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Parent-Child Interaction Over Time in Families of Young Children With Borderline Intellectual Functioning

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A previous study suggested that mothers of 5-year-old children with borderline intellectual functioning displayed lower positive engagement with their children as compared with both mothers of typically developing children and mothers of children with significant developmental delays (Fenning, Baker, Baker, & Crnic, 2007). The current study integrated father data and followed these families over the subsequent 1-year period. Parent and child behavior were coded from naturalistic home observations at both waves. Results revealed that mothers of children with borderline intellectual functioning displayed a greater increase in negative-controlling parenting from child age 5 to 6 than did other mothers; fathers displayed more negative-controlling behavior in comparison to fathers of typically developing children. In addition, children with borderline intellectual functioning themselves exhibited a more significant escalation in difficult behavior than did typically developing children. Cross-lagged analyses for the sample as a whole indicated that maternal negative-controlling behavior predicted subsequent child difficulties, whereas negative paternal behavior was predicted by earlier child behavior. In conjunction with evidence from Fenning et al. (2007), these findings suggest a complex, dynamic, and systemic developmental pattern in the emotional behavior of families of children with borderline intellectual functioning. Implications and areas in need of additional research are discussed.

Keywords: parenting, parent-child interaction, borderline intellectual functioning, disability, behavior problems

Children with developmental delays exhibit increased risk for social difficulties, behavior problems, and psychological disorder relative to typically developing children (B. L. Baker, Neece, Fenning, Blacher, & Crnic, 2010; J. K. Baker, Fenning, Crnic, Baker, & Blacher, 2007; Emerson & Hatton, 2007; Guralnick, 1999). Intrinsic processes involving children's regulatory and social-cognitive skills have been implicated in the development of problems in this population (J. K. Baker et al., 2007; Fenning, Baker, & Juvonen, 2011; Guralnick, 1999; Leffert & Siperstein, 2002). However, the environment—and parenting in particular—

has also emerged as key to understanding risk and resilience in children with developmental vulnerabilities (B. L. Baker, Neece, et al., 2010; J. K. Baker et al., 2007; Fenning & Baker, 2012; Fenning et al., 2011; Guralnick, 1999; Landry, Smith, & Swank, 2006; Ramey & Ramey, 1999; Warren & Brady, 2007). Transactions between children's competencies and the caregiving context may produce significant variation in developmental outcomes, contributing to the broad heterogeneity often documented for children with early cognitive risk. The current study represents a longitudinal follow-up to a previous investigation involving families of children with borderline intellectual functioning (Fenning et al., 2007) to enhance understanding of family process over time for this unique risk group.

Little research has been devoted to children with borderline intellectual functioning, a population defined by IQ performance between one and two standard deviations below the mean (IQ range 71–84; American Psychiatric Association, 2000). Although once considered within the range of intellectual disability (formerly mild mental retardation), borderline intellectual functioning is no longer classified as a primary disability or mental disorder (see Ferrari, 2009 for further discussion). Nonetheless, the profile and needs of individuals within the borderline IQ range may be similar to those of individuals with diagnosed intellectual disability (IQ \leq 70). Indeed, individuals with borderline intellectual functioning appear more vulnerable to academic problems and poor psychosocial outcomes than their typically developing coun-

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terparts (Emerson, Einfeld, & Stancliffe, 2010; Fernell & Ek, 2010; Hassiotis et al., 2008; MacMillan, Gresham, Bocian, & Lambros, 1998; Seltzer et al., 2005; Vaillant & Davis, 2000). Evidence that individuals with borderline IQ are at risk for maladaptive functioning underscores the need for research focused on this population and has led to calls for increased attention to this underrecognized and underserved group (Fenning et al., 2007; Fernell & Ek, 2010; MacMillan et al., 1998).

Despite the important research and policy implications of studies on borderline intellectual functioning, relevant investigations remain limited and largely focused on adults. Studies of children have generally centered on psychiatric comorbidity (e.g., Emerson et al., 2010) and academic outcomes (e.g., MacMillan et al., 1998; Fernell & Ek, 2010), with some additional attention to social-cognitive and executive functioning deficits (Alloway, 2010; van Nieuwenhuijzen, Orobio de Castro, van Aken, & Matthys, 2009). Notably absent is an emphasis on transactions between these children and the family context. Given that parenting may play a pivotal role in fostering resilience in individuals with or at high risk for developmental difficulties across the life span (B. L. Baker, Neese, et al., 2010; J. K. Baker et al., 2007; J. K. Baker, Messinger, et al., 2010; J. K. Baker, Smith, Greenberg, Seltzer, & Taylor, 2011; Crnic & Greenberg, 1987; Fenning et al., 2011; Fenning & Baker, 2012; Landry et al., 2006), the lack of research attention to this domain is rather striking.

For typically developing children, parental warmth and responsiveness have been linked consistently with a host of positive child outcomes (e.g., Baumwell, Tamis-LeMonda, & Bornstein, 1997; Kirsh, Crnic, & Greenberg, 1995; Spinrad et al., 2012; NICHD Early Child Care Research Network, 1999), whereas negative and controlling parenting behaviors have been associated with externalizing behavior problems and poor adjustment (Dodge, 2002; Granic & Patterson, 2006; Mullineaux, Deater-Deckard, Petrill, & Thompson, 2009). Comparatively little is known about processes in families of children with developmental difficulties. Existing evidence suggests that raising a child with developmental delays often creates unexpected challenges for the family, including increased caregiving demands, resource and financial difficulties, and parenting stress, all of which may complicate parent-child interaction (B. L. Baker, Blacher, Crnic, & Edelbrock, 2002; B. L. Baker, Blacher, Kopp, & Kraemer, 1997). Indeed, some investigations have found that parents of children with developmental difficulties may exhibit greater intrusiveness and more asynchrony during interactions with their children as compared with parents of typically developing children (Costigan, Floyd, Harter, & McClintock, 1997; Fenning et al., 2007; Floyd & Phillippe, 1993). Conversely, the ability to preserve a positive interactional style has been linked with resilience in this population. Parenting characterized by effective scaffolding, responsiveness, and mutual positive affect has been found to predict important developmental gains, including adaptive cognitive, language, social-emotional, and behavioral outcomes in children at high risk for developmental problems (J. K. Baker et al., 2007; J. K. Baker, Messinger, et al., 2010; Fenning & Baker, 2012; Landry et al., 2006; Warren & Brady, 2007).

Research has most often focused on maternal parenting, although findings suggest that mothers and fathers make shared as well as independent contributions to children's cognitive, academic, and social-emotional functioning (Brown, Mangels-

dorf, & Neff, 2012; Clarke-Stewart, 1978; Gauvain, Fagot, Leve, & Kavanagh, 2002; Lucassen et al., 2011; Martin, Ryan, & Brooks-Gunn, 2010; Schacht, Cummings, & Davies, 2009). Evidence of unique, and at times differential influence, highlights the importance of examining both mother-child and father-child interaction (Clarke-Stewart, 1978; Holmes & Huston, 2010). In an effort to conceptualize the family context more broadly, researchers have increasingly explored the role that fathers may play in the lives of children with developmental problems (Dyer, McBride, Santos, & Jeans, 2009; Shannon, Tamis-LeMonda, London, & Cabrera, 2002). Some have postulated that the challenges presented by raising a child with developmental difficulties might prompt fathers to withdraw from family interactions; others have suggested that fathers may be motivated to increase involvement in order to help meet their children's needs (Hodapp, 2002; see also Dyer et al., 2009 for a discussion). Although findings remain somewhat mixed regarding the quantity of father involvement in this population, recent evidence suggests that fathers of children with developmental delays may remain as involved in functional care and language stimulation activities as fathers of typically developing children across the early childhood years (Dyer et al., 2009). Furthermore, evidence suggests that fathers of children with developmental risk make important contributions to children's play skills (de Falco, Esposito, Venuti, & Bornstein, 2008) and overall cognitive development (Shannon et al., 2002), and may be as emotionally available, sensitive, and structuring with their children as mothers (de Falco, Venuti, Esposito, & Bornstein, 2009).

Virtually nothing is known about families of children with borderline IQ. However, the lack of a specific disability diagnosis and the unclear nature of these children's developmental vulnerabilities might create particular challenges for parent-child interaction by complicating parental interpretations of child functioning. To our knowledge, the only study to examine processes in families of children with borderline intellectual functioning was a single time point investigation involving naturalistic home observations of mother-child interaction at child age 5 (Fenning et al., 2007). In that study, mothers of children with borderline IQ displayed significantly less positive and less sensitive parenting behaviors than did *both* mothers of typically developing children and mothers of children with significant developmental delays. Mothers of children with borderline IQ did not differ from other mothers in observed negative-controlling behavior (negativity and intrusiveness), although mothers of children with significant delays displayed more negative-controlling behavior than did mothers of typically developing children. Notably, observed child behavior did not account for the poorer quality parent-child interaction observed among mothers of children with borderline IQ. However, these mothers *reported* more child behavior problems than did mothers of typically developing children. Interestingly, for mothers of children with borderline IQ, the presence of an "explanatory working model" or an understanding of their child's developmental status appeared to be associated with parenting behaviors. Mothers who reported an early awareness of their child's developmental differences exhibited more positive parenting behaviors than did mothers who did not identify any such understanding (Fenning et al., 2007).

The current study served as a follow-up to the original investigation of Fenning et al. (2007). We extended this earlier work in several important ways. First, the original study suggested that mothers of children with borderline IQ exhibited problems maintaining positive parent–child interaction, but did not necessarily exhibit increased risk for negative parenting behaviors. However, the extent to which these findings accurately characterized patterns of parent–child interaction over time remained unknown. It is possible that our initial findings simply reflected a “snapshot” of development and family dynamics at the time of school entry, a particularly stressful transition period for many families of children with developmental vulnerabilities. To address these considerations, the present study adopted a longitudinal design and examined change in patterns of parent–child interaction in the year following the Fenning et al. (2007) investigation.

Second, the current study included both mothers and fathers, thereby affording a more comprehensive perspective on the family context of children with borderline intellectual functioning. This design also permitted consideration of differences and similarities in parenting behavior as a function of parent sex. Finally, with child and parent behavior measured at multiple time points (child ages 5 and 6), analyses considered issues of causality in a manner that was not possible in the original, cross-sectional study.

Consistent with the initial investigation, the present study clearly differentiated between children with borderline intellectual functioning, significant cognitive delays, and typical cognitive functioning in order to enhance the ability to draw specific inferences about families and children within each group. The current study examined four central questions. First, father–child interaction was examined at child age 5 in order to parallel the original data presented on mother–child interaction in Fenning et al. (2007). It was expected that fathers would demonstrate a pattern similar to that observed for mothers, with ratings of father–child interaction in families of children with borderline IQ falling between the two comparison groups in the degree of observed negative-controlling behavior, but significantly lower than both groups in level of positive engagement (Hypothesis 1).

Given evidence that families of children with borderline IQ may be especially vulnerable to poor quality parent–child interaction (Fenning et al., 2007) and these children may also be at increased risk for poor psychosocial adjustment, it was expected that a longitudinal analysis would reveal declining individual (Hypothesis 2) and family functioning (Hypothesis 3) as compared with families of typically developing children and families of children with more significant cognitive delays. Drawing upon models of coercive family process (Granic & Patterson, 2006), it was expected that mothers and fathers of children with borderline IQ would continue to decrease in their level of positive engagement over time, while simultaneously increasing in negative-controlling behavior (Hypothesis 3). This was anticipated to coincide with a similar increase in child behavior problems among children with borderline intellectual functioning (Hypothesis 2). Finally, bidirectional influences were hypothesized to exist, with child behavior problems at age 5 thought to predict change in parenting behaviors over the following year, and parenting behaviors at child age 5 expected to relate to subsequent change in child behavior problems (Hypothesis 4).

Method

Participants

Participants were drawn from an ongoing, multisite longitudinal study of the emergence of problems and competence in children with early developmental risk (Fenning et al., 2007). Families in southern California and central Pennsylvania were recruited from the general community and from agencies serving children with developmental delays (see Fenning et al., 2007). Exclusionary criteria for the larger study at intake (age 3 years) included diagnosis of an autism spectrum disorder and the presence of severe motor difficulties. All families were fluent in English. Of the 217 families considered by Fenning et al. (2007) at age 5 years, 172 (79%) provided data 1 year later. Based upon the total IQ score at age 5 years on the Stanford-Binet-IV (Thorndike, Hagen, & Sattler, 1986), children were classified as typically developing (TD; SB-IV ≥ 85), as functioning within the borderline range of intelligence (BD; SB-IV 71 to 84), or as demonstrating significant developmental delays (DD; SB-IV ≤ 70). Maternal data were available for 111 families of TD children (78% of the original families; $M_{IQ} = 104.32$, $SD = 11.82$), 24 families of BD children (83%; $M_{IQ} = 77.83$, $SD = 3.99$), and 37 families of DD children (80%; $M_{IQ} = 51.14$, $SD = 10.49$). Analyses revealed that attrition was unrelated to demographic variables, including maternal/paternal age and education, and variables of interest at age 5 (child behavior problems, parental positive engagement, and parental negative-controlling behavior). Of the families participating in both visits, data were available for 99 fathers of TD children (89%), 19 fathers of BD children (79%), and 30 fathers of DD children (81%). Seven children in the DD group (19%) were diagnosed with Down syndrome; no child in the BD group was reported to have a genetic syndrome (genetic testing was not performed in our study).

Developmental status groups did not differ by child sex (42% female) or child race/ethnicity. Sixty percent of mothers identified their children as Caucasian, non-Hispanic, 17% as Hispanic, 7% as African American, 2% as Asian, and 15% as “other,” usually of mixed race/ethnicity. Maternal education, paternal education, family income, and maternal race/ethnicity significantly differed by child developmental status group. TD families exhibited higher paternal education (M grade = 15.83) and family income (M = \$50,000–\$70,000 per year) as compared with DD families (M grade = 14.10, $F = 5.23$, $p < .01$, M income = \$25,000–\$50,000, $F = 6.14$, $p < .01$). BD families fell between the other groups on these variables and did not differ from either. Mothers of TD children reported higher educational achievement (M grade = 15.82) than did DD ($M = 14.19$) and BD mothers ($M = 14.20$), $F = 10.82$, $p < .001$. The percentage of Caucasian, non-Hispanic mothers (70%) was larger for TD families, as compared with DD (54%) and BD (46%) families, $\chi^2 = 6.84$, $p < .05$. Developmental status group was not related to any other demographic variable considered. Eighty-six percent of mothers were married. Mean age was 35.74 years for mothers ($SD = 5.9$) and 38.45 years ($SD = 6.46$) for fathers. Demographic variables were controlled in analyses as appropriate.

Procedures

The Internal Review Boards of the participating universities approved all procedures. Informed consent was obtained from all families at the outset of the larger study (child age 3). Following the child's fifth birthday, families participated in a laboratory visit, which included an assessment of cognitive functioning, as well as a home visit. 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 home, family members were instructed to act as they normally would, which resulted in live observation of a range of activities such as free play, cooking, and sports. Total observation time was 60 min, divided into four, 10-min periods. Observation epochs were separated by intervening 5-min rating periods during which the observer reviewed notes and completed ratings of parent and child behavior. An identical home observation was conducted one year later at child age 6.

Measures

Stanford-Binet IV (SB-IV). Children's cognitive ability at age 5 was evaluated with the SB-IV (Thorndike et al., 1986), 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. Consistent with Fenning et al., 2007, the definition of borderline intellectual functioning employed in the current study (IQ in the 71 to 84 range) is aligned with the *DSM-IV-TR* definition (APA, 2000).

Naturalistic observation of parent and child behavior. Mother and father behavior in the home was rated using the reliable and valid system described in Fenning et al. (2007) and used extensively elsewhere (e.g., Aber, Belsky, Slade, & Crnic, 1999; Crnic, Gaze, & Hoffman, 2005; Woodworth, Belsky, & Crnic, 1996). Consistent with the original study, we averaged ratings across four 10-min observation periods. Six dimensions of 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 toward the child through verbal means (e.g., harsh tone of voice) or nonverbal behavior (e.g., strained expression, look of disgust). *Sensitivity* was defined by parental behavior that was child-centered and developmentally appropriate (e.g., the sensitive parent was responsive to the child's needs, soothed the child when necessary, and provided appropriate structure and stimulation). *Intrusiveness* was characterized by parent behavior that was adult-centered rather than child-centered. The intrusive parent sought to impose an agenda upon the 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 parental 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. Consistent with previous investigations using this system

(Aber et al., 1999; Woodworth et al., 1996) and the principal component analysis (PCA) in the original Fenning et al. (2007) study, parenting dimensions were organized into two factors: *positive engagement* (positivity, sensitivity, stimulation of cognition, and reversed detachment), and *negative-controlling behavior* (negativity and intrusiveness).

Difficult child behavior. Difficult child behavior was coded from the same interactions as parent behavior. Consistent with the PCA from Fenning et al., 2007, the composite included ratings of the child's negativity, demandingness, and sustained attention (reversed). *Negativity* assessed the extent to which the child expressed anger, hostility, and discontent through verbal and nonverbal behavior, including crying, fussing, and screaming as well as episodes of temper tantrums. *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). *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. Reversal of the sustained attention rating therefore represented a lack of focus and interest. Observed child behavior was considered in the present study due to evidence that a potential perceptual and/or report bias regarding child problem behaviors might exist for mothers of children with borderline IQ (Fenning et al., 2007).

Fenning et al. (2007) described the rigorous training process for these observational ratings and reported within-site interrater reliability Kappa coefficients of .59 and .61, and cross-site reliability of .64 (see also Crnic et al., 2005). As discussed in the original study, Kappa coefficients represent a conservative reliability index, and these levels are considered acceptable (Fleiss, Cohen, & Everitt, 1969).

Results

Data Analysis Plan

Differences between diagnostic groups in the quality of father-child interaction at age 5 were examined through ANCOVAs (Hypothesis 1). Differential change in child problems as a function of developmental status (Hypothesis 2) was evaluated using a hierarchical regression in which age 5 child behavior was controlled. Differential change in parenting behavior as a function of borderline cognitive status (Hypothesis 3) was also examined using hierarchical regressions. Family income, marital status (married vs. not), and relevant parental education and race/ethnicity (coded as Caucasian, non-Hispanic vs. Other), were controlled. To consider potential bidirectional influences between parent and child behavior (Hypothesis 4), we performed two cross-lagged path analyses (one for mothers and one for fathers) using Mplus (Muthén & Muthén, 2011) and controlled for the aforementioned demographic variables. Cross-lagged models are commonly used to investigate issues of causality in longitudinal studies (e.g., Greenberg, Seltzer, Hong, & Orsmond, 2006; Neece, Green, & Baker, 2012).

Table 1
Means and Standard Deviations for Variables of Interest by Age and Developmental Status Group

Variable	Typical development <i>n</i> = 111/99		Borderline <i>n</i> = 24/19		Developmental delay <i>n</i> = 37/30	
	Age 5	Age 6	Age 5	Age 6	Age 5	Age 6
Difficult child behavior	1.59 (.31)	1.57 (.34)	1.79 (.56)	1.91 (.44)	2.09 (.65)	2.03 (.56)
Mother negative-controlling	1.52 (.52)	1.60 (.56)	1.67 (.64)	2.00 (.77)	1.89 (.75)	1.70 (.48)
Mother positive engagement	2.65 (.64)	2.53 (.67)	2.13 (.63)	2.31 (.67)	2.48 (.73)	2.47 (.66)
Father negative-controlling	1.29 (.39)	1.28 (.32)	1.38 (.41)	1.61 (.56)	1.51 (.59)	1.62 (.53)
Father positive engagement	2.36 (.80)	2.09 (.76)	2.03 (.71)	2.15 (.90)	2.27 (.80)	2.12 (.73)

Note. Sample size statistics represent the number of mothers and children followed by the number of fathers.

Hypothesis 1: Similarity in Father and Mother Parenting Behavior Patterns

Table 1 presents the means and standard deviations for all variables of interest at each age by developmental status group. Two ANCOVAs were performed with the father data: one for father negative-controlling behavior and one for father positive engagement. Analyses revealed no significant differences among diagnostic groups in these two paternal variables at age 5, $F = 1.77$, *ns*, and $F = 0.78$, *ns*, respectively. However, the rank pattern of scores was identical to that observed for mothers in the original study (Fenning et al., 2007). Specifically, a linear pattern was present for father negative-controlling behavior, which corresponded to child cognitive status (i.e., $DD > BD > TD$); fathers of children with borderline IQ were rated lowest in their level of positive engagement ($TD > DD > BD$; see Table 1).

Hypothesis 2: Increase in Problem Behavior Over Time for Children With Borderline IQ

Correlations among study variables of interest can be found in Table 2. A hierarchical regression was performed predicting difficult child behavior at age 6. Demographic variables and difficult child behavior at age 5 were entered on Step 1. Developmental status group comparison variables were constructed by creating one variable that was coded for typical development ($TD = 1$, BD and DD both = 0), and another that was coded for developmental delay ($DD = 1$, BD and $TD = 0$). The inclusion of both of these

variables on the same step in the regression (Step 2) allowed borderline status to serve as the index variable to which each group was compared. The regression predicting difficult child behavior indicated stability of the ratings and revealed that children with borderline IQ increased in observed difficult behavior at a higher rate than did typically developing children (see Table 3 and Figure 1).

Hypothesis 3: Decrease in Positive Engagement and Increase in Negative-Controlling Behavior Over Time for Parents of Children With Borderline IQ

Four hierarchical regressions were performed, predicting to age 6 maternal positive engagement, paternal positive engagement, maternal negative-controlling behavior, and paternal negative-controlling behavior. For each regression, demographics for the relevant parent were included on Step 1, along with the appropriate age 5 parenting variable. Step 2 included the developmental status variables as described above. Analyses revealed stability in individual differences for observed maternal and paternal positive engagement ($\beta = .52$, $p < .001$, and $\beta = .51$, $p < .001$, respectively), but no differential change in positive engagement as a function of child borderline status.

Regressions for negative-controlling behavior revealed significant stability in individual differences observed among mothers, but for fathers at the level of a trend only (see Table 4, Step 1). However, as a group, mothers of children with borderline intellectual functioning increased in negative-controlling behavior at a higher rate than did both mothers of typically developing children

Table 2
Correlations Among Study Variables of Interest

Variable	1	2	3	4	5	6
Age 5						
1. Positive engagement	.39***	.09	-.21*	.51***	.00	-.06
2. Negative-controlling	-.15	.23**	.34***	.08	.15	.24**
3. Difficult child behavior	-.18*	.51***	N/A	.01	.29***	.41***
Age 6						
4. Positive engagement	.54***	-.07	-.11	.04	.23**	-.02
5. Negative-controlling	-.14	.48***	.17*	-.03	.41***	.45***
6. Difficult child behavior	.02	.34***	.41***	.20**	.45***	N/A

Note. Correlations in the lower left of the diagonal are for mothers and those in the upper right are for fathers. Coefficients referencing the correlation of a given variable with itself represent associations between maternal and paternal scores on that variable.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Hierarchical Regression Predicting Observed Difficult Child Behavior at 6 Years

Variable	Difficult child behavior at 6 Years	
	ΔR^2	β
Step 1	.19***	
Family income		-.11
Mother education		.07
Mother race/ethnicity ^a		.06
Mother marital status ^b		-.06
Difficult child behavior age 5		.40***
Step 2	.10***	
Family income		-.11
Mother education		.17*
Mother race/ethnicity ^a		.09
Mother marital status ^b		-.04
Difficult child behavior age 5		.28***
Borderline vs. DD (DD = 1)		.03
Borderline vs. TD (TD = 1)		-.34**

Note. DD = developmental delay; TD = typically developing.

^a Mothers' race/ethnicity was coded 1 for Caucasian, non-Hispanic, and 0 for other. ^b Mothers' marital status was coded 1 for married and 0 for not married.

* $p < .05$. ** $p < .01$. *** $p < .001$.

and mothers of children with developmental delays. Fathers of children with borderline IQ, as a group, exhibited a greater increase in negative-controlling behavior as compared with fathers of typically developing children, but did not differ from fathers of children with developmental delays (see Table 4 and Figure 1).

Hypothesis 4: Presence of Bidirectional Influences Over Time

Results indicated that families of children with borderline intellectual functioning increased more in both observed difficult child behavior and parental negative-controlling behavior as compared with families of typically developing children. Two path analyses were therefore performed (one for each parent) in order to clarify potential causal pathways between difficult child behavior and parent negative-controlling behavior across the 1-year period. In the models, each age 5 variable (parent negative-controlling behavior and difficult child behavior) was designated as a predictor of each age 6 variable. Effects of previously considered demographic variables on the outcome variables were controlled. Results suggested different patterns of prediction for mothers and fathers. For mothers, maternal negative-controlling behavior at age 5 predicted subsequent increases in difficult child behavior, $\beta = .19$, $p < .05$, but difficult child behavior at age 5 did not predict change in maternal behavior, $\beta = -.10$, *ns*. Father behavior at age 5, on the other hand, did not predict change in difficult child behavior, $\beta = .13$, *ns*. Rather, child behavior at age 5 predicted increases in paternal negative-controlling behavior, $\beta = .25$, $p < .01$.

Discussion

Children with borderline intellectual functioning are at risk for psychiatric difficulties and poor long-term adjustment (Emerson et

al., 2010; Hassiotis et al., 2008; Seltzer et al., 2005). These children also comprise a much larger proportion of the general population than do children with intellectual disability. Nonetheless, we know surprisingly little about the cognitive and social-emotional profiles of children with borderline IQ, and even less about their family environments. Given the documented significance of family processes for the development of children with

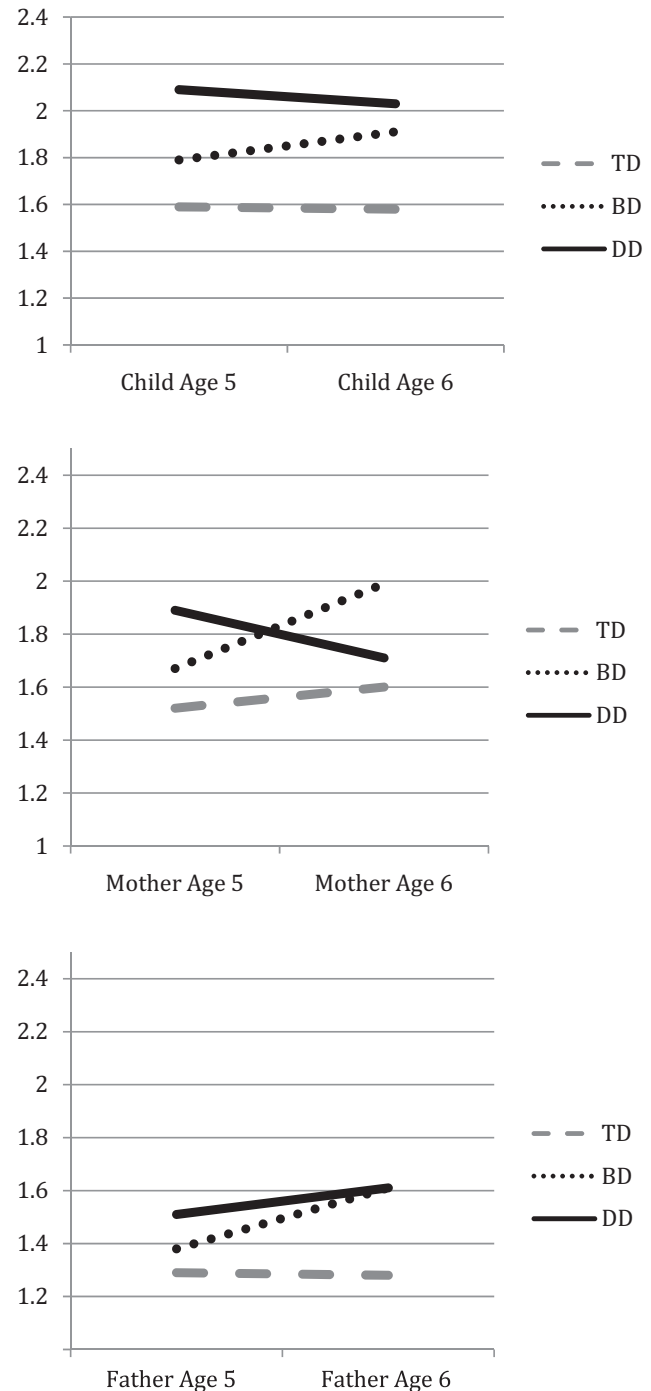


Figure 1. Difficult child behavior, mother negative-controlling behavior, and father negative-controlling behavior at child ages 5 and 6 years.

Table 4
*Hierarchical Regressions Predicting Mother and Father
 Negative-Controlling Behavior at Child Age 6 Years*

Variable	Negative-controlling behavior at 6 years			
	Mother		Father	
	ΔR^2	β	ΔR^2	β
Step 1	.28***		.02	
Family income		.07		-.01
Parent education		.09		.02
Parent race/ethnicity ^a		-.16*		-.02
Mother marital status ^b		-.14 ⁺		n/a
Negative-controlling at age 5		.45***		.16 ⁺
Step 2	.03*		.12***	
Family income		.06		.06
Parent education		.12		.06
Parent race/ethnicity ^a		-.14*		-.01
Mother marital status ^b		-.12		n/a
Negative-controlling at age 5		.46***		.08
Borderline vs. DD (DD = 1)		-.24*		.00
Borderline vs. TD (TD = 1)		-.26**		-.37**

Note. DD = developmental delay; TD = typical development.

^a Parent race/ethnicity was coded 1 for Caucasian, non-Hispanic, and 0 for other. ^b Mothers' marital status was coded 1 for married and 0 for not married.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

cognitive risk (J. K. Baker et al., 2007; Crnic & Greenberg, 1987; Fenning et al., 2011; Fenning & Baker, 2012; Landry et al., 2006; Warren & Brady, 2007), the present study sought to address a critical gap in the literature.

In addition to a lack of empirical attention, children with borderline IQ are also largely neglected from a policy perspective. Once deemed eligible for special education services, children with borderline IQ no longer qualify for supports without a comorbid diagnosis due to changes in the diagnostic classification system (Ferrari, 2009). Consequently, although children with borderline IQ experience impairment in cognitive functioning and heightened vulnerability across multiple domains, many of these children are not served by the systems designed to support children with developmental problems (Fennell & Ek, 2010; MacMillan et al., 1998). By drawing increased attention to the needs of children with borderline IQ and expanding understanding of family interaction within this population, the current investigation also aimed to inform potential avenues for prevention and intervention.

The current longitudinal study included both mothers and fathers in order to provide a more comprehensive representation of family process. Findings revealed notable similarities in patterns of interaction across parent sex. At child age 5 mothers and fathers of children with borderline IQ were found to exhibit less positive engagement with their children than parents of typically developing children and parents of children with developmental delays (although this difference did not reach significance for fathers). This low level of positive engagement remained relatively stable over the next year. In contrast, parents of children with borderline IQ differentially increased in their rate of negative-controlling behavior from child age 5 to 6, with mothers of children with borderline IQ displaying larger increases in negative-controlling behavior than both other groups, and fa-

thers exhibiting a greater increase than fathers of typically developing children.

As parents of children with borderline intellectual functioning became increasingly negative and controlling, a corresponding escalation in children's difficult behavior was observed in the home. Whereas children with borderline IQ did not differ from other children in their level of observed difficult behavior at age 5 (Fenning et al., 2007), they exhibited a significantly greater increase in difficult behavior over time as compared with typically developing children. These findings provide further evidence to support general associations between negative parenting and children's behavioral problems (Dodge, 2002; Patterson, DeBaryshe, & Ramsey, 1989). Observed patterns also suggest the potential emergence of a coercive cycle (Granic & Patterson, 2006), wherein increases in negative-controlling parenting corresponded with an exacerbation of child behavioral difficulties. Consistent with our prior findings, current results suggest that children with borderline IQ may be uniquely at risk for detrimental family processes, which appear underway by the end of the preschool period.

Further efforts to elucidate bidirectionality in this study highlighted the dynamic and potentially systemic nature of family interaction and revealed meaningful differences in the direction of effects. Interestingly, mothers' negative-controlling behavior during early parent-child interaction at child age 5 predicted a subsequent increase in children's difficult behavior. Conversely, children's initial level of difficult behavior predicted change in fathers' negative-controlling behavior over time. This pattern echoes early research suggesting that the directional influence of certain family factors might originate with the mother and child, and then transfer to the father (Clarke-Stewart, 1978). Results are also consistent with recent multidimensional models of father involvement that highlight child characteristics as a contributor to father-child interaction quality (Holmes & Huston, 2010; Cabrera, Fitzgerald, Bradley, & Roggman, 2007).

Taken together, these findings underscore the importance of considering the family environment and the role of parent-child interaction in the emergence of behavioral challenges in children with borderline IQ. Results also highlight family interaction as a potential target for prevention and intervention. Efforts to improve the family emotional climate by promoting positive parent-child engagement, reducing negative-controlling behavior, and addressing the cascading effects of family processes might ultimately prevent subsequent child behavior problems. Increased understanding of factors that contribute to positive parent-child interaction in families of children with borderline intellectual functioning will therefore be critical to the success of therapeutic programs.

In our original investigation of children with borderline intellectual functioning, we discovered that mothers of children with borderline IQ exhibited more positive parenting behaviors if they expressed an early awareness of their child's developmental differences (Fenning et al., 2007). These results provided preliminary support for the notion that problematic patterns of mother-child interaction might stem in part from a lack of an "explanatory model" for children's difficulties. Given that the challenges experienced by children with borderline IQ often become more pronounced in the context of formal schooling, we suspected that the gap between parental perceptions and children's abilities might

widen over time, producing increasingly problematic patterns of parent–child interaction. As we followed families over the course of a 1-year period in the present study, we observed just such an increase in parents' negative-controlling behavior.

The present investigation focused on a largely overlooked topic in an understudied population. In doing so, this study enhanced understanding of the role of the family, and mother–child interaction in particular, in the unfolding of behavioral challenges in children with borderline intellectual functioning. The longitudinal design, careful observational measurement, and inclusion of both mothers and fathers afforded a unique opportunity to examine similarities and differences in transactional family processes and child functioning. By identifying systemic influences within the family that appear to be associated with important child outcomes, findings provide considerable insight into intervention targets.

However, much remains to be learned and it will be important to replicate findings with a larger sample. Although our overall sample size was sufficient for the analyses performed, sample sizes for the families of children with borderline intellectual functioning and those with developmental delays were somewhat small, particularly when considering father data. Certain null findings should therefore be considered provisional, pending further investigation with a larger sample of children with cognitive risk. In addition, all data in the current study were gathered through use of a single multidimensional observation system. Thus, associations among ratings might be somewhat inflated; however, final analyses controlled for earlier time points, which considerably reduces concern regarding shared method variance.

Future research would also benefit from additional longitudinal investigations to further elucidate the development of family processes in this population. For example, it is possible that the striking lack of positive engagement observed among mothers of children with borderline IQ at age 5 might stem from difficulties associated with the transition to school, which in turn set the stage for subsequent ongoing tension and negativity in the family environment. Accordingly, it will be important to improve understanding of external and internal factors contributing to disruption in parent–child interaction in these families. Data related to parents' explanatory models for child difficulties were unavailable at age 6 years, and would represent an especially promising line of inquiry given preliminary evidence of associations between parental cognitions and parenting behaviors in our original investigation (Fenning et al., 2007). Considering the way in which a mismatch between mothers' and fathers' perceptions of child functioning might also transact with broader coparenting processes could further enhance strategies for achieving systemic change. Indeed, exploration of couple-level dynamics and parenting teams may be critical to clarifying potential causal mechanisms. Further consideration of the broader family context, including the mental health of individual family members as well as the role of siblings and extended family, would also enhance our understanding of this high-risk population and thereby contribute further to support efforts. Additional emphasis on cultural issues in parenting would also be of interest. The parenting scales utilized in the present study have been used extensively with diverse families (e.g., Fenning et al., 2007; Fenning & Baker, 2012), and parental race/ethnicity was controlled in all regressions. However, a main effect of maternal race/ethnicity was present in the regression predicting change in parenting over time, which underscores the importance

of future research on this topic, independent of child developmental status.

Lastly, the field would also benefit from further attention to the clinical significance of diagnostic thresholds. Our findings suggest that families of children with borderline intellectual functioning are at particular risk for problematic patterns of interaction. However, it is possible that similar, albeit reduced, effects may also be observed in families of children close to the diagnostic threshold. As we seek to identify family needs and implement targeted supports, improved understanding of mechanisms contributing to vulnerability remains a critical research endeavor.

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