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The influence of mother, father, and child risk on parenting and children's cognitive and social behaviors

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Abstract

The association among mothers', fathers', and infants' risk and cognitive and social behaviors at 24 months was examined using SEM and data on 4,178 on toddlers and their parents from the Early Childhood Longitudinal Study-Birth Cohort. There were 3 main findings. First, for cognitive outcomes, maternal risk was directly and indirectly linked to it through maternal sensitivity whereas paternal risk was only indirectly related through maternal sensitivity. Second, for social behaviors, maternal and paternal risks were indirectly linked through maternal sensitivity and father engagement. Third, maternal and paternal levels of risk were linked to maternal supportiveness whereas mothers' and children's risk were linked to paternal cognitive stimulation. Implications are that policy makers must take into account effects of mothers', children's, and fathers' risk on young children's functioning.

Keywords

Childhood/Children; Early childhood risk; ECLS-B; Fathers; Parenting

Research findings on the effects of environmental risk (i.e., family structure, income, poverty) factors on children's development are consistent and robust. Children growing up in poverty, with single parents who have low levels of education, have mental health problems, lack social support, and experience frequent residential mobility are at high risk for cognitive difficulties and behavioral problems (Adams, 2004; Brooks-Gunn, Liaw, & Klebanov, 1992; Burchinal, Campbell, Bryant, Wasik, & Ramey, 1997; McLoyd, 1990; Rubin, Burgess, Dwyer, & Hastings, 2003; Teti et al., 2009). Overall, this literature has emphasized the effects that family adversity or the risk of one parent, mainly the mother, poses for children's wellbeing. The risk that the father and the child simultaneously pose for parenting and child adjustment has not been examined. Consequently, the mechanism by which this occurs is not well understood. In this study we address this gap by using family systems theory, which postulates that all members of a family system contribute to family functioning.

Our study builds upon the work of previous researchers and examines how mothers', fathers', and children's risk level influence couple conflict and parenting (fathering *and* mothering behaviors), which in turn influences child cognitive and social behaviors. We use

the Early Childhood Longitudinal Birth Cohort study (ECLS-B) to examine how couple conflict mediates the association between each family member's risk and parenting and how parenting mediates the association between each family member's risk and child outcomes. Our study also examines how each parent's risk moderates the association between the other parent's risk and parenting. That is, mothers' risk may negatively influence her parenting, but it may be exacerbated by her partner's risk.

Theoretical Framework

Our study is guided by the risk perspective that certain psychological or social factors increase the likelihood that an individual will experience poor outcomes (Harvey & Delfabbro, 2004; Specht, Miller Polgar, & King, 2003). Research reveals that children living with parents, mainly mothers, who have a high number of risk factors experience less positive and more harsh parenting and are at greater risk for negative outcomes than children living with parents who have fewer risk factors (Ayoub et al., 2009; Brooks-Gunn, et al., 1992; Burchinal et al., 1997; Burchinal, Roberts, Hooper, & Zeisel, 2000; Burchinal, Roberts, Zeisel, & Rowley, 2008a; Burchinal, Vernon-Feagans, & Cox, 2008b; Swisher & Waller, 2008). Children living with parents who have multiple risk factors are most at risk for behavioral problems and low cognitive skills (Brody et al., 1994; Burchinal et al., 2008a; Kerr, Black, & Krishnakumar, 2000; Peters & Ehrenberg, 2008). Moreover, high levels of maternal risk have been linked with more rapids rate of decline in cognitive scores (Ayoub et al., 2009). Consequently, scholars have argued that maternal risk is the strongest predictor of negative outcomes for children (Olson, Ceballo, & Park, 2002). However, this research suffers from several limitations. It is based mostly on mothers' risk factors. It does not integrate findings showing that fathers' and children's risk factors also contribute to children's functioning (Baker, Blacher, & Olsson, 2005; Van Zeijl et al., 2007). Because most studies to date have examined risk factors in isolation from one another, they have not investigated the simultaneous effect that maternal and paternal risk have on children (e.g., Peters & Ehrenberg, 2008). On the basis of this literature, we examine the effect of mothers', fathers', and children's additive risk factors on parenting as well as child functioning.

We are also guided by the family system theory that families are systemic units (e.g., mothers, fathers, and children) of interconnected relationships and action patterns where individuals respond and interact with one another as individuals, as partners (i.e., couple subsystem), and as sons and daughters (i.e., parent-child subsystem) (Burchinal et al., 2008b; Cox & Payley, 1997; McHale et al., 2002; McLoyd, 1990). Individuals affect one another through their own personal resources and stresses (risk factors) and through the quality of their relationships (couple dyad), which can then have a spillover effect on the relationship with others in the system (parent-child subsystem) (Coley & Hernandez, 2006; authors). Thus, parents' risk levels influence children directly and indirectly through parenting behaviors (Brody et al., 2002; Burchinal et al. 2008b). For example, parents' depression might influence children's outcomes both directly and indirectly through its effects on parenting (parent-child subsystem). Parents' depression might also influence parenting through its effects on the couple dyad. At the individual level, children's risk also influences their own development both directly and indirectly through its association to parenting. This view is consistent with a transactional view of development that children contribute to their own functioning by influencing parenting and vice versa in a dynamic way (Sameroff, 2009). For example, a child with a difficult temperament can put strain in the parent-child dyad and the couple dyad which can negatively influence the child through negative parenting. Additionally, family system theory stipulates that there are cross-over effects where parents' risk levels influence their own and the other parent's parenting behaviors (authors; Wiemann, Augrucia, Rickert, Berenson, & Volk, 2006).

Conceptual Model

Our hypothesized model tests the simultaneous associations among father, mother, and child risk factors and child outcomes and shows that when the child is 9 months old family members' risk level is directly linked to children's outcomes at 24 months. Numerous studies have shown a direct linkage between parental risk, mainly maternal, and child outcomes, but few have modeled the associations among these variables. For example, socio- economic status (SES) has been associated with a wide array of negative child outcomes from birth to adulthood (Ayoub et al., 2009; Burchinal et al., 2008b; Bradley & Corwyn, 2002; Runions & Keating, 2007). There is also evidence suggesting that family members' risk factors directly influence child outcomes through parenting (Burchinal et al., 2008a, 2008b; Deater-Deckard & Dodge, 1997). Parents with high risk have a negative effect on their children's outcomes because they are less able to parent positively and effectively.

Maternal, paternal, and children's risk factors are hypothesized to be directly linked to parenting (mothering and fathering) by decreasing positive parenting behaviors (e.g., sensitivity and responsiveness) and increasing negative behaviors (e.g., spanking) (Baumrind, Larzelere, & Cowan, 2002; Brooks-Gunn & Markman, 2005; Burchinal, et al., 1997; Burchinal et al., 2008a & 2008b; Conger, Ebert-Wallace, Sun, Simons, McLoyd, & Brody, 2002; Deater-Deckard, Dodge, Bates, & Pettit, 1996; Jaffee, Moffit, Caspi, & Taylor, 2002). Several parental risk variables have been linked to decreased positive parenting or increased negative parenting, including poverty and unemployment (Gassmann-Pines & Yoshikawa, 2006; McLoyd, Jayarante, Ceballo, & Borquez, 1994; McLoyd, 1998), low English speaking proficiency (White, Roosa, & Nair, 2009), teenage parenting (Farrie, Lee, & Fagan, in press), low educational achievement (Luster & Haddow, 2005), maternal and paternal depression (Albright & Tamis-LeMonda, 2002; Cabrera, Shannon, & La Taillade, 2009; Knoche, Givens, & Sheridan, 2007), and excessive use of alcohol and drugs (Carta et al., 2001; Fitzgerald, Davies, & Zucker, 2002; Nelson, 2004). Based on this evidence, we hypothesize that parents with a high number of risk factors will be less positively engaged with their children and will use more harsh discipline than parents with fewer risk factors.

Research on the influence of children's risk factors (e.g., temperament and health status) on parenting is robust (Harrison & Magill-Evans, 1996; Lamb, 2004). In accordance with transactional developmental theory that children contribute to their own development (Sameroff, 2009), several studies, mostly with white middle-class families, have found that net of other variables, child temperament (e.g., ability to self-regulate) was linked to negative parenting (Baker, et al., 2005), negative discipline (Van Zeijl et al., 2007) and maternal control (Gaertner, Spinrad, & Eisenberg, 2008; Gedeyne, Ghesquiere, & Onghena, 2004). Children's health status has also been found to have a negative effect on parenting (Simmerman, Blacher, & Bruce, 2001). Based on this review, we hypothesize that high-risk children will experience less positive parenting and harsher discipline.

Our conceptual model hypothesizes that the risk of one parent influences not only his/her own parenting behaviors, but also the parenting behaviors of the other parent (i.e., cross-parental association) (Cox & Paley, 1997). Because parents with increased risk may be negative or less sensitive in their interactions with their children, they are more likely to increase the stress for the other parent who may also interact negatively with children (Pesonen, Räikkönen, Heinonen, Järvenpää, & Strandberg, (2006). Few studies have examined crossover effects between parents; there is some evidence that fathers might be more sensitive to mothers' risk than vice versa (Cummings, Goeke-Morey, & Raymond, 2004; Doherty, Kouneski, & Erickson, 1998). Mothers' parenting may be less influenced by fathers' risk because cultural norms for parenting are stricter for mothers than for fathers

(Doherty et al., 1998). That is, mothers are expected to parent at all times, whereas fathers can opt out of parenting responsibilities. On the basis of this work, we examine whether mothers' risk factors have a stronger influence on fathers' parenting than do fathers' risk factors on mothers' parenting.

According to our conceptual model, parents' risk factors affect parenting behaviors *indirectly* through its effect on the couple relationship. Couple conflict has been found to be influenced by a host of risk variables, including mothers' and fathers' lack of income, low education, unemployment, residential mobility, substance abuse, maternal depression, poor health, teen pregnancy, receipt of public assistance, and lack of social support (Conger, Ge, Elder, O'Lorenz, & Simons, 1994; Cummings, et al., 2004; Grych, 2002). From a systemic view, couple conflict may spill over onto the parent-child relationship, especially for fathers (Belsky, 1984; Cox, Paley & Harter, 2001; Cummings, et al., 2004; Gottman & Katz, 1989; Krishnakumar & Buehler, 2000). Thus, couple conflict partially explains why family members' risk factors influence parenting (Coley & Hernandez, 2006; authors, in press). We thus hypothesize that mothers', fathers', and children's risk factors will influence couple conflict. Moreover, we expect that the association between family members' risk factors and parenting will be partially explained by couple conflict. Couple conflict has also been shown to produce a negative emotional climate in the family which has negative effects on kids (Cummings & Merrilees (in press). Thus we expect that couple conflict will have a direct effect on child functioning.

We also hypothesize that the effect of the risk of one parent on parenting behavior and child outcomes will be moderated by the risk of the other parent. In a sample of middle class white fathers, involved fathers moderated mothers' depression effect on children's internalizing behaviors, but also exacerbated the effects of mothers' depression, when fathers were also depressed (Mezulis, Hyde, & Clark, 2004). Based on this review, we examine moderation effects between father and mother (i.e., mother risk x father risk) on the couple relationship, parenting behavior, and child outcomes.

Control Variables

To isolate the independent associations of mother's, fathers' and children's risk factors on parenting and children's outcomes, we control for child sex and age. Research shows that fathers tend to be more restrictive and controlling but also spend more time and are more sensitive with their sons than their daughters (Easterbrooks & Goldberg, 1984; Leaper, 2000; Maccoby, 1998; Rothbart & Maccoby, 1966), whereas mothers tend to be more sensitive with but also have stronger reactions to problem behaviors in girls than boys (Garner, Robertson, & Smith, 1997; Mills & Rubin, 1990). Moreover, boys tend to be more aggressive than girls (Coie & Dodge, 1998; Maccoby; Rubin & Burgess, 2002) and girls show greater social competence and positive affect during peer interactions than boys (Garner, Jones, & Miner, 1994; Garner, et al., 1997; Hoglund & Leadbeater, 2004). We control for child age because of the differences in the timing of the child outcome data collection within each round of the ECLS-B. For example, at the 9-month data collection, children's age ranged from 8 to 13 months at the time of the home visits. Finally, we control for maternal supportiveness and fathers' cognitive stimulation at 9 months because of their links to 24 month parenting.

Method

Data Source

The Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) is a nationally representative probability sample of 10,700 children born in 2001, designed to represent the

nearly four million children born in the United States in that year (National Center for Education Statistics, 2005a). Children were excluded from the study if: (1) they were born to mothers under the age of 15, (2) they were adopted at or shortly after birth, and (3) they died before the age of 9 months. The ECLS-B cohort of children was followed at approximately 9, 24, and 48 months and at kindergarten entry. The study oversampled Asian and Pacific Islander children, American Indian and Alaska Native children, Chinese children, twins, and low and very low birth weight children. The sample was selected using a clustered, list frame sampling design, which was made up of registered births in the National Center for Health Statistics (NCHS) vital statistics system. Births were sampled from 96 core primary sampling units (PSUs, counties and county groups) representing all infants born in the United States in the year 2001. For the American Indian/Alaska Native oversample, 18 additional PSUs were selected from a supplemental frame consisting of areas where the population had a higher proportion of American Indian/Alaska Native births (National Center for Education Statistics, 2005b).

The study collected data from primary caregivers (mostly mothers), resident and nonresident fathers, child care providers, teachers, and school administrators. Data about children were collected from parents, through direct observation and assessment, and from teachers and caregivers. Primary caregivers included biological, adoptive, and foster mothers, stepmothers, and a very small percentage of fathers. Resident fathers included biological, adoptive, foster, and stepfathers. The present study uses the parent interview (conducted with the primary caregiver), resident father questionnaire, child assessment, and observation of parent-child interaction. The parent interview was conducted in the child's home at each data point. Resident fathers completed a self-administered questionnaire at their home. Child assessments and parent-child observations were also conducted during the home visits.

Over 14,000 births were sampled and fielded. Of these, 76% (n = 10,700) of primary caregivers (primarily mothers) were interviewed at 9 months. Of these, 92% (n = 9,850) completed the 9-month survey and the 24-month protocol. Mothers reported on whether or not a father was resident, living with mother and child. The general response rate for resident fathers who completed the self-administered father questionnaire was 76% and 77.7% at 9 and 24 months, respectively.

Analytic sample

The present study included only biological mothers and resident biological fathers at 9 months. The first step in selecting the sample was to identify households in which the primary caregiver questionnaire was completed by the biological mother at 9 and 24 months (n = 9,850); we omitted 113 biological fathers, 120 non-parent relatives, 1 father figure, and 66 adoptive or foster parents who filled out the primary caregiver questionnaire at 9 and 24 months. Of these (n = 9,550), we selected cases where the birth father also resided with the child and mother at 9 months (n = 7,535). We then selected cases where the birth father also resided with the child at 24 months (n = 7,077). Next, we omitted 149 cases in which the mother reported that the child had been diagnosed as mentally retarded or had another developmental delay (n = 6,928). We omitted these cases because these families may have additional stresses that may be linked to our dependent variables. Finally, 2,750 cases were omitted because the father's population weight was missing. The ECLS-B dataset does not compute weights for fathers who did not complete an instrument during the 9- or 24-month interview; but if fathers had missing data at the item-level, weights were calculated for those cases (National Center for Education Statistics, 2005b). The final analytic sample size was n = 4,178. All data were weighted using the ECLS-B custom 24-month longitudinal weights for analyses that utilize father information at both the 9- and 24-month surveys—either alone or in combination with data collected through the parent interview and/or birth certificate (Nord, Edwards, Andreassen, Green, & Wallner-Allen, 2006).

To examine the possible effects of father nonresponse bias on the findings in our study, we compared estimates of father characteristics (age, race and ethnicity) derived from the mother interview using two sets of weights. One weight (W2C0) adjusts for nonresponse to the mother interview and the absence of child assessment data and the other (W2FC0) adjusts for these plus for nonresponse to the father survey. We calculated the standard errors for the two sets of estimates and ran a *t*-test (results available upon request). Results showed no significant differences. Thus, when the data are appropriately weighted, there is no evidence of nonresponse bias in the findings in our study.

Table 1 is based on weighted means and shows that our analytic sample includes 61% (*n* = 2,300) White families, 3% (*n* = 500) Asian families, 25% (*n* = 700) Hispanic families, 6% (*n* = 250) African American families, 7% (*n* = 400) belonging to various other ethnicities (e.g., American Indian, multiracial, and Pacific Islanders). The median household income of the mother-father co-residential families ranged from $40,001 to $50,000 per year, with approximately 15% (*n* =500) of these families with earnings below the poverty level. At 9 months, 10% of mothers (*n* = 400) completed some college, 21% (*n* = 1,050) completed a college degree or higher, 29% (*n* = 1,250) had a high school diploma or equivalent, 36% (*n* = 1,350) had no high school diploma, and 4% (*n* = 150) attended or completed a vocational technology program beyond high school. Also at 9 months, 16% of fathers (*n* = 700) completed some college, 37% (*n* = 1,850) completed a college degree or higher, 19% (*n* = 750) had a high school diploma or equivalent, 20% (*n* = 550) had no high school diploma, and 8% (*n* = 300) attended or completed a vocational technology program beyond high school. At 24 months, 3% of fathers and 5% of mothers were unemployed. The mean age of the children was 10.38 months (*SD* = 1.72) at the 9 month survey and 24.28 months (*SD* = 1.11) at the 24 month survey. The mean age of the mothers and fathers at the 9 month interview was 31.98 years (*SD* = 6.42, range = 15 to 52) and 29.5 years (*SD* = 6.3, range = 14 to 57), respectively.

Measures of Child Outcome Variables

Cognitive ability—To measure child's cognitive development at 24 months we used the Bayley Short Form–Research Mental Scale (BSF), which is an adaption from the Bayley Scales of Infant Development (BSID-II) (Bayley, 1993) especially designed for the ECLS-B. Children's cognitive abilities were assessed through observation conducted by field staff who completed an extensive training to administer standardized tasks (e.g. naming pictures, verbalizing, compare sizes) to the child (National Center for Education Statistics, 2005a). Interviewers were trained and certified on the assessments. During the course of data collection, quality control procedures were implemented to verify adherence to the study protocol. Telephone verification interviews with the parent respondents were conducted to confirm the authenticity of the home visit data. In addition, periodic descriptive analyses on the assessment data were conducted to check for any unusual response distributions.

The BSF assessed memory, vocabulary, and problem solving, early counting, and reasoning. These separate scales were summed to form a total raw score, which was used to estimate the Overall Mental Scale. Item response theory (IRT) calibration and scoring were used to develop the mental scale score. IRT true-score equating was used to place the BSF results on the same 0-to-178-point scale used by the BSID-II. The BSF mental scale score is an estimate of the number of items a child would have answered correctly had the full BSID-II been administered. The reliability of the BSF was .79. The scores for children in the analytic sample ranged from 92.61 to 174.14 with a mean of 128.17.

Social behavior—To measure children's socioemotional functioning at 24 months we used the Two Bags Task (i.e., joint book reading and pretend play), which is a modified

version of the Three Bags Task that was used in the Early Head Start Research and Evaluation Project (EHS) (Love et al., 2005) and in the National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network (Owen, Barfoot, Vaughn, Domingue, & Ware, 1996). In the ECLS-B 24-month data collection, the Two Bags Task asks the mother and the child to play for 10 minutes with items from the two bags. The first bag contained the children's picture book *Corduroy* and the second bag contained Play-Doh® and cookie cutters. The parent is instructed to begin with the first bag before playing with the items in the second bag. The sessions were videotaped and analyzed by field staff who were trained by researchers from the EHS Evaluation and Research Project. Reliability of the coding was established by requiring coders to first code 30 EHS videotapes and meet 90% agreement with already coded EHS tapes (i.e., the gold standard). Reliable trainers were allowed to train coders using the same EHS test procedures to proof their reliability (National Center for Education Statistics, 2005a). Additionally, coders received full supervision for their first 10 videotapes and part-time supervision for their next 20 videotapes. To establish in-house reliability coders had to complete one reliability tape a week (National Center for Education Statistics, 2005a). Coders received an average reliability of 95.95% agreement, with a range from 95.06% to 97.33%.

The videotaped data were coded on 3 child rating scales (child engagement of mother, child quality of play, and child negativity towards mother) and 5 parent rating scales (emotional supportiveness, negative regard for child, intrusiveness, detachment, and cognitive stimulation of the child). The scales are on a 7-point Likert-type rating scale that ranged from *very low* (1) to *very high* (7), which were also used in the EHS project (Love et al., 2005). The *Child Engagement of Mother Scale* measured the quality and extent of the child's interaction with the mother. Researchers coded the extent to which the child shows, initiates, and maintains interaction with the parent, and the degree to which the child communicates positive regard or positive affect to the parent. Children with higher scores sustained positive affect toward mother and attempted to interact with her; children with lower scores displayed no affect with the mother or ignored or rejected her. The *Child Quality of Play Scale* measured whether the child paid attention to objects and sustained this attention on three dimensions: attention to play objects, self-direction, and complexity of play. The *Child Negativity Scale* measured the child's negative affect including anger and hostility toward the mother (e.g., hitting an object or himself, throwing a toy, pushing parent away). Children with higher scores were constantly angry with the mother during the task. We used each of these three scales, which we refer to as *positive affect, sustained attention,* and *negative affect*, respectively, in our analysis. Factor analysis was conducted on the child social behavior scales. The analysis produced two factors. The first factor included positive affect and sustained attention (eigenvalue = 1.72, 57% of variance explained). The second factor included only negative affect (eigenvalue = 1.03, 34% of the variance explained). We summed the two items in the first factor (positive affect and sustained attention) which we refer to as positive social behavior index ($\alpha = .86$). Because the second factor included only one scale, we used it as it is.

We caution the reader that the ECLS-B measures of maternal parenting and infant social behavior are coded from the same mother-child observation, which may introduce some measurement bias into our findings. This may result in some overestimation of the association between infant and maternal behavior.

Measures of Independent Variables

Father and mother risk variables—We selected items that addressed three domains of maternal and paternal risk totaling 8 risk variables when the child was 9 months old: poverty (teenaged parenting, level of education, ability to speak English, and unemployment),

emotional/physical health (poor physical health, depressive symptoms), and anti-social behavior (excessive drinking, and history of arrests). We selected only risk variables in both the father and mother questionnaires. All categorical risk variables were recoded to a scale from 0 = *no/low risk* to 1 = *yes/high risk*. Continuous risk variables were recoded to a continuous score ranging from 0 = *no/low risk* to 1 = *yes/high risk*. For example, the scale for physical health was recoded from 1 to 5 to 0 to 4 and divided by 4 to create a continuous scale ranging from 0 to 1. Risk indexes were constructed for mothers and for fathers by summing the eight risk variables; high scores suggest greater risk (range = 0 to 8).

We included four poverty domain risk items: teenaged parenting, level of education, ability to speak English, and unemployment. Status as a teenaged parent was coded as a dichotomous variable. At the time of the birth of the target child, parents older than 19 years old were coded as no risk (0 = 20+) and teenaged parents were coded as being at risk (1 = < 20). Level of education was also recoded as a dichotomous variable. At the time of the 9 month interview, parents who completed high school or higher were coded as no risk (0 = ≥ high school) and those who had did not complete a high school degree were coded as being at risk (1 = did not receive a diploma or successfully complete the GED examination). Two items were used to compute the dichotomous unemployment variable: parent reported not working for pay in the previous week and parent was looking for work in the past 4 weeks. Parents who were working were coded as having no risk (0 = working) and parents who were not working and were also looking for work were coded as being unemployed and at risk (1 = not working). Stay-at-home mothers or fathers were coded as no risk. Low ability to speak English was assessed with one item that asked respondents how well they speak English on a scale of 1= *very well* to 4 = *not very well*. Responses to this item were recoded to a continuous variable ranging from 0 = high ability to speak English or no risk to 1 = low ability to speak English or being at risk.

The emotional/physical health domain risk variables included physical health status and depression. To assess physical health, mothers and fathers were asked to rate their own general health with one item on a scale of 1 = *excellent* to 5 = *poor*. This item was recoded to a continuous variable ranging from 0 = excellent health or no risk to 1 = poor health or being at risk. Depressive symptoms were measured using the Center for Epidemiological Studies Depression Scale—Short Form (CESD-SF) (Ross, Mirowsky, & Huber, 1983), which comprises 12 of the 20 items from the full CES-D (Radloff, 1977). The CES-D is a self-report scale that measures the absence or presence of negative thoughts, feelings, and behaviors during the prior week. The measure is based on parents' responses to questions on how many days in the past week, the respondent felt bothered, had a poor appetite, could not shake the blues, had trouble keeping focus, felt depressed, felt everything was an effort, felt fearful, had difficulty sleeping, talked less than usual, felt lonely, felt sad, and could not get going. Items were rated on a 4-point Likert scale (1 = *rarely* to 4 = *most or all days*). Higher scores indicated more depressive symptoms (α = .90 and.85 for mothers and fathers, respectively). Depressive symptom indexes were constructed for mothers and fathers by summing the 12 CESD-SF items. The indexes were then recoded to a continuous scale ranging from 0 to 1.

The anti-social behavior domain risk variables included two variables: excessive alcohol use and history of arrests. Excessive alcohol use was assessed by one item that asked mothers and fathers the number of drinks consumed per week (coded as dichotomous variable). Respondents who reported consuming less than six drinks per week were coded as no risk (0 = < 6) and respondents who reported consuming six or more drinks per week were coded as risk (1 = ≥ 6) (Fitzgerald et al., 2002). The history of arrest was assessed by asking mothers and fathers whether they had ever been arrested. This dichotomous variable was coded so

that parents who had never been arrested were coded as no risk (0 = no arrest) and parents who had ever been arrested were coded as at risk (1 = had been arrested).

Child risk—Two child risk domains were assessed: physical health/disability and self-regulatory behavior. For children's health and disability, risk items included mothers' perception of child's health and child's physical disabilities, including blindness and vision problems, difficulty hearing, heart disease, failure to thrive, cleft palate, and problems with general mobility at 9 months. These data were used to construct a single dichotomous item measuring whether or not the child has any disability (0 = *no*, 1= *yes*). The child health variable was measured on a scale ranging from 1 = *excellent* to 5 = *poor* and recoded on a continuous scale of 0 = excellent health/no risk to 1= poor health/at risk.

To assess the degree of self-regulatory behaviors, we used the seven item abbreviated form of the Infant/Toddler Symptom Checklist (ITSC, DeGangi, Poisson, Sickel, & Weiner, 1995), which was designed to screen 7 to 30 month-old infants and toddlers for sensory and regulatory disorders. It identifies children who are behaviorally problematic and show disturbances in sleep, feeding, state control, self-calming, and mood regulation, and who, as a result, may be especially demanding of their caregivers or unpredictably fussy (Nord et al., 2006). Mothers were asked how often the child is fussy or irritable; the child goes easily from a whimper to an intense cry; the child demands attention and company constantly; the child wakes up three or more times at night and is unable to go back to sleep; the child needs a lot of help to fall asleep; and the child is unable to wait for food or toys without crying or whining. For each item, mothers' report of children who had never, used to, sometimes, and fit the description was coded as 0, 1, 2 and 3, respectively. The scores for each item were then added together to create a single variable assessing the child's self-regulation (range = 0 to 21; $\alpha = .59$). Higher scores indicated more self-regulatory behavior problems. The summed self-regulation index was then recoded to a continuous scale with scores ranging from 0 to 1.

Relationship conflict—Six items assessing relationship conflict and communication were available in the mothers' and resident fathers' questionnaires at 24 months. Respondents were asked to indicate how often on a scale of 1 = *often* to 4 = *never* they shout at each other, hit or throw things, criticize each other, keep opinions to yourself, discuss disagreements openly, and reach a compromise. The first four items were reverse coded so that a high score indicated high relationship conflict and poor conflict resolution skills. The fathers' and mothers' items were subjected to separate factor analyses using varimax rotation. These analyses revealed that three of the items (shout at each other, hit or throw things, and criticize each other) loaded on one factor for both fathers and mothers, explaining 36.07 % of the variance for fathers (eigenvalue = 2.16) and 38% of the variance for mothers (eignevalue = 2.34). We only used these three items to construct indices referred to as mothers' self-reported relationship conflict ($\alpha = .63$) and fathers' self-reported relationship conflict ($\alpha = .62$).

Fathers' engagement in cognitively stimulating activities (fathers' cognitive stimulation)—Three self-report items were used to assess fathers' cognitive stimulation. The items included: read books to, tell stories to, and sing songs with the child. All questions were scaled from 1 = *more than once a day* to 6 = *not at all*. These items were recoded so high scores mean higher levels of cognitive stimulation. The three items were added together to form an index of fathers' cognitive stimulation ($\alpha = .71$).

Mothers' supportiveness—The ECLS-B 24-month survey contains a measure of mothers' quality of supportiveness for the child obtained from the Two Bags Task, which was scaled as were the social behavior variables described above (1 = *very low* to 7 = *very*

high). The codes for the mother were summarized in seven scores, including Parental Sensitivity, Parental Intrusiveness, Parental Stimulation of Cognitive Development, Parental Positive Regard, Parental Negative Regard, and Parental Detachment. The Two Bags Mother's Supportiveness score is the average of the sum of the mother's scores for Parental Sensitivity, Parental Cognitive Stimulation, and Parental Positive Regard divided by 3. In this study, we only included positive dimensions of mother-child interactions because there was little variability on the negative dimensions, including intrusiveness and negative regard.

Harsh parenting—Mother's and father's harsh parenting was based on the sum of their responses to three questions asking the mother and father if the child got angry, would she/he respond by: hitting child back, spanking child, yelling or threatening child. The response choices for the individual were 1 = *yes* and 0 = *no*. Higher scores indicate harsher parenting. Due to low reliability ($\alpha = .33$), these measures were not used. We used instead frequency of spanking. Mothers' and fathers' frequency of spanking their child was assessed at 24 months using one item that measured how often the parent spanked the child during the last week. Parents were asked to report the actual number of times they spanked. Parents who indicated they did not spank the child received a score of 0 for frequency. The data were positively skewed because a large number of mothers and fathers reported not spanking their child at all. We therefore calculated the log of the variables, which substantially reduced the skewness of the data (from 5.0 to 1.0).

Control variables—We included in our models child sex to control for the potential effect that this variable might have on our dependent variables (Hoglund & Leadbeater, 2004; Rubin & Burgess, 2002).We also control for child age at assessment because of the differences in the timing of the data collection within each round of the study. For example, at the 9-month data collection home visits, children's age ranged from 8 to 13 months (National Center for Education Statistics, 2005b). We used the age of the child in months at the 24-month survey. Fathers' cognitive stimulation was controlled at 9 months using the same three items described above. The quality of mother-infant interactions was assessed at 9 months from videotapes using the Nursing Child Assessment Teaching Scale (NCATS) as a measure of mother's early parenting. The child is assessed for about five minutes during a semi-structured teaching task. The NCATS is a binary scale of 50 parent items assessing parent-child interaction (sensitivity to cues, response to child's distress, cognitive growth fostering, and socioemotional growth fostering) where 1 = *observed* and 0 = *not observed*. Possible scores range from 0 to 50 with higher score indicating more positive and responsive maternal interactions. The total parent score demonstrated adequate internal consistency as measured by alpha of .67.

Results

Preliminary Analyses

We conducted factor analyses on the mother and father spanking variables to determine if these data could be reduced to single factors. This analysis produced a one factor solution (eigenvalue = 1.54, 76.93% of variance explained). We therefore summed mothers' and fathers' spanking scores and used this composite index in subsequent analyses. Higher numbers signify more spanking.

The correlation matrix (Table 2) shows no evidence of collinearity among independent variables. The largest correlation was between mothers' supportiveness and fathers' risk, $r = -.24$. Furthermore, all the variance inflation factor (VIF) parameters, which is a diagnostic

for multicollinearity, were under 2.5 and all tolerance parameters were over .40 in regression analyses, suggesting there was no multicollinearity (see William, 2008).

Descriptive Statistics

Table 1 is based on weighted means and shows that mothers reported about the same number of risk factors as fathers (M = 1.51, 1.52, respectively). Although a cumulative risk factor below 2.0 means that an individual has low risk (range= 0 to 8), even low risk may have significant effects on parenting because our risk variables assess important issues (e.g., history of arrests). Mothers and fathers reported low level of couple conflict. The relationship items in the ECLS-B reflect harsh forms of conflict (hitting, shouting, and criticizing) and do not include minor arguing and disagreement. A mean score of 5.08 for mothers and 5.16 for fathers (range = 3 to 12) on conflict suggests low level conflict for mothers and fathers. For the child risk index, the mean score was .63 (range = 0 to 3), suggesting low risk. To understand the distribution of risk in the sample, we categorize our risk variables. A risk value of less than .90 is considered “low risk” (25th percentile), a risk value of .90 to 1.9 is considered “moderate risk” (25–75th percentile), and a risk value greater than 1.9 is considered “high risk” (75th percentile). Using weighted data, 24%, 49%, and 27% of mothers were low, moderate, and high risk, respectively. In contrast, 15%, 59%, and 26% of fathers were low, moderate, and high risk, respectively.

The weighted mean score for children’s BSF-R was 128.7 (range 92.61 to 174.14), which was slightly higher than the average reported for all children sampled at 24 months (127.1) (Nord et al., 2006). Children’s positive social behavior score based on their Two Bag assessment ranged from 2 to 14 with an average score of 9.25, and their average negative social behavior score ranged from 1 to 7, with an average of 1.30. These scores were similar to the average scores reported for all 24 month-old children. We emphasize that because our study focuses on two-parent families, our sample does not include children in certain groups such as living in single-parent families who are disproportionately African American.

Path Analysis

Analyses were conducted using Mplus version 5.21. Mplus provided calculations of direct and indirect effects. Full information maximum likelihood estimation in Mplus was used to handle all missing data. Research shows this method offers several advantages over more traditional approaches (Acock, 2005). All data were weighted using the customized 24-month longitudinal ECLS-B weights for analyses that utilize father information at both the 9- and 24-month surveys—either alone or in combination with data collected through the parent interview and/or birth certificate (Nord et al., 2006). We used the MLR estimator in Mplus, which produces maximum likelihood parameter estimates with standard errors and a chi-square test statistic that are robust to non-normality and non-independence of observations (Muthén & Muthén, 2007).

The structural equation models included the following exogenous variables: fathers’, mothers’, and children’s risk indexes (T1); mother supportiveness (T1); father cognitive stimulation (T1); and controls (child age and child sex). Endogenous variables (all T2) included mother and father perception of couple conflict index, mothers’ supportiveness of the child, fathers’ cognitive stimulation, and the combined mother-father spanking variable. The hypothesized model was examined with all three child outcome variables in one model, including child cognition, positive social behavior, and negative social behavior. Goodness of fit of the model to the data is suggested when the chi-square is nonsignificant, the comparative fit index (CFI) is greater than .90 (Hu & Bentler, 1999), and the root-mean-square error of approximation (RMSEA) is less than .06 (Browne & Cudeck, 1993). A RMSEA score less than .05 is indicative of a close fit (Browne & Cudeck). Researchers

have suggested that because the chi-square is so conservative (prone to Type II error), a negative model chi-square finding can be discounted if other model fit measures such as CFI and RMSEA supportiveness the model and if the sample size is reasonable (Garson, 1998). While the distribution of mediation and suppression effects can be skewed when sample sizes are small, the normality assumption has been found to hold with larger sample sizes (e.g., greater than 500 observations) (Cheung & Lau, 2008). Thus, we used the delta method standard errors provided as the default method in Mplus, to test the indirect effects (Muthen & Muthen, 2007). We also remind the reader that because our observational measures of maternal sensitivity and infant social behaviors are derived from the same event, infant positive and negative behaviors may be overestimated.

The hypothesized model explaining child outcome variables fit the data well, $\chi 2$ (4, N = 4,178) = 10.22, p = .04, CFI = 1.00, RMSEA = .019. With approximately 90% confidence, the RMSEA was between .004 and .034. Figure 2 shows path analysis results and only significant parameters (Table 3).

Direct effects—Figure 1 reveals that only maternal additive risk at 9 months was associated directly and negatively with child cognition at 24 months; the standard coefficient was significant but small. Additionally, mothers who exhibited higher levels of supportiveness and fathers who reported higher levels of cognitive stimulation at 24 months had children who scored higher on the test of child cognition at 24 months than those parents who did not; the standardized coefficients for these associations were moderate and small, respectively.

There were no significant direct associations between paternal and maternal additive risk measured at 9 months and children's positive or negative social behavior at 24 months. In contrast to the findings for cognition, only highly supportive mothers had children who scored significantly higher on positive social behavior and significantly lower on negative social behavior; the standardized coefficients for these associations were large and moderate, respectively. There was no significant association between parents' spanking and child outcome at 24 months. Contrary to expectation, there was a negative and significant association between mother perception of couple conflict and child negative social behavior at 24 months; the standardized coefficient was small. That is, mothers who reported higher couple conflict had children who scored lower in the test of negative social behavior.

Predicting to mother supportiveness, higher levels of paternal and maternal risk were negatively and significantly associated with lower mothers' supportiveness; the standardized coefficients were small. However contrary to previous findings, mother or father reported couple conflict was not associated with maternal supportiveness. When predicting to father cognitive stimulation, mother and child risk and father report of conflict were directly and *negatively* associated with it. Child risk and father report of conflict were directly and *positively* related to spanking; the standardized coefficients were significant but small for these associations.

We also found that fathers' risk was positively associated with both parents' reports of conflict; however, the standardized coefficients were small. Furthermore, mother risk moderated the associations between father risk and both parents' reports of conflict. The interaction term (father risk x mother risk) was significantly associated with mothers' and fathers' report of conflict. When we graphed the interactions (graphs available from the authors), we found that when a father was high risk, both parents reported higher levels of couple conflict only when mothers were low risk.

Indirect Effects—Fathers' risk index at 9 months was also indirectly related to child cognition, positive social behavior, and negative social behavior at 24 months, although the indirect standardized coefficients were small. For *cognition*, when father risk increased by 1 standard deviation, cognition scores were lowered by a total of .03 standard deviations ($p < .01$), explained entirely by the specific mediating effect of mothers' supportiveness ($\beta = -.03$, $p < .001$). The mediating effects of mother supportiveness is the result of multiplying −.12 (father risk to mother supportiveness path) x .29 (mother supportiveness to child cognition path). For *social* behaviors, when father risk increased by 1 standard deviation, *positive social* behavior scores were lowered by a total of .07 standard deviations ($p < .001$), explained entirely by the specific mediating effect of mothers' supportiveness ($\beta = -.07$ $p < .01$). Finally, when father risk increased by 1 standard deviation, *negative social* behavior was increased by .02 standard deviations ($p < .05$), again explained by the mediating effect of mothers' supportiveness ($\beta = .02$ $p < .001$).

There was a significant indirect effect of mother risk on child cognition. When mother risk increased by 1 standard deviation, cognition scores were lowered by a total of .05 standard deviations ($p < .001$), explained almost entirely by the specific mediating effect of mothers' supportiveness ($\beta = -.04$, $p < .001$). Similarly, there was a significant indirect effect of mother risk on positive and negative social behaviors. When mother risk increased by 1 standard deviation, positive social behavior scores were lowered by a total of .02 standard deviations ($p < .001$) explained almost entirely by the specific mediating effect of mothers' supportiveness ($\beta = -.02$, $p < .001$). The significant indirect effect of mother risk on negative social behavior ($\beta = .03$, $p < .001$), was explained entirely by the specific mediating effect of mothers' supportiveness ($\beta = .03$, $p < .001$). There were no indirect effects of child risk or mother x father risk on child outcomes.

Discussion

Prior research on the influence of risk on children's development has focused on biological risk (e.g., low birth weight) or environmental risk, mainly mothers (Pressman, Klebanov, & Brooks-Gunn, in press). Scholars have thus argued that maternal risk is the strongest predictor of negative outcomes for children (Burchinal et al., 2008a, 2008b; Olson et al., 2002; Pressman et al., in press). Although research shows that fathers' and children's risk also contribute to children's development, studies investigating the simultaneous influence of maternal, paternal and child risk on parenting and child's functioning are rare. Including all family members in research is consistent with a family system perspective that parents influence their children's development through their relationships with them. In this study, we use family system theory and a risk perspective to examine the influence of maternal, paternal, and child risk when children were 9 months old on 24 months outcomes. Thus this study offers a different approach to understanding the influence of risk on children's wellbeing. We focus on toddlerhood because it is a critical period of development with important implications for school readiness. The use of a nationally representative longitudinal sample of infants born in the U.S. in 2001 offers a robust test of our hypothesized model and generates further research questions regarding the way family members' risk influences child outcomes over time. The hypothesized model is useful because it combines a systemic view of family processes and the risk factors that influence relationships within two-parent coresidential families. The model has practical appeal because it is supported by findings that showed that risk factors for mothers, fathers, and children have additive effects on children's outcomes through their influence on both mothers' and fathers' parenting.

Guided by a family system theory and a risk perspective, we hypothesized that the association between father and mother risk (i.e., poverty, emotional/physical health) and

child risk (i.e., health/disability, child self-regulation) and children's cognitive and social behaviors would be both direct and indirect, mediated by the quality of mother-child interactions, father engagement in cognitive stimulating activities, and negative parenting practices (i.e., how often parents reported spanking their children). We also hypothesized that the association between family members' risk factors and parenting would be partially explained by perceived couple conflict. Further, we hypothesized that the risk factors of one parent will moderate the effect of the risk factors of the other parent on parenting behaviors. Our results showed some support for the hypothesized direct and meditational models but showed no evidence of moderation by parent risk. Two caveats are in order. First, we limited our sample to children who lived with their biological mothers and biological fathers; and second, we used an observational measure of mothering behaviors and a self-reported measure of paternal behaviors because the ECLS-B does not have observational measures of father-child interactions. Observational measures of parent-child observations are considered to be better assessments of parenting. It is possible that observational measures of father-child interactions would have resulted in more associations for fathers (Ryan, Martin, & Brooks-Gunn, 2006).

One of the more interesting findings of this study was that the pathways from parent risk to child outcomes are different for specific child outcomes as well as for mothers and fathers, highlighting the importance of including both parents in studies of parenting and risk. Although the associations are small, maternal and paternal risk measured during infancy are related to toddler's cognitive and social behaviors because they reduce maternal supportiveness. The differences in pathways between mothers and fathers are that for cognition, maternal risk is *directly* related to children's cognition whereas paternal risk is only indirectly associated with it. For social behaviors, both maternal and paternal risks are only *indirectly* related to positive and negative social behaviors. Higher risk mothers and fathers are more likely to have children with fewer positive and more negative social behaviors *because* their risk is associated with reduced quality of mother-child interactions than their peers. Risk is not linked to children's outcomes through its effect on fathers' engagement with their children, as hypothesized, although father engagement is related to children's cognition. Although both direct and indirect effects are small, these findings are important because fathers' risk negatively influences the quality of the mother-child interaction, which is directly related to children's cognitive and social behaviors. A possible explanation is that in general toddlers spend more time with their mothers than fathers; consequently, they may learn to focus, pay attention and respond to others (measured as social behaviors in this study) through interactions with their mothers more so than with their fathers during toddlerhood.

Prior research on the effects of family-based risk (e.g., poverty, family structure, and income) on children's well-being have found stronger associations between these risk variables and child outcomes than some of the individual risk factors we tested in this paper (e.g., Pressman et al., in press). This discrepancy might be due to the young age at which child outcomes were assessed in the present study; perhaps these associations will be stronger as children get older and demand more stimulation and attention from their parents. It is also possible that some of these individual risk factors are not as predictive as the family-based variables. This is an area that merits future research attention.

As expected from family system theory, we found evidence of cross-parental association. In our study, we found that mothers' parenting is influenced by her level of risk and by that of her partner, although the effect of maternal and paternal risk on mothers' supportiveness is not interactive. Fathering is influenced by mothers' and child's risk but not by his own risk. This finding merits a discussion as it is generally accepted that mothers are more likely to influence fathering behaviors than the other way around (Cummings et al., 2002; Doherty et

al., 1998). It is likely that this view has not been rigorously and empirically tested. The scarcity of national and systemic data on fathering behaviors that would enable researchers to test such claims may be a contributing factor. We caution, however, that cause-effect associations cannot be assumed from our findings despite the fact that mothers' and fathers' risk were assessed at 9 months and parenting was assessed at 24 months. It is possible that the high risk levels of parents and their diminished parenting are both associated with lower competence levels in general. Future research should focus on these processes and examine how mothers and fathers cope with the risk of all family members when interacting with their young children. Nonetheless, this finding points to a fruitful area of research and suggests that studies that do not consider the effects of the risk of all family members on children's well being might underestimate how poorly children would fare in those conditions or overlook potential strengths. Additionally, these findings have implications for programs and policies promoting marriage. If such policies bring together two high risk parents without due intervention, the effects on children might be more detrimental than if such mothers were married to men with few (or no) risk factors.

An unexpected finding is that children classified as higher risk (indicated by the child's self-regulatory difficulties and health status) at 9 months are more likely to have fathers who engaged with them in cognitively stimulating activities (e.g., reading, telling stories) less frequently when they were toddlers than children with lower levels of risk. Although high risk children may experience positive interactions with their mother (child risk was not related to mother supportiveness), our findings suggest that their cognitive development might be additionally compromised, although the effect is small, because their fathers are less likely to read to them and tell stories, which are significant predictors of cognitive behaviors at 24 months. It is important to point out that child risk was not directly linked to any of the child outcomes measured in this study. It is possible that these associations may emerge later on, but we did not find them at this age. This finding has implications for timely and early interventions.

Collectively, these findings suggest that mothering behaviors, which are moderately to strongly related to children's cognitive and social behaviors are more strongly associated with their own and their partners' level of risk than are fathering behaviors, which are only linked to levels of maternal and child risk. Mothers' parenting behaviors appear to act as a filter through which maternal and paternal risk influence children. This is particularly troublesome given that the quality of mother-child interactions is directly linked to children's cognitive outcomes. Previous researchers have shown how each parent's own risk is associated with their own parenting and then with child outcomes (Burchinal et al., 2008a). We extend this body of knowledge by demonstrating the complexity of these relationships when maternal, paternal, and child risk and mothers' and fathers' parenting are examined in a single model. We also show the importance of mothers' parenting behavior as a conduit through which risk affects children.

It is also worth noting, however, that contrary to expectation mothers' and fathers' risk factors were not linked to harsh parenting (spanking)—the influence of parents' risk on parenting were mainly on reducing positive parenting. A possible explanation might be the age of the children. Research has found that spanking increases with children's age (Bradley & Corwyn, 2002), implying that older children in high risk families may experience increased negative parenting. In our study, only child's risk was associated with spanking by both parents. Parents reported more spanking of their toddlers when their children had health difficulties and had difficulty regulating their behaviors, providing evidence that some young children do get spanked. It also suggests that interventions should consider how children contribute to their own development, not just focus on parents.

We also expected that the influence of family members' risk on parenting behaviors would be mediated by couple conflict. Our hypothesis that high-risk families would experience more couple conflict than families with fewer risks was partially supported. Fathers with high risk were more likely to report more couple conflict than fathers with low levels of risk. We also found associations between the interaction term (mother risk x father risk) and father and mother reported couple conflict. That is, fathers' risk was positively associated with higher levels of father and mother reported conflict only when mothers experienced low levels of risk. One hypothesis is that mothers with low levels of risk are less tolerant of their high risk partners and therefore engage in more conflict with them. Again, these findings show the complexity of parental risk influences on the couple relationship. Contrary to expectation, we find no evidence that couple conflict mediated the association between risk and parenting. Fathers who reported more couple conflict also reported engaging less frequently with their children in cognitive stimulating activities and spanking them more than fathers who reported low levels of couple conflict. Although mother reported conflict was not associated with mothering behaviors, it was linked to children's lower levels of negative social behaviors, although the coefficient was small. These findings are unexpected and inconsistent with prior research that reports of couple conflict are linked to more negative parenting and reduced positive parenting (Cummings et al., 2004). Future research needs to examine the complex nature of family dynamics including the nature of couple conflict and support among high-risk families.

Consistent with prior research showing that children from low-income families begin to show cognitive deficits as young as 2 years of age (Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998), our findings suggest that *early maternal, paternal, and child* risk can place children in a negative trajectory as early as 24 months. Toddlerhood is an important developmental period for children as it sets the foundation for later growth and development and ultimately school readiness. It is also a challenging time for parents who must provide consistent positive and nurturing opportunities for children to promote their development. During this period of time, the risk of all family members makes children particularly vulnerable mainly because it compromises the quality of the mother-child interaction. Importantly, the direct and indirect effects of maternal and paternal risk on children are small suggesting that intervening at 24 months is not too late, although earlier interventions would be more effective. Thus, promoting positive mothering and fathering behaviors and targeting risk factors of both parents, as early in the child's life as possible, should be important priorities for early childhood policy and program.

Limitations

The findings of this study need to be considered in light of several limitations. First, there were some potentially important risk factors (e.g., legal problems and involvement in the criminal justice system) that were not available in the data set. Consequently, our risk indices are not as comprehensive as they could be. Second, some constructs were not asked in depth. For example, couple relationship conflict was assessed with a few items but did not include a measure of perceived support. Having a measure of support *and* conflict resolution might be a better indicator of how parents perceive the couple relationship than just a report of conflict. Third, the ECLS-B collected observational data of mother-child interactions but not of father-child interactions. Past research based on self-report measures of fathering behaviors, as were used in this study, has not found associations to child outcomes; only measures of father-child quality have found such associations (Ryan et al., 2006; Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004). However, in our study we found an association between fathers' reported father engagement and child outcomes suggesting that this effect was strong enough to detect even with a self-report measure. The effect, however, might have been stronger had we used an observational measure of father engagement.

Fourth, the number of children in the household is an important consideration in any study of family systems; however, in our study this variable was not related to any of the variables of interest. Fifth, maternal supportiveness and the child's social behaviors are coded from the same mother-child interaction. Although different researchers coded the mother and child behaviors, there might be some shared variance reflected in the large associations in the path from maternal supportiveness to child outcomes.

Conclusions

Despite these limitations, the results presented highlight the importance of taking a systemic approach to understand family members' risk effects on children's development. Focusing on only one parent's risk is inadequate. These findings suggest the following take-home messages: (1) The path of influence from maternal and paternal risk to child outcomes is different for each parent and for each specific child outcome. Maternal risk measured at 9 months has a direct influence on cognition and an indirect effect on all three outcomes through reducing the quality of interactions with her children. Fathers' risk at 9 months, on the other hand, has a small and negative indirect effect on all three child outcomes through reducing mothers' supportive behaviors at 24 months. Thus in addition to focusing on reducing maternal risk, keeping high-risk fathers positively engaged with their children as they get older and designing interventions that might reduce his level of risk might be worth the effort given the potential benefits that paternal engagement on cognitive stimulating activities with his children might have on children's school readiness. (2) Maternal and paternal risk are directly related to the quality of her interactions with her children (maternal risk also reduces fathers' engagement). Mothers and fathers who have partners with high risk levels are more likely to be less supportive and engage with their children less frequently than their counterparts. These cross-parental associations are important because there are moderate to strong direct associations between maternal supportiveness and all three children's outcomes and between paternal engagement and cognition. These findings support a growing body of evidence that highlights the critical need to intervene with the whole family early to promote sensitive parenting. And (3) children contribute to their own development and to the way they are parented and thus their level of risk needs to be considered as well by researchers, policymakers, and programs. Children's self-regulatory and health difficulties are significantly linked to fathers' engagement in cognitive activities with their toddlers, although this association is weak. Moreover, children with these difficulties tend to be spanked more frequently than their counterparts.

Overall, the present investigation offers the following extensions: Tests a model in a national sample of infants and their mothers and fathers; simultaneously examines risk of the mother, father, and child at the individual and dyadic level; and, examines the meditational effects of parenting on the association between maternal, paternal, and child risk and children's cognitive development and social behaviors. These extensions represent an important contribution to the study of the effects of risk on children's development.

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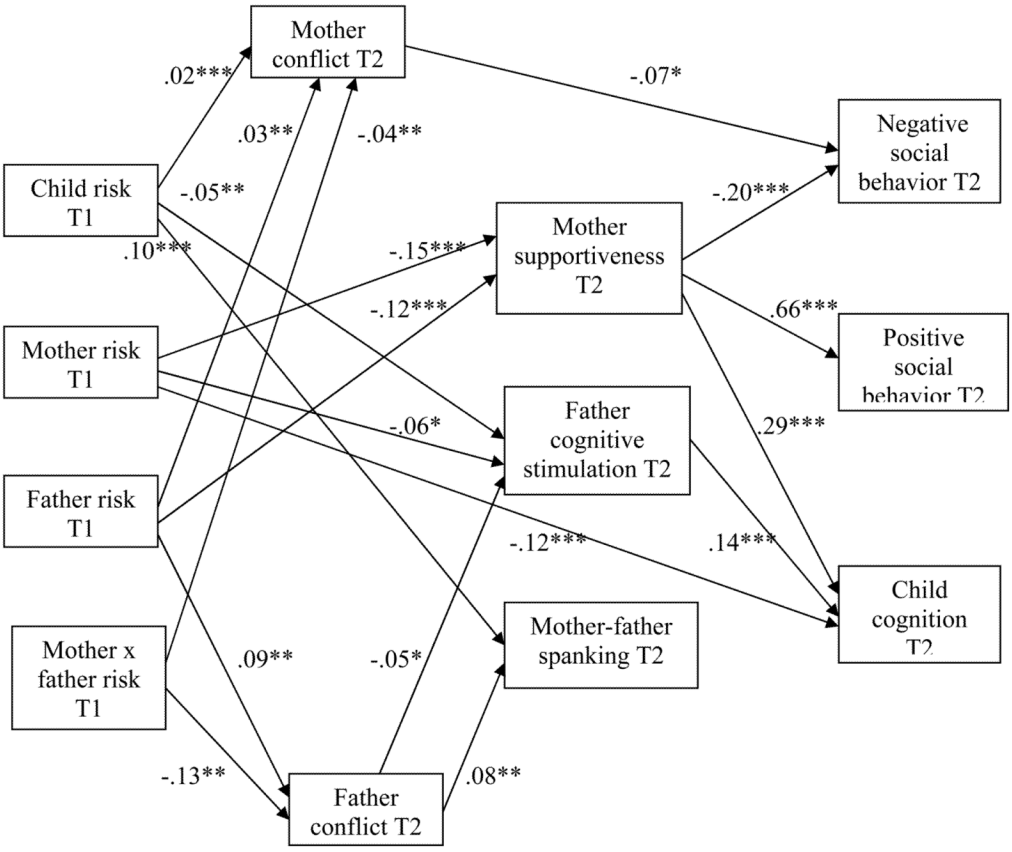

Figure 1. Structural equation model for risk variables, conflict, parenting, and child outcomes

Note. Control variables include child age, sex, mother supportiveness at T1, and father cognitive stimulation at T1. The control variables are not shown. Risk variables, mother supportiveness, father cognitive stimulation, and child sex at T1 are correlated but not shown. Contemporaneous residuals for the conflict, parenting, and child outcome variables are correlated but not shown.

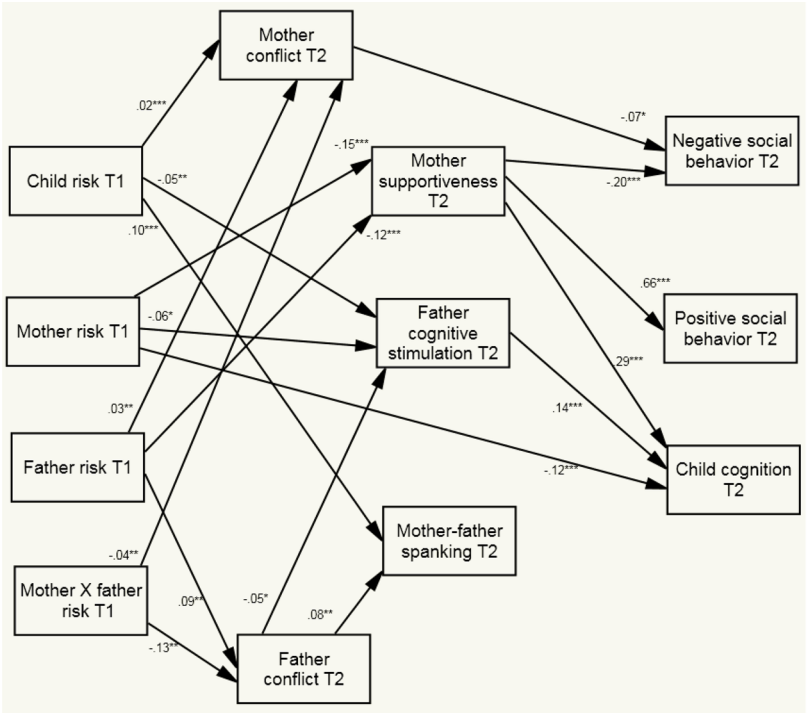

Figure 2. Structural equation model for child outcome variables

Note. Control variables include child age, sex, mother supportiveness and father cognitive stimulation at T1. The control variables are not shown. Risk variables, mother supportiveness, father cognitive stimulation, and child sex at T1 are correlated but not shown. Contemporaneous residuals for the conflict, parenting, and child outcome variables are correlated but not shown.

Table 1

Descriptive Statistics of Background and Risk Variables

	N	Percentage	Mean	*SD*
Child race				
White, non-Hispanic	2300	61.44		—
Asian	500	3.31		—
AA	250	6.28		—
Hispanic	700	24.57		—
Other	400	7.35		—
Race/ethnicity not ascertained	0	0.35		—
Mothers' characteristics				
Education				
Less than high school	1350	35.91		—
High school or GED	1250	28.82		—
Vocational/technical	150	4.43		—
Some college	400	10.22		—
College degree or higher	1050	20.63		—
Mothers' age			29.57	5.77
Fathers' characteristics				
Education				
Less than high school	550	20.05		—
High school or GED	700	19.23		—
Vocational/technical	300	7.78		—
Some college	750	16.41		—
College degree or higher	1850	36.53		—
Fathers' age		31.98		6.42
Household number of children			1.79	2.08
Median Household Income	4200		$40,001–$50,000	—
Percent below poverty threshold	500	15.05		—
Mother Risk Variables				
Overall mother risk score			1.51	0.80
Teenaged parenting	200	5.38		—
No high school degree	1350	35.90		—
Low English proficiency			0.33	0.21
Unemployed	200	5.40		—
Poor physical health			0.39	0.18
Depressed			0.34	0.10
Consume 6+ drinks a week	50	0.73		—
Have been arrested	100	2.90		—
Father Risk Variables				
Overall father risk score			1.52	0.79
Teenaged parenting	50	1.88		—

	N	Percentage	Mean	*SD*
No high school degree	550	20.05		—
Low English proficiency			0.32	0.18
Unemployed	100	2.69		—
Poor physical health			0.44	0.17
Depressed			0.32	0.09
Consume 6+ drinks a week	300	7.94		—
Have been arrested	550	14.33		—
Child Risk Variables				
Overall child risk score			0.63	0.31
Poor physical health			0.3	0.15
Disabled	250	5.00		—
Self regulatory behavior			0.29	0.14
N	4200			

Note. Means are weighted; sample sizes are not. Range for continuous variables is 0–1.

Table 2

Correlations among Independent and Control Variables and Children's Outcomes at 24 Months

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Child's cognitive development (T2)	1.00														
2	Child's pos. social behavior (T2)	0.48 ***	1.00													
3	Child's neg. social behavior (T2)	−0.20 ***	−0.39 ***	1.00												
4	Mother risk (T1)	−0.25 ***	−0.22 ***	0.08	1.00											
5	Father risk (T1)	−0.16 ***	−0.15 ***	0.03	0.40 ***	1.00										
6	Child risk (T1)	−0.08 ***	−0.06 ***	0.01	0.15 ***	0.09 ***	1.00									
7	Mother Conflict	0.03	0.03	−0.06 **	−0.06 **	0.03	0.10 ***	1.00								
8	Father Conflict	0.03	0.07 ***	−0.02	−0.09 ***	0.00	0.00 **	0.46 ***	1.00							
9	Mother's Two Bag Support (T2)	0.37 ***	0.67 ***	−0.21 ***	−0.30 ***	−0.24 ***	−0.06 ***	0.04 *	0.08 ***	1.00						
10	Father's cognitive stimulation (T2)	0.20 ***	0.11 ***	−0.05 **	−0.14 ***	−0.10 ***	−0.09 ***	−0.06 ***	−0.07 ***	0.10 ***	1.00					
11	Spank child (T2)	−0.05 **	−0.04 *	0.04 *	−0.01	0.01	0.11 ***	0.08 ***	0.10 ***	−0.04 *	−0.19 ***	1.00				
12	Child is a boy	0.18 ***	0.12 ***	−0.07 ***	−0.01	−0.02	−0.03 *	−0.05 **	−0.04 *	0.05 **	0.03 *	−0.08 ***	1.00			
13	Child age (T2)	0.18 ***	0.05 **	0.03	0.07 ***	0.03 *	0.03 *	0.01	−0.05 **	0.00	0.03	−0.01	−0.01	1.00		
14	Mother's NCATS (T1)	0.19 ***	0.19 ***	−0.09 ***	−0.26 ***	−0.17 ***	−0.04 *	0.04 *	0.04 *	0.27 ***	0.10 ***	−0.06 ***	0.01	0.00	1.00	
15	Father's cognitive stimulation (T1)	0.10 ***	0.09 ***	−0.04 *	−0.09 ***	−0.06 ***	−0.03	−0.03	−0.04 *	0.11 ***	0.49 ***	−0.11 ***	0.02	0.04 *	0.08 ***	1.00
	Mean	128.17	9.24	1.30	1.51	1.52	0.63	5.08	5.16	4.49	7.34	1.00	1.48	24.28	34.93	6.83
	Standard deviation	10.39	2.14	0.71	0.80	0.79	0.31	1.61	1.59	0.87	2.09	1.11	0.50	0.99	4.45	2.22
	N	4150	3600	3600	4200	3950	4150	3550	4000	3600	4050	3300	4200	4200	3650	4150

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3

Unstandardized and Standardized Estimates for Direct and Indirect Associations in the Path Analysis

	Cognitive Development			Positive Social Behavior			Negative Social Behavior		
	B	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**β**
Direct Effects on DVs									
M Risk (T1)	−1.59	0.36	−0.12 ***	−0.06	0.06	−0.02	0.03	0.03	0.03
F Risk (T1)	−0.23	0.33	−0.02	0.11	0.06	0.04	−0.02	0.03	−0.02
C Risk (T1)	−0.04	0.09	−0.01	−0.01	0.02	−0.03	−0.01	0.01	−0.04
M-F Risk Interaction (T1)	−0.94	0.65	−0.03	−0.07	0.12	−0.01	0.00	0.05	0.00
F Conflict (T2)	0.05	0.14	0.01	0.04	0.03	0.03	0.01	0.01	0.02
M Conflict (T2)	0.10	0.15	0.02	0.00	0.03	0.00	−0.03	0.01	−0.07 *
F Cog. Stim. (T2)	0.70	0.11	0.14 ***	0.03	0.02	0.03	−0.01	0.01	−0.03
M Supportiveness (T2)	3.44	0.27	0.29 ***	1.62	0.05	0.66 ***	−0.17	0.02	−0.20 ***
Spanking (T2)	0.02	0.20	0.00	−0.01	0.04	−0.01	0.01	0.02	0.02
C Sex	3.36	0.39	0.16 ***	0.39	0.07	0.09 ***	−0.09	0.03	−0.06 **
C Age (T2)	2.04	0.21	0.19 ***	0.12	0.04	0.05 ***	0.02	0.02	0.03
M NCATS (T1)	0.14	0.05	0.06 **	0.00	0.01	0.00	−0.01	0.00	−0.03
F Cog. Stim. (T1)	−0.13	0.10	−0.03	0.00	0.02	0.00	0.00	0.01	0.00
Direct Effects on Endogenous Variables									
M risk (T1) → F cog. stim. (T2)	−0.15	0.06	−0.06 *	−0.15	0.06	−0.06 *	−0.15	0.06	−0.06 *
F risk (T1) → F cog. stim. (T2)	−0.03	0.07	−0.01	−0.03	0.07	−0.01	−0.03	0.07	−0.01
M-F risk (T1) → F cog. stim. (T2)	−0.02	0.02	−0.04	−0.02	0.02	−0.04	−0.02	0.02	−0.04
C risk (T1) → F cog. stim. (T2)	−0.35	0.12	−0.05 **	−0.35	0.12	−0.05 **	−0.35	0.12	−0.05 **
F conflict → F cog. stim. (T2)	−0.07	0.03	−0.05 *	−0.07	0.03	−0.05 *	−0.07	0.03	−0.05 *
M conflict → F cog. stim. (T2)	−0.04	0.03	−0.03	−0.04	0.03	−0.03	−0.04	0.03	−0.03
C sex → F cog. stim. (T2)	0.08	0.08	0.02	0.08	0.08	0.02	0.08	0.08	0.02
C age (T2) → F cog. stim. (T2)	0.04	0.04	0.02	0.04	0.04	0.02	0.04	0.04	0.02
M NCATS (T1) → F cog. stim. (T2)	0.02	0.01	0.03	0.02	0.01	0.03	0.02	0.01	0.03
F cog. stim. (T1) → F cog. stim. (T2)	0.45	0.02	0.47 ***	0.45	0.02	0.47 ***	0.45	0.02	0.47 ***

	Cognitive Development			Positive Social Behavior			Negative Social Behavior		
	B	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**β**
M risk (T1) → M supportiveness (T2)	−0.17	0.03	−0.15 ***	−0.17	0.03	−0.15 ***	−0.17	0.03	−0.15 ***
F risk (T1) → M supportiveness (T2)	−0.13	0.03	−0.12 ***	−0.13	0.03	−0.12 ***	−0.13	0.03	−0.12 ***
M-F risk (T1) → M supportiveness (T2)	−0.02	0.01	−0.06	−0.02	0.01	−0.06	−0.02	0.01	−0.06
C risk (T1) → M supportiveness (T2)	−0.04	0.06	−0.01	−0.04	0.06	−0.01	−0.04	0.06	−0.01
F conflict (T2) → M supportiveness (T2)	0.02	0.02	0.05	0.02	0.02	0.05	0.02	0.02	0.05
M conflict (T2) → M supportiveness (T2)	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02
C sex → M supportiveness (T2)	0.08	0.04	0.05 *	0.08	0.04	0.05 *	0.08	0.04	0.05 *
C age (T2) → M supportiveness (T2)	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01
M NCATS (T1) → M supportiveness (T2)	0.04	0.01	0.19 ***	0.04	0.01	0.19 ***	0.04	0.01	0.19 ***
F cog. stim. (T1) → M supportiveness (T2)	0.02	0.01	0.06 *	0.02	0.01	0.06 *	0.02	0.01	0.06 *
M risk (T1) → Spanking (T2)	−0.04	0.05	−0.03	−0.04	0.05	−0.03	−0.04	0.05	−0.03
F risk (T1) → Spanking (T2)	−0.01	0.05	−0.01	−0.01	0.05	−0.01	−0.01	0.05	−0.01
M-F risk (T1) → Spanking (T2)	0.00	0.01	−0.01	0.00	0.01	−0.01	0.00	0.01	−0.01
C risk (T1) → Spanking (T2)	0.35	0.09	0.10 ***	0.35	0.09	0.10 ***	0.35	0.09	0.10 ***
F conflict (T2) → Spanking (T2)	0.06	0.02	0.08 **	0.06	0.02	0.08 **	0.06	0.02	0.08 **
M conflict (T2) → Spanking (T2)	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.03
C sex → Spanking (T2)	−0.14	0.05	−0.06 **	−0.14	0.05	−0.06 **	−0.14	0.05	−0.06 **
C age (T2) → Spanking (T2)	−0.01	0.03	−0.01	−0.01	0.03	−0.01	−0.01	0.03	−0.01
M NCATS (T1) → Spanking (T2)	−0.02	0.01	−0.06 *	−0.02	0.01	−0.06 *	−0.02	0.01	−0.06 *
F cog. stim. (T1) → Spanking (T2)	−0.05	0.01	−0.11 ***	−0.05	0.01	−0.11 ***	−0.05	0.01	−0.11 ***
M risk (T1) → F conflict (T2)	−0.10	0.06	−0.05	−0.10	0.06	−0.05	−0.10	0.06	−0.05
F risk (T1) → F conflict (T2)	0.17	0.06	0.09 **	0.17	0.06	0.09 **	0.17	0.06	0.09 **
M/F risk (T1) → F conflict (T2)	−0.05	0.02	−0.13 **	−0.05	0.02	−0.13 **	−0.05	0.02	−0.13 **
C risk (T1) → F conflict (T2)	0.08	0.13	0.02	0.08	0.13	0.02	0.08	0.13	0.02
M NCATS (T1) → F conflict (T2)	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02
F cog. stim. (T1) → F conflict (T2)	−0.04	0.02	−0.05 *	−0.04	0.02	−0.05 *	−0.04	0.02	−0.05 *
M risk (T1) → M conflict (T2)	−0.07	0.06	−0.04	−0.07	0.06	−0.04	−0.07	0.06	−0.04

	Cognitive Development			Positive Social Behavior			Negative Social Behavior		
	B	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**β**
F risk (T1) → M conflict (T2)	0.19	0.06	0.10 **	0.19	0.06	0.10 **	0.19	0.06	0.10 **
M/F risk (T1) → M conflict (T2)	−0.04	0.02	−0.11 **	−0.04	0.02	−0.11 **	−0.04	0.02	−0.11 **
C risk (T1) → M conflict (T2)	0.53	0.11	0.11 ***	0.53	0.11	0.11 ***	0.53	0.11	0.11 ***
M NCATS (T1) → M conflict (T2)	0.02	0.01	0.05	0.02	0.01	0.05	0.02	0.01	0.05
F cog. stim. (T1) → M conflict (T2)	−0.03	0.02	−0.04	−0.03	0.02	−0.04	−0.03	0.02	−0.04
Total Indirect Effects on DVs									
M risk (T1)	−0.70	0.13	−0.05 ***	−0.28	0.05	−0.02 ***	0.03	0.01	0.03 ***
F risk (T1)	−0.43	0.13	−0.03 **	−0.20	0.05	−0.07 ***	0.02	0.01	0.02 *
M-F risk (T1)	−0.08	0.03	−0.03	−0.03	0.01	−0.01	0.00	0.00	0.02
C risk (T1)	−0.31	0.23	−0.01	−0.07	0.09	−0.05	0.00	0.01	0.00
M conflict (T2)	0.01	0.06	0.00	0.01	0.02	0.01	0.00	0.00	0.00
F conflict (T2)	0.04	0.06	0.01	0.04	0.03	0.03	0.00	0.00	−0.01
M NCATS (T1)	0.14	0.02	0.06 ***	0.06	0.01	0.13 ***	−0.01	0.00	−0.04 ***
F Cog. Stim (T1)	0.38	0.06	0.08 ***	0.05	0.02	0.05 **	−0.01	0.01	−0.03

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Note. Standardized values less than .10 are considered small effects, values around .30 are medium effects, and values greater than .50 are large effects. Results are based on weighted analyses.