Feeding Abnormalities at 36 Months as Related to Maternal Psychopathology

Table 4 shows the correlations between the ORI-CEBI factors and the maternal variables hypothesized to be associated with them. No maternal EDSQ scores were significantly related to offspring scores on any of the ORI-CEBI factors.

Children whose mothers had a history of any Axis I disorder ($n = 56$) were least likely to score highly on the food refusal scale ($r = -.23, p < .05$). Children whose mothers had a lifetime history of alcohol dependence ($n = 8$) were most likely to score highly on the Pickiness scale ($r = .22, p < .05$).

Conclusion

Relatively little empiric information is currently available regarding the eating and feeding patterns of young children. To contribute to this area, the current study examined eating-related behaviors by creating a multifactor measurement to assess pickiness (e.g., child eats a limited variety of food), food refusal (e.g., child refuses to eat specific foods), struggle for control (e.g., frequent struggles with child about food), and positive parental behaviors (e.g., praising child about food intake). The currently developed instrument appears to reliably capture some fundamental aspects of childhood eating and feeding behaviors, as indicated by its psychometric properties and factorial structure. Consistent with expectations, this measure comprised four factors. The first three factors involve childhood eating and feeding problems (pickiness, food refusal, and struggle for control). The fourth factor is reflective of eating-related parental behaviors during the child's mealtime (positive parental behaviors). However, negative parental behaviors were not evident in the fourth factor as previously hypothesized. There was no evidence of a higher-order factor. Therefore, each of the four identified factors is important to consider independently.

When choosing the items for inclusion in the factor analysis, we had several concerns. The current sample size was relatively small. Therefore, to avoid statistical errors (e.g., inadequate subject to variable ratio), the number of items entered in the

analysis needed to be limited. Certain items were excluded because either all or none of the 36-month-old children were positive on the item. For example, all children were able to feed themselves with a spoon and fork and were able to drink from a cup, and none of the children were still being fed by a caretaker with a spoon. In future administrations of this measure, items with severely restricted variance and age-inappropriate items should be removed. In future assessment of clinical populations, researchers may wish to consider certain items for inclusion that were excluded in the analysis of the current population. For example, items like "Does your child appear angry during feeding time?" and "If your child wants something to eat and you say no for any reason, does he/she become upset?" may show more variance in clinical samples of children with more serious problems (clinic cases). Similarly, items like "Does your child eat enough food?" and "Does your child ever eat or drink so much that it appears s/he has difficulty stopping?" may be more relevant with parents self-selected because of their concerns or in clinical samples.

Because the current study focused on generating preliminary findings for a new measure and conducting an EFA, results must be interpreted with caution. Nevertheless, some noteworthy and consistent findings were apparent. In a somewhat counterintuitive manner, pickiness and food refusal emerged as two distinct factors. Although the pickiness and food refusal domains were statistically, significantly correlated, their relationship was relatively weak and does not account for much of the variance observed between them. It might be suggested that pickiness is a reflection of a child's general food preferences (general trait) (e.g., Does your child eat a limited variety of foods? and Will he/she eat favorite foods only if prepared in a certain way?). Although pickiness includes the refusal of a few foods, such as fish and squash, the food refusal factor loads on many specific foods that are typically eaten by the majority of children without problems. Examples of foods that loaded on this factor are breads, chips, cereals, and milk. The current results indicate that identifying these two distinct, yet related, factors may be helpful in distinguishing between children who are choosy (pickiness) and those who refuse to eat basic foods (food refusal).

Food neophobia (avoidance of new foods) did not emerge as a separate factor. Compared with the much more extensive inclusion of neophobia items (e.g., Galloway et al., 2003), we had only very sparse coverage of this construct (Does your child accept new foods readily?) which loaded .78 on

Factor 1. Future studies might want to include a greater number of neophobia items from the scale used by Galloway et al. (2003). With greater representation, neophobia and pickiness might have emerged as separate factors. They appear to have somewhat different predictors and consequences.

An important finding of the current study is the relationship of the struggle for control factor and the child's BMI and behavioral problems as reported by the mother. The items that load on the struggle for control factor are indicative of conflict between a child and his/her mother at feeding time. High child BMI was associated with more conflicted mealtime interaction. Furthermore, high ratings on the struggle for control factor were significantly correlated with the total problem and the externalizing scales of the CBCL. This finding suggests that children who are involved with control struggles with their mother during mealtimes also manifest other, more general behavioral problems. Prospective studies are needed to examine the temporal relationship between these variables. For example, one might speculate that mothers of heavy children may try to exert more control over the feeding situation than mothers of lean children. Pending cross-validation, the clinical significance of the control dimension deserves more study.

The other child dimensions, pickiness and food refusal, were not correlated with any of the indicators of childhood weight or behavioral problems, suggesting that these factors are indicative of normative eating and feeding behaviors, and are not part of a pattern of child pathology. Our findings further suggest that none of the troublesome eating behavior factors were related to the level of the children's developmental skills as assessed by the Vineland. Although this result was not unexpected, the negative result is worth noting. Hence, in a community sample of physically healthy children, troublesome eating behavior does not appear to be indicative of developmental delays.

The food refusal factor was negatively associated with the presence of any maternal Axis I disorder: Mothers with a history of an Axis I disorder were less likely to report that their child was refusing specific foods. Chatoor (1989) previously noted that maternal psychopathology is associated with feeding disorders in infancy and early childhood. The mechanisms underlying this association are not yet fully understood.

Our results did not support a relationship between maternal weight and eating pathology and troublesome childhood eating behaviors in this community sample. Previous researchers

(Stein et al., 1994, 1999; Waugh & Bulik, 1999) had observed relationships between maternal eating concerns and negative mealtime interactions, but these studies specifically compared mothers with eating disorders (DSM) with those without problematic eating histories. The mothers in the current community sample experienced relatively low levels of eating-disordered pathology.

Several clinical implications can be suggested based on the results of the current study. Struggle for control was associated with externalizing behavior problems. One area of interest will be determining whether control struggles about eating are part of a broader pattern of control problems, for example, oppositional defiant disorder. Assessment of this construct may signal a need for early intervention. Clinicians working with mothers who experience a mental disorder need to be sensitive to the fact that the mothers may encounter difficulties in their mealtime interactions with their children. Finally, a variety of physical complications, such as gastrointestinal reflux or short gut syndrome, can impact the eating and feeding habits of a child (Bryant-Waugh & Lask, 2002). In this study, no relationships were found between medical problems and troublesome eating behaviors, likely because our sample was drawn from the community and medical disorders involving feeding are uncommon. When assessing childhood eating and feeding problems, however, it is necessary to consider the presence of medical disorders.

There are several limitations of the current study that need to be recognized. First, the sample size was relatively small. Future studies should be based on a larger number of participants to ensure results that are more broadly representative. Second, items had different number of scale points because they were kept in the format in which they were originally developed by their creators. In the future, all should have the same scale, preferably a Likert-type rather than a dichotomous scale to allow for more variance in the responses. Moreover, although the ORI-CEBI appears to be a comprehensive and reliable measure of troublesome eating behaviors in young children, there are ways that it could be improved. Factor 4, which measures positive parental behaviors, consisted of only two items that had factor loadings greater than .3. To the extent that future investigators wish to focus more fully on maternal (or paternal) behavior during mealtime, additional items that assess these behaviors should be added. Future studies also should attempt to establish the validity of the scales. An additional limitation of this study is that the range of child problems, child weights, and maternal eating disorder problems was limited. For example, we might not

have been able to properly evaluate the impact of child adiposity on some childhood problems or on parental behavioral and attitude problems because so few of our children were overweight. Finally, the current study was cross-sectional. Future research needs to examine whether the childhood problem eating factors are related to future developmental problems and psychopathology, including eating disorders.

In conclusion, our study was conducted in an exploratory framework. Initial analyses support the structure and proposed correlates of the currently developed measurement. The results should be interpreted conservatively. Future administrations of the ORI-CEBI will serve to refine the measure, and to cross-validate the positive and negative current findings on diverse samples. In addition, future studies should be aimed at identifying long-term correlates of childhood eating and feeding problems.

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