
Involvement Among Resident Fathers and Links to Infant Cognitive Outcomes

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Using a sample of resident fathers in the Early Childhood Longitudinal Study–Birth Cohort (9-month Father Study), this study examined how father involvement is associated with infant cognitive outcomes in two domains (babbling and exploring objects with a purpose). Results from a series of logistic regression models indicate that varied aspects of father involvement (cognitively stimulating activities, physical care, paternal warmth, and caregiving activities) are associated with a lower likelihood of infant cognitive delay. Two-way interaction models further indicate that father involvement is related to greater reductions in infant cognitive delay for male infants than for female infants and for infants with disabilities than for infants without. These findings point to the importance of considering fathers' roles in early infant outcomes. Early positive father–child interactions reduce cognitive delay.

Keywords: *infants; behaviors; father involvement; parenting; cognitive delay*

Although the role of fathers in family life has been receiving increasing attention, many aspects of fathers' interactions with infants, as well as their links to infant mental proficiencies, still remain unexplored. Available research on father involvement and infant cognitive outcomes still suffers

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several limitations (Marsiglio, Amato, Day, & Lamb, 2000). Some studies that cite evidence of a link between father involvement and infant cognitive outcomes have focused on deficits in children in father-absent families rather than on the direct influence of father involvement on such outcomes (Lamb, 1997). In addition, most analyses have not been conducted using large representative samples of diverse populations of fathers, instead using small, White middle-class samples of men, and data about fathers are often provided by mothers. Furthermore, most studies tend to focus on father involvement as a general construct, with little research examining the specific fathering behaviors that constitute men's interactions with children.

At the same time, studies measuring the cognitive abilities of infants have for the most part been conducted using small-scale, rare, convenience samples that are not nationally representative. For instance, many studies of infants involve select samples of babies born in a particular metropolitan area (Wilson, 1983), preterm infants (Rose & Wallace, 1985), or children with rare medical conditions (McGrath, Bellinger, Newburger, Wypij, & Rappaport, 2004). Information on the cognitive functioning in the first year of life represents an important policy debate, as these cognitive outcomes are precursors of later child outcomes, including motor outcomes, laying the building blocks for subsequent language development, higher thought processes, and language acquisition (Ejiri & Masatake, 2001). Moreover, the first year of life is a period marked by rapid advances in language and other symbolic competencies (Lamb, 1997), and an understanding of fathers' contributions during this phase is of paramount importance.

Given the shortcomings of previous research, this study has three objectives. Using a nationally representative sample of young children and their resident fathers in the Early Childhood Longitudinal Study–Birth Cohort (ECLS-B), this study will (a) examine whether father involvement is associated with two cognitive outcomes for infants (babbling and exploring objects with a purpose), (b) examine whether the association between father involvement and child cognitive outcomes differs by the gender of the child, and (c) examine whether the association between father involvement and infant cognitive outcomes differs by the disability status of the child. Analyses focused on resident fathers because the patterns and predictors of father involvement and forms of father involvement are structurally different for resident and nonresident fathers. In addition, the nonresident father sample of the ECLS-B suffered a low response rate (Nord et al., 2004).

Theoretical Framework

Researchers generally agree that there is no singular overarching theory of fatherhood (Day & Lamb, 2004). Rather, fatherhood research has relied on a number of varied theoretical frameworks, and the role of the father has been diversely conceptualized in light of numerous contextual factors, including father characteristics (e.g., age, ethnicity, education, employment status), relational factors (e.g., the coparental relationship), maternal characteristics (e.g., employment status, education), and child characteristics (e.g., age, gender; Rane & McBride, 2000). Our analyses will be informed by a theoretical framework of father involvement proposed by Lamb and colleagues (Lamb, Pleck, Charnov, & Levine, 1985), which defines father involvement as “the amount of time spent in activities involving the child” (p. 884). This framework identifies three critical dimensions of fathering: (a) father engagement, or direct interaction between a father and child; (b) accessibility, or the presence and availability of a father to the child (i.e., temporal and proximal positioning that would allow the child to interact if desired or necessary); and (c) responsibility, or the extent to which the father arranges for resources to be available to the child, including financial support, as well as organizing and planning for the child. This includes making plans and arrangements for care as distinct from the performance of the care. Lamb, Pleck, Charnov, and Levine’s (1987) theoretical framework of father involvement enables the study of various dimensions of father involvement rather than a vague overall assessment of time spent with children and is used to guide the present study.

Literature Review

Resident Father Involvement and Links to Infant Cognitive Outcomes

Fathers generally spend less time with their children than do mothers (Lamb, 1987), and when they do become actively involved, they do so in limited ways. Regrettably, however, the cumulative body of work on father involvement has relied solely on small select samples of White middle-class fathers. Recent trends emphasize a “new father” role that encourages active participation in children’s lives (Almeida, Wethington, & McDonald, 2001).

Several studies conducted with infants, using small middle-class samples of men, report an association between resident fathers’ involvement and infants’

cognitive outcomes (Pleck, 1997). Most suggest that fathers' direct interactions with children have been found to provide benefits to children's cognitive outcomes (Radin, 1981; Shannon, Tamis-LeMonda, London, & Cabrera, 2002). Involvement in direct caregiving activities such as playing with children and driving them to places may enhance resident fathers' self-confidence and competence in the parenting role (Almeida et al., 2001), and the amount of time fathers spend engaged with children has been linked to increases in parental warmth over time (Almeida & Galambos, 1991). A number of early studies with small samples (Radin, 1981) suggest that paternal involvement, particularly the nurturance that fathers provide for infants, has implications for children's intellectual outcomes that become evident during infancy and the preschool years. For example, in an early study of two-parent British families, Osborn and Morris (1982) found that resident fathers' involvement in four types of paternal care (looking after children when the mother was busy, taking children to nursery school, putting children to bed, and reading to children) was significantly related to children's performance on verbal IQ and cognitive ability.

In one study of resident fathers, interactions found as early as the first month of infancy, including playing, singing and talking to infants, putting infants to bed, changing diapers, feeding, and soothing infants, had implications for cognitive functioning 1 year later (Nugent, 1991). In another study of a small sample of children, Clarke-Stewart (1980) found that father-child talk was related to the child's early developmental quotients. Osborn and Morris (1982) also reported a link between paternal involvement and verbal IQ and children's performance on spatial motor tasks. Cumulatively, this body of evidence using small select middle-class samples of men (Billler & Lopez Kimpton, 1997) has found that positive father involvement is predictive of positive cognitive outcomes. Some studies have linked father involvement to boys' mastery motivation during the first year of life (Yarrow et al., 1984) and to better performance on the Uzgiris-Hunt Scales (Wachs, Uzgiris, & Hunt, 1971). Father-child talk has also been found to uniquely influence language outcomes in young children because men tend to use more imperative language, a more complex vocabulary, and more attention-getting phrases than do women (Lewis, 1997). Studies have shown that children who grow up without fathers often demonstrate decreased cognitive competence (Pedersen, Rubenstein, & Yarrow, 1979). Yet, other studies have failed to find an association between father involvement and children's cognitive outcomes (Hunter, McCarthy, MacTurk, & Vietz, 1987). Based on the existing body of research, we hypothesize that higher levels of involvement will be associated with positive cognitive outcomes.

Differences by gender. Although mixed, some evidence suggests that fathers are more involved with infant sons than with infant daughters. Fathers may be more involved with male infants as opposed to female infants for two reasons. First, a father may feel that he can identify more with a same-sex child, and second, there may be greater external pressure for fathers to serve as role models for boys (Bronte-Tinkew, Moore, Capps, & Zaff, 2006; Carlson & McLanahan, 2004). Early studies using small select samples have shown that fathers may better identify with and more quickly respond to changes in infant boys' affective states (Feldman, 2003). Some other studies show that fathers are more accessible to and responsible for infant sons than for infant daughters (Manlove & Vernon-Feagans, 2002), and although fathers and mothers are equally sensitive to infant sons, fathers are less sensitive than mothers are to infant daughters (Schoppe-Sullivan et al., 2006). On the other hand, some other studies suggest that fathers of infants and preschoolers are similarly involved in reading to and playing with children regardless of gender (Marsiglio, 1991). The evidence on the influence of such involvement by gender for infants is also inconsistent. Radin and Epstein (1975), in an early study of 180 preschoolers, found complex interactions between the sex of the child, the family's social class membership, and paternal nurturance on child IQ. Boys appeared to be more influenced than girls by the amount of paternal involvement but differentially in three social class groups. Another study found that for toddlers, sons' development is more influenced than daughters' development by father involvement (see Easterbrooks & Goldberg, 1984). Based on this literature, we anticipate that the association between father involvement and infant cognitive outcomes will likely differ by gender and will be stronger for boys than for girls.

Differences by disability status. Very few studies have focused on fathers and the ways in which they are involved with their children with special needs (Dollahite, 2004). What little is known suggests that father involvement with children with disabilities seems to vary depending on particular experiences, such as the nature of the child's disability and the father's parenting style (Young & Roopnarine, 1994). Many fathers of children with special needs report experiencing a number of significant barriers to involvement with their children, such as work and time conflicts and a tendency for healthcare workers to exclude fathers from participation in their children's healthcare (Moore & Kotelchuck, 2004). Fathers of children with disabilities may not experience the same levels of support that mothers receive because they are not typically thought of as caregivers and often

lack role models from whom to gain guidance about caring for children with disabilities (Davis & May, 1991; Moore & Kotelchuck, 2004). Despite these added challenges, many fathers are involved with their children who are disabled or ill (Dollahite, 2004), especially in the areas of playing, nurturing, discipline, and deciding on the use of services (Simmerman, Blacher, & Baker, 2001). Based on the limited existing literature, we anticipate that the association between father involvement and child cognitive outcomes will be stronger for children with special needs.

In sum, despite the breadth and consistency of findings regarding father involvement and child outcomes, most empirical studies have relied on small, White middle-class samples of fathers and use mothers' reports of father involvement. Few studies have examined the direct influence of fathers' involvement on child outcomes using large nationally representative samples. Moreover, a possible interaction between father involvement and child disability status has been all but ignored in prior research, and mixed findings have emerged with regard to gender. Our empirical examination will be instructive in addressing these gaps in the literature.

Additional Covariates Associated With Father Involvement

Although father involvement is likely to influence infant cognitive outcomes, additional father characteristics, mother characteristics, and child characteristics are also likely to influence both father involvement and cognitive outcomes. To better isolate the relationship between father involvement and child outcomes, our analyses control for these potentially confounding demographic and socioeconomic characteristics. Research on father's race/ethnicity has been found to be important yet has yielded inconsistent findings, with some studies suggesting that Black fathers are more engaged with their children than White fathers are, whereas other studies have found the opposite (Pleck, 1997). In general, studies have found that a father's age is either insignificantly or inversely related to involvement with children (Pleck, 1997). Being an immigrant father may also affect involvement, as stressors such as underemployment, unemployment, language barriers, shifts in identity roles, and barriers to services can affect parenting abilities. In addition, sociocultural beliefs about the roles and expectations of fathers may differ according to the norms in a father's native country (Shimoni, Este, & Clark, 2003). Some research has found that fathers with higher levels of educational attainment are more involved with their children (Nord, Brimhall, & West, 1997). Some studies suggest

that unemployed fathers spend more time with their children (for a review, see Pleck, 1997), whereas others have found that fathers who work longer hours are less involved with their children than are fathers who work fewer hours (NICHD Early Child Care Research Network, 2000). High levels of economic distress have been found to be associated with decreased levels of paternal involvement (see Pleck, 1997). Compared to married fathers, unmarried fathers may be less invested with children (Hofferth & Anderson, 2003). High levels of father involvement have been found to exist when parents have more positive mother–father relationships that enable men to identify more strongly with their roles as fathers and become more actively involved in parenting (Coiro & Emery, 1998). Incarceration and criminal activity can dramatically change fathers' role investments and levels of involvement with children (Arditti, Acock, & Day, 2005), affecting the maintenance of positive paternal identities and damaging relationships with children (Dyer, 2005). Men who identify strongly with being a father and who are committed to the role are more likely to be actively involved with and invested in children's lives (Bronte-Tinkew, Carrano, & Guzman, 2006). Illness presents unique challenges that may disrupt a father's ability to perform the functions of his role and force him to decrease the time and energy spent attending to and being involved with children (Bronte-Tinkew, Moore, Matthews, & Carrano, 2007; Helseth & Ulfsaet, 2005). Although some researchers have found that religious membership and frequent church attendance are related to increased father involvement (Bollinger & Palkovitz, 2003), other studies suggest the opposite (Anderson, 2005). The number of children fathered may affect father involvement in one of two ways: As the number of children grows, a father may have less time during which he is able to interact with each child (Harris & Morgan, 1991), or conversely, as a man fathers additional children, he may better understand child development and child care responsibilities and feel more confident about his skills as a parent (Culp, Schadle, Robinson, & Culp, 2000).

Some research also shows that fathers are more involved with their children when mothers are older (Pleck, 1997). Higher levels of maternal education have been linked to higher levels of paternal involvement with children, although this has been inconsistent (Pleck, 1997). Maternal employment has been linked to higher levels of paternal involvement (Pleck, 1997). Furthermore, fathers have been found to increase their levels of involvement when mothers work more hours (NICHD Early Child Care Research Network, 2000). Some studies indicate that there are differences between biological fathers and nonbiological fathers in both paternal role expectations and fathers' parenting behavior, with nonbiological fathers expected to be less

involved in the lives of children (Coleman, Ganong, & Cable, 1996). Some studies suggest that fathers have been found to be more involved with older children than with infants (Lamb, 1987), whereas other studies find the opposite (Pleck, 1997). Recent studies suggest that as children age, fathers become less involved in personal care, play, and companionship activities but more involved in achievement-related and social activities (Yeung, Sandberg, Davis-Kean, & Hofferth, 2001).

Method

Data Source

These analyses used data from the ECLS-B 9-month father survey. The ECLS-B is the first longitudinal study in the United States to track a nationally representative sample of children born in 2001 from infancy to the time they enter first grade to assess prospectively their experiences in a variety of domains (Nord et al., 2004). The sample consists of 10,000 children born in 2001 (Nord et al., 2004). Data occur in five waves: at approximately 9 months after birth, 24 months, 48 months, entrance to kindergarten, and at first grade. It includes oversamples of important populations such as Asians and American Indians, low to moderately low birth weight infants, and twins. The primary modes of data collection are in-person interviews and direct child assessments that occur during home visits. Information on children is also drawn from birth certificates and from interviews with the child's parents, child care providers, and teachers. The ECLS-B resident father component includes the father who lives in the same household as the sampled child. Resident fathers are asked about their attitudes and behaviors, including the quality and quantity of their involvement with their children. At each data collection point, resident fathers are asked to complete a 20-minute self-administered questionnaire.

Resident father sample. At the completion of the 9-month data collection, there were approximately 6,270 completed questionnaires from resident fathers of the total number of 6,949 fathers who completed a survey in the base year collection. The resident father was identified as the spouse or partner of the respondent to the parent interview, and the vast majority (98%) was the child's biological father. Other persons meeting the criteria to be included as resident fathers were stepfathers, adoptive fathers, or foster fathers, provided that they were identified by the primary respondent to the parent interview. The response rate of resident fathers in the 9-month data collection wave was 76.1% (Nord et al., 2004).

Sample for analysis. Our analytical sample is restricted to those resident fathers (both biological and nonbiological) in the 9-month wave of the study who provided complete responses to questions for our variables of interest ($N = 6,270$). All children from whom data were collected at the 9-month survey were included for analyses. These children ranged in age from 8 months to 11 months ($M = 10.5$, $SD = 3.8$). The resident father was identified as the spouse or partner of the respondent to the parent interview, and in the majority of cases (98%) he was the child's biological father. Other persons meeting the criteria to be included as resident fathers were stepfathers, adoptive fathers, or foster fathers, provided that they were identified by the primary respondent to the parent interview. Table 1 provides further details of the sample of resident fathers. Because the fathers who completed questionnaires are likely to be those who are highly involved with their families, it should be noted that the ECLS-B may overrepresent married fathers and fathers with strong attachments to children and underrepresent fathers who are less involved in their children's lives at an early age. In addition, given that many of these fathers live in intact families, our sample may overrepresent involved resident fathers (Nord et al., 2004).

Dependent Variables

Cognitive outcomes. We examine children's cognitive outcomes in two of five proficiencies using the Bayley Short Form—Research Edition (BSF-R; Nord et al., 2004), a shortened version of the Bayley Scales of Infant Development—Second Edition (BSID-II; Bayley, 1993). This is a standardized assessment of mental outcomes status for children from birth to 42 months of age (Nord et al., 2004). Five proficiencies (skills) are measured in the ECLS-B to provide a means of distinguishing status in specific skills within a content area. The five proficiencies for early mental skills that were measured in the 9-month study correspond to exploring objects (e.g., reaching for and holding objects), exploring objects with a purpose (e.g., trying to determine what makes the ringing sound in a bell), babbling, early problem solving (e.g., when a toy is out of reach, using another object as a tool to retrieve the toy), and communicating with words. A child's score is reported as a proficiency level, ranging from 0 to 1 in each of the five sections. For the purpose of these analyses, we examine how father involvement is linked to two of these five proficiencies, specifically *babbling* and *exploring objects with a purpose*. The other three of the five proficiencies were not examined because almost 100% of children in the 9-month sample had in some cases achieved or not achieved these developmental

(text continues on page 1223)

Table 1
Descriptive Statistics for Variables Used in the Analysis, Early Childhood Longitudinal Study–Birth Cohort 9-Month Father Survey (N = 6,270)

	Mean or Percentage	Standard Deviation	Range	α
Independent variables				
Father engagement	3.9	3.35	0-9	.64
Cognitively stimulating activities	11.9	0.96	0-15	.87
Physical care	9.6	3.34	0-10	.87
Warmth	8.7	2.20	0-16	.73
Nurturing activities	10.3	3.59	0-20	.72
Caregiving activities				
Fathers' sociodemographic characteristics				
Race				
Non-Hispanic White	63%	10.96	0-1	
Non-Hispanic Black	8%	6.25	0-1	
Hispanic	23%	9.58	0-1	
Other Race	5%	5.13	0-1	
Age	31.6	1.49	16-73	
Citizenship status				
U. S. citizen	84%	1.50	0-1	
Non-U.S. citizen	16%	2.60	0-1	
Educational status				
Less than high school	22%	9.34	0-1	
High school or GED	22%	9.46	0-1	
More than high school	56%	11.28	0-1	
Employment status				
Full-time	86%	7.95	0-1	
Part-time	5%	4.88	0-1	
Looking for work	3%	4.15	0-1	

(continued)

Table 1 (continued)

	Mean or Percentage	Standard Deviation	Range	α
Not in labor force	6%	5.39	0-1	
Poverty status				
Below poverty line (100%)	17%	8.40	0-1	
Above poverty line	84%	6.10	0-1	
Marital status				
Married to the mother of the child	83%	8.60	0-1	
Not married to mother of child	17%	8.00	0-1	
Other father characteristics				
Relationship quality				
Not happy	2%	3.00	0-1	
Happy	28%	10.21	0-1	
Very happy	70%	10.40	0-1	
Spent time in jail or prison	16%	8.25	0-1	
Fathers' perceptions of the role of a father	18.0	5.80	0-21	
Health status				
Poor health	6%	5.50	0-1	
Good health	94%	2.40	0-1	
Religious activities				
Attend religious services all of the time	35%	10.80	0-1	
Never attend religious services	22%	9.40	0-1	
Attend church some of the time	43%	11.30	0-1	
Number of children fathered				
Number of biological children fathered	2.4	1.33	1-10	

(continued)

Table 1 (continued)

	Mean or Percentage	Standard Deviation	Range	α
Mother's characteristics				
Age	29.2	13.40	15-52	
Educational status				
Less than high school	23%	9.49	0-1	
High school or GED	21%	9.17	0-1	
More than high school	57%	11.26	0-1	
Employment status				
Full-time	31%	10.55	0-1	
Part-time	21%	9.21	0-1	
Looking for work	6%	5.21	0-1	
Not in labor force	42%	11.23	0-1	
Child characteristics				
Biological status				
Biological child	98%	3.05	0-1	
Nonbiological child	2%	1.10	0-1	
Child gender				
Male	52%	2.60	0-1	
Female	48%	1.30	0-1	
Disability status				
Disability	7%	5.69	0-1	
No disability	93%	3.40	0-1	
Dependent variables				
Babbling	60%	-	0-1	
Exploring objects with a purpose	92%	-	0-1	

Note: Due to rounding, categories may not sum to 100%.

milestones. In addition, we did not use the composite mental proficiency score because of our interest in determining the particular components underlying the mental test score that were associated with the various aspects of father involvement.

Babbling. Babbling assesses communication through diverse nonverbal sounds and gestures, for example, vowel and vowel–consonant sounds, gesturing for an object, and jabbering (Nord et al., 2004). The onset of babbling represents an important outcome milestone that infants typically acquire around 6 months of age and has been shown to be an important precursor of later cognitive, linguistic, and motor outcomes (Masataka, 2001) and an important cognitive process that enables infants to lay the building blocks for subsequent language outcomes (Ejiri & Masatake, 2001).

Exploring objects with a purpose. Exploring objects with a purpose refers to children's purposeful exploration of objects; that is, the child touches and works with objects for a reason. Exploring objects with a purpose is an important precursor of later outcomes because it helps infants to gain an understanding of the world and their place in it. This exploration involves reflexive and random exploration, and through the exploration of objects, babies develop object permanence, or the understanding that objects continue to exist even if they are out of sight. Object permanence is a crucial cognitive outcome that enables babies to use mental representation to think about things that are not immediately present, which is essential to the outcomes of higher thought processes and language acquisition (Piaget, 1952).

For both of these outcome domains, proficiency probabilities provide information about whether children have reached key milestones. The probability scores range from 0 to 1 and are averaged to produce estimates of mastery rates (Nord et al., 2004). For each of these outcomes (babbling and exploring objects with a purpose), children's proficiency scores were treated dichotomously—in the delayed range (i.e., a negative cognitive outcome) versus within normal limits. Children achieving the milestone for babbling were coded 1 (*babbling*), whereas those who did not were coded 0 (*not babbling*). With respect to babbling, 60% of children achieved this milestone, and 40% did not. Similarly, children achieving the milestone for exploring objects with a purpose were coded 1 (*exploring objects with a purpose*), whereas those who did not were coded 0 (*not exploring objects with a purpose*). With respect to exploring objects with a purpose, 92% of children achieved this milestone, and 8% did not.

Independent Variables

Father involvement. The father involvement measure includes five constructs that capture cognitively stimulating activities, physical care, warmth, nurturing activities, and caregiving activities. We created a composite measure of father involvement by standardizing 19 items from three separate questions (so they are measured at the same point on the index with similar variances). The three questions totaling 19 items asked about (a) the frequency with which fathers engaged in a typical week in the following 4 activities with infants: read books, tell stories, sing songs, and run errands, with response categories ranging from *not at all* to *everyday*; (b) the frequency with which fathers engaged in the past month in the following 10 activities with infants: changing diapers, preparing meals and bottles, feeding the child, playing peekaboo with the child, holding the child, tickling the child, putting the child to sleep, washing or bathing the child, taking the child outside for a walk, and dressing the child, with response categories ranging from *not at all* to *more than once a day*; and (c) how often the father ever did the following 5 activities with the child: get up with the child during the night, soothe the child when upset, take the child to the doctor, stay home with the child when he or she is ill, and take the child from the sitter or day care center. Response categories ranged from *never* to *always*.

Factor analyses with varimax rotation were then performed to investigate the underlying structure of the 19 items. It was decided a priori that items with a factor loading of .70 or greater on a principal component and less than .30 on any other factor would be considered part of an orthogonal construct. Eigenvalues and scree plots were examined to determine the optimum number of components to rotate. The analysis yielded a five-factor solution (cognitively stimulating activities, caregiving activities, paternal warmth, nurturing activities, and monitoring or supervising activities). Of the original 19 items, 3 items did not load on to any factor; these were play peekaboo, put the child to sleep, and take the child from the sitter or day care center. Reliability estimates indicated that Cronbach's alpha coefficients (a measure of reliability, reflecting the weighted average correlation among all items in the created scales, or internal consistency) for each scale exceeded .64. Tests of association conducted between the created dimensions of father involvement and family characteristics confirmed the validity of the father involvement domains. Analyses showing the factor loadings for the indexes that comprise the father involvement construct, as well as the correlations between the various components of the father involvement constructs, are available on request.

Cognitively stimulating activities. Cognitively stimulating activities consisted of three items that asked the father about the frequency with which he read, told stories, and sang songs to the child. Scores range from 0 to 9, with higher scores indicating more involvement in cognitively stimulating activities ($M = 3.96$, $\alpha = .64$).

Physical care. Physical care consisted of three items that asked the father about the frequency with which he changed diapers, prepared meals and bottles, and fed the child. Scores range from 0 to 15, with higher scores indicating more involvement in caregiving activities ($M = 11.86$, $\alpha = .87$).

Paternal warmth. Warmth was measured using two items that asked the father about the frequency with which he held the child and tickled the child. Scores range from 0 to 10, with higher scores indicating greater warmth ($M = 9.69$, $\alpha = .87$).

Nurturing activities. Nurturing was measured using four items that asked the father about the frequency with which he woke with the child at night, soothed the child when he or she was upset, remained at home with the child when ill, and took the child to the doctor. Scores range from 0 to 16, with higher scores indicating more involvement in nurturing activities ($M = 8.72$, $\alpha = .73$).

Caregiving activities. Caregiving was measured using four items that asked the father about the frequency with which he would wash the child, take the child for a walk, dress the child, and take the child along on an errand. Scores range from 0 to 20, with higher scores indicating more involvement in supervision and monitoring activities ($M = 10.34$, $\alpha = .72$).

Control Variables

Fathers' sociodemographic characteristics. We include a variety of self-reported measures of fathers' sociodemographic characteristics. Demographic covariates include categorical variables, each represented as a set of dummy variables for fathers' race (non-Hispanic White, non-Hispanic Black, Hispanic, or other), citizenship status (U.S. citizen or non-U.S. citizen), educational attainment (less than high school, high school or GED, or more than high school), employment status (working full-time, working part-time, looking for work, or not in the labor force), and poverty status (at or less than 100% of the poverty line or above the poverty line). Age was measured as a continuous variable.

Other father characteristics. We include a variety of self-reported measures of other father characteristics. These include dummy variables for father–mother relationship quality (not happy, happy, or very happy); whether the father had ever spent time in jail, prison, or other correctional institution (served time or did not serve time); paternal health status (poor or good); religious activity (no religious involvement, some religious involvement, or frequent religious involvement); and marital status (separated or divorced, married, never married, or cohabiting). We also include a continuous measure of the father’s perception of the importance of his role. We created a seven-item index of father’s agreement with regard to views on the following: it being essential for the child’s well-being that fathers spend time playing with their children; it being difficult for men to express affectionate feelings toward babies; a father should be as heavily involved as the mother in the care of the child; the way a father treats his baby has a long-term effect on the child; the activities that a father does with his child do not matter, what matters is that he provides for them; one of the most important things that a father can do is to give the mother encouragement and emotional support; and all things considered, fatherhood is a highly rewarding experience. For these items, fathers indicated whether they *strongly agreed* (0), *agreed* (1), *disagreed* (2), or *strongly disagreed* (3). We reverse coded some of the items and created an index of perceptions of the role of the father ranging from 0 to 21 by adding scores from each of the seven items ($M = 17.87$, $\alpha = .63$). Higher scores indicate a more positive perception of the role as a father. We also included a measure of the number of biological children fathered, operationalized as a continuous variable.

Mother characteristics. We include a variety of self-reported measures of mothers’ sociodemographic characteristics from the parent survey. Demographic covariates include age, measured as a continuous variable. Additional categorical variables measured as dummy variables include educational status (less than high school, high school or GED, or more than high school) and employment status (working full-time, working part-time, looking for a job, or not in the labor force). We control for these to address the possibility that the father’s behaviors may reflect characteristics of the mother.

Child characteristics. We include a dummy variable indicating the sex of the child (male or female) and the biological status of the child (biological or nonbiological child of the father). Children with a disability were identified as those with a variety of moderate to severe physical and cognitive delays (including blindness, difficulty seeing, difficulty hearing or deafness, a cleft lip

or palate, a heart defect, failure to thrive, a problem with mobility or using legs to get around, a problem using arms or hands, Down syndrome, Turner's syndrome, spina bifida, or any other type of special needs or limitations). Children having one or more of these illnesses were coded as 1 (*with a disability*), whereas those without were coded 0 (*without a disability*).

Analytic Strategy

We examine the effects of father involvement on infant cognitive outcomes using logistic regression models (Allison, 1999). This is the appropriate statistical test for dichotomous dependent variables. In these models, the logistic regressions explore whether specific aspects of father involvement significantly predict the odds of a child being delayed in terms of babbling or exploring objects with a purpose. Results are interpreted in terms of odds ratios. For categorical variables, an odds ratio greater than 1 indicates an increased chance of an outcome occurring; those odds ratios less than 1 signify a decreased chance of an outcome occurring. An odds ratio of 1 means that the variable has no effect. For continuous variables such as scales, the odds ratio measures the change in the dependent variable per unit change in the variable. In such cases, we calculate the percentage change, $100(e^{\beta} - 1)$, in the odds for each 1-unit increase in the independent variable (Allison, 1999). We report odds ratios because, conceptually, odds ratios bear more social impact than the reporting of explained variance, which is the traditional metric of continuous regressions. Models are built using hierarchical regression. Finally, we add two-way interaction terms (gender and disability status) to the main effect models. Analyses are conducted using various sample weights to correct for the different probabilities of sample selection resulting from factors such as oversampling in the ECLS-B. In each model, the standard errors of the logistic coefficients are adjusted using a SUDAAN correction for the effects of the stratified clustered sample design of the ECLS-B.

Results

Descriptive Statistics

Table 1 presents weighted descriptive statistics (means and standard deviations) for all variables used in the analysis. In the sample, the majority of fathers were non-Hispanic White (63%), followed by Hispanic (23%), non-Hispanic Black (8%), and fathers of other races (5%). Fathers

ranged in age from 16 to 73, with a mean age of 31.6 years. The mothers of the children in our sample had a mean age of 29.2. Approximately half the children (52%) were male, and 48% were female. Fathers in the sample had on average 2.44 children. Nearly 7% of infants were identified as having a disability. Fathers were highly involved in some aspects of involvement and not as involved in other aspects. The mean of the scale for the cognitively stimulating activities (read, tell stories, and sing) was 3.9, with a range of 0 to 9. This suggests that the majority of fathers were not highly involved in such activities with their children. With regard to physical care (changing diapers, preparing meals, and feeding children), the mean of the scale was 11.9, with a range from 0 to 15. The high value of the mean suggests that fathers tend to be quite highly involved in such activities with their children. Fathers reported high involvement in warmth activities (holding and tickling children) with a reported mean of 9.6 on a scale with a range from 0 to 10. Fathers reported lower levels of involvement with regard to nurturing activities (waking with the child, soothing the child when upset, taking the child to the doctor, and staying at home with the child when sick). The mean of this index was 8.7 with a range of 0 to 16. Low levels of caregiving activities (washing the child, walking the child, dressing the child, and taking the child on errands) were also reported for resident fathers, the mean being 10.3 with a range of 0 to 20. With respect to infant cognitive outcomes, 60% of children achieved the milestone for babbling, and 40% did not; with respect to exploring objects with a purpose, 92% of children achieved this milestone, and 8% did not.

Multivariate Analyses

Question 1: Net of individual father characteristics, mother-level factors, and child-level factors, is father involvement associated with child cognitive outcomes (i.e., babbling and exploring objects with a purpose)?

Table 2 presents the results of the logistic regression analysis for two outcomes: babbling and exploring objects with a purpose. For each of these outcomes, children's proficiency scores were treated dichotomously—in the delayed range (i.e., a negative cognitive outcome) versus within normal limits. The results presented here estimate the additive effects of the explanatory variables on the likelihood of children having a negative cognitive outcome. Results are interpreted in terms of odds ratios.

Babbling. Model 1 of Table 2 shows that, consistent with prior research, positive father involvement in the domains of physical care, paternal warmth,

(text continues on page 1233)

Table 2
Logistic Regression Analysis for Variables Predicting the Associations Between
Father Involvement and Cognitive Outcomes Among Infants, Early Childhood Longitudinal
Study–Birth Cohort 9-Month Father Survey (N = 6,270)

Variable	Babbling		Exploring Objects With a Purpose	
	Model 1		Model 2	
	Odds Ratio	SE B	Odds Ratio	SE B
Father involvement				
Physical care	0.94****	0.00	0.98****	0.00
Paternal warmth	0.98****	0.00	0.97****	0.01
Nurturing activities	1.00	0.00	1.00	0.00
Cognitively stimulating activities	0.93****	0.00	0.96****	0.00
Caregiving activities	0.97****	0.00	0.98****	0.00
Father's sociodemographic characteristics				
Race				
(Non-Hispanic White)				
Non-Hispanic Black	1.13**	0.01	1.61**	0.01
Hispanic	1.07**	0.00	1.52*	0.01
Other race	1.10*	0.01	0.79	0.02
Age	1.01	0.00	1.00	0.00
Citizenship status				
(U.S. citizen)				
Non-U.S. citizen	0.77*	0.01	1.22*	0.02
Educational status				
(More than high school)				
Less than high school	1.16**	0.00	0.79	0.02
High school or GED	1.04*	0.00	1.17*	0.01
Employment status				
(Full-time)				
Part-time	1.12	0.01	1.15**	0.02

(continued)

Table 2 (continued)

Variable	Babbling		Exploring Objects With a Purpose	
	Model 1		Model 2	
	Odds Ratio	SE B	Odds Ratio	SE B
Looking	1.24*	0.01	1.15*	0.05
Not in labor force	1.21**	0.11	1.17**	0.02
Primary language (English)				
Non-English	1.12*	0.01	0.95	0.02
Poverty status				
(Above the poverty line: 100%)				
Below the poverty line	1.02*	-0.02	1.21****	0.01
Marital status				
(Married to mother of child)				
Not married to the mother of child	1.19**	0.00	1.21**	-0.02
Other father characteristics				
Health status				
(Good health)				
Poor health	1.22***	0.01	1.80***	0.11
Religious activities				
(Always attending religious activities)				
Never attends	1.12**	0.00	1.34**	0.11
Sometimes attends	1.11*	0.00	1.11	0.01
Relationship quality				
(Very happy)				
Fairly happy	0.67**	0.01	0.10**	0.08
Not too happy	1.02**	0.00	0.83**	0.01

(continued)

Table 2 (continued)

Variable	Babbling		Exploring Objects With a Purpose	
	Model 1		Model 2	
	Odds Ratio	SE B	Odds Ratio	SE B
Fathers' perceptions of the role of a father	1.03	0.00	0.86**	0.00
Criminal history (Father did not spent time in jail or prison)	1.20	0.00	0.71	0.01
Father spent time in jail or prison	1.19	0.00	0.61	0.01
Number of biological children fathered				
Child characteristics				
Biological status				
(Biological child)	1.29**	0.01	0.66	0.03
Nonbiological child				
Child gender				
(Male child)	1.22****	0.00	1.02	0.01
Female child				
Disability status				
(Nondisabled child)	1.05*	0.01	2.05*	0.01
Disabled child				
Mother's characteristics				
Age	1.01	0.01	1.04**	0.00

Table 2 (continued)

Variable	Babbling		Exploring Objects With a Purpose	
	Model 1		Model 2	
	Odds Ratio	<i>SE B</i>	Odds Ratio	<i>SE B</i>
Educational status (More than high school)				
Less than high school	1.02*	0.02	1.54*	0.01
High school or GED	0.88	0.03	1.35	0.01
Employment status (Full-time)				
Part-time	1.11**	0.01	0.97**	0.01
Looking	1.19*	0.01	2.05*	0.02
Not in labor force	1.33**	0.00	1.76**	0.01
Log likelihood (<i>df</i>)	31,971 (39)		31,971 (39)	

Note: Parentheses indicate the omitted or reference category.

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

cognitively stimulating activities, and caregiving activities reduces the likelihood of a negative cognitive outcome, controlling for fathers' sociodemographic characteristics, mother characteristics, and child characteristics. The odds of a negative cognitive outcome in terms of babbling are 7% lower for infants with fathers who engage in more cognitively stimulating activities, net of the effects of other variables (odds ratio [OR] = 0.93). Similarly, the odds of a negative cognitive outcome are 2% lower for infants with fathers who engage in more warm play (OR = 0.98), as opposed to those who do not, net of the effect of other variables. The odds of a negative cognitive outcome are 6% lower for children whose fathers are more involved in physical care (OR = 0.94) and are 3% lower for children whose fathers are more involved in caregiving activities (OR = 0.97), compared to children whose fathers are not involved in these activities. Surprisingly, the coefficient for nurturing activities was not significantly associated with the babbling outcome.

Additional covariates that are significantly associated with higher odds of a negative cognitive outcome in terms of babbling include being a father who is non-Hispanic Black, Hispanic, or of another race, compared to being non-Hispanic White (reference category); having a father with less than high school and high school or GED level of education, compared to more than high school level of education (reference category); looking for work and not being in the labor force, compared to having a full-time job (reference category); being a nonbiologically related child as opposed to a biologically related child (reference category); being a disabled child compared to being nondisabled (reference category); being a male child (compared to being a female child); having a mother with less than a high school education compared to more than high school level of education (reference category); having a mother with a part-time job, looking for work, and unemployed compared to having a mother with a full-time job (reference category); having a father who is not married to the mother of the child compared to a father who is married (reference category); and having a father living below the poverty line as opposed to above the poverty line (reference category). Covariates that are significantly associated with lower odds of a negative cognitive outcome with regard to babbling include having a father who is a non-U.S. citizen as opposed to a U.S. citizen (reference category) and being in a mother–father relationship rated as fairly happy compared with very happy (reference category). In sum, four domains of father involvement are positively associated with decreased odds of a negative cognitive outcome with regard to babbling: cognitively stimulating activities, warmth, physical care, and caregiving activities.

These are related but distinct aspects of father involvement and matter in different ways for infant cognitive outcomes.

Exploring objects with a purpose. Model 2 of Table 2 shows that, consistent with prior research, positive father involvement in the domains of physical care, paternal warmth, cognitively stimulating activities, and caregiving activities decreases the likelihood of a negative cognitive outcome net of sociodemographic controls. The odds of a negative cognitive outcome for infants in terms of exploring objects with a purpose are 4% lower for infants with fathers who engage in more cognitively stimulating activities, net of the effects of other variables (OR = 0.96). Similarly, the odds of a negative cognitive outcome in terms of exploring objects with a purpose are 3% lower for infants with fathers who engage in more warm play (OR = 0.97), as opposed to those who do not, net of the effects of other variables. The odds of a negative cognitive outcome are 2% lower for children whose fathers are more involved in physical care (OR = 0.98) and are 2% lower for children whose fathers are more involved in caregiving activities (OR = 0.98), compared to children whose fathers are not involved in these activities. As was the case with the babbling outcome, the coefficient for nurturing activities was also not a significant predictor of exploring objects with a purpose.

Additional covariates that are significantly associated with higher odds of a negative cognitive outcome in terms of exploring objects with a purpose include being non-Hispanic Black or Hispanic compared to being non-Hispanic White (reference category); having a father who is a non-U.S. citizen compared to being a U.S. citizen (reference category); having a father with a high school or GED level of education compared to more than high school (reference category); having a part-time job, looking for a job, or not being in the labor force compared to having a full-time job (reference category); living below the poverty threshold compared to above; having a father who is not married to the mother of the child compared to a father who is married to the mother of the child (reference category); being in poor health compared to good health (reference category); never attending religious activities compared to attending some of the time (reference category); having a child with a disability as opposed to a child without a disability (reference category); having an older mother compared to a younger mother; having a mother with less than high school level of education compared to more than high school (reference category); having a mother looking for work and not in the labor force compared to having a mother with a full time job (reference category).

Covariates that are significantly associated with lower odds of having a negative cognitive outcome include having a father with less than high school level education compared with more than high school (reference category); having a relationship that is rated fairly happy and not too happy compared to very happy (reference category); having a father with more positive perception of his role as a father as opposed to a less positive perception of his role; and having a mother with a part-time job as opposed to a full-time job (reference category).

Question 2: Net of individual father characteristics, mother-level factors, and child-level factors, do associations between father involvement and child cognitive outcomes differ according to the gender of the child?

Results reported in Table 3 (Models 2 and 4) for the babbling outcome indicate that the interaction term was significant for three of the five domains: physical care, paternal warmth, and cognitively stimulating activities. Table 3 (Models 1 and 2) results also indicate similar significant interaction terms for the exploring objects with a purpose outcome. These results suggest that the association between father involvement in these three domains is stronger for male infants than for female infants. The results of log likelihood tests between the models of direct effect and the models with interaction effects show that the interaction effect models do improve the fit of the data.

Question 3: Net of individual father characteristics, mother-level factors, and child-level factors, do associations between father involvement and child cognitive outcomes differ according to the disability status of the child?

Results reported in Table 3 (Models 1 and 3) show that for babbling, two interaction terms were significant: cognitively stimulating activities and physical care. Model 4 shows that for exploring objects with a purpose, three interaction terms are significant: paternal warmth, nurturing activities, and cognitively stimulating activities. These results suggest that the association between father involvement and child cognitive outcomes is stronger in some domains for children with a reported disability than for those without, controlling for fathers' sociodemographic characteristics, mother characteristics, and child characteristics. The results of log likelihood tests between the models of direct effect and the models with interaction effects also show that the interaction effect models do improve the fit of the data.

Table 3

Interaction Effect Logistic Regression Analysis of Father Involvement and Associations With Child Cognitive Outcomes, Early Childhood Longitudinal Study–Birth Cohort 9-Month Survey (N = 6,270)

Interaction Model	Babbling						Exploring Objects With a Purpose					
	Model 1		Model 2		Model 3		Model 4		Model 3		Model 4	
	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Disability status interaction model												
Father engagement	2.00	0.10	0.97***	1.83	0.10	0.94***	0.56	0.09	0.97***	-0.49	0.01	0.95**
Physical care	0.02	0.11	0.94**	-0.41	0.10	0.98***	0.24	0.08	1.10***	-1.51	0.02	1.10***
Paternal warmth	-0.06	0.12	0.99**	0.51	0.12	1.00	-0.70	0.06	0.99*	0.82	0.01	0.97*
Nurturing activities	-2.07	0.01	0.93***	-2.33	0.11	0.93***	-1.46	0.01	0.94**	-2.33	0.01	0.93**
Cognitively stimulating activities	-0.91	0.02	0.97**	-1.00	0.10	0.97***	0.45	0.02	0.97***	-1.08	0.01	0.95**
Caregiving activities												
Disability status (Nondisabled child)	12.81	0.01	1.05*				0.78	0.10	1.22*			
Disabled child												
(Father Engagement × Nondisabled Status)												
Physical Care × Disabled	3.12	0.02	1.10*				1.00	0.05	1.00			
Paternal Warmth × Disabled	-11.01	0.02	0.82				3.15	0.07	1.03**			
Nurturing Activities × Disabled	0.02	0.04	0.99				3.77	0.04	1.22*			
Cognitively Stimulating Activities × Disabled	1.30	0.02	1.10**				1.44	0.06	1.13*			
Caregiving Activities × Disabled	-5.89	0.03	0.81				-8.16	0.06	0.71			

(continued)

Table 3 (continued)

Interaction Model	Babbling				Exploring Objects With a Purpose			
	Model 1		Model 2		Model 3		Model 4	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Gender Interaction Model								
Child gender								
(Female child)								
Male child								
(Father Engagement × Female Child)	-0.66	0.10	1.22*				-31.83	0.10
Physical Care × Male Child	1.74	0.13	1.02**				5.00	0.03
Paternal Warmth × Male Child	2.17	0.18	1.02*				27.03	0.03
Nurturing Activities × Male Child	-1.86	0.01	0.97				-2.58	0.04
Cognitively Stimulating Activities ×								
Male Child	0.89	0.01	1.02**				2.51	0.03
Caregiving Activities × Male Child	-1.11	0.01	0.99				0.91	0.01
Log likelihood (<i>df</i>)	66,684 (39)		53,522 (39)			61,352 (39)	42,427 (39)	

Note: Parentheses indicate the omitted or reference category. Models include controls for father characteristics, mother characteristics, and child characteristics.

p* < .05. *p* < .01. ****p* < .001. *****p* < .0001.

Discussion and Conclusion

Father involvement and infant cognitive outcomes. We found that four domains of father involvement were consistently associated with a lower likelihood of negative cognitive outcomes (cognitively stimulating activities, warmth, physical care, and caregiving activities), net of sociodemographic controls. These are related, but distinct aspects of father involvement that matter in different ways for infant cognitive outcomes. We interpret this to mean that for children, resident father involvement matters for infant cognitive outcomes. Our finding that father involvement matters is consistent with previous research that shows that positive father involvement benefits children's cognitive development. Several researchers have shown that children benefit when their fathers are sensitively responsive and play active roles in childrearing (Lamb, 1997; Pleck, 1997) and is also confirmed in this nationally representative sample of children and their resident fathers. These associations between paternal behaviors and offspring outcomes have tended to be, on average, moderate rather than large, as is also the case in this study. Our results also confirm that father involvement is multidimensional and the importance of individual dimensions are varied in their implications for child well-being. Fathers may interact with young children in different ways and for different amounts of times, and our findings replicate a theme that has emerged in smaller samples that suggest that father engagement and play with infants is predictive of mental development and language abilities (Flouri & Buchanan, 2004).

Differences by gender. Consistent with our hypothesis, we found that the association between father involvement and infant cognitive outcomes was stronger for male infants as opposed to female infants, suggesting that father involvement is more protective of cognitive outcomes for infant boys as opposed to infant girls. Research examining the differential involvement of fathers with female children versus male children has been inconclusive, and findings generally vary by age of child. A number of analyses have demonstrated that fathers are more involved in caregiving activities and play activities with male infants than they are with female infants (Manlove & Vernon-Feagans, 2002); other studies have indicated that these variations in father involvement are most pronounced with older children (see Pleck, 1997). Our findings reinforce the point that fathers play a particularly important role in the lives of infant sons, with consequences for their cognitive outcomes, a finding also replicated using samples of older children (Bronte-Tinkew & Moore, 2006; Harris & Morgan, 1991). This finding

may reflect the fact that fathers may believe that they are better equipped with the appropriate knowledge and perhaps skills to be involved with their sons than with their daughters (Marsiglio, 1991) and that they are more comfortable interacting with sons. It may also reflect that some fathers may have more positive prenatal representations of sons than of daughters, and such a representation may be reflected in postbirth attachment styles that influence cognitive outcomes (Fonagy, Steele, & Steele, 1991).

Differences by disability. We found that the association between father involvement and infant cognitive outcomes varied by the disability status of the infant. The positive influence of father involvement on cognitive outcomes is stronger for children with special needs compared to those without. This indicates that father involvement is more protective of cognitive outcomes for infants with special needs compared to those without. Fathers play an important role in the lives of infants with special needs, and their influence is particularly important for children with such difficulties (Dollahite, 2004). These findings supplement recent findings that suggest that fathers of children with special needs are just as involved with their children as are fathers of children without special needs, and they are involved with decisions about children's care, playtime, discipline, and nurturing (Simmerman et al., 2001). Data demonstrating that fathers' engagement with children with special needs has positive links to cognitive development corroborate studies demonstrating that fathers' involvement is associated with enhanced functioning and development (Dubowitz, Black, & Cox, 2001).

Limitations. There are some limitations of this study that should be noted. Although the ECLS-B is longitudinal, data available are only from the first wave, so our sample for analyses is cross-sectional. As a result, we were not able to account for the reciprocal relationships among all father, mother, and family variables, and it is conceivable that our estimates of father involvement may have been overestimated because of our inability to account for temporal order selection effects. Although there were five proficiencies for early mental skills that were measured in the 9-month study for the purpose of these analyses, we only examined how father involvement is linked to two of these five proficiencies. In addition, we did not use the BSF-R composite mental score because we were interested in investigating the associations between varied domains of father involvement and the individual components underlying the composite mental test score. The study relied solely on fathers' reports of their involvement. Although

having father reports is a strength that is often missing in research, some studies identify discrepancies between mother reports and father reports, which may affect results (Coley & Morris, 2001). Although the ECLS-B provides a nationally representative sample of children, it is not a representative sample of fathers. The ECLS-B likely overrepresents married fathers and fathers with strong attachments to children and underrepresents fathers who are uninvolved in their children's lives at an early age. The data do not contain variables that would allow us to measure the possible negative associations of parents' own cognitive outcomes on infant outcomes. We derived low scores for our measure of father's involvement in cognitively stimulating activities, which may be due in part to the young age of the infants in our sample. It is likely that this measure may not be age appropriate for young infants, as parents may not be reading to children as young as 9 months. Moreover, we do not analyze these associations for nonresident fathers. Finally, because this is secondary analysis, we necessarily had to construct the father involvement measures from available items for our outcomes. Although the factor analysis identified several coherent scales, these scales tend to be short. Nevertheless, the measures seem to be quite robust.

Contributions. This study provides strong evidence of a link between positive paternal involvement and cognitive outcomes for infants, using data from fathers in a nationally representative sample of children. The ECLS-B is the first large, nationally representative sample with measures of mental functioning (a shortened version of the Bayley Scales of Infant Outcomes) for children age 1 year and younger. Our study explores the various facets of father involvement, noting that it is multidimensional in nature. Fathers also provided information about their own involvement with children, and cognitive outcomes are derived from direct assessments, reducing the likelihood of same-source bias. This study is also one of a few to allow for the measurement of multiple aspects of father involvement. The substantive analyses presented here suggest that the measures in the ECLS-B capture critical fathering behaviors that are influential in the lives of infants and that are robust predictors of important outcomes. Finally, our study considers the influence of father involvement on children with disabilities, a population often neglected in prior research.

Implications for future research. Future research on this issue would benefit from examining trajectories of father-child activities over time, as children and the constellation of activities in which fathers tend to be involved change. An understanding of the mediators or pathways through

which father involvement may work to influence child cognitive outcomes is well warranted, as is an examination of outcomes for nonresident fathers of young children.

Policy implications. Policy implications result from this study. Regarding fathering, our study provides continuing evidence that fathers are important to the well-being of very young children and suggests that any holistic policy or program to promote child and infant well-being should include fathers where and when feasible. At a policy level, these analyses document whether fathers shift the odds of a child being cognitively delayed and, if so, by how much. These analyses also have clinical and policy implications. At a clinical level, children who are cognitively delayed may be eligible to receive early intervention services, whereas children who are not may be ineligible. In sum, fathers matter for separate and related reasons. Fathers' involvement reflects both emotional and behavioral components.

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