Mother-Child Interaction as a Predictor of Mastery Motivation in Children with Disabilities Born Preterm

JESSICA MERCER YOUNG AND PENNY HAUSER-CRAM
Boston College

This study examined mother-child interaction as a predictor of mastery motivation (i.e., persistence on a problem-posing task) in 3-year-old children who were born premature and had either motor impairment or developmental delay (n = 34). Two aspects of mother-child interaction were hypothesized to predict for mastery motivation: response to child's distress and cognitive growth-fostering behaviors. Hierarchical regression analyses revealed that maternal response to distress, but not cognitive growth promotion, added significant unique variance (15.3%) beyond child cognitive performance in the prediction of mastery motivation. Results suggest that interventions focused on emotional aspects of the mother-child dyad provide important benefits to young children with disabilities who are born preterm.

Developmental psychologists have long proposed that the basis of cognitive development is rooted in children’s intrinsic curiosity and motivation to initiate behaviors that help them master their environment (Piaget, 1952; White, 1959). One form of motivation, mastery motivation, which is the child’s independent persistence to accomplish moderately challenging tasks, has been one focus of researchers studying children who are typically developing and children with disabilities (Hupp, 1995; Jennings & MacTurk, 1995). Mastery motivation is considered to be part of the child’s self-regulatory attention system and as such, predicts later cognitive competence in young children with and without disabilities (Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001; Messer, 1993).

The research literature indicates that both individual and group differences exist in mastery motivation. Two groups of young children appear vulnerable to low levels of mastery motivation during the preschool and school-age years, children with developmental disabilities and children born preterm. Children with developmental disabilities, particularly those with intellectual impairment or physical disabilities, tend to demonstrate lower levels of mastery motivation. Early studies of school-aged children with intellectual impairments indicated that they demonstrated lower levels of mastery motivated behavior on challenging tasks in comparison to typically developing children of the same mental age (Harter & Zigler, 1974). The early studies were conducted before children with disabilities had the advantages of participating in early intervention (EI) services and inclusive classrooms stimulated by federal legislation such as P.L. 99-457 and sustained by the current Individuals with Disabilities Education Improvement Act of 2004 (IDEA, P.L. 108-446).
More recent studies, however, also suggest that many preschool- and school-age children with disabilities demonstrate relatively low levels of mastery motivation in comparison to other children their age. Jennings and MacTurk (1995) found that preschool children with physical disabilities or visual impairments had lower levels of mastery motivation than their peers. Landry, Copeland, Lee, and Robinson (1990) found a similar difference in the level of mastery motivation between school-aged children with and without physical disabilities. In contrast, Hauser-Cram (1996) reported that the mastery motivation of toddlers with developmental delay or motor impairment, in comparison to typically developing children of the same mental age, did not differ on mastery motivation tasks. Taken together, it is likely that children with developmental disabilities in comparison to their peers might develop mastery motivated behaviors more slowly during the preschool years, making early childhood a potential critical point of intervention.

Children born preterm also tend to display lower levels of mastery motivation during their early years. In a review of studies on mastery motivation in very young children without known disabilities born preterm and full term, Harmon and Murrow (1995) concluded that cognitive performance measures by themselves are insufficient to describe and evaluate the developmental level of the perinatal risk population. In the studies reviewed, the preterm group seemed to be functioning at a cognitive level similar to the full term group. Deficits in task persistence within the preterm group as compared to the full term group, however, were evident whether determined by observational measures or by maternal reports.

In an analysis of 50 toddlers with developmental disabilities, 38% of whom were born preterm, Hauser-Cram (1996) found that the extent of prematurity (i.e., number of weeks born preterm) was associated with less persistence on a measure of mastery motivation using puzzle tasks. Specifically, toddlers with greater degrees of prematurity displayed more nongoal-oriented manipulation and less persistence and competence in task completion. Degree of prematurity and cognitive developmental level were not found to be related, suggesting that children with disabilities born preterm have a unique developmental profile. Since research suggests that this group of children is particularly vulnerable to displaying lower levels of task persistence than their peers of the same mental age, delineating the particular predictors of mastery motivation would be valuable for designing appropriate early childhood interventions.

Young children develop within the family system and much research emphasizes the importance of the relational aspects of that system to children’s healthy development (National Research Council and Institute of Medicine, 2000). One of the most studied relationships within the family system is the relationship between mothers and their young children. Research has consistently pointed to this dyadic relationship as central both to children’s learning of self-regulation, including attentional regulation (National Research Council and Institute of Medicine, 2000) and to future cognitive competence (Bornstein & Tamis-LeMonda, 1989; Landry, Smith, Swank, & Miller-Loncar, 2000; Teti & Candelaria, 2002).

Sociocultural theoretical perspectives point to the value of studying caregiver-child interaction. Vygotsky (1993) emphasized the importance of the social environment as a context within which children learn to develop independent actions through experiences with a more knowledgeable other. Researchers have proposed that interactions with caretakers play a key role in the early development of human mastery (Heckhausen, 1993) and the socializing environment influences mastery motivation in particular (Busch-Rossnagel, Knauf-Jensen, & DesRosiers, 1995).

Bornstein (1989) delineated two general modes of interaction between children and caregivers that have consequences for cognitive development: social and didactic. In relation to social interactions, many studies
have illustrated the importance of maternal 
responsiveness to later general cognitive de-
velopment (e.g., Kelly & Barnard, 2000; Lewis & Goldberg, 1969) and children’s 
mastery motivation (Valenzuela, 1997). One 
speculation is that the socio-emotional re-
relationship between a child and primary 
caregiver establishes a critical belief in the 
child about the responsiveness of the envi-
ronment to his or her actions (Lamb & 
Malkin, 1986). Children who anticipate 
positive responses from their caregiver might 
begīn to establish a cycle of activity in which 
they can act upon the environment in causal 
ways (Heckhausen, 1993; Jennings, 1993).

A second way in which mother-child 
interaction might influence children’s mas-
tery motivation relates to the didactic or 
cognitive growth-promoting interaction of 
mothers. Derived from sociocultural theory 
(Bruner, 1986; Vygotsky, 1993), research 
suggests that maternal attempts to provide 
“one step ahead” scaffolding might encour-
age children to engage in persistent problem 
solving. Through assistance on tasks moder-
ately difficult for the child to undertake 
alone, mothers both support children’s cur-
rent skills and challenge children to solve 
problems at a level just above their current 
one. In a longitudinal study, Heckhausen 
(1993) demonstrated through micro-sequn-
tial analyses how such cognitive growth 
promoting assistance can lead to children’s 
i\ncreased striving to produce behavior-event 
contingencies and how maternal scaffolding 
changes as children become more competent. 

Although research indicates that a relation 
between mother-child interaction and mas-
tery motivation might be anticipated for all 
infants, preterm infants appear to have a somewhat different interactive profile than 
their peers. Preterm infants are typically less 
responsive to their caregivers and tend to 
give fewer and less clear cues than full 
term infants (Lester, Hoffman, & Brazelton, 
1985). Children born preterm also are more 
likely than other children to have demon-
strated difficulties with visual-spatial reason-
ing and attention regulation (Anderson et al., 
2003; Aylward, 2002). Davis and Burns 
(2001) suggested that self-regulatory func-
tioning might explain the array of cognitive, 
behavioral, and academic problems that have 
been reported in children born preterm. They 
noted that because children learn to organize 
their environment through social interac-
tions, preterm infants are at greater risk for 
deficits in attention regulation. Such deficits, 
in turn, might impede their motivation and 
persistence to master challenging tasks.

The findings of a study by Landry and her 
colleagues (Landry et al., 2000) on the 
influence of early maternal behaviors on 
preterm and full term children’s later cogni-
tive functioning indicated that children learn 
how to internally regulate their cognitive 
behavior through interaction with their 
mothers. Based on these findings, the re-
searchers proposed that a theoretical frame-
work which emphasizes mother-child inter-
action is essential to understanding children’s 
cognitive skill development.

Despite interest in studying the caregiving 
environment’s influence on mastery motiva-
tion (Busch-Rossnagel et al., 1995), few 
studies have examined the relation between 
specific maternal behaviors and children’s 
mastery behaviors in children with disabil-
ities. Hauser-Cram (1993) examined aspects 
of the proximal caregiving environment using 
the HOME inventory (Bradley, Rock, Cald-
well, & Brisby, 1989) in relation to mastery 
motivation in toddlers with Down syndrome. 
She found that the provision of play materi-
als in the home was positively related to 
mastery motivation. In contrast, high levels 
of parent involvement (i.e., structuring the 
child’s activities) were associated with lower 
mastery motivation. No study, however, has 
examined the relation between different 
aspects of mother-child interaction and 
mastery motivation exclusively in children 
with disabilities who were born preterm.

Building on the growing body of research 
indicating that a relation exists between 
mother-child interaction and mastery moti-
vation, in this study we investigated the 
unique patterns of interaction that predict 
mastery motivation in three-year-old chil-
dren with developmental disabilities and
a history of prematurity. We reasoned that because the social interactive context facilitates development, mother-child interactive behaviors will predict children’s mastery motivation. Specifically, we hypothesized that two aspects of mother-child interaction would predict the mastery motivation on cause-and-effect tasks of children with developmental disabilities born preterm: maternal cognitive growth fostering behaviors and maternal response to child’s distress. Maternal cognitive growth fostering behaviors are those that scaffold and support a child in problem-solving activities. Maternal response to her child’s distress includes behaviors that assist the child during periods of dysregulation of affect or disengagement.

Previous research has indicated that although child cognitive performance and mastery motivation are distinct constructs, they often are related (Morgan, MacTurk, & Hrncir, 1995). We suggest that the mother-child interactional context is particularly important for the development of children with biologic risk regardless of their level of cognitive delay. Therefore, we tested the following research hypothesis: two aspects of mother-child interaction (cognitive growth fostering and response to distress) will predict variance in children’s mastery motivation above and beyond the variance predicted by the child’s cognitive performance.

METHOD

Participants
Participants included 34 mothers and their 3-year-old children with biologically-based disabilities who were born preterm. The children and their mothers participated in the Early Intervention Collaborative Study (EICS), an ongoing longitudinal investigation of children with developmental disabilities and their families from entry into EI services through age 18 (Hauser-Cram et al, 2001; Shonkoff, Hauser-Cram, Krauss, & Upshur, 1992). The overall goals of EICS are to analyze individual differences, generate conceptual models of children’s development within the context of families and services, and contribute to the growing knowledge base related to the needs of children with biologically-based disabilities and their families.

The majority of children in the EICS sample were not born preterm (77.4%), and therefore, only a subsample of EICS participants were included in the analyses presented here. Families were recruited initially from 29 community-based EI programs in the Northeast. Of the 34 children born preterm, 21 were identified as having a motor impairment and 13 were determined to have a developmental delay (See Table 1). These designations were confirmed at age 3 through independent child assessment. Participants were equally divided by gender and largely of Euro-American descent. Sixteen of the children were born 1-month preterm, 10 were born 2-months preterm, and 8 were born 3-months preterm. The average birth weight of the children was 4.03 pounds ($SD = 1.62$, range = 1.63 to 6.63).

Procedures
Data were collected during a home visit within 3 months of the child’s third birthday ($M = 36.7$ months, $SD = 1.2$) by two field staff members who were unfamiliar with the hypotheses guiding the investigation. The field staff members were trained on the observational scales and certified through the Nursing Child Assessment Satellite Training program.

Child cognitive performance. As a measure of cognitive performance, the McCarthy Scales of Children’s Abilities (McCarthy, 1972) were administered to the child. The General Cognitive Index, a standardized assessment of children’s verbal performance, perceptual performance, and quantitative reasoning, was used in this investigation. Cronbach’s alpha reliability coefficient was .97 for the General Cognitive Index for this sample.

Mastery motivation. As a measure of mastery motivation, children were presented with a cause and effect problem-posing toy (e.g. slide a lever to make a figure appear; complete a sequence of steps to get music to
The toys were commercially manufactured and hierarchically ordered according to the level of task difficulty (Morgan, Busch-Rossnagel, Maslin-Cole, & Harmon, 1992). Children were presented with one toy that was considered to be moderately challenging for the particular child. The task was moderately challenging if the child was able to complete one, but not all possible solutions to the toy within the first 90 s. If the child completed all solutions within 90 s, a more challenging toy was presented. If the child could not complete any solutions within 90 s another less challenging toy was presented. Children’s persistence on the task was scored every 15 s for a total of 4 min. A total score was computed based on the percentage of 15-s trials during the 4 min in which the child persisted in task-directed mastery. Inter-rater reliability for the summary score for persistence on the cause and effect task was .92.

Mother-child interaction. Interaction within the dyad was measured by the Nursing Child Assessment Teaching Scales (NCATS; Barnard, 1978). This observational rating scale is designed to assess a teaching interaction between a mother and child. A task just beyond the child’s ability level is chosen for the mother to teach to the child. These tasks were selected from standardized child assessments and generally formed a hierarchy of increasingly difficult skills (e.g., from putting a cube in a cup to copying geometric shapes). The task was selected by the field staff member who had engaged in simple play with the child before the assessment. If the task proved too easy for the child (i.e., the child could complete it in less than 30 s) a more difficult task was selected. If the child slept or was otherwise disengaged during the entire assessment period, the task was repeated at another time or on another day. Instructions given to the parent were “We have an activity we’d like you to try to teach (child’s name). We have purposefully chosen something that she/he cannot now do herself/himself, so don’t worry if she/he can’t do it. Just tell us when you’re done.” Each mother’s interaction with her child was recorded live by a field staff member using a predetermined event coding scheme that included the subscales of interest in this investigation: cognitive growth fostering and response to distress.

Table 1
Sample Characteristics

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th>M (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal years of education</td>
<td>13.29 (1.96)</td>
<td>10.0–18.0</td>
<td></td>
</tr>
<tr>
<td>Family income</td>
<td>$20,000–24,999 ($7,500–9,999)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (female)</td>
<td>50.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth weight in pounds</td>
<td>4.03 (1.62)</td>
<td>1.63–6.63</td>
<td></td>
</tr>
<tr>
<td>Ethnicity: Euro-American</td>
<td>91.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor impairment</td>
<td>13.05 (1.96)</td>
<td>10.0–18.0</td>
<td></td>
</tr>
<tr>
<td>Family income</td>
<td>$20,000–24,999 ($7,500–9,999)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (female)</td>
<td>52.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth weight in pounds</td>
<td>4.37 (1.57)</td>
<td>2.31–6.63</td>
<td></td>
</tr>
<tr>
<td>Ethnicity: Euro-American</td>
<td>90.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developmental delay</td>
<td>13.77 (1.96)</td>
<td>12.0–17.0</td>
<td></td>
</tr>
<tr>
<td>Family income</td>
<td>$20,000–24,999 ($7,500–9,999)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (female)</td>
<td>46.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth weight in pounds</td>
<td>3.71 (1.64)</td>
<td>1.63–6.56</td>
<td></td>
</tr>
<tr>
<td>Ethnicity: Euro-American</td>
<td>92.3</td>
<td></td>
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</tbody>
</table>
The cognitive growth fostering subscale includes items such as “Parent uses both verbal description and modeling simultaneously in teaching any part of the task” and “after parent gives instructions, at least 5 s is allowed for the child to attempt the task before parent intervenes again.” The response to distress subscale codes a mother’s responsive behaviors to her child’s distress or disengagement. Examples of items on the response to distress subscale include “makes positive sympathetic or soothing verbalizations” and “makes soothing nonverbal response (e.g., pat, touch, rock, caress, kiss).” The NCATS operationally defines response to distress slightly differently than the lay person’s understanding of distress. Though it does include the mother’s reactions to distress cues such as fussing, crying, and pushing away, the definition of distress includes all “potent disengagement signals.” Therefore, responses to child behaviors such as gaze aversion and whining also are included as they indicate disengagement cues (Byrne & Keefe, 2003). Inter-rater reliability was conducted for 20% of the observations after initial training to criterion: percent agreement was .94 and .91 and Cohen’s kappa (which adjusts for chance agreement) was .87 and .82 for the cognitive growth fostering subscale and the response to distress subscale, respectively. Cronbach’s alpha reliability coefficient was .71 for the cognitive growth fostering subscale and .78 for the response to distress subscale for this sample. Means, standard deviations, and ranges for both mother-child interaction subscales and for mastery motivation are shown in Table 2.

### RESULTS

Preliminary t-test analyses indicated that the preterm children with motor impairment and the preterm children with developmental delay did not differ significantly in regard to birth weight or any of the predictor variables: family income, maternal education, child’s cognitive performance, response to distress, cognitive growth fostering, or to the criterion variable mastery motivation. In addition, t-tests revealed no main effect of gender for the predictors or for the criterion variable. The sample, therefore, was analyzed as a whole.

Bivariate correlations revealed that type of disability and gender were not correlated

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**Table 2**
*Descriptive Statistics for Child Cognitive Performance, Mother-Child Interaction, and Mastery Motivation*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sample (n = 34)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive performance</td>
<td>74.79</td>
<td>23.45</td>
<td>27–109</td>
</tr>
<tr>
<td>Cognitive growth fostering</td>
<td>12.94</td>
<td>2.88</td>
<td>4–17</td>
</tr>
<tr>
<td>Response to distress</td>
<td>8.00</td>
<td>2.57</td>
<td>1–11</td>
</tr>
<tr>
<td>Mastery motivationa</td>
<td>64.89</td>
<td>34.88</td>
<td>0–100</td>
</tr>
<tr>
<td>Motor impairment (n = 21)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive performance</td>
<td>73.67</td>
<td>23.53</td>
<td>27–106</td>
</tr>
<tr>
<td>Cognitive growth fostering</td>
<td>13.43</td>
<td>2.91</td>
<td>4–17</td>
</tr>
<tr>
<td>Response to distress</td>
<td>7.76</td>
<td>2.91</td>
<td>1–11</td>
</tr>
<tr>
<td>Mastery motivationa</td>
<td>65.48</td>
<td>33.34</td>
<td>6.25–100</td>
</tr>
<tr>
<td>Developmental delay (n = 13)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive performance</td>
<td>76.62</td>
<td>24.15</td>
<td>27–109</td>
</tr>
<tr>
<td>Cognitive growth fostering</td>
<td>12.15</td>
<td>2.76</td>
<td>7–17</td>
</tr>
<tr>
<td>Response to distress</td>
<td>8.38</td>
<td>1.93</td>
<td>6–11</td>
</tr>
<tr>
<td>Mastery motivationa</td>
<td>63.94</td>
<td>38.62</td>
<td>0–100</td>
</tr>
</tbody>
</table>

*Note. aMastery Motivation is represented as a percentage of trials.*
significantly with any of the predictor variables or the criterion variable (see Table 3). Income and maternal education were moderately correlated to each other ($r = .37$, $p < .05$), but were not related significantly to any of the variables.

Additional bivariate correlations showed that response to distress and mastery motivation were correlated significantly ($r = .40$, $p < .05$) as were cognitive performance and mastery motivation ($r = .42$, $p < .05$). Gestational age (in weeks) and cognitive performance were not found to be correlated significantly ($r = -.24$, $p > .05$) nor were gestational age and mastery motivation ($r = .07$, $p > .05$). The response to distress and cognitive growth-fostering subscales were not related significantly to children’s cognitive performance, suggesting that mothers were responding similarly to children with higher and lower levels of cognitive skill. The response to distress and cognitive growth-fostering subscales were not correlated to each other indicating that for this sample, they measure different aspects of mothers’ interactive skills (see Table 3).

Child’s type of disability and gender and family characteristics of income and maternal education were not related to mastery motivation and given the small sample size (and concomitant limited power), they also were not included in the final regression equation. Therefore, to test our hypothesis a hierarchical regression analysis was conducted on the criterion variable (children’s mastery motivation), with predictor variables entered in the following blocks (a) child characteristic: cognitive performance; (b) mother-child interaction: cognitive growth fostering and response to distress. This order was chosen to determine the unique contribution of maternal interactive behaviors to mastery motivation after accounting for the contribution of child cognitive performance (Pedhazur, 1997).

Results indicated that children’s cognitive performance accounted for 17.8% of the variance in mastery motivation (see Table 4). A test of the main hypothesis indicated that mother-child interaction significantly predicted children’s mastery motivation above and beyond child cognitive performance. Overall, maternal interactive behaviors contributed 15.3% additional variance to the prediction of mastery motivation. Mother’s cognitive growth fostering behavior was not statistically significant, but mother’s response to her preterm child’s distress predicted greater mastery motivation ($p < .05$). Structure coefficients (Courville & Thompson, 2001) and beta weights further indicated that mother’s response to distress was the significant maternal interactive predictor of mastery motivation.

**DISCUSSION**

Children’s cognitive performance significantly predicted their mastery motivation. Children with higher levels of cognitive skills
were more likely to be persistent in solving the cause and effect tasks. Although the relation between mastery motivation and cognition in typically developing children is often positive (Morgan et al., 1995), these constructs are not redundant. McCall (1995) emphasized that mastery motivation differs from cognitive competence in that mastery motivation is the disposition to persist with problem-posing activities, whereas cognitive competence relates to success with problem solving. Type of disability, family income, and maternal education were not related significantly to mastery motivation. Two aspects of mother-child interaction were tested, and one, maternal responsiveness to children’s distress, was found to predict mastery motivation above and beyond children’s cognitive performance. The lack of relation between socio-economic status and mastery motivation in this study is consistent with the results of another recently reported investigation of children at risk of poor school performance (Turner & Johnson, 2003). These findings increase confidence in the importance of the mother-child dyad in predicting task persistence for this unique group of children.

The finding that maternal cognitive growth-fostering behavior was unrelated to children’s mastery motivation is surprising. This analysis however, indicated that the responsiveness of a mother’s behavior to her child’s disengagement during interaction might be the more critical element in encouraging mastery motivation among children who are both preterm and have biologically-based disabilities. In a recent study, Davidov and Grusec (2006) found that maternal responsiveness to distress predicted better regulation of negative affect in typically developing school-aged children. We speculate that such responsiveness aids in the development of self-regulation of children with developmental disabilities as well, and this increased ability to self-regulate might play a unique role in mastery motivation. One interpretation is that maternal responsiveness to the child’s distress establishes a cause-and-effect interaction pattern. Clear and consistent responsiveness to the child’s emotionally driven behaviors might help the child learn about behavior event contingencies (Heckhausen, 1993). Such learning might promote the child’s sense that he or she has an effect on the environment. In turn, this knowledge helps the child to persist at the type of problem-posing cause-and-effect tasks used in this study.

The children in this investigation had a mean mental age of 27.08 months and therefore, were cognitively (and probably behaviorally) similar to toddlers. We speculate that maternal cognitive growth-fostering behaviors might become more predictive of mastery motivation for children with disabilities born preterm during the later preschool years when they have more developed self-regulatory skills and exhibit more emotional self-control. This speculation is in keeping with Bornstein’s (1989) view that one pattern of interaction might have greater consequences at a younger age and another at an older age. Toddlers with developmental

### Table 4

**Final Hierarchical Regression Model for Variables Predicting Mastery Motivation**

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>Structure Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cognitive performance</td>
<td>.608</td>
<td>.225</td>
<td>.409*</td>
<td>.73</td>
</tr>
<tr>
<td>2</td>
<td>Cognitive growth fostering</td>
<td>-1.896</td>
<td>1.904</td>
<td>-.157</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>Response to distress</td>
<td>5.522</td>
<td>2.121</td>
<td>.407*</td>
<td>.70</td>
</tr>
</tbody>
</table>

Note: $R^2 = .178$ for Step 1 ($p < .05$); $ΔR^2 = .153$ for Step 2 ($p < .05$).

*p < .05.
disabilities who were born preterm might require the benefits of maternal responsiveness to assist them in self-regulation before they can benefit from maternal cognitive growth promotion.

Another possible interpretation is that maternal cognitive growth-fostering behaviors might be too directive to benefit independent mastery attempts by the young child with a disability born preterm. Research has indicated that high levels of parent involvement and maternal directiveness can diminish the attempts at independent mastery of children with developmental disabilities (e.g. Hauser-Cram, 1993; Hauser-Cram & Shonkoff, 1995). In a study of preterm and full term typically developing children, Landry et al. (2000) reported that high levels of maternal directiveness when children were 3½ years had a direct negative influence on child cognitive and social independence measured a year later. Further research might delineate which of these two possibilities are supported empirically.

**Limitations**

This investigation has several limitations. As with any study employing a correlational design, causal effects cannot be determined. It is possible that the direction of effects works in the reverse order and that children who are more highly motivated evoke more positive interactions from their mothers or stimulate a positive transactional cycle (Sameroff & Fiese, 2000). Nevertheless, the data indicate that maternal behaviors did not differ based on children's cognitive skills alone so that the child's level of cognition did not appear to be driving maternal behaviors. Additionally, participants in this study were mostly Euro-American, and given current knowledge about cultural perspectives on parenting and the meaning of child disability (García Coll & Magnuson, 2000), the findings of this study might not be relevant to a wide range of ethnic and cultural groups. Further, the measures themselves are limited in providing only one type of indicator (i.e., an observational measure) of the important constructs of mother-child interaction and mastery motivation. Finally, little is known about the extent to which the etiology of children's disability and prematurity might be related.

**Implications**

Despite these limitations, results of this study support prior work that focuses on the importance of the mother-child dyad to children's positive development (e.g., Landry et al., 2000). Although cognitive performance was found to be related to mastery motivation in predictable ways, the added importance of mother-child interaction, especially in the area of maternal response to children's distressed social-emotional reactions, is highlighted in this study. Interventions that focus on the mother-child dyad, such as providing mothers with strategies to respond sensitively to their child's distress, might provide additional important benefits to young children with disabilities born preterm. Through responsive mother-child interaction, such children might develop self-regulatory patterns sufficient to enhance their abilities to persist in the face of problem-posing tasks. The findings of this study also suggest that investigating earlier mother-child interactive behaviors in relation to the mastery motivation of children with disabilities would be a valid line of inquiry, as by 36 months-of-age the interactive patterns of mother and child might be well established. Studying younger dyads might provide a more complete understanding of the influence of mother on child and child on mother in the development of mastery motivation.

Empirical work that includes the entire sample in the EICS has demonstrated that persistence at age 3 years is related to increasing cognitive advantages over the middle childhood years for children with developmental disabilities, especially for those with motor impairment or developmental delay (Hauser-Cram et al., 2001). Although interventions that directly affect mastery motivation in young children have rarely been conducted (Hauser-Cram & Shonkoff, 1995), the results of this study suggest that evaluations of interventions
designed to enhance the mother-child relationship in relation to mastery motivation would be an important line of investigation. Following the children longitudinally and assessing the long term benefits of such interventions for children with disabilities would be especially valuable.

REFERENCES


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*Correspondence regarding this article should be addressed to Jessica Mercer Young, Developmental and Educational Psychology, Boston College, Lynch School of Education, Chestnut Hill, MA 02467-3813. E-mail: mercerj@bc.edu*