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Parenting Children With Borderline Intellectual Functioning: A Unique Risk Population

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Abstract

Parenting was examined among families of children with borderline intelligence in comparison to families of typically developing children and children with developmental delays. Parenting data were obtained at child age 5 via naturalistic home observation. Mothers of children with borderline intelligence exhibited less positive and less sensitive parenting behaviors than did other mothers and were least likely to display a style of positive engagement. Children with borderline intelligence were not observed to be more behaviorally problematic than other children; however, their mothers perceived more externalizing symptoms than did mothers of typically developing children. Findings suggest the importance of mothers' explanatory models for child difficulties and highlight children with borderline intelligence as uniquely at risk for poor parenting.

Since Bell's (1968) seminal paper emphasized the importance of child effects on parenting, socialization research has significantly advanced understanding of reciprocal influences within the parent–child relationship (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). Research on bidirectionality has led to increased appreciation for the transactional relations between child attributes and parenting in the prediction of children's socioemotional functioning. Although substantial research has been focused on families of typically developing children, an important area in which to examine child effects is in the context of families of children at risk for poor outcomes due to biological factors or developmental disruptions. Evidence suggests that children's developmental status may not only amplify the importance of parenting (Crnic, Friedrich, & Greenberg, 1983; Crnic & Greenberg, 1987), but also may alter the actual parenting that a child receives (Floyd & Phillippe, 1993).

Relatively little is known about the quality of parenting among families of children with borderline intelligence, despite evidence that these children are at heightened risk for maladaptive outcomes (Valliant & Davis, 2000). Although children with borderline intellectual functioning fall within a narrow IQ band, defined as 71–84 by the Diagnostic and Statistical Manual of Mental Disorders—DSM-IV (American Psychiatric Association, 2000), they comprise a greater percentage of the population than do children with diagnosable

developmental delays, suggesting that evidence of maladaptive family processes may have significant implications for future intervention and prevention efforts. In the present study we addressed this gap in the literature by investigating parenting behavior among families of children with borderline intellectual functioning in comparison to families of children with and those without developmental delays. Differences in child behavior were also examined in order to assess the potential contribution of child behavior to the quality of parent–child interaction.

Family processes in populations with special needs can be informed by the literature on families of typically developing children. Parenting factors such as warmth and responsiveness have consistently been identified as key elements of an adaptive parenting style, which provide a foundation for children's social, emotional, and moral development (Baumrind, 1993; Calkins, Smith, Gill, & Johnson, 1998; Campbell et al., 2004; Kachanska, 1997; Maccoby & Martin, 1983). Conversely, low levels of parental warm involvement have been linked with child maladaptive outcomes, including increased oppositional and externalizing behavior problems (Dodge, Pettit, & Bates, 1994; Stormshak, Bierman, McMahon, Lengua, & Conduct Problems Prevention Research Group, 2000). A lack of parental responsiveness in the form of intrusiveness or overcontrol, particularly in the context of harsh discipline, has similarly been associated with children's behavioral difficulties (Dodge et al., 1994; Smith, Calkins, Keane, Anastopoulos, & Shelton, 2004).

Parental emotional expressiveness also plays a critical role in establishing the tenor of family interactions and relates significantly to children's socioemotional functioning (Eisenberg, Cumberland, & Spinrad, 1998; Halberstadt, 1991). Whereas expression of positive affect has been associated with children's affective perspective-taking (Halberstadt, Crisp, & Eaton, 1999) and prosocial behavior (Denham & Grout, 1992; Garner, Jones, & Miner, 1994), parental expression of negative affect, especially anger, has been linked to low empathetic responding (Crockenberg, 1985), limited emotion understanding (Denham, Zoller, & Couchoud, 1994; Dunn & Brown, 1994), and maintenance of behavior problems over time (Denham et al., 2000). Exploration of mechanisms underlying the relation between parental expressiveness and child outcomes suggests possible direct (e.g., imitation—Isley, O'Neil, Clatfelter, & Parke, 1999; Malatesta, Grigoryev, Lamb, Albin, & Culver, 1986) and indirect pathways (e.g., through child regulation—Eisenberg et al., 2001).

Research suggests that parenting may be particularly influential for children who are vulnerable or at risk. In a study of externalizing behavior problems from early to middle childhood, Denham and colleagues (2000) found that relations between parenting and externalizing problems were strongest for children who exhibited clinically significant behavior problems at the outset of the study, suggesting that parenting had the greatest impact for children already exhibiting deviant developmental trajectories. Similarly, studies of preterm infants have shown that parent and family variables bear a much stronger relationship with child outcomes for children at risk (preterm) than for typically developing children (Crnic & Greenberg, 1987).

In light of evidence that parenting is altered under conditions of risk (e.g., Dodge et al., 1994) and may be especially influential for vulnerable populations, the quality of parent–child interaction may be critical for children with developmental delays. These children are at heightened risk for a host of maladaptive outcomes, including significant social difficulties (Guralnick, 1997; Guralnick & Groom, 1987, 1988; Kopp, Baker, & Brown, 1992), behavior problems (Baker, Blacher, Crnic, & Edelbrock, 2002; Baker et al., 2003), and psychiatric illness (Tonge, 1999). The mechanisms underlying the relation between delay status and development of psychopathology are not well-understood. However, research demonstrates the important role that parenting can play in fostering adaptive skills and socioemotional development in this population (e.g., Baker, 1996; Guralnick 1997).

Although parenting a child with developmental delays is similar to parenting a typically developing child in many respects, the specialized needs of a child with delays create further demands on the family system (Baker, Blacher, Kopp, & Kraemer, 1997). In addition to broad family effects such as chronic stress (Baker et al., 1997) and role asymmetry (Stoneman & Brody, 1990), the quality of parent-child interaction may be affected by children's developmental status. Parent-child interactions in families of children with developmental delays may be asynchronous (Crnic et al., 1983), lacking the mutuality observed in families of typically developing children (e.g., positive reciprocity and playfulness—Floyd & Phillippe, 1993). Parents are also more likely to exhibit behaviors traditionally considered intrusive when interacting with a child who has delays, issuing more commands and directives than do parents of typically developing children. Such findings have been obtained via general observations as well as in the more specific context of family problem-solving interactions (Costigan, Floyd, Harter, & McClintock, 1997; Floyd, Harter, & Costigan, 2004; Floyd & Phillippe, 1993).

Many questions remain unanswered regarding the impact of a child with delays upon family functioning in general and parent-child interaction in particular. However, even less is known about families of children with borderline intellectual functioning, a population that may be similarly vulnerable to maladaptive outcomes (Valliant & Davis, 2000). Unlike children with more significant delays, whose pronounced deficits may lead to early identification and intervention, children with borderline intellectual functioning are rarely identified prior to school entry. Consequently, for children with borderline intelligence, deficits may become increasingly apparent over time, especially as children enter the school setting where comparisons with same-aged peers become commonplace.

Researchers have begun to document the unique challenges presented by children with borderline intellectual functioning by focusing upon classification problems in the formal school setting. Children with borderline intelligence frequently demonstrate pervasive academic difficulties and are often referred for educational services. However, these children frequently fail to meet formal disability criterion, which complicates appropriate identification and intervention efforts (MacMillan, Gresham, Bocian, & Lambros, 1998). Similar to the confusion generated in the school context, the lack of a specific disability diagnosis for children with borderline intelligence may also affect parents' interpretation of child problems. The presence of an explanatory model, defined by an understanding of the meaning and implications of a disability diagnosis for current and future functioning, has been highlighted as central to adaptive functioning for youths with developmental delays and their families (Daley & Weisner, 2003). Indeed, research suggests that a core coping mechanism for parents of children with developmental delays is acceptance of, and adjustment to, a child's disability status, which is facilitated by an understanding of the ramifications of diagnosis and anticipation of associated challenges (Baker et al., 1997). However, unlike parents of children with developmental delays, parents of children with borderline intellectual functioning may lack a sufficient explanatory model for child difficulties or may in fact misattribute child deficits to aspects of motivation and effort rather than to limited cognitive capacity. Difficulty understanding inconsistencies in child behavior coupled with unclear or unmet parental expectations may, in turn, challenge parent-child interactions, placing children with borderline intelligence uniquely at risk for poor quality parent-child interaction.

In the current study we built upon evidence that family functioning is altered by the presence of a child with special needs to examine parenting behavior among families of children with borderline intellectual functioning in comparison to families of typically developing children and families of children with developmental delays. By focusing on participants at child age 5, we considered an important transition period in the lives of families as children enter the formal school setting.

The present investigation was focused on core dimensions of parenting, including expressiveness, attunement, involvement, and stimulation, that have been linked to important child outcomes in previous studies. Given the lack of empirical research on families of children with borderline intellectual functioning, the current study was somewhat exploratory in nature. Two general research questions regarding the quality of parenting were, therefore, proposed. (a) Do some aspects of parenting present in a linear fashion commensurate with the IQ continuum (i.e., Does the quality of parenting for children with borderline intellectual functioning fall between that of typically developing children and children with developmental delays)? (b) Do the specific challenges associated with parenting a child with borderline intellectual functioning result in some poorer parenting behaviors for these children than for either typically developing children or children with developmental delays?

In order to address the possibility that child behavior may have influenced parent behavior, child effects were also investigated, both proximally in the context of mother–child interaction as well as more globally via maternal report of child behavior problems. Children with borderline intellectual functioning were expected to display more behavior problems than were typically developing children, but fewer behavior problems than children with developmental delays.

Finally, given preliminary evidence that problems exhibited by children with borderline intelligence may be especially difficult to interpret (e.g., MacMillan et al., 1998), we anticipated that mothers' restricted understanding of child functioning could negatively affect the quality of mother–child interaction. Specifically, we hypothesized that mothers of children with borderline intellectual functioning who did not report a formal awareness of their children's cognitive delays would exhibit the most problematic parenting. Conversely, mothers who clearly identified their children's cognitive limitations were expected to display parenting similar to that of mothers of children with developmental delays.

Method

Overview

The current study was part of an ongoing, longitudinal (age 3 to 9 years) investigation of child and family factors thought to relate to the development of psychopathology among children with a range of cognitive abilities (Baker et al., 2002; Baker et al., 2003). Data collection for the larger study involved laboratory and home visits as well as questionnaire measures administered to parents and teachers. Exclusionary criteria for participation in the initial data collection at age 3 included child diagnoses of autism and the presence of severe motor difficulties. Participants were recruited primarily from community agencies serving children with developmental delays and through normative preschools.

Participants

Participants were 217 mothers and their 5-year-old children (126 boys, 91 girls) who took part in the age 5 data collection. The participating families represented relatively diverse racial/ethnic (60% Caucasian) and socioeconomic backgrounds. Approximately three quarters of the families were drawn from southern California, and the remaining quarter of the families were from central Pennsylvania. The sample included children with a range of cognitive abilities. Based upon the total IQ score from the age 5 assessment with the Stanford-Binet Intelligence Scale-IV—SB-IV (Thorndike, Hagen, & Sattler, 1986), 142 children were classified as typically developing ($SB-IV \geq 85$), 29 children were identified as functioning within the borderline range of intelligence ($SB-IV 71$ to 84), and 46 children were classified as demonstrating developmental delays ($SB-IV \leq 70$). The definition of *borderline intellectual functioning* employed in the current study (IQ in the 71 to 84 range) is consistent with the

definition specified in the *DSM-IV*. However, results held even when the more conservative IQ band of 76 to 84 was considered ($n = 17$), suggesting the robustness of the processes observed among families of children with borderline intellectual functioning.

Demographic data by status group are presented in Table 1. Families of children with borderline intellectual functioning did not differ from families of typically developing children or families of children with developmental delays in terms of annual family income or marital status. Significant group differences did emerge with regard to maternal education, $F(2, 214) = 7.15$, $p < .01$. Post hoc tests (Tukey's *b*) revealed that mothers of typically developing children completed a higher level of education than did mothers of children with borderline intelligence and mothers of children with developmental delays; the latter two groups did not differ from one another. As such, maternal education was controlled for in subsequent analyses when this variable was also significantly related to the dependent variable. The three groups did not differ in terms of child gender or race/ethnicity.

Procedure

Informed consent was obtained from all parents at the beginning of the study (child age 3). Following the child's 5th birthday, each family came to the laboratory where a trained assessor administered the Stanford-Binet IV to determine the child's intellectual ability. A home visit was then scheduled for each family, and parents were provided with questionnaire packets, including the Child Behavior Checklist (Achenbach, 1991), to complete and return by mail. Home visits were typically scheduled in the late afternoon or evening, which permitted observation of family interaction around dinnertime. Upon the arrival of a trained observer at the family's home, families were instructed to act as they normally would, resulting in observation of a range of activities, such as free play, cooking, and sports. Total observation time was 60 min, with four 10-min observation periods. The observation epochs were separated by intervening 5-min rating periods, during which time the observer reviewed notes and completed ratings of parenting and child behavior. At the conclusion of the visit, a semi-structured interview was administered to mothers to update family demographic information.

Measures

Stanford-Binet IV (SB-IV)—Children's cognitive ability was evaluated with the SB-IV, a widely used assessment instrument with sound psychometric properties. The instrument is particularly well-suited to the evaluation of children with delays because the examiner adapts starting points according to the child's developmental level.

Naturalistic observation of parent–child interaction—Observation of families at child age 5 provided measures of maternal parenting and child behavior. In order to increase the reliability of measurement, we averaged ratings across the four 10-min observation periods.

Six dimensions of maternal parenting were evaluated: positivity, negativity, sensitivity, intrusiveness, stimulation of cognition, and detachment. Each of the dimensions was rated on a 5-point Likert scale (1 = *not at all characteristic*, 5 = *highly or predominantly characteristic*) that considered both the frequency and intensity of the expressed affect or behavior. *Positivity* included the verbal and behavioral expression of positive regard or affect, warmth, and affection. *Negativity* referred to the expression of negative affect, disapproval, and hostility through verbal means (e.g., harsh tone of voice) or nonverbal behavior (e.g., strained expression, look of disgust). *Sensitivity* was defined by maternal behavior that was child-centered and developmentally appropriate (e.g., the sensitive mother was responsive to the child's needs, soothed the child when necessary, and provided appropriate structure and stimulation). *Intrusiveness* was characterized by maternal behavior that was adult-centered rather than child-centered. The intrusive mother sought to impose an agenda upon her child

without regard to the child's signals and may have been overly stimulating or unable, or unwilling, to relinquish control. *Stimulation of cognition* reflected maternal attempts to foster the child's cognitive growth at a developmentally appropriate level. Finally, *detachment* represented marked nonresponsiveness and a lack of awareness of the child's needs.

In order to evaluate reciprocal relations between observed parenting and child behavior, we examined ratings of child behavior in the context of the same interactions. Child positivity, negativity, liveliness/activity, sociability, sustained attention, and demandingness were evaluated to provide measures of proximal child behavior. *Positivity* and *negativity* were defined for the child in a manner consistent with the descriptions provided for the parenting codes. *Liveliness/activity* represented the extent to which the child was physically active during the observation (e.g., the speed, frequency, and intensity of motor activity). *Sociability* reflected the degree to which the child initiated and responded to social interactions in a developmentally and socially appropriate manner (i.e., engagement with others in a negative or destructive manner was not considered prosocial and was, therefore, not represented on this scale). *Sustained attention* was defined by the child's ability to maintain involvement with the physical world and objects, as well as the child's capacity to remain focused and interested during interactions with others. *Demandingness* measured the extent to which the child made excessive, persistent, and/or negative bids for attention when basic needs had already been met (e.g., a demanding child may have repeatedly interrupted the ongoing activities of his or her parent, such as cooking or talking on the phone).

Prior to collecting observational data in the home, coders were trained on videotapes of home observations and attended live home observations with an experienced coder until reliability was established. *Reliability* was defined as a criterion of over 70% exact agreement with the primary coder and 95% agreement within one scale point. After obtaining reliability, individual observers conducted home observations. To maintain reliability within and across project sites, we designated a primary coder at each site, and reliability was collected regularly through videotaped and live home observations. The kappa coefficient for within-site reliability was .61 and .59 at the California and Pennsylvania sites, respectively, and kappa for across-site reliability was .64 (see also Crnic, Gaze, & Hoffman, 2005). Kappa coefficients represent a conservative reliability index, and these levels are considered acceptable (Fleiss, Cohen, & Everitt, 1969).

Previous research suggests that the dimensions assessed by the rating system employed in the present study are relatively stable over time (Park, Belsky, Putnam, & Crnic, 1997) and represent reliable and valid measures of naturalistic parent-child interaction (e.g., Aber, Belsky, Slade, & Crnic, 1999; Belsky, Hsieh, & Crnic, 1998; Crnic et al., 2005; Park et al., 1997; Woodworth, Belsky, & Crnic, 1996). Researchers using the current rating system have found predictive associations between observed parenting and young children's later inhibition (Park et al., 1997) and externalizing behavior problems (Belsky et al., 1998). Maternal parenting, as measured by the current observational system, has also been found to predict change in mothers' positive perceptions of their parent-child relationship (Aber et al., 1999).

Child Behavior Checklist—In order to examine the relation of distal aspects of child behavior to patterns of proximal parent-child interaction observed during the home visit, we examined maternal report of externalizing behavior problems on the Child Behavior Checklist at child age 5. We selected the Externalizing subscale of the Child Behavior Checklist to provide a measure of behaviors likely to challenge mother-child exchanges overtly. This scale yields a *T* score with a mean of 50 and *SD* of 10. The Child Behavior Checklist is one of the most widely used parent-report measures of child socioemotional functioning and has high reliability and validity.

Maternal interview—Demographic information, including mothers' educational history and family income, was obtained through a semi-structured interview. Mothers were also asked to report on whether their children had received any mental health or special education diagnoses. In order to evaluate mothers' explanatory models for difficulties experienced by children with borderline intellectual functioning, mothers' explanations of child problems were categorized according to whether mothers did or did not express an awareness of cognitive and/or general developmental delays at child age 5.

Results

Parenting Differences

Maternal education was significantly related to all maternal parenting variables except intrusiveness and was controlled for in relevant subsequent analyses. We took a conservative approach in analyses involving variables with unequal variance, including maternal negativity and intrusiveness. When appropriate, Welch's F statistic was calculated as an alternate omnibus test that is preferable to the F statistic when the assumption of equal variance does not hold. In addition, we employed the SAS proc mixed procedure (SAS Institute, 2004), with a repeated statement and group option in the analysis involving maternal negativity in order to adequately control for maternal education while also accounting for unequal variance by estimating three separate residual variances.

Figure 1 displays differences in observed parenting behavior. Univariate ANCOVAs revealed significant differences among the three groups for positivity, $F(2, 213) = 3.13, p < .05$, and sensitivity, $F(2, 213) = 4.36, p < .05$. Group differences did not emerge for maternal stimulation of cognition or for maternal detachment. The SAS proc mixed procedure indicated significant group differences for maternal negativity, $F(2, 213) = 3.63, p < .05$. Because maternal education was not significantly correlated with intrusiveness, we performed a one-way ANOVA, which revealed significant group differences for this variable, Welch's $F(2, 54.69) = 5.15, p < .01$.

We employed appropriate follow-up tests to examine significant main effects, taking into consideration instances of unequal variance. Simple contrasts revealed that mothers of children in the borderline group displayed significantly less positivity and less sensitivity than both mothers of typically developing children and mothers of children with developmental delays. Mothers of children with borderline intellectual functioning did not differ significantly from other mothers in observed negativity. Similarly, post hoc tests (Games-Howell) indicated that mothers of children with borderline intellectual functioning did not differ from other mothers in intrusiveness.

In order to represent the broader context of maternal parenting style and to address the moderate to high intercorrelations among the parenting variables (see Table 2), we performed a principal-components analysis with varimax rotation. Consistent with findings from studies of typically developing children in which researchers have employed the present observational system (e.g., Aber et al., 1999; Woodworth et al., 1996), the analysis yielded two factors with eigenvalues over 1. The first factor included maternal positivity (factor loading = .87), sensitivity (.90), stimulation of cognition (.76), and detachment (−.81), and accounted for 46.8% of the variance. This first factor was termed the Positive Engagement factor. The second factor was characterized by maternal negativity (factor loading = .90) and intrusiveness (.92). This second Negative–Controlling factor accounted for 31.2% of the variance. An ANCOVA controlling for maternal education revealed significant group differences in Positive Engagement, $F(2, 213) = 3.71, p < .05$. Simple contrasts indicated that mothers of children with borderline intellectual functioning were significantly less likely to exhibit a style of positive engagement than either mothers of typically developing children or children with developmental delays (see Figure 2). With regard to the Negative–Controlling factor, which

was unrelated to maternal education, a one-way ANOVA revealed a significant main effect of group, Welch's $F(2, 54.85) = 4.33, p < .05$. Post hoc tests (Games-Howell) revealed that mothers of children with borderline intellectual functioning did not differ from other mothers on this factor. However, mothers of typically developing children were significantly less likely to display a negative-controlling style than mothers of children with developmental delays.

Observed Child Behavior

To address the possibility that proximal child behavior may have influenced the observed maternal parenting behavior, we performed analyses on child variables derived from the same mother-child interactions. Table 3 presents group differences in child behavior. Maternal education was related only to child sociability and was controlled for in the analysis involving this variable. Appropriate omnibus and post hoc tests were employed to account for the inequality of variance observed for child negativity and demandingness. A series of one-way ANOVAs revealed significant group differences in child negativity, Welch's $F(2, 52.75) = 7.47, p < .01$, sustained attention $F(2, 214) = 20.07, p < .001$, and demandingness, Welch's $F(2, 53.29) = 4.36, p < .05$. Significant group differences also emerged for child sociability, even after accounting for the effects of maternal education, $F(2, 213) = 8.64, p < .001$. Follow-up analyses revealed that children with borderline intellectual functioning did not differ significantly from typically developing children on any of the dimensions assessed. Children with borderline intellectual functioning also did not differ from children with developmental delays in negativity or demandingness. Children with developmental delays were rated as significantly less sociable and less attentive than were children with borderline intellectual functioning and typically developing children. Children with delays were also rated as significantly more negative and demanding than typically developing children.

As was the case with ratings of maternal parenting behavior, ratings of observed child behavior were significantly intercorrelated (see Table 4). In order to represent the construct of child behavioral style and to reflect the level of relatedness between the observational variables, we performed a principal-components analysis with varimax rotation. The analysis yielded two child behavior factors with eigenvalues over 1. The first factor consisted of child positivity (factor loading = .87), liveliness/activity (.74), and sociability (.81), and accounted for 33.5% of the variance. This factor was identified as the Positive Child Behavior factor. The second factor was composed of child negativity (.76), sustained attention (-.75), and demandingness (.79), which accounted for 32.6% of the variance. This second factor was termed the Difficult Child Behavior factor. An ANCOVA, controlling for maternal education, did not reveal significant group differences in Positive Child Behavior. A one-way ANOVA examining Difficult Child Behavior revealed significant group differences, Welch's $F(2, 52.74) = 12.06, p < .001$. Post hoc tests (Games-Howell) indicated that children with borderline intellectual functioning did not differ from typically developing children or children with developmental delays in extent of difficult child behavior. However, children with developmental delays displayed significantly greater difficult behavior than did typically developing children. In sum, given that children with borderline intellectual functioning were no less positive and no more negative than were typically developing children or children with developmental delays, ratings of child behavior within the context of mother-child interaction did not appear to account for the poorer parenting profiles observed among families of children with borderline intellectual functioning.

Distal Child Behavior

In order to assess the hypothesis that global aspects of child behavior may have influenced the quality of the observed mother-child interaction, we examined maternal report of child externalizing behavior problems on the Child Behavior Checklist. A one-way ANOVA revealed significant group differences in sum scores on the Externalizing subscale, suggesting

substantial discrepancy in maternal report of child externalizing behavior problems, $F(2, 210) = 14.92, p < .001$. Post hoc tests (Tukey's *b*) revealed that ratings of child externalizing problems by mothers of children with borderline intelligence did not differ significantly from ratings by mothers of children with developmental delays (mean *T* scores = 54.11 and 56.39, respectively). However, mothers of typically developing children reported fewer child externalizing behavior problems (mean *T* score = 46.31) than did mothers of both other groups.

Role of Explanatory Models

Given the hypothesis that insufficient explanatory models for child difficulties might partially underlie the poorer parenting observed among mothers of children with borderline intellectual functioning, we undertook efforts to evaluate whether mothers were aware of their children's cognitive limitations. Of the children classified within the range of borderline intellectual functioning, 6 mothers reported that their children evidenced cognitive and/or general developmental delays, whereas 22 mothers did not identify the presence of cognitive delays. Data pertaining to maternal explanatory model were unavailable for one subject. Although formal statistics were not performed due to the small sample sizes involved, the means of observed parenting for these two groups of children in the borderline range of intellectual functioning were compared to the means of observed parenting for typically developing children and children with developmental delays (see Table 5). Comparisons were restricted to those parenting variables that differentiated the group with borderline intellectual functioning from both other groups in earlier analyses (positivity, sensitivity, and positive engagement). Examination of the means revealed that mothers who possessed an explanatory model for their children's difficulties (i.e., indicated awareness of cognitive and/or general developmental delays) were more similar to mothers of children with developmental delays in terms of parenting profiles than were mothers who did not possess a clear understanding of their children's cognitive functioning. Results were not altered significantly when analyses of parenting data were computed without the 6 children with borderline intellectual functioning whose mothers did identify cognitive delays.

Discussion

In the current investigation we examined parenting, specifically the quality of mother-child interaction, among families of children with a range of cognitive abilities. A particular emphasis was placed upon evaluation of parenting for children with borderline intellectual functioning, an understudied population that may be at heightened risk for development of psychopathology due to the presence of cognitive limitations that impair functioning but do not warrant a specific disability diagnosis.

Findings provide support for previous research documenting differences in parenting as a function of child risk and highlight children with borderline intelligence as a group uniquely vulnerable to poor parenting profiles. Given the importance of warm and sensitive maternal responding for children's adaptive social, emotional, and behavioral development, it is noteworthy that mothers of children with borderline intellectual functioning were markedly less positive and less sensitive than other mothers and were least likely to display a style of positive engagement. Although group differences existed in maternal negativity and intrusiveness, as well as in the Negative-Controlling factor, mothers of children with borderline intellectual functioning did not differ from other mothers in these domains. It is, therefore, interesting that examination of the means for intrusiveness and the Negative-Controlling factor provided the only support, albeit not significantly, for linearity in parenting behaviors.

Given the parenting profile displayed by mothers of children with borderline intelligence, interaction patterns in these families are likely to be marked by low maternal involvement rather than by hostility or overt mother-child conflict. Although parental negativity and

overcontrol have been linked to children's aggressive behavior, reduced positive engagement has been associated with similar externalizing problems (Dodge et al., 1994; Stormshak et al., 2000). Indeed, some evidence suggests that low positive involvement may be more predictive of child behavior problems than negative parent-child exchanges (Pettit & Bates, 1989). Warm and sensitive maternal responding also plays an important role in the development of secure attachment patterns, adaptive regulatory capabilities, and conscience, all of which provide a foundation for successful interpersonal interaction (Calkins et al., 1998; Campbell et al., 2004; Grusec, Goodnow, & Kuczynski, 2000; Kachanska, 1997; Kachanska & Murray, 2000). Consequently, even though mothers of children with borderline intelligence did not display greater active negativity or intrusiveness, the lack of maternal positive engagement places these children at heightened risk for emotional and behavioral dysregulation as well as problematic social functioning.

In light of evidence of particularly poor quality parenting among mothers of children with borderline intellectual ability, it is reasonable to suspect that difficult child behavior may have instigated or exacerbated problematic parenting. However, according to independent observers, children in the borderline range of intelligence did not exhibit behaviors consistent with such an interpretation. Instead, the behavior of children with borderline intellectual functioning did not differ from that of typically developing children, suggesting that children with borderline intelligence did not seem to be pulling for the poor parenting observed in the context of naturalistic mother-child interaction.

Although observed child behavior did not appear to account for parenting profiles, it is possible that the quality of mother-child interaction was influenced by mothers' general perceptions of child behavior problems. Mothers of children with borderline intellectual functioning reported significantly more child behavior problems than did mothers of typically developing children, but did not differ from mothers of children with developmental delays. On one hand, these findings could suggest that actual differences in distal child behavior contributed to challenges during in-the-moment mother-child interaction. On the other hand, these results might suggest that mothers of children with borderline intellectual functioning perceived greater child problems, despite findings from home observations that these children were no more difficult than typically developing children. Regardless, even if mothers of children with borderline intellectual functioning accurately reported heightened levels of child behavior problems relative to typically developing children, differences in externalizing difficulties cannot account for evidence that children with borderline intellectual functioning experienced poorer parenting than children with developmental delays.

An alternative explanation for the obtained results is that the poor parenting observed in families of children with borderline intellectual functioning actually depressed children's intelligence into the borderline range (i.e., in the context of a more facilitative family environment, these children would have been typically developing). Prior research suggests the importance of environmental factors, particularly the quality of mother-child interaction, to the expression of intelligence (Bennett-Gates & Zigler, 1998; C. Ramey, Farran, & Campbell, 1979), which makes this possibility important to consider. However, early data from the larger project of which this study was part do not support the conjecture that children's functioning degenerated under conditions of poor parenting. Rather, a majority of children identified as functioning in the borderline range of intelligence at age 5 had increased in measured IQ from the prior assessment at age 3. Based upon the assumption made in longitudinal studies that parenting affects child development over time, if poor parenting had depressed the children's intelligence, results would be expected to show a continuing degeneration of children's intellectual functioning and not an increase in IQ from age 3 to 5. Although instability in measured IQ was apparent during the preschool period, most children

classified within the borderline range of intelligence at age 5 had shifted within the expected assessment confidence interval of 95%.

Because some of the children with borderline intellectual functioning at age 5 displayed prior difficulties, mothers may have had insight into developing problems and, thus, some elements of an explanatory model early on. However, improved child functioning from age 3 to 5 likely complicated maternal expectations because, despite gains, deficits remained at age 5. A lack of explanation for lingering child difficulties may, in turn, have led to increased maternal frustration and challenges in the context of mother–child interaction. Evidence from the present study provides preliminary support for this hypothesis. According to an examination of mean levels, mothers of children with borderline intelligence who reported an awareness of their children's cognitive delays at age 5 exhibited better parenting profiles than mothers who did not express knowledge of their children's cognitive limitations. Indeed, mothers who articulated an explanatory model based upon cognitive factors were more similar in their parenting to mothers of children with developmental delays. Although further research is needed in order to elucidate the impact of explanatory models in greater depth, results from the present study suggest that the nature of mothers' understanding of child difficulties might contribute importantly to the quality of mother–child interaction in families of children with borderline intelligence. As these children's limitations become more apparent in the context of formal schooling, child difficulties and maternal cognitions may transact to produce increasingly problematic mother–child interactions.

Results from the present study provide evidence of poorer quality parenting among families of children with borderline intellectual functioning and suggest the need for further research with this population. Although problems for these children tend to emerge within the educational arena, the results from this study suggest that detrimental family processes may be underway by the end of the preschool period. Given evidence that dysfunctional parent–child interactions may maintain or exacerbate child difficulties over time (Patterson, 1982; Patterson, Reid, & Dishion, 1992), the findings reveal a need to extend intervention to families of children with borderline intellectual functioning. Previous early intervention and prevention efforts targeting populations at risk for developmental delays have demonstrated significant positive effects on children's long-term adjustment, with evidence suggesting the beneficial impact of improved mother–child interactions (C. Ramey et al., 1979; S. Ramey & Ramey, 1999; C. Ramey, Ramey, Lanzi, & Cotton, 2002). Once the presence of cognitive delays has been established, the current findings suggest that an important additional component of intervention may be to help parents understand and adapt to the limited capabilities of children with borderline intellectual functioning by adjusting behavior and expectations accordingly. By promoting a style of positive engagement with the child, intervention may lead to changes in parenting behaviors that contribute to an improved emotional climate in the home environment.

The present research centered upon the quality of mother–child interaction as a foundation for studying families of children with borderline intelligence. Maternal perceptions of child problems were a particular focus, though awareness of positive child characteristics might also influence the quality of mother–child interaction. In future studies investigators should explore the possibility that mothers of children with borderline intellectual functioning might view their children as possessing fewer desirable characteristics than same-aged peers, which could contribute to the diminished positive involvement observed in the present investigation. Furthermore, researchers should also examine the heritability of intelligence as a possible factor influencing the compromised parenting observed among mothers of children with borderline intellectual functioning. In the current study we attempted to address this issue by evaluating mothers' special education eligibility and by controlling for maternal education. However, future studies would benefit if the investigators measured the contribution of

maternal intelligence more directly. In light of the importance of co-parenting (Belsky, Crnic, & Gable, 1995; Feinberg, 2003) and the unique contributions of fathering to child development (Lamb & Lewis, 2004), subsequent studies should also attend to the role of fathers in families of children with borderline intellectual functioning.

Findings from the current study represent a first step in understanding the complex dynamics underlying family processes for children with borderline intelligence. Although we employed a modest sample of children within this IQ range, the strong results obtained suggest the importance of replication with a larger sample. Further exploration of mechanisms underlying the relation between children's IQ status and observed parenting profiles is also warranted. Our findings suggest possible avenues for such research, particularly from the standpoint of parental beliefs, expectations, and explanatory models.

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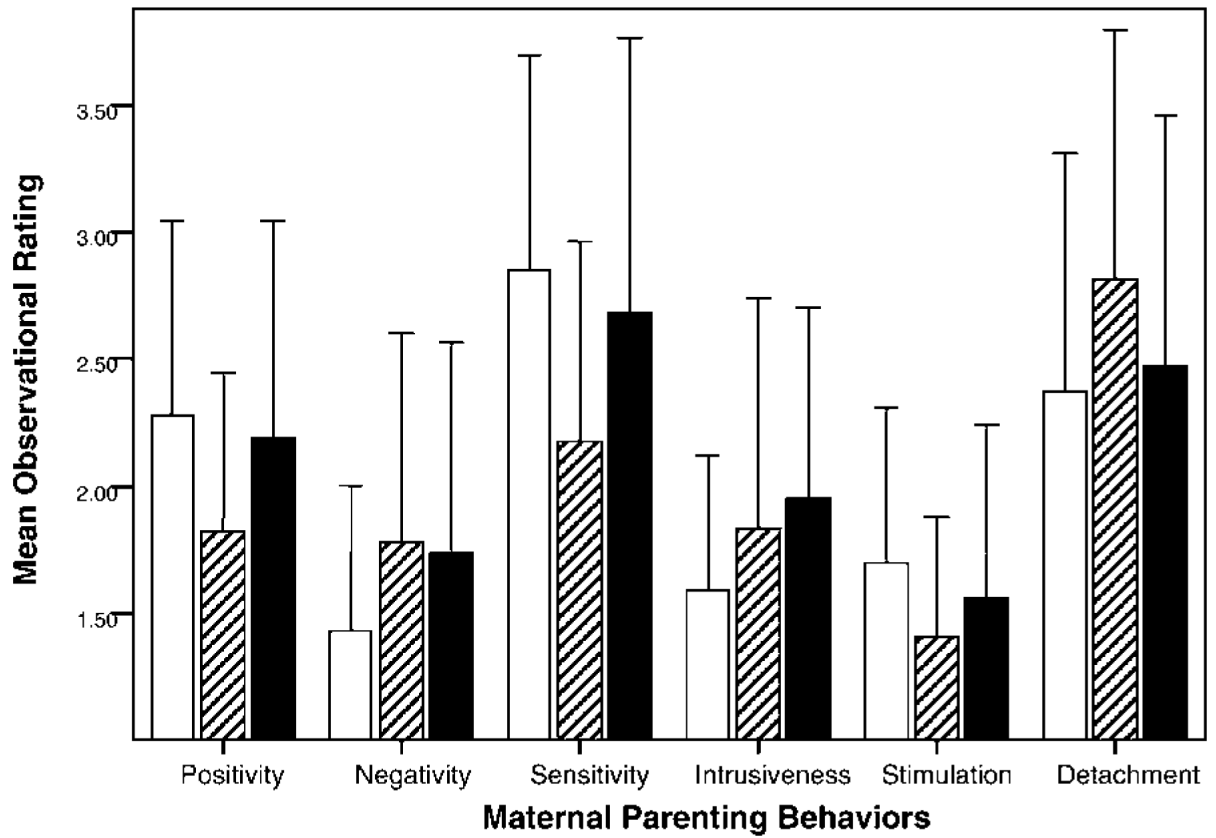


Figure 1. Comparisons of maternal parenting behaviors by developmental status group. Error bars represent one *SD* above the mean. White bars = typically developing, hatched bars = borderline range, black bars = delayed range.

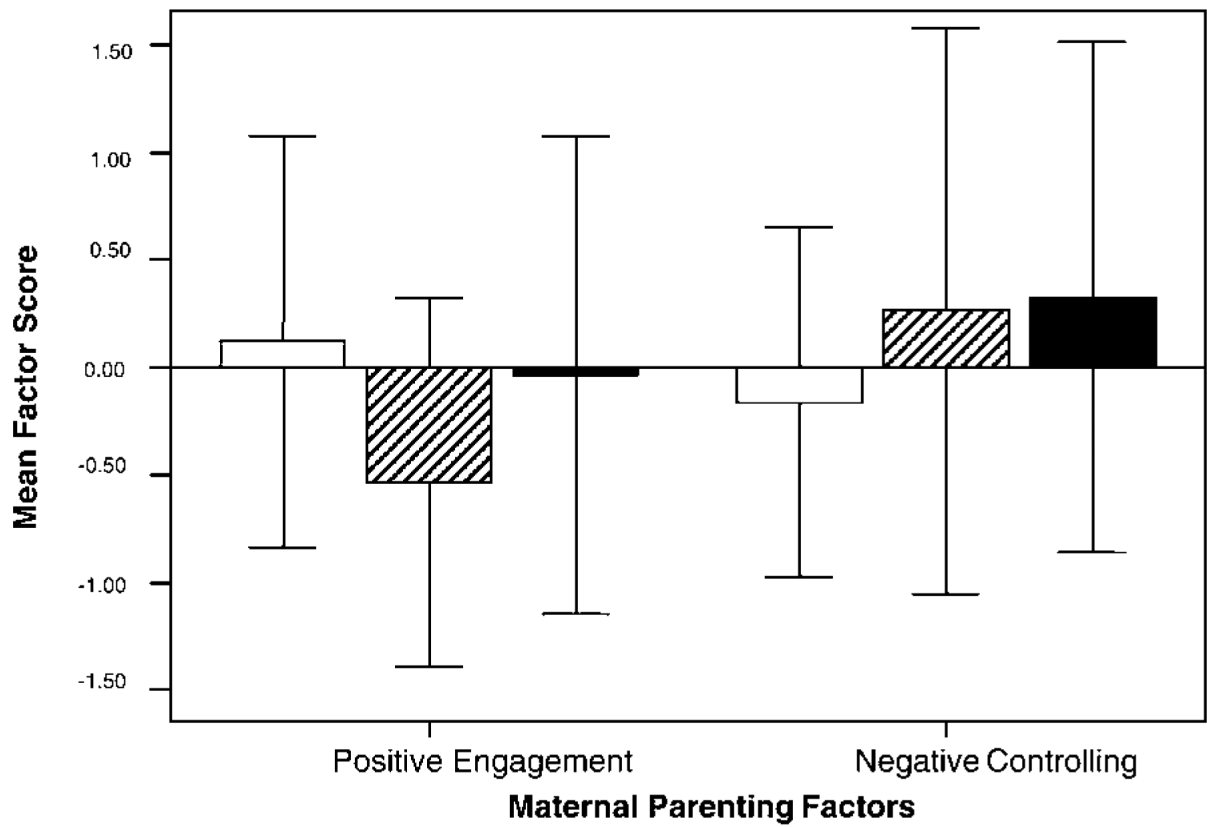


Figure 2. Comparisons of maternal parenting factors by developmental status group. Error bars represent one *SD* above and below the mean. White bars = typically developing, hatched bars = borderline range, black bars = delayed range.

Table 1

Participant Demographics by Status Group

Variable	Typically developing (<i>n</i> = 142)		Borderline range (<i>n</i> = 29)		Delayed range (<i>n</i> = 46)	
	Mean/%	SD	Mean/%	SD	Mean/%	SD
Child						
Gender (% boys)	57.7	–	65.5	–	54.3	–
Race/Ethnicity (% Caucasian)	60.6	–	48.3	–	65.2	–
Mean SB-IV, Full IQ	103.4	11.4	77.7	4.2	50.0	10.9
Parent and family						
Marital status (% married)	83.8	–	75.9	–	78.3	–
Maternal education ^a	15.6	2.4	14.2	2.2	14.4	2.2
Annual family income (%)						
≤ 35,000	23.4	–	34.5	–	41.3	–
35,001–70,000	29.1	–	37.9	–	28.3	–
≥ 70,001	47.5	–	27.6	–	30.4	–

^aMaternal education represents grade completed in school. To address concerns that mothers of children with borderline intellectual functioning may themselves have limited cognitive abilities, we considered the history of maternal special education eligibility. Of the 29 mothers of children in the borderline range of intellectual functioning, only 1 mother reported special education eligibility. When analyses were computed without this mother, results were not affected significantly.

Table 2

Intercorrelations Among Maternal Parenting Variables

Variable	1	2	3	4	5	6
1. Positivity	—					
2. Negativity		-.29***			.54***	-.56***
3. Sensitivity			.82***		-.09	-.11
4. Intrusiveness			-.32	.70***	.58***	-.62***
5. Stimulation				-.20**	-.02	-.26***
6. Detachment						-.45***

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3

Group Differences in Observed Child Behavior

Variable/Factor	Typically developing (<i>n</i> = 142)		Borderline range (<i>n</i> = 29)		Delayed range (<i>n</i> = 46)	
	Mean	SD	Mean	SD	Mean	SD
Variable						
Positivity	2.84	.71	2.74	.78	2.64	.80
Negativity	1.30 _a	.34	1.53 _{a,b}	.53	1.67 _b	.73
Sociability	3.43 _a	.79	3.16 _a	.90	2.77 _b	.91
Liveliness/Activity	3.31	.69	3.40	.76	3.35	.76
Sustained attention	3.97 _a	.63	3.82 _a	.71	3.24 _b	.81
Demandingness	1.46 _a	.44	1.66 _{a,b}	.69	1.80 _b	.83
Factor						
Positive Behavior	0.10	.96	-0.05	1.1	-0.29	1
Difficult Behavior	-0.27 _a	.67	0.18 _{a,b}	1.1	0.71 _b	1.4

Note. Means in the same row that do not share subscripts differ at $p < .05$ in appropriate follow-up tests (Tukey's *b*, Games-Howell, or simple contrasts).

Table 4

Intercorrelations Among Child Behavior Variables

Variable	1	2	3	4	5	6
1. Positivity	—					
2. Negativity		-.27***			.09***	-.10***
3. Liveliness			.46***		-.32***	.55**
4. Sociability			.01	.63***	-.37***	.15*
5. Attention				-.15*	.25***	.01
6. Demanding				.35***	-.	-.35***

* $p < .05$.

*** $p < .001$.

Table 5

Group Differences in Observed Parenting: The Role of Explanatory Models

Variable/Factor	Typically developing (n = 142)		Borderline range, no noted cognitive delay (n = 22)		Borderline range, noted cognitive delay (n = 6)		Delayed range (n = 46)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Variable								
Positivity	2.28	.76	1.75	.61	2.22	.50	2.19	.85
Sensitivity	2.85	.85	2.14	.78	2.50	.74	2.68	1.1
Factor								
Positive engagement	.12	.96	-.63	.89	-.21	.79	-.03	1.1