Problem-Solving Abilities Among Mothers of Infants With Failure to Thrive

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Objective: Maternal problem-solving abilities, as they related to specific child-rearing situations, were examined and compared among mothers of infants with failure to thrive (FTT) and a matched group of comparison mothers.

Methods: Participants were 37 mothers of children diagnosed with FTT and 37 mothers with normally growing children matched on three child variables and five maternal variables. Participants were administered a means-ends problem-solving measure specific to parents of young children and measures of language ability, depression, negative affect, and stressful life events.

Results: Multivariate analysis of covariance results supported our main study hypotheses that mothers of infants with FTT would generate fewer problem-solving strategies that would be judged of poorer quality (i.e., less likely to result in positive outcomes) than mothers of healthy, normally growing infants. There were no significant associations obtained among problem-solving variables and individual difference variables (e.g., depression, negative affect, and stressful life events).

Conclusions: Limited maternal problem-solving abilities may contribute to FTT by interfering directly with the quality of nurturance, feeding, and caloric intake the child receives. Recommendations are made for future research and interventions with mothers of children with FTT.

Key words: maternal problem-solving abilities; failure to thrive.

Failure to thrive (FTT), or growth deficiency (Bithoney & Rathbun, 1983), is a widely recognized pediatric condition known to have adverse consequences on children's health and psychological development (Kessler & Dawson, 1999). Multiple factors contribute to the development of FTT and the psychosocial outcomes of affected children (Drotar, 1988). Research has identified correlates and etiological patterns of FTT including parental history of maltreatment (Altemeier, O'Connor, Sherrod, & Vietze, 1985), partner discord (Chatoor & Egan, 1983; Lobo, Barnard, & Coombs, 1992), more frequent stressful life events (Gorman, Leifer, & Grossman, 1993), financial problems (Frank, Allen, & Brown, 1985), dysfunctional maternal-child interactions (Chatoor & Egan, 1983), and family dysfunction (Drotar, 1991b).

Although the critical factors affecting the management of FTT are as yet not well understood, deficient parental competencies have been identified among mothers of infants with FTT in several well-controlled empirical studies. For example, mothers of children with FTT showed significantly more indifferent or anxious behaviors toward their children and were less likely to communicate or socialize...
during mealtimes than mothers of healthy, adequately growing children (Heptinstall et al., 1987). Black and colleagues’ (Black, Hutcheson, Dubowitz, Berenson-Howard, 1994) assessment of parenting style during mealtimes identified twice as many neglectful parenting patterns among families of children with FTT than among a group of families with healthy children.

Although broad areas of deficient parenting have been identified in mothers and families with infants diagnosed as FTT, specific patterns of parenting competencies as well as deficits have not been well documented but are potentially important in targeting areas of intervention that can improve parenting.

One potentially important aspect of parenting that is not well documented among mothers of infants with FTT is problem-solving skills. Social problem solving is defined as the “self-directed cognitive behavioral process by which a person attempts to identify or discover effective or adaptive ways of coping with problematic situations encountered in everyday living” (D’Zurilla, 1986; D’Zurilla & Goldfried, 1971). Research on social problem-solving skills indicates that the problem-solving process consists of five stages: (1) problem identification, (2) generating of alternate solutions, (3) decision making, (4) implementation of the solution, and (5) evaluation of the outcomes (Jayanthi & Friend, 1992). Two major types of problem-solving measures that reflect the cognitive and behavioral aspects of problem solving have been used: process measures and outcome measures (D’Zurilla & Maydeu-Olivares, 1995). Process measures assess the general cognitive and behavioral activities that facilitate or inhibit the discovery of effective or adaptive problem-solving solutions and are considered most useful for assessing problem-solving attitudes and skills. For example, problem-solving processes represent the cognitive antecedent activity that enables a person to find a solution. This includes formulating the problem, appraising solutions that are generated, and considering the social-emotional processes concerned with taking the other person’s perspective (Nezu, Nezu, & Perri, 1989; Shure, 1985). On the other hand, outcome measures assess the quality of specific solutions to specific problems and are considered most useful for evaluating problem-solving performance or the ability of individuals to apply their problem-solving skills effectively to specific problems.

Research on parental problem solving has assessed both process and outcome variables and are potentially relevant to the parents of children who fail to thrive. For example, negative emotion (e.g., distress) has been found to disrupt parental problem solving and the ability to reason clearly about child-rearing conflicts (Emmerich, 1969; Maccoby, 1980). By undermining problem solving, strong negative emotion may also make it difficult for parents to effectively coordinate their behavior with that of their children (Dix, 1991). Moreover, mothers who experience high life stress have been shown to perform more poorly on family problem-solving tasks than mothers experiencing low stress (Paterson, 1982). Pridham and colleagues (Pridham, Denney, Pascoe, Chiu, & Creasey, 1995) found that aspects of the problem-solving process (problem clarification, contingency planning) had a mediating effect on maternal quantity and quality of child-rearing solutions.

Investigations of maternal problem solving have also focused on problem-solving outcome variables. In developing the Parent Means-Ends Problem-Solving Instrument, Bryant and Wasik (1994) discovered that mothers in a low-income group generated fewer relevant solutions in response to 10 child-rearing situations than did a middle-income group, daycare center group, and a community sample. Azar, Robinson, Hekimian, and Twentyman (1984) found that mothers identified as physically abusing and/or neglecting their children generated fewer relevant solutions in response to problematic child-rearing situations than did nonmaltreating mothers.

As a measure of problem-solving outcome, the quantity of solutions generated for everyday problems, such as child-rearing problems, has consistently predicted adaptive behavioral and emotional responses for the problem solver and positive relationships with others (Heppner & Krauskopf, 1987; Nezu et al., 1989). The generation of several solutions to problems indicates flexibility of thought and resourcefulness, supports persistence in problem solving, and increases the chances of successful resolution of the problem (Nezu et al., 1989).

Several of the factors thought to influence maternal problem-solving abilities have been noted with greater frequency among mothers of infants with FTT. Among these factors are quality of family resources and support (Bithoney & Newberger, 1987), greater negative emotion (i.e., depression; Benoit, Zeanah, & Barton, 1989; Gorman, et al., 1993; Kotchuck & Newberger, 1983), and higher levels of stress (Benoit et al., 1989; Gorman et al., 1993; Lobo et al., 1992; Pollitt, Eichler, & Chan, 1975).
To our knowledge, parent-specific problem-solving abilities have not been studied among mothers of infants and children who fail to thrive. To address this need, the purpose of this study was twofold: (1) to document between-group differences in maternal quantity and quality of problem-solving responses to 10 parent-specific situations among mothers of infants with FTT and mothers with healthy, normally growing children, and (2) to describe the relationship among several factors including socioeconomic status (SES), stressful life events, language ability, symptoms of depression, and self-perceptions of negative affect to maternal problem solving.

Mothers of infants diagnosed with FTT report multiple continuing stressors in their lives (Gorman et al., 1993; Lobo et al., 1992), as well as greater negative emotion that would be expected to affect the quality of their problem solving. Consequently, we hypothesized that mothers of infants with FTT would generate fewer relevant solutions, elaborate less frequently about those solutions, identify fewer types of solutions, and generate greater numbers of irrelevant solutions in child-rearing problem-solving situations than would mothers of normally growing children. We also hypothesized that mothers of normally growing infants, in response to 10 hypothetical child-rearing situations, would generate solutions judged to be of a higher quality than would mothers of children with FTT.

The second set of hypotheses concerned the relationship among individual difference factors and maternal problem-solving ability. We hypothesized that mothers of infants with FTT would endorse greater numbers of depressive symptoms, stressful life events, and negative affect than would mothers of healthy children. We also hypothesized that among mothers in both groups, depressive symptoms, negative affect, and stressful life events would be associated with fewer problem-solving solutions, fewer enumerations of solutions, lower total number of strategy types, and decreased overall solution quality when presented with 10 child-rearing problem-solving situations.

**Method**

**Participants: Eligibility Criteria of Children Diagnosed as Nonorganic Failure to Thrive**

Children with FTT were identified from an urban pediatric primary care clinic serving low-income families within a large metropolitan area. In accord with previous research (Black et al., 1994; Drotar, Eckerle, Satola, Pallotta, & Wyatt, 1990), eligibility criteria included current age between 6 and 24 months, weight-for-height at or below the fifth percentile based on the National Center for Health Statistic growth charts (Waterlow et al., 1977), decrease in rate of weight gain from within normal limits at birth to below the fifth percentile, birth weight appropriate for gestational age, no history of perinatal complications, and the absence of congenital disorders (e.g., heart malformation), chronic illness (e.g., cystic fibrosis), or developmental disabilities that could account for growth delay. To limit the influence of potential risk factors other than FTT, four exclusionary criteria were applied: (1) absence of suspected child abuse as evidenced by referral to child protective services; (2) absence of drug exposure based on chart review; (3) birth weight less than 1,500 grams and gestational age less than 36 weeks; and (4) foster care placement.

**Comparison Group of Healthy Children and Matching Procedures**

Children in the comparison group were recruited from the same primary care clinic as the children in the FTT group. Eligibility criteria were also the same with the exception that children in the comparison group had to demonstrate weight-for-height at or above the 25th percentile.

We attempted to match control children with the FTT sample on demographic variables of age (± 1 month), gender, and race. All children and mothers matched on the variable of race (n = 37 pairs), while 92% of children (n = 34 pairs) matched on gender, and 73% (n = 27 pairs) matched on age. Efforts to match maternal variables of age (± 1 year), race, education (± 1 year), marital status, and socioeconomic status (± 1 level) (Hollingshead Four Factor Index; Hollingshead, 1975) were also attempted but were not as successful. However, these variables were comparable across the groups as shown in Table I.

**Participant Characteristics**

The total number of families contacted to participate included 63 children identified as FTT and 59 children identified and contacted as possible comparison participants. Twelve (19%) families of children with FTT declined participation while 8 (14%) comparison families declined. The most frequent
reason given for nonparticipation was a lack of time. An independent samples t test demonstrated participants and nonparticipants were comparable on the variable of child age, while chi-square statistics demonstrated group comparability for the child’s gender and medical insurance provider.

There were a total of 16 (n = 7, FTT; n = 9, comparison) families with disconnected phones. These families received a letter inviting them to participate and only one family responded. Two families of children with FTT were excluded after participation due to exclusionary criteria that went unidentified until the point of inclusion.

The final sample participating in the study included a total of 74 mothers and their children, 37 with FTT (M age = 14.4 months, SD = 5.3) and 37 comparison mothers and their children (M age = 14.5 months, SD = 5.8), all of whom were African American, identified as the child’s biological mother, and reported themselves as being the primary caregiver. All participating mothers demonstrated the ability to read and comprehend the study questionnaires. All families had limited economic resources, and 81% were receiving financial medical assistance (see Table I).

Children with FTT were all below the 5th percentile in weight-for-height. Paired t tests demonstrated that in weight in kilograms, comparison children were significantly heavier (M = 10.3, SD = 1.6) than children diagnosed with FTT (M = 8.4, SD = 1.5), t (36) = 8.46, p < .001. Comparison children (M = 75.4, SD = 6.0) and children diagnosed with FTT (M = 75.1, SD = 6.5), t (36) = .34, p = NS, had similar heights. The mean gestational age of

### Table I. Demographic Characteristics of FTT and Comparison Groups

<table>
<thead>
<tr>
<th></th>
<th>FTT (n = 37)</th>
<th>Comp. (n = 37)</th>
<th>Matched pairs n (%)</th>
</tr>
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<tbody>
<tr>
<td>Child variables</td>
<td></td>
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<tr>
<td>Chronological age (months)</td>
<td>14.4 (5.3)</td>
<td>14.5 (5.8)</td>
<td>27 (73)</td>
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<tr>
<td>Gender (% female)</td>
<td>49</td>
<td>54</td>
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<tr>
<td>Parental variables</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Maternal age (yrs)</td>
<td>24.5 (5.8)</td>
<td>24.1 (6.1)</td>
<td>22 (59)</td>
</tr>
<tr>
<td>Maternal education (yrs)</td>
<td>11.9 (1.3)</td>
<td>11.7 (1.4)</td>
<td>34 (92)</td>
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<tr>
<td>Marital status (% single)</td>
<td>81</td>
<td>81</td>
<td></td>
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<tr>
<td>PPVT-R</td>
<td>79.2 (15.9)</td>
<td>78.3 (11.8)</td>
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<td>Public assistance variables</td>
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<tr>
<td>Medical Assistance (MA)</td>
<td>81</td>
<td>70</td>
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<tr>
<td>Aid to Families with</td>
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<tr>
<td>Dependent Children (AFDC)</td>
<td>54</td>
<td>62</td>
<td></td>
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<td>Social Sec. income (SSI)</td>
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<td>SSI &amp; ADCF (%)</td>
<td>8</td>
<td>5</td>
<td></td>
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<tr>
<td>Women, Infant and Children Program (WIC)</td>
<td>49</td>
<td>54</td>
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<tr>
<td>Birth variables</td>
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</tr>
<tr>
<td>Age at birth of first child (yrs)</td>
<td>19.5 (3.5)</td>
<td>20.4 (5.1)</td>
<td></td>
</tr>
<tr>
<td>First and only child (%)</td>
<td>49</td>
<td>54</td>
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<tr>
<td>Second child (%)</td>
<td>24</td>
<td>32</td>
<td></td>
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<tr>
<td>Third child (%)</td>
<td>19</td>
<td>14</td>
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<tr>
<td>Fourth child (%)</td>
<td>11</td>
<td>0</td>
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</tr>
<tr>
<td>Total no. children (%)</td>
<td>1.9 (1.1)</td>
<td>1.5 (.69)</td>
<td></td>
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<tr>
<td>Socioeconomic status</td>
<td></td>
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<td>35 (94)</td>
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<tr>
<td>Level 5 (lowest) (%)</td>
<td>57</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Level 4 (%)</td>
<td>24</td>
<td>22</td>
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<tr>
<td>Level 3 (%)</td>
<td>16</td>
<td>19</td>
<td></td>
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<tr>
<td>Level 2 (%)</td>
<td>3</td>
<td>5</td>
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<tr>
<td>Level 1 (highest) (%)</td>
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<tr>
<td>SES score</td>
<td>18.7 (8.9)</td>
<td>18.8 (10.7)</td>
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</table>

*Paired t test.
*Chi-square.

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children with FTT ($M = 39.5$, $SD = 1.6$) and comparison children ($M = 39.1$, $SD = 2.45$), $t(36) = .78$, $p = NS$, were also comparable.

Identification and Recruitment of Participants

Methods of recruitment and laboratory procedures were developed from a feasibility study. A review of charts (3–4 days a week) was conducted at the continuity clinic from February 1996 through March 1998. Once a child with FTT was identified, a practicing pediatrician with expertise in this condition reviewed the information and verified the child’s diagnosis while confirming the eligibility for participation of the mother and child. The pediatrician phoned the mother, gave her a description of the project, and asked for her participation.

Next, the principal investigator contacted the mother and answered any further questions. Furthermore, the mother was told she would receive $25.00 for her participation. If the identified participant had a disconnected phone, a letter was sent inviting the mother to participate. Comparison participants were identified in the same manner. If a potential comparison child met inclusion criteria and matched a FTT subject on the identified variables, the mother was contacted.

Identified participants, if they failed to show for their appointment, were rescheduled up to three additional times before being dropped from the study. Nine participants ($n = 4$, FTT; $n = 5$, comparison) gave verbal consent but failed to keep their appointments.

Procedure

Upon presentation to the clinic, the participants were introduced to the observation room, which was equipped with two cameras, a child’s table and chairs, a high chair, adult chairs and table, and a box of age-appropriate toys. First, the investigator explained the informed consent procedure to the mother, which described approval of the study by the hospital Institutional Review Board. Written consent was then obtained. Mothers were alerted that if they demonstrated high levels of depression, as measured by the Beck Depression Inventory (Beck, 1967), the study investigator would help facilitate referrals to the appropriate mental health services.

Next, demographic and family history information was obtained. Then, assessment of stressful life events and measures of depression and affect were administered followed by interviews that assessed problem-solving and language ability. The final phase of the study consisted of a debriefing and payment for participation. Furthermore, every mother was provided with a list of resources in which the investigator highlighted those agencies that could be helpful (i.e., community resources, etc.). All participants were sent a thank-you letter following participation.

Measures

Descriptive Measures

Socioeconomic Status/History. Participants were asked to provide information concerning their family income, years of education, race, marital status, and the age and number of children living in the home. Participants were also asked to indicate sources of financial assistance and current work activity.

The Hollingshead Four Factor Index of Social Status (Hollingshead, 1975) was used to assess socioeconomic status. This index yields both a score and a rank (1–5). The lower the social status, the higher the rank and the lower the score. Scores were computed by considering the following four factors: education, occupation, sex and marital status.

Stressful Life Events. A measure of current life stress was administered to provide descriptive data concerning the mother’s material quality of living, daily stressors, and perceptions of family support. The Crisis in Family Systems (CRISYS; Shalowitz, Berry, Rasinski, & Dannhausen-Brun, 1998) was selected for its utility with families from a wide range of economic and cultural circumstances. The CRISYS is a 64-item measure of life events derived from the experiences of an inner-city population and administered in interview form. Respondents indicated whether specific events had occurred in their life within the past 6 months and how stressful the event had been based on a 0–6 scale. The CRISYS has demonstrated acceptable psychometric properties of face, content, and construct validity along with adequate test-retest reliability (Shalowitz et al., 1998).

Independent Measures

The Peabody Picture Vocabulary Test–Revised. The Peabody Picture Vocabulary Test–Revised (PPVT-R; Dunn & Dunn, 1981) is a nonverbal multiple-choice test designed to evaluate receptive vocabu-
lary for both children and adults. The PPVT-R was selected as a measure of comprehension because it can be administered rapidly to individuals with a range of SES characteristics. The PPVT-R has a mean standard score of 100 and a standard deviation of 15. The split-half reliability is considered adequate (Sattler, 1992).

Maternal Affect. Two measures of maternal affect were selected for this study: the Beck Depression Inventory (BDI: Beck, 1967) and the Positive and Negative Affect Schedule (PANAS: Watson, Clark, & Tellegen, 1988). The BDI was selected as a measure of maternal depressive symptoms that have been present over the past 2 weeks, whereas the PANAS was selected as a measure of more stable or trait affectivity.

The BDI is a 21-item self-report method for assessing severity of depressive symptoms. The BDI has been used in numerous studies with mothers of infants with FTT and was selected because of its adequate psychometric properties (Beck, 1967) and its wide use and ease of administration. Each item consists of four self-evaluative statements that are rated from 0 to 3, with increasing scores indicating greater severity of depressive symptoms.

The PANAS (Watson et al., 1988) was developed to address the inadequacies of other mood scales (i.e., low reliability, poor discriminant validity) and consists of two 10-item mood scales. Participants were asked to rate, on a 5-point scale, to what extent they had experienced various emotions and feelings (i.e., interested, irritable, alert, etc.) over the course of the past several years.

The PANAS scales have demonstrated high internal consistency, are largely uncorrelated, and are stable at appropriate levels over a 2-month period with test-retest reliabilities of .68 for the Positive Affect Scale and .71 for the Negative Affect Scale. Furthermore, the PANAS scales compare favorably with other measures of affect, having acceptable convergent correlations (i.e., .76 to .92).

Dependent Measure

The Parent Means-Ends Problem-Solving Instrument. The Parent Means-Ends Problem-Solving Instrument (PMEPS; Bryant & Wasik, 1994) was selected as an outcome measure of problem solving that is specific to parents of young children. Furthermore, outcome measures are considered most useful for evaluating problem-solving performance or the ability of individuals to apply their problem-solving skills effectively to specific problems (D’Zurilla & Maydeu-Olivares, 1995). The PMEPS was patterned after the Means-Ends Problem-Solving Procedure reported by Platt and Spivack (1975a), which assesses the ability to conceptualize, in problem situations, appropriate and effective means to reach a specified goal (Platt & Spivack, 1975b).

The PMEPS includes 10 stories concerning typical child-rearing situations. A beginning and an ending are described for each of the 10 problem situations that were created based on results from a nationwide survey of information needs of 1,500 parents with young children (Sparling, Lowman, Lewis, & Bartel, 1979). The stories reflect typical parental concerns (e.g., child care, developmental issues, interpersonal issues, and child management). The mother, after having been read a standard set of instructions, is read the story (the vignette/s) and asked to provide the middle portion, thus articulating the means to the specified end. For example, “Diane feels that her baby is ready to begin feeding himself. Up until now, she has fed the baby. The story ends with the baby feeding himself. Begin the story with Diane wondering what she can do to encourage her baby to be more independent in feeding.”

The examiner does not prompt solutions by the mother. The response is recorded by the examiner and later coded for the total number of relevant and irrelevant solutions, enumerations, and the content or type of each relevant solution. Relevant solutions are scored if the respondent allowed the story character to reach the end specified. Irrelevant responses are scored when the response given is not an effective solution within the context of the story or when no response to the story is given. Enumerations are scored if the parent gives more details about a specific solution without changing the content. The following represents a response that included three enumerations: “She could give the baby finger foods like crackers, dry cereal or bananas.” Each of these three solutions is a component of “giving finger food.” One rater, blind to group status, was trained by the principal investigator to score the problem-solving measure. The rater practiced scoring interviews that were used in the pilot study until agreement with the principal investigator reached 85% or greater on all dimensions.

The PMEPS has shown discriminant validity on the mean number of relevant solutions between mothers in a low income SES group (n = 47, M = 11.85), mothers from a general community sample (n = 50, M = 16.52), and a heterogeneous group of mothers from a daycare center (n = 23, M = 18.09) (Wasik, Bryant, & Fishbein, 1981). Azar et al. (1984)
demonstrated that neglectful or abusive parents gave significantly fewer relevant solutions on the PMEPS than a matched group of nonneglectful parents. Wahler and Dumas (1983) showed an increase in the number of relevant responses on the PMEPS as the result of a short-term parent intervention program. The 4-week test-retest reliability of the PMEPS was shown to be adequate on the dimension of relevant solutions \( r = .65 \), but irrelevant responses or enumerations did not show stability over time.

The quality of the solutions was also assessed. All responses to the individual vignettes were evaluated and grouped by content categories. Responses representative of the identified categories were then typed on index cards. If a response did not fit into a category, it was typed separately. The cards were given to five “experts,” professionals in the area of failure to thrive and child development (e.g., two developmental pediatricians, two pediatric psychologists, and one nurse specialist). They were asked to read all the categorical responses and rate them from 1 to 7, with 1 representing a poor quality response and 7 representing a high quality response. Solution quality was rated on dimensions of (1) engagement with the child, (2) effectiveness in solving the problem, and (3) developmental appropriateness. For example, in response to the feeding vignette, a characteristic low quality response was “Diane gave him chips, raisins and hot dogs. She sees how that works and goes from there.” The mother indicated Diane had little interaction with the child (engagement); her overall strategy was unlikely to result in the child feeding himself (effectiveness); and the mother failed to acknowledge the developmental needs of the child, which was represented by feeding the child raisins and hot dogs, foods that toddlers are known to choke on (developmental appropriateness). An example of a high quality response was, “Diane puts the high chair up to the table when the family is eating and gives the baby his own spoon and has him watch. She starts with cereal and finger foods like [teething] biscuits. She sets the baby food jar on the tray and lets him explore.” This response demonstrated proactive maternal behavior that was highly likely to result in the child feeding himself and developmentally appropriate for the child’s needs.

Based on the experts’ perceptions of response quality, a mean rating was calculated for each category of responses. To assess interrater reliability, two pairs of raters were selected (e.g., a pediatrician and psychologist) and Cohen’s kappas were calculated on 30% of randomly selected responses from each of the 10 vignettes. Agreement was defined as matching within 1 point. The first pair of experts demonstrated interrater reliability of kappa = .79, \( p < .001 \), across all 10 vignettes with kappas ranging from .34 to 1.0 on the individual vignettes. The second pair of experts also demonstrated interrater reliability of kappa = .79, \( p < .001 \), with kappas ranging from .55–1.0 across the individual vignettes. All kappas were significant \( (p < .05) \) with the exception of the ratings by the first pair of experts on the vignette assessing maternal ability to find a babysitter.

**Results**

**Tests of Group Comparability**

To assess group comparability on identified demographic variables, paired \( t \) test analyses were conducted for the following variables: SES score, child’s age, maternal age, maternal education, age at birth of first child, and total number of children. Chi-square analyses were conducted for the following nominal variables: gender of the child, marital status, public assistance variables including participation in WIC, birth order, and SES ranking. There were no significant differences between the groups on any of these variables (see Table I).

**Maternal Problem-Solving Ability**

Prior to testing our study hypotheses, a Pearson product moment correlation matrix was generated to assess the strength and pattern of associations among the problem-solving outcome variables, individual difference variables, SES, and PPVT-R scores. SES was evaluated as a potential covariate because previous research has demonstrated associations between SES and maternal problem-solving ability (Wasik et al., 1981). Scores on the PPVT-R were considered as potential covariates because responses to the PMEPS are dependent on language ability and several studies of parental problem solving have found associations of higher language ability with increased performance on family (Cornelius & Caspi, 1987) and child-rearing problem-solving (Pridham et al., 1995).

As Table II demonstrates, there were significant correlations among the problem-solving outcome variables. Furthermore, SES and PPVT-R scores were significantly correlated with the problem-solving
outcome variable of Total Quality Score. The PPVT-R was also significantly correlated with Enumerations.

The main study hypothesis that mothers of infants diagnosed with FTT, when given 10 hypothetical child-rearing problem-solving situations, would demonstrate poorer performance (i.e., fewer relevant solutions, fewer content areas, fewer enumerations, greater irrelevant solutions, and lower scores of quality on the PMEPS) than mothers of healthy, normally growing children, was tested with a multivariate analysis of covariance (MANCOVA). SES and PPVT-R scores were entered as covariates with the independent variable being group status (FTT vs. Comparison).

A significant group main effect using Wilk's criterion, $F(5, 66) = 7.77, p < .001$, was found for problem solving. The mean scores of the two groups were in the expected directions with mothers of infants with FTT performing more poorly than mothers of healthy, normally growing infants.

Univariate $F$ tests were significant for four of the five problem-solving domains: Relevant Solutions, Types of Solutions, Enumerations, and Total Quality Score. The number of Irrelevant Responses was not significantly different between groups (see Table III).

### Relationship of Individual Difference Variables to Maternal Problem-Solving Abilities

To test the second set of hypotheses, we examined both between- and within-group differences on selected individual difference variables. As Table II shows, measures of depressive symptoms (BDI), negative affect (PANAS), and stressful life events (CRISYS) were significantly correlated. Therefore, to determine if there were between-group differences, a MANOVA was conducted with the independent variable being group status (FTT vs. Comparison). The overall MANOVA was not significant using Wilk’s criterion, $F(3, 70) = .86, p = \text{NS}$. Univariate $F$ tests were not significant for any of the variables (FTT vs. Comparison): BDI, $M = 7.5$ versus 5.9; PANAS negative affect subscale, $M = 15.6$ versus 15.5; CRISYS, $M = 8.4$ versus 6.9.
To test our hypothesis that among mothers in both groups depressive symptoms, negative affect, and stressful life events would be associated with poorer problem-solving performance on measures of the PMEPS, Pearson product-moment correlations were calculated. As shown in Table II, there were no significant correlations among any of the depression, affect, or stressful life events variables and the problem-solving outcome variables.

Finally, a post hoc analysis was conducted to assess whether the relationship between problem-solving abilities and maternal stress, depression, and negative affect was moderated by group (FTT vs. Comparison). Pearson product-moment correlations were calculated for each group, assessing associations among depressive symptoms, negative affect, stressful life events and performance on measures of the PMEPS. Among each group, and similar to the results shown in Table II, there were no significant correlations.

**Discussion**

This study was to our knowledge the first controlled study of problem-solving skills with mothers of infants diagnosed as FTT. As predicted, when compared to mothers of normally growing infants, mothers of infants with FTT demonstrated poorer problem-solving skills on four dimensions of the PMEPS: (1) total number of solutions, (2) total number of enumerations of solutions, (3) total number of solution types, and (4) overall quality of problem-solving responses. Furthermore, these differences in problem solving were evident despite a close match on demographic variables and could not be attributed to differences in maternal language comprehension. Taken together, these findings suggested that a range of problems involving child-rearing situations present special difficulty to mothers of infants with FTT due to their narrow repertoire and poor quality of parenting responses. More effective problem-solving abilities have been associated with greater parental competence (Wahler & Dumas, 1983, 1989), whereas deficits have been associated with aberrant parenting (i.e., maltreating mothers; Azar et al., 1984). Consequently, problem-solving deficits among mothers of infants with FTT could hinder their ability to make necessary and appropriate changes in child rearing to respond effectively to their children. Therefore, they may experience greater frustration in the parenting role, increased parent/child conflict, and a decreased sense of competence.

However, group differences in maternal problem solving identified here could reflect more general problem-solving deficits. One limitation of this study was that general problem-solving abilities, for example, deficits in planning and organization (Porteus, 1959), were not assessed.

Given the study design, we could not determine whether the observed deficits in problem solving were causes of or consequences of FTT. However, we did discover that mothers of healthy infants generated more problem-solving strategies that indicated greater incidents of positive parent-child interactions, that were developmentally more appropriately matched to the child's needs, and that were judged to more likely result in positive outcomes than did mothers of infants with FTT. Problematic maternal problem solving may contribute to FTT by interfering directly with the quality of the child's nurturing, feeding, and caloric intake (Drotar, 1991b). On the other hand, parent-specific problem-solving deficits among mothers of infants with FTT may also compromise the quality of parental management of FTT. In accord with Belsky's (1984) process model of parental competence that underscores the interrelated influence of parental personal resources, child characteristics, and family support and functioning, the problem-solving deficits observed here could reflect the influence of current parenting burdens related to the child's FTT and associated behavioral deficits, for example, irritability and poor social responsiveness (Bithoney & Newberger, 1987; Siegel & Parke, 1987).

A second focus of this study was to identify correlates of maternal problem-solving ability. Our hypotheses that among mothers of infants with FTT, stressful life events and symptoms of depression and negative affect would correlate with parent-specific problem-solving abilities were not supported. One of the most surprising findings of this study was the level to which problem-solving deficits were independent of factors such as stress, depression, or negative affect. These findings suggest that problem-solving deficits among mothers of children with FTT are influenced by other factors. For example, one possibility is that parental histories of aberrant socialization and learning, which were not assessed here, affect the quality of maternal problem solving related to child rearing. Research among mothers of infants with FTT has documented higher than average frequency of trau-
matic childhood experiences and aberrant early nurturing (Altemeier et al., 1985; Gorman et al., 1993; Politt et al., 1975), which may include exposure to parents with limited problem-solving abilities. Mothers of children who fail to thrive may have learned, based on their exposure to less than optimal caregiving models, to manage child-rearing problems by less than optimal means.

Another explanation of these findings is that perceptions of depressive symptoms and negative affect among mothers of children with FTT in this study were well within the normal range, and hence were not severe enough to disrupt maternal problem solving. While several well-controlled studies of African American mothers of infants with FTT have found levels of depression in the normative range (Black et al., 1994; Singer, Song, Hill, & Jaffe, 1990), in contrast, other studies have found increased rates of depressed mood among mothers of infants with FTT compared to control mothers (Fossom & Wilson, 1987; Gorman et al., 1993; Polan et al., 1991). Differences in findings could reflect differences in selected measures and the use of self-report rather than observational measures of stress and affect.

On the other hand, we recruited a community-based sample from an urban pediatric primary care clinic that did not include children who required hospitalization for their FTT. Much of the previous research with FTT has included hospitalized samples of children with more severe medical and social problems than are seen in primary care settings. Thus, this study allows for generalizability to populations of children and families more typically seen in outpatient settings. The difference in severity of FTT and recruitment within a primary care setting could account for some of the differences in findings from this study when compared with previous research.

Several limitations of this study should be considered when interpreting the results. The generalizability of the findings is limited by a sample that included only African American, low-income mothers and children. To our knowledge, the PMEPS has not been administered exclusively to an African American population, and therefore comparisons with normative data should be approached with caution. Furthermore, the mothers in this sample demonstrated language ability scores on the PPVT-R that were greater than a standard deviation below the mean. Consequently, it would be of interest to replicate the study with Caucasian participants and mothers with higher SES and greater verbal abilities.

This study was also limited in several ways by the selected measures. First, the study relied on self-report measures rather than observational assessment of maternal problem solving or feeding. Second, the PMEPS relied on verbal responses. Mothers of infants with FTT perhaps were less verbal due to a cautious self-protective response set when placed in an interview situation about parenting. The PMEPS assessed problem-solving outcomes and did not assess processing factors. For example, problem-solving process variables such as problem clarification, appraisal of generated solutions, and maternal decision making concerning problems that parents of children who fail to thrive in their day-to-day lives face were not assessed.

**Clinical Applications and Future Research**

Our findings underscore the potential importance of considering deficits in maternal problem-solving abilities when assessing and planning psychosocial interventions for families of infants with FTT. In particular, interventions that focus on training mothers of infants with FTT to improve their problem-solving skills could produce beneficial outcomes on child rearing. In some cases, mothers may also require professional help to develop more effective problem-solving strategies and skills to enhance compliance with treatment and the quality of their feeding interactions with their infants. Dawson, de Armas, McGrath, and Kelly (1986) utilized cognitive problem-solving training with neglectful parents and demonstrated positive outcomes using modeling, shaping, and practice to improve maternal child-care problem-solving skills. Similar interventions may be effective with mothers of infants who are failing to thrive.

Our findings suggest several other salient areas for future research with families of infants with FTT. A comprehensive assessment of maternal problem solving, especially in feeding situations, may be instructive. Moreover, developing instruments that assess a range of child-rearing problems and/or nutrition-specific problems might be helpful for targeting areas of intervention. For example, maternal ability to manage problematic feeding situations, utilize health care, access resources for the child, and allocate family resources are all areas that might require increased problem-solving abilities and thus be potential target areas of investigation and intervention for families of children with FTT. For this reason, further studies should identify individual variations in the quality of problem-solving strategies among parents of children with FTT and estab-
lish their validity concerning key areas of parental competence and clinical outcomes. Detailed assessment of parent-specific problem-solving abilities could provide the information that is necessary to tailor interventions to address patterns of parenting that disrupt children's nutritional intake and development.

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