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Preschool Children with and without Developmental Delay: Risk, Parenting, and Child Demandingness

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Abstract

Although past literature has established relations between early child risk factors, negative parenting, and problematic child behavior, the nature of these interrelations and pathways of influence over time remains largely unknown, especially in children with developmental delays or disabilities. In the current study data were drawn from the longitudinal Collaborative Family Study and included a sample of 260 families with preschool children with and without developmental delays. Child-related risk was assessed at child age 36 months, maternal intrusiveness and negative affect at 48 months, and child demandingness at 60 months. Results indicated significant relations between early risk, negative parenting, and subsequent child demandingness. Sickliness as an infant was the most salient predictive risk factor of later child demandingness. Developmental delay was the most significant predictor of subsequent negative parenting. Results are discussed as being more indicative of additive rather than mediational processes given that early child risk and negative maternal parenting both contributed uniquely to the subsequent development of child demandingness.

Keywords

child risk; behavior problems; developmental delay; parenting

A wealth of research has focused on relations between a variety of risk factors and later child behaviors. Risk factors investigated and thought to relate to behaviors observed in children range from those associated with the environment to those more specifically involving the parent or child (e.g., Eckenrode, Rowe, Laird, & Brathwaite, 1995; McCormick, McCarton, Brooks-Cunri, Belt, & Gross, 1998; Nelson, Stage, Duppong-Hurley, Synhorst, & Epstein, 2007). For example, children living in adverse environmental situations, such as a neighborhood characterized by high crime rates, have been found to be at risk for negative developmental outcomes (Jaffee, Caspi, Moffitt, Polo-Tomas & Taylor,

2007). Other studies have linked a wide variety of environmental risk factors to negative child developmental outcomes (Barocas, Seifer, & Sameroff, 1985; Supplee, Unikel, & Shaw, 2007).

Past research has commonly examined poorer child outcomes in terms of the development of major disorders or general child behavior problems (e.g. Carter et al., 2010). Few studies have investigated specific risk factors that are related to a normative but challenging child behavior, such as demandingness, which may be a precursor to disorder. In the present study, the risk factors of interest were child-related, and included developmental delay status and sickness during infancy. Although child-related risk factors linked to developmental outcomes are numerous, birth complications and health status of the child seem to be of particular importance and interest in past literature (Brachfeld, Goldberg, & Sloman, 1980; Greene, Fox, & Lewis, 1983). Indeed, past research has examined these risk factors and shown relations to developmental delays and adverse child outcomes. For example, Langkamp, Kim, and Pascoe (1998) found that premature infants were more difficult temperamentally than babies born full-term; however, no study has addressed the effects of these risk factors on child problem behaviors such as demandingness, or in relation to parenting.

Child-Related Risk

Delay status

Children with developmental delays may face unique risk in terms of the development of emotional and behavioral problems later in childhood (Baker et al., 2003; McIntyre, Blacher, & Baker, 2006). Emerson and Einfeld (2010) found that children with developmental delays, in comparison to their typically developing peers, displayed significantly higher rates of subsequent emotional and behavior problems. Moreover, the impact of developmental delay may move beyond just that of the child and affect caregivers and other family members (Baker, Blacher, Crnic, & Edelbrock, 2002; Hastings, 2002, 2007). Herring and colleagues (2006) found that parents of children with developmental delay and emotional or behavioral difficulties had heightened levels of stress and mental health problems.

Sickness during infancy

The impact of child health status as related to subsequent behavior problems may be evident as early as infancy. Infants born preterm, or those that experience illness within the first few months of life, may be especially susceptible to the development of behavioral difficulties lasting well into the preschool age. Delobel-Ayoub et al. (2009) found that children born very preterm or very low birth weight experienced more cognitive impairment and displayed more behavioral problems than children born full-term. Beyond preterm infants or babies born with very low birth weight, illness during infancy may relate to other psychosocial and behavioral difficulties, perhaps mediated through caregiver behavior. For example, Finkelstein (1978) studied infants in day care settings. When babies were sick, they vocalized significantly less and were responded to by teachers significantly less than when the infants were well. Thus, it is plausible that infants who have a history of receiving less attention and interactions from caregivers may engage in more inappropriate and demanding behavior to solicit caregiver responses. On the other hand, Haskins, Hirschbiel, Collier, Sanyal, and Finkelstein (1981) found that sick infants vocalized more and received more attention from caregivers. Although the literature on infant sickness and subsequent behavior problems is scant, it is plausible that infant illness may alter caregiver-infant interactions. Thus, from birth, some children may already be faced with unique risk for the successive development of challenging behavior.

Problematic Child Behavior

Developmental delay status and sickness during infancy may be associated with various child behavior problems that later emerge. Of these subsequent child behaviors, many are normative and common; however, some of these emerging behaviors are more of a hassle to parents than others. For example, demandingness may be a common childhood behavior, yet it is generally undesired by parents. There are a variety of behaviors that children show that may be labeled as demanding. For example, a child that is very demanding may hate waiting and want things right when they are asked for, or may whine and complain when demands are not met promptly. A demanding child may also seek help or attention constantly. While seeking help and attention can be normal and appropriate, such attempts become demanding to parents if they perceive their child's bids for attention as too persistent, rude, or expressed at inappropriate times. Although demandingness may be related to other child-related risk factors, child demandingness has not been studied in isolation.

Negative Parenting

Parenting styles and characteristics have been the focus of vast amounts of past research, and it is almost impossible to study child behavioral outcomes without considering the quality and style of parenting. While a clear relation between risk and problematic child behavior has been found, this connection may be primarily indirect through parenting (e.g., Deater-Deckard, 1998). The present study explored parenting as a possible mediator between risk status and subsequent child behavior. That is, we tested if parenting accounted for the observed relation between risk status and child behavior.

Intrusiveness and negative affect

As previous studies have linked various risk factors to subsequent child behavior outcomes, so too have studies addressed the link between risk factors and parenting characteristics. Maternal intrusiveness and maternal negative affect are two parenting constructs that have received much empirical attention. Past research suggests that these two parenting qualities may be related to child-related risk factors (birth complications and physical/mental health). Regarding the relation between child health and maternal intrusiveness, Melamed (2002) suggested that a mother's excessive direction and protection is often worsened or encouraged because of her child's disability. Both directiveness and overprotectiveness seem to be closely tied to maternal intrusiveness. Greene et al. (1983) also found a relation between birth complications and both intrusiveness and negative affect. Results showed that mothers of premature infants spent more time close to the infant and were less affectively expressive.

In determining whether parenting is a mediator, evidence to support a relation between given risk factors and parenting constructs must also be paired with evidence that supports a relation between the parenting behaviors and observed child behavior. In making a general association between parenting and child behavior, Mantymaa, Puura, Luoma, Salmelin and Tamminen (2004) describe that, "hostility and intrusiveness were the features in early mother infant interaction most likely to be associated with behavioral and emotional symptoms of the child" (p. 146), suggesting that negative parenting attributes are related to more negative outcomes in the child, and possibly demandingness in particular.

As stated earlier, no studies have examined demandingness in isolation, but rather within a group of behaviors labeled as negative child behavior. Despite the lack of previous research investigating a relation between intrusiveness and negative affect and child demandingness, it is plausible that these two parental qualities may elicit demanding qualities in a child through social learning and modeling. Mantymaa et al. (2004) found that intrusiveness was

likely to increase a child's behavior problems. For example, a mother's intrusive actions may cause her child to avoid his mother, and when avoidance fails the child may become easily frustrated and upset. An easily angered and frustrated child may be seen as demanding, or may become demanding because of maternal intrusiveness. This pattern of parent-child interactions has been characterized as a coercive cycle that most likely begins early in childhood and is bidirectional. Parenting behavior has an effect on the child's behavior which, in turn, has an effect on further parenting behavior (Patterson, 1982; Patterson, Reid, & Dishion, 1992).

In summary, prior research suggests relations between child-related risk factors, parenting, and child behavior. Evidence suggests a strong relation between child-related risk factors and subsequent child behavior, but questions remain surrounding whether the relation is direct or indirect through parenting. While the relation between risk condition and child behavior appears to be strong, it is possible that parenting mediates this association. Evidence exists to support relations between risk and parenting and parenting and child behavior. Further, the child-related risk factors are related to both intrusiveness and negative affect in mothers. Although there is support for the relation between maternal intrusiveness and negative affect and later adverse child behavior, no studies to date have addressed the specific relation between parenting and child demandingness, a child construct that may serve as a normative developmental precursor to emergent behavior problems or disorders.

Study Purpose and Hypotheses

The purpose of this study was to examine the relations between child-related risk, negative parenting, and child behavior in a longitudinal study of preschool-aged children with and without developmental delays. We tested the following hypotheses:

1. Greater child-related risk at age 3, as indicated by history of child physical illness, history of being sickly as an infant, receipt of special education/or with a mental health diagnosis, and Bayley Scales of Infant Development-II Mental Development Index scores, will be associated with more demanding child behavior at age 5.
2. More child-related risk at age 3 will be associated with greater negative parenting at age 4, as indicated by maternal intrusiveness and negative affect during naturalistic home observations.
3. Greater negative parenting at age 4 will be associated with more demandingness in children's behavior at age 5, as indicated by mother and father reports on the CBCL, home observations and lab-based observations of child demandingness in the clean-up task and problem solving task.
4. The effect of child- and maternal-related risk at age 3 on demandingness at age 5 will be indirect, partially mediated through negative parenting at age 4.

Method

Design

Data were drawn from the Collaborative Family Study (CFS), a longitudinal investigation that prospectively examines interrelations among child developmental status, family processes, and emergent psychopathology in children aged 3 to 9 years (P.I., K. Crnic; R01 HD34879).

Participants

The participants in the CFS included both typically developing children and children with developmental delays and their families. Families were recruited from community service agencies, such as early intervention programs, preschools, daycare centers, and family resource centers, in addition to flyers posted throughout the communities. Approximately 25% of participants were recruited from communities in Central Pennsylvania, and 75% from communities in Southern California. Initial exclusion criteria included severe neurological impairment, autism, non-ambulation, or a history of abuse.

The developmental status of the children was determined initially at the age of 3 years based on their Mental Developmental Index (MDI) scores on the Bayley Scales of Infant Development (BSID-II; Bayley, 1993). In total, 260 children and their families participated. A BSID-II MDI score of less than 76 classified the child as developmentally delayed ($N=103$), and a score above 85 classified the child as typically developing ($N=143$). Those children that fell in the borderline area between the BSID-II MDI scores of 76 and 85 were excluded from the sample for this study ($N=14$). Fifty-nine percent of children were male. Ethnicity was representative of the population at each site; 60% of children in the study were Caucasian, 17% were Hispanic, 7% were African-American, 3% were Asian, and 14% identified as multi-racial. At intake (child age 3 years), 48% of mothers had a college education or higher, and 57% of mothers were employed outside the home (see Table 1).

Procedure

Once identified as potential participants to be involved in the larger investigation, families were asked to schedule an initial home visit when the child was 36 months old. During this first visit, a trained graduate student administered the BSID-II in order to determine the child's developmental functioning. From the BSID-II MDI score, the child was classified as typically developing or developmentally delayed. Demographic information was also obtained at this visit, including ethnicity, status of employment, education level, income, marital status, and health history. Mothers and fathers were asked to independently complete a booklet of several questionnaires to assess child and family functioning, parental attitudes and beliefs, and relationship between parent and child. At the end of this initial visit, the research assistant scheduled a naturalistic home observation session and an hour-long laboratory visit with the mother and child.

Laboratory visits were conducted yearly around the child's birthday across each of the ages 3 to 9 years. Naturalistic home observations were conducted every six months between 3 and 5 years of age, and yearly around the child's birthday from ages 5 to 9 years. Demographic information was updated each year at the home observation along with another series of questionnaires for both mother and father. Mothers were interviewed annually (ages 5 through 9 years) to assess child psychopathology, and the child's cognitive ability and adaptive functioning were likewise re-assessed at ages 5 and 9 years.

For the present study, data were used from child ages 3, 4, and 5. Questionnaires from age 36 months were used to assess aspects of child risk. Naturalistic home observations and lab-based observations from ages 48 and 60 months were used to assess negative parenting and child demandingness. Parental report questionnaires at age 60 months were also used to add depth to the assessment of child demandingness. Data collected across these three time points allows the exploration of pathways and mechanisms of effect over time. Attrition was assessed and analyzed for any differential loss over time.

Home Observations

Home observations took place when the entire family was in the home and lasted 60 minutes. Families were instructed to “act as they normally do” during the observation. The emotional states of the children, mothers, and fathers, as well as family interactions, were coded by two trained graduate students. Researchers stood in an unobtrusive area that gave them a clear view of the family members’ faces and eye contact. Verbal interaction was avoided in order to not distract the family. The child and family were observed for a 10 minute episode followed by a period of 5 minutes for the observer to rate family interactions. There were four such episodes in a single visit. Observers were trained by watching videos of home observations and observing live observations with an experienced coder until reliability was established (reliability was defined as 70% exact agreement and 95% agreement within one point on the coding scale with the master coder). To maintain cross-site reliability between California and Pennsylvania, master coders were established at each location and reliability was collected regularly in-site and across-site to ensure its maintenance. For both within and inter-site reliability, Kappa was .6 or higher each year.

Laboratory Tasks

Lab tasks designed to assess child regulatory behavior and parenting characteristics were used to assess parent-child interactions and child behavior. All lab visits followed a standardized protocol and took place in the CFS laboratory. Laboratory visits involved the child and mother. The visits were conducted in a room with a small couch, an end table with magazines, a table with two chairs, a locked toy cabinet, and a one-way mirror. A video camera was mounted in the room near the ceiling and a second was concealed behind the one-way mirror. Visits were videotaped for later coding. Lab visits consisted of a variety of tasks, both structured and unstructured. Tasks were modified for each age. Mothers and children were guided through the activities by a graduate student experimenter and followed a standardized protocol. The visits were comprised of 8 segments including 10-minute free play, 3 minute clean-up, 2 minute “easy” problem-solving task, 3 minute “medium” problem-solving task, 5 minute “difficult” problem-solving task, 5 minute snack time, and 5 minute “waiting” task.

During the clean-up task, children were asked to pick up their toys and place them in a clear bin. The mother was given no instructions. For the three problem-solving tasks, there were a series of puzzles that became increasingly difficult, as to require more help from the mother as the problems progressed. Children with developmental delays were given a modified version of the task appropriate to their mental age. Mothers were asked to let their children try the task on their own and provide whatever help they felt necessary to successfully complete the task.

Measures

Child-related risk—At 36 months of age, information of child physical and mental health status was obtained using the Family Information Form. The FIF is a family demographic and health history questionnaire completed as an interview with the parents and is comprised of multiple questions. Parents were asked to respond “yes” or “no” to items related to the child’s health. These four items included, “Child physical illness”, “Child special education/mental health”, “Child vision/hearing problems”, and “Child use of mental services”. An answer of “yes” was scored as 1 and an answer of “no” was scored as 0.

Also at 36 months, information regarding birth complications was obtained using the Developmental History Questionnaire. The DHQ was completed as an interview with the parents and covers the domains of pregnancy, birth, infancy, and toddlerhood. Items used to assess birth complications included “Birth weeks preterm” (in which the parents indicated

the number of weeks the child was born preterm, or none = 0), “Birth complications” (in which the parents indicated if there were no problems (0), minor problems (1), or major problems (2)), “Birth weight” (in which the parents indicated weight in pounds), and “Infant sickly” (in which the parents responded “yes” = 1 or “no” = 0).

Negative Parenting—At 48 months, maternal intrusiveness and negative affect were examined using the Parent Child Interaction Rating System (PCIRS). The PCIRS consists of observational ratings of 26 areas rated on a scale of 1 (low intensity/frequency) to 5 (high intensity/frequency) (Belsky, Crnic, & Gable, 1995). Of these 26 areas, 6 are related to maternal parenting, and 3 of these 6 represent negative parenting. These three variables include negative affect, intrusive interaction, and detached manner. Data were gathered during naturalistic home observations of family interaction. For the purpose of this study, ratings of maternal intrusiveness and negative affect were examined. Detached manner was not included, as intrusiveness and detachment were almost entirely mutually exclusive. Furthermore, intrusiveness was more connected to maternal negativity than was detachment. Maternal intrusiveness was characterized by overstimulation of the child, inability to relinquish control, and the overwhelming of the child with a rapid set of approaches or toys. Negative affect was the expression of hostility toward the child, considering both the frequency and intensity of its expression. Some characteristic behaviors included negative voice, disapproval, tense body and facial muscles, and threatening the child. For each variable, the four episodes rated on a scale of 1 to 5 were averaged to obtain two summary scores, one for intrusiveness and another for negative affect during naturalistic interactions in the home.

The PCIRS coding system was also used in the lab-based observations. For purposes of this study, scores on negative affect and intrusiveness were taken from the lab-based clean-up and the medium-difficulty problem-solving tasks. Scores were averaged across the two observational episodes, providing summary scores of negative affect and intrusiveness for the structured interactions involving parenting challenge.

Child Demandingness—At 60 months, child demandingness was assessed using the PCIRS from the home and lab contexts as well as items from the CBCL. Higher scores of child demandingness on the PCIRS included more frequent and excessive bids for attention, behavior that interrupted ongoing activity of parent, inappropriate bids of attention, and rude interactions. Scores from the four home observation episodes were averaged to create a single score for demandingness in naturalistic observational contexts. Scores from the lab-based clean-up task and medium-difficulty problem-solving task were likewise averaged to create a single score for demandingness in structured and challenging contexts.

To further delineate demandingness, items reflective of demanding behaviors were chosen from the parental report form of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000). The CBCL is a questionnaire consisting of 100 items descriptive of specific problematic child behavior in which parents are asked to respond 0 (not true), 1 (somewhat or sometimes true), or 2 (very true or often true) to a series of behavioral descriptions. The CBCL has well-established reliability and validity. The specific items used to assess demandingness included “Can’t stand waiting; wants everything now”, “Constantly seeks help”, “Demands must be met immediately”, “Temper tantrums or hot temper”, “Wants a lot of attention”, and “Whining”. Scores for these items were summed to create an index of parent reported demandingness.

Results

Data Reduction

Risk factors—For the purpose of data analysis and to increase power, the number of risk variables was reduced by eliminating variables that did not meaningfully relate to the dependent variable of child demandingness. Correlations were computed between the nine risk variables and the composite factor of child demandingness described below. Of the nine original independent variables, four were found to significantly relate to child demandingness and were retained. The four child-related risk variables included history of child physical illness ($r = .22, p < .01$), child in special education/or with a mental health diagnosis ($r = .29, p < .01$), the degree to which the child was considered to be sickly as an infant ($r = .29, p < .01$), and BSID-II MDI score ($r = -.35, p < .01$). The interrelations among the four risk variables can be found in Table 2.

Negative parenting—The six indices of negative parenting (maternal negative affect in home observation, maternal intrusiveness in home observation, maternal negative affect in lab-based clean-up activity, maternal intrusiveness in lab-based clean-up activity, maternal negative affect in lab-based problem solving activity, and maternal intrusiveness in lab-based problem solving activity) were subjected to a reliability analysis in order to determine whether a single summary index of negative parenting could be reliably created. A Cronbach's alpha of .75 was found, indicative of sufficient internal consistency to use as an index of negative parenting. The intercorrelations among all five independent variables can be found in Table 2.

Child demandingness—The variables chosen from both the mother and father CBCL, home observation measure of child demandingness, and lab-based observation of child demandingness in the clean-up task and problem solving task were subjected to a reliability analysis to determine whether a single summary index of child demandingness could be reliably created. A Cronbach's alpha of .85 was found, indicative that this composite measure of child demandingness was internally consistent and could be retained as a reliable index of child demandingness. Descriptive statistics of composite variables and variables used in analyses are presented in Table 3 by delay status group.

Hypothesis Testing

In order to assess the proposed mediational model, a series of three regressions was employed to explore the basic assumptions regarding the relations among risk, negative parenting, and child demandingness.

Hypothesis 1: Risk factors and child demandingness—A linear regression was run to address the relations between the risk factors at age 36 months and child demandingness at age 60 months. History of child physical illness, child in special education and/or with a mental health diagnosis, the degree to which the child was considered sickly as an infant, and BSID-II MDI score were entered together as the independent variables. The composite factor of child demandingness was entered as the dependent variable. Results are presented in Table 4. The overall equation was significant, accounting for a total of 16.8% of the variance in child demandingness. Among the risk factors, the degree to which the child was considered sickly as an infant contributed significantly to the prediction of child demandingness. History of child physical illness, child in special education and/or mental health diagnosis, and BSID-II MDI score did not contribute meaningfully when entered with the other variables.

Hypothesis 2: Risk factors and negative parenting—A second linear regression was run to address the relations between the risk factors at age 36 months and negative parenting at age 48 months. Again, history of child physical illness, child in special education and/or with a mental health diagnosis, the degree to which the child was considered sickly as an infant, and BSID-II MDI score were entered together as the independent variables. The negative parenting composite was entered as the dependent variable. Results are presented in Table 5. The overall equation was significant, accounting for 19.8% of the variance in child demandingness. BSID-II MDI score was the only variable to contribute significantly to the prediction of subsequent negative parenting. A history of child physical illness, child in special education and/or mental health diagnosis, and the degree to which the child was considered sickly as an infant did not make a meaningful contribution to negative parenting when entered with the other variables.

Hypothesis 3: Negative parenting and child demandingness—A third linear regression was run to address the relation between negative parenting at age 48 months and child demandingness at age 60 months. The composite of negative parenting was entered as the independent variable and the composite of child demandingness was entered as the dependent variable. Results are presented in Table 6. The equation was significant, accounting for 4.3% of the variance in child demandingness.

Hypothesis 4: Risk factors and child demandingness mediated by negative parenting—The key question of this study was whether the relation between early risk and later child demandingness would be best characterized as indirect, or mediated by negative parenting. A hierarchical regression was run to address this mediation hypothesis. The negative parenting composite was entered on the first step, with the same four risk factors entered on the second step. The child demandingness composite served as the dependent variable. Results are presented in Table 7. Results indicate that the overall equation was significant, accounting for 11.4% of the variance in child demandingness. With respect to mediation, the risk factors maintained a significant prediction to child demandingness even after negative parenting was allowed to enter first and make its significant contribution. The risk factors accounted for 7.3% of the variance in this model, which represented a small decrease in the proportion of variance accounted for relative to when the risk factors were entered alone. Thus, it appears that there is little evidence to support a mediated relation between risk and child demandingness. Rather, the composite of negative parenting and the risk factors each explain a significant proportion of the variance, suggesting that the relationship between these variables and child demandingness is direct. The data, in fact, best reflect an additive model rather than a mediational model. Further, the degree to which the child was considered sickly as an infant was the only risk factor among the four found to contribute meaningfully to the overall equation.

Discussion

This investigation sought to further the understanding of the relations between child-related risk factors, negative parenting, and normative but challenging child behavior in preschool children with and without developmental delay. Although relations between these constructs have been established in past research, the pathways of influence and their directions have remained largely unknown. This study aimed to address the possibility that the relation between early risk factors and emerging child demandingness was indirect through the construct of negative parenting. Similar to past research, the findings supported relations between the three main factors: child risk, negative parenting, and child demandingness. However, the pathways of influence and ways in which these constructs operated collectively did not support the proposed indirect model. Rather, the findings suggested the

presence of an additive effect; risk factors and negative parenting together make meaningful contributions to the emergence of child demandingness.

Child Risk and Demandingness

Past research has identified multiple risk factors that show relations with subsequent negative child behavior outcomes (Barocas et al., 1985; Supplee et al., 2007). However, the current findings suggest that of these many factors, those risk factors that were child-related were most predictive of later child demandingness. More specifically, the child risk factors that appeared to contribute to the greatest degree were those related to early biological and health influences, including infant health, physical health, mental health, and developmental status. Past research has identified this early biological and health risk that relates to subsequent problematic behavior. Najman, Bor, Andersen, O'Callaghan, and Williams (2000) suggested that poor child health, as measured by child health at birth and at 6 months of age, was a predictor of troublesome behavior later in childhood. This finding is intuitive. A child who is sickly as an infant or encounters health problems within the first three years of life is most likely going to demand more attention and time from the parent.

Further, the current study and the findings of Najman et al. (2000) illustrated an association that exists over an extended period of time; that is, early biological and physical/mental health risk and developmental delay are related to problematic child behavior measured up to two years later. A relation that exists over this extended time period suggests that the effects of early health problems do not quickly subside. Rather, these risk factors have a lasting impact on the development of children, creating an increased chance of subsequent behavioral problems.

Sickness as an infant—Of the risk factors shown to relate to child demandingness, the most salient factor appeared to be whether the child was sickly as an infant. While physical illness and mental health may influence a child's display of demanding behavior, it seems plausible that infant sickliness may be a more pervasive risk factor. Physical illness may be temporary. Due to the possible fleeting nature, these health issues may not impact subsequent behavior problems one or two years later as significantly as sickliness as an infant may. Although we found no specific studies in the literature linking sickliness as an infant to later child behavior, infant illness was linked to concurrent changes in caregiver behavior (e.g., Finkelstein, 1978; Haskins et al., 1981). We postulate that sickliness as an infant may align the family on a trajectory of specific parent-child interactions, possibly resulting in subsequent negative parenting and child demandingness two and three years later.

Child Risk and Negative Parenting

Child-related risk was not only predictive of child demandingness, but also of subsequent negative parenting. Children with greater levels of biological risk had mothers that were more intrusive and showed more negative affect. Lamb (1982) explained how child biological risk might negatively impact mother-child interactions by suggesting that the nature of a child given a certain level biological risk creates interactions with parents that are troublesome and less rewarding. These difficulties may lead a parent to display more negative affect and act in a more intrusive manner. Such connections between these parent and child factors are reasonable to understand. A mother with a sick child may be more likely to spend greater amounts of time in direct contact, and when a situation is perceived as less rewarding, a mother may be more likely to show heightened levels of negative affect. This prediction, too, held across an extended period of time in a young child's life. Measures of child risk predicted negative parenting up to a year later; this again suggests that these risk factors incurred lasting effects.

Developmental delay—Delay status was the most significant predictor of subsequent negative parenting. This aligns with the findings of Herring et al. (2006), as it suggests that developmental delay significantly impacts parental functioning. Indeed, it is important to acknowledge that the parent-child interactions of children with delays are characterized by parenting that is more intrusive and negative (Floyd, Harter, & Costigan, 2004; McIntyre, 2008), placing children at heightened risk for developing a severe behavior disorder or mental health problem. Furthermore, the relations between parents' psychological distress and child behavior may be bidirectional, with each exhibiting influence over time (Baker et al., 2003; Hastings Daley, Burns, & Beck, 2006). Implications of this finding are discussed further.

Negative Parenting and Demandingness

Vast amounts of past research also support a relation between parenting and child behavior. Egeland, Pianta, and O'Brien (1993) found that mothers who appeared to be more intrusive in parent-child interactions had children who performed more poorly than others behaviorally, socially, and emotionally. This finding aligns with those of the current study; parents who were intrusive and showed negative affect had children who were generally more demanding. Perhaps this relation exists because an intrusive mother, or one who shows negative affect, is modeling these behaviors for her child. Further, mothers who are negative and intrusive generally possess qualities of demandingness in that they are not allowing their child to act independently.

Findings suggest that while a meaningful relation between the constructs of negative parenting and child demandingness existed, the effect was rather small. Perhaps child demandingness is, for the most part, not a product of a child's context or learned behavior. Nonetheless, this relationship was observed across a one year time period, suggesting that the effects of negative parenting were, to an extent, effects that were persistent and lasting over time.

Pathways of Influence

Although the findings did not confirm an indirect relation between early risk and later demandingness, it is evident that early risk and negative parenting are both influential in the subsequent development of demanding child behavior. Whether considered separately or together, risk and negative parenting were meaningfully related to child demandingness. These findings suggest that the constructs may be operating in an additive manner more so than as an indirect pathway of influence. It may be that child risk and negative parenting predict child demandingness more additively because they operate in different manners. Our findings indicate that early child risk is directly influencing a child's demandingness due to some extent to the child's early health circumstances. Negative parenting, however, possibly teaches and reinforces demanding behavior through social learning (e.g., Patterson, 1982). Further, although child risk and negative parenting shared variance, it was not the shared variance that contributed most meaningfully to child demandingness. Risk and parenting each made unique contributions.

Demandingness—Through this additive risk model, it is apparent that child demandingness is an interesting and important early child behavior. While demandingness is normative and most children exhibit demandingness to some extent, the results suggest that the level at which a child is demanding varies greatly. Findings also support the notion that a variety of child risk conditions seem more predictive of later child demandingness than negative parenting. Thus, perhaps child demandingness is closely related to temperament, with contextual and learned factors being more distantly associated with child behavior outcomes. Moffitt (1993) considered that postnatal difficulties which contributed to

neuropsychological variations increased the probability that an infant was considered to have a difficult temperament. Moffitt's findings coincide with the current study, suggesting possibly that early child health and biological risk relate to subsequent temperamental difficulties. Given the somewhat small but meaningful effect that existed between negative parenting and child demandingness, demandingness may be a temperamental attribute to which early child health risk is closely related.

Limitations

There are important limitations of the current research to consider when interpreting findings. An inherent design limitation in many longitudinal studies is the representativeness of the sample. The sample of the current study was a predominantly middle-class sample, which may limit generalizability. Additionally, a relatively important limitation of the study stems from the fact that the children in the overall sample were relatively low on demandingness. Perhaps a sample containing many undemanding, moderately demanding, and highly demanding children would more accurately depict how the constructs relates to important child and parenting risk factors.

The variable of infant sickliness also presents another potential limitation to the present study. Infant sickliness is underexplored in the literature, and given that this variable was measured based on a single item on a parent-report measure in the present study, the conclusions that can be drawn are limited. It is unknown whether sickliness as an infant is directly related to the constructs of interest in this study or if a third variable is actually accounting for the importance of infant sickliness. Future research should explore the nature and type of infant sickliness to better understand its influence on parent behavior and later child outcomes. Similarly, the conclusions that can be drawn based on the child special education and/or mental health diagnosis variable are limited. This variable, too, was measured based on a single item reported by the parent. It is unknown which component of this item (i.e., special education, mental health diagnosis, or both) corresponded with a parent's affirmative response. It is important to note that a mental health diagnosis did not necessarily represent a major mental health disorder, as this was left to parental interpretation. In future research, it will be helpful to differentiate between the two constructs represented within this single item, as well as the nature and severity of the diagnosis or special education need.

Summary and Implications

Findings from the current study support meaningful connections between early child risk, negative parenting, and later child demandingness. Children with physical and mental health issues at a young age were more likely to be demanding later in childhood. Additionally, these children were also more likely to have mothers who were intrusive and displayed negative affect. While child health risk and negative parenting both increased the chances of a child being demanding, it was early child biological and health risk that contributed to the greatest degree to a child's level of demandingness. Most particularly, it was children who were reported to be sickly as infants that showed heightened levels of demandingness two years later. The salience of this risk factor emphasizes the need to further understand the implications of infant sickliness, both with future research programs as well as risk prevention and intervention programs. Research efforts in the future could also focus on deriving and executing programs that intervene at both the child and parent level. Finally, while demandingness may appear to be a normative child behavior, its importance as a precursor to subsequent behavior problems and emerging disorders is highlighted in the current study. In identifying risk factors associated with the display of child demanding behavior, preventive measure may be taken and the efficacy of interventions may be improved.

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Table 1

Demographics for Families of Typically Developing and Developmentally Delayed Children

Demographic	TD (<i>n</i> = 143)	DD (<i>n</i> = 103)	<i>t</i> or X^2
Child			
Sex % (<i>n</i>) Male	49.7 (71)	64.1 (66)	$X^2 = 5.05^*$
Race % (<i>n</i>) African American	11.9 (17)	3.9 (4)	$X^2 = 20.51^{***}$
Asian	4.9 (7)	1.0 (1)	
Caucasian	60.1 (86)	59.2 (61)	
Hispanic	8.4 (12)	26.2 (27)	
Other	14.7 (21)	9.7 (10)	
Mother/Family			
Age in Years at Intake <i>M</i> (<i>SD</i>)	34.1 (5.51)	32.7 (6.35)	$t = -1.82$
Grade Completed <i>M</i> (<i>SD</i>)	15.7 (2.51)	14.45 (2.38)	$t = -4.00^{***}$
Family Income % (<i>n</i>) <\$15k	6.3 (9)	13.6 (14)	$X^2 = -15.19^*$
\$15–25k	6.3 (9)	16.5 (17)	
\$25–35k	8.5 (12)	11.7 (12)	
\$35–50k	19.7 (28)	15.5 (16)	
\$50–70k	18.3 (26)	17.5 (18)	
\$70–95k	21.1 (30)	10.7 (11)	
>\$95k	19.7 (28)	14.6 (15)	

Note.

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

Table 2

Intercorrelations Among Independent Variables for Children With (N = 103) and Without Delays (N = 143)

	1	2	3	4	5
1.Child physical illness	--	-.05	.20	.01	.28*
2.Child sped/mental health diag	.12	--	-.00	-.23*	.01
3.Infancy sickly	.40**	.19*	--	-.01	.22*
4.BSID-II MDI	-.30**	-.24**	-.26**	--	-.27*
5.Negative parenting total	-.04	.08	-.04	-.17	--

Note.

* $p < .05$.

**

$p < .01$. Correlations above the diagonal are for delayed group; correlations below the diagonal are for the non-delayed group.

BSID-II MDI = Bayley Scales of Infant Development-II Mental Development Index.

Table 3
Group Differences on Child Risk Factors for Children With and Without Delays

Risk factors	Non-delayed (N = 143)		Delayed (N = 103)		χ^2
	N	%	N	%	
Child physical illness	50	35	64	62.1	$\chi^2 = 17.30^{***}$
Child spec.ed./mental health	28	19.6	88	85.4	$\chi^2 = 105.10^{***}$
Infancy sickly	27	18.9	34	33	$\chi^2 = 6.77^{**}$
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>T</i>
Risk factors					
Bayley-II MDI	104.66	11.40	57.62	11.26	$t = -32.10^{***}$
Negative parenting total	9.39	2.45	11.87	3.45	$t = 5.97^{***}$
Demandingness total	12.10	5.13	15.34	6.38	$t = 3.55^{**}$

Note.

**
 $p < .01$.

 $p < .001$.

BSID-II MDI = Bayley Scales of Infant Development-II Mental Development Index.

Table 4

Linear Regression Results for 36 Months Risk Variables' Predictions to 60 Months Child Demandingness

Predictors of child demandingness	ΔR^2	β
	.168	
Child Physical Illness		.094
Child Spec. Ed/Mental Health Diagnosis		.115
Infancy Sickly		.181*
BSID-II MDI		-.187

Note.

*
 $p < .05$.

BSID-II MDI = Bayley Scales of Infant Development-II Mental Development Index.

Table 5

Linear Regression Results for 36 Months Risk Variables' Predictions to 48 Months Negative Parenting

Predictors of negative parenting	ΔR^2	β
	.198	
Child Physical Illness		.068
Child Spec. Ed/Mental Health Diagnosis		.008
Infancy Sickly		.048
BSID-II MDI		-.400***

Note.

 $p < .001$.

BSID-II MDI = Bayley Scales of Infant Development-II Mental Development Index.

Table 6

Linear Regression Results for 48 Months Negative Parenting Predictions to 60 Months Child Demandingness

Predictor of child demandingness	ΔR^2	β
Negative parenting total	.043	-.207**

Note.

**
p < .01.

Table 7

Hierarchical Regression Results for 36 Months Risk and 48 Months Negative Parenting Predictions to 60 Month Child Demandingness

Predictors of child demandingness	ΔR^2	β
Step 1		
Negative parenting total	.041 *	.203 *
Step 2		
	.114 **	
Negative parenting total		.068
Child physical illness		.111
Child special education/mental health diagnosis		.179
Infancy sickly		.177 *
BSID-II MDI		-.060

Note.

* $p < .05$.

** $p < .01$.

BSID-II MDI = Bayley Scales of Infant Development-II Mental Development Index.