Male Pregnancy Intendedness and Children's Mental Proficiency and Attachment Security During Toddlerhood*

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ABSTRACT

Using a sample of biological resident fathers and their children from the Early Childhood Longitudinal Study Birth Cohort (ECLS-B) 9- and 24-month surveys, (N = 5,300), this study examines associations and the direct and indirect pathways through which men's pregnancy intentions influence toddler's mental proficiency and attachment security. Findings indicate that unwanted and mistimed pregnancies for fathers have negative consequences for toddlers' mental proficiency and attachment security. Additionally, men's pregnancy intentions were found to work indirectly through lower prenatal behaviors and father engagement, and greater mother-father relationship conflict to negatively influence toddlers' mental proficiency. Men's pregnancy intentions also worked indirectly through greater relationship conflict and higher father involvement to influence attachment security.

Key words: Pregnancy Early Childhood Father-child relations Development or Outcomes

INTRODUCTION

Over the last two decades, significant attention has been paid to women's pregnancy intentions (i.e., attitudes about the wantedness of a pregnancy) (Pulley, Klerman, Tang, & Baker, 2002). A clear deficit exists in this existing body of research, however, which has primarily focused on mothers while ignoring the role of men's pregnancy intentions. Understanding the role of men's pregnancy intentions and their consequences is important for various reasons. First is the finding that the context within which a birth occurs may have implications for fathers' commitment and involvement over time (Bronte-Tinkew, Ryan, Carrano, & Moore, 2007). Second is the growing body of research suggesting a positive influence of fathers' involvement on child outcomes (Lamb, 1987; Parke, 2002), as recent research demonstrates that fathers' pregnancy intentions may affect infant wellbeing, beyond that of mothers' intentions (Korenman, Kaestner, & Joyce, 2002). Third, unintended childbearing (among women) has traditionally been linked to multiple dimensions of children's physical health, but has not focused on outcomes in other developmental domains (Axinn, Barber, & Thornton, 1998; Brown & Eisenberg, 1995), and while the main effects of negative pregnancy intentions have generally been found to be unfavorable for children, prior research has not thoroughly explored the role of other mediating family processes in influencing such outcomes.

In light of gaps in existing research, we use nationally representative longitudinal data from the Early Childhood Longitudinal Study Birth Cohort 9 and 24-month surveys to address two research questions: (1) Are men's pregnancy intentions associated with mental proficiency and attachment security outcomes for their young children during toddlerhood, and are these associations mediated by men's prenatal behaviors, the quality of the father-mother relationship and post-birth father involvement (accounting for mother's pregnancy intentions)?; and (2) Do associations between father's pregnancy intentions and children's mental proficiency and attachment security differ by mother's pregnancy intentions? We build on an existing body of research that has primarily focused on women by using nationally representative longitudinal data on children and their fathers to examine a fully articulated

model of the linkages between *male* pregnancy intentions and their implications for children's early mental proficiency and attachment security (while accounting for female pregnancy intentions).

We focus specifically on infancy and toddlerhood because these are the periods when children advance rapidly in language and other symbolic competencies and form their first relationships with caregivers (fathers and mothers). Our analyses also focus on resident fathers because the patterns and predictors of pregnancy intentions as well as father involvement are structurally different for resident fathers versus non-resident fathers. Moreover, measures of key family processes were not collected for nonresident fathers. By limiting our analyses to resident fathers therefore, we test whether or not father's pregnancy intentions have implications for child well-being even for fathers with the strongest commitment to their partners and children (accounting for mother's intentions). We also consider unwanted and mistimed births separately as studies that separate unwanted from mistimed pregnancies have found less negative outcomes associated with having a mistimed birth versus an unwanted birth (T. Joyce, Kaestner, & Korenman, 2000; Mohllajee, Curtis, Morrow, & Marchbanks, 2007; Santelli et al., 2003; Taylor & Cabral, 2002).

Theoretical and Conceptual Framework

These analyses will be informed by two theoretical frameworks – a *life course approach* that explains the timing and consequences men's fertility and family formation decisions, as well as a *family systems perspective* that explains men's interactions with partners and children in the context of the family.

The *life course* perspective as it relates to pregnancy intentions among males reflects processes that highlight the sequence of significant life events related to childbearing (Elder, 1998). The timing of the onset of fatherhood is a powerful organizer of the paternal role and an important life course transition that accounts for men's attitudes towards family formation. The life course perspective posits that the effects of life course transitions (such as the transition to a birth) can be understood only in the context of a system of relationships in which men live (Bengston & Allen, 1993). As such, the family context and

male-female relationships are the primary settings for males' fertility decisions and family formation attitudes. The life course perspective also posits that family members' lives are interdependent, emphasizing that parents' decisions (both fathers and mothers) and circumstances affect the well-being of all other family members, including their children (Elder, 1994).

The *family systems* perspective posits that the family is comprised of a number of sub-systems, including the father-mother dyad, the mother-child dyad, and the father-child dyad (McHale et al., 2002). Using this framework, the couple dyad is viewed as one subsystem in the family (Cox & Paley, 2003; McHale et al., 2002), and the quality of the couple relationship is associated with how mothers and fathers coordinate their efforts to deal with issues related to childrearing (Lindsey, Caldera, & Colwell, 2005). In addition, the father-child dyad has implications for child well-being as fathers' parenting and the father-child relationship exists within the context of a network of mutually interdependent relationships within the family (Parke & Buriel, 1998). From a family systems perspective, the fathers' perspective is salient because the level of joint decision making between fathers and mothers that constitutes decisions about childbearing and parenting implies that fathers' perceptions and attitudes influence the couple relationship and parent-child dyads, with consequences for the child and the family as a whole (Arditti & Kelly, 1994). Subjective assessments that both mothers and fathers may have about a pregnancy may affect the relationships that parents have with each other and how they interact with children after birth. These relationships all have implications for child wellbeing. Following both the life course and family systems frameworks, we consider fathers' prenatal behaviors, the father-mother relationship, and father involvement as pathways through which men's pregnancy intentions may influence child well-being. Based on both of these theoretical frameworks, Figure 1 shows the conceptual framework that guides the current analyses.

[Figure 1 about here]

LITERATURE REVIEW

Direct Associations between Pregnancy Intentions and Child Outcomes

Men's *pregnancy intentions* refer to men's feelings about the pregnancies of their partners. These pregnancies can either be intended (planned at the time of conception), mistimed (not wanted at the time of conception, but wanted eventually), or unwanted (not wanted at the time of conception or ever in the future). In keeping with the life course perspective, the point of the life course at which a pregnancy occurs may influence fathers' perceptions of whether a pregnancy is wanted or unwanted, and, given the interdependence of family members' lives and experiences, based on the family systems perspective, fathers' pregnancy intentions are likely to have consequences for their involvement with children, the adult couple relationship, co-parenting roles, and ultimately child well-being.

Prior research primarily focused on mothers' intentions suggests that not intending a pregnancy may not only be a significant predictor of future parental behavior (Joyce, Kaestner, & Korenman, 2000) but is also associated with more adverse child outcomes (Axinn, Barber, & Thornton, 1998). In particular, an unintended pregnancy for mothers has been linked to a host of negative child outcomes, and the observed "main effects" of having an unintended pregnancy as reported by mothers on child outcomes have been generally unfavorable (Baydar, 1995; Brown & Eisenberg, 1995; Sharma, Synkewecz, Raggio, & Mattison, 1994; Zuravin, 1991). Adverse effects have been found to be stronger for unwanted than for mistimed children, and may depend on both parents' pregnancy intentions (Korenman, Kaestner, & Joyce, 2005). The majority of this research on the effects of pregnancy intentions, however, has focused on women's intentions and infant health, with comparatively less attention being given to other developmental outcomes in the early childhood years. Empirical analyses that focus specifically on the role of men's pregnancy intentions on children's mental proficiency and attachment security have not been previously conducted. On the basis of the available research, we hypothesize the following:

Hypothesis 1: Men's positive pregnancy intentions (i.e., wanting or intending the pregnancy) will be *directly* associated with higher mental proficiency and higher attachment security for young children (net of mother's pregnancy intentions).

Indirect Associations between Pregnancy Intentions and Child Outcomes

The life course and family systems perspectives both emphasize the importance of the relationship context in which family transitions occur. The transition to a birth, and whether or not the birth was intended, is likely to affect aspects of a couples' relationship and also influence men's behaviors and their interactions with other family members. Based on these two theoretical frameworks and findings from prior research, we have identified several key pathways through which fathers' pregnancy intentions may influence child well-being. These include: 1) prenatal behaviors, 2) the father-mother relationship, and 3) father involvement. These pathways are neither mutually exclusive nor exhaustive and can operate simultaneously (Carlson & Corcoran, 2001).

Prenatal Behaviors as a Mediator

Men's prenatal behaviors are defined as activities with their partners during pregnancy (e.g., discussed the pregnancy, visited the doctor with partner for prenatal care, attended Lamaze classes), and with the child during and around the time of birth (i.e., present at child's birth, visited the child in the hospital, held the baby, established paternity). Male prenatal behaviors represent a potential *indirect* pathway through which resident men's pregnancy intentions may influence child outcomes (Carter & Speizer, 2005). First, men's pregnancy intentions may be directly linked to their levels of pre-natal involvement. If a pregnancy is unintended, men's levels of prenatal involvement are likely to be lower (Waller & Bitler, forthcoming). Reasons for feeling a pregnancy is too early may reduce fathers' investments as early as during pregnancy. These effects may be stronger for an unwanted pregnancy than a mistimed pregnancy. Some prior research indicates that men can negatively affect women's and children's health at the prenatal stages by not providing transportation or enough money for a health care visit, or not following a health care provider's treatment advice (Carter & Speizer, 2005; Sangi-

Haghpeykar, Mehta, Posner, & Poindexter, 2005). Some studies of married and unmarried fathers have found a positive association between male prenatal behaviors and partner's use of prenatal care (Sangi-Haghpeykar et al., 2005). Men may also encourage women to seek prenatal care and their support has been found to be positively associated with earlier initiation of and more adequate prenatal care (Gazmarian, Arrington, Bailey, Schwarz, & Koplan, 1999; Teitler, 2001) among nonresident couples.

Men's prenatal behaviors may also be directly linked to their later levels of involvement with children. Prenatal involvement on the part of fathers may be indicative of their positive perceptions of and commitment to the father role (Teitler, 2001), that fathers view themselves as important to their child's development, and that they have an interest in the child and the desire to become a father (Mann, 1995; Nicholson, Gist, Klein, & Standley, 1983). Fathers' prenatal behaviors may also indicate that fathers have a positive relationship with the mother (Lamb, 1981; Lamb, Thompson, Gardner, & Charnov, 1985; Nicholson, Gist, Klein, & Standley, 1983). These types of prenatal beliefs may be related to increased levels of postbirth father involvement. It may be that male involvement at the prenatal stages leads to early relationships with infants, and this may keep fathers more invested in children over time. One can only speculate given that the majority of the early literature on infant-parent relationships has been done with mothers, and often tends to focus on the consequences of early attachments for infants—not for fathers, or children in the first years of life. An empirical model that explores these linkages has yet to be tested.

Similarly, men's prenatal behaviors may also be directly linked to the father-mother relationship. Previous research corroborates the hypothesis that fathers are more likely to be involved with their children if the relationship with the child's mother is positive. For married resident fathers, the quality of the marital relationship predicts the frequency of paternal visits to hospitalized premature infants (Cox, Owen, Lewis, & Henderson, 1989). For unmarried parents, a conflicted relationship between the mother and father discourages positive father involvement, while an amicable relationship supports healthy father-child interaction (Coley & Chase-Lansdale, 1999; Danziger & Radin, 1990; Seltzer, 1991).

Male prenatal behaviors may also be directly associated with child outcomes; although, this association is only now beginning to be established. Generally, outside of attachment theory, there is little evidence concerning the direct links between male prenatal behaviors and child outcomes. It may be that fathers' sharing and involvement at the prenatal stages may facilitate or lead to positive child outcomes. At the same time, male prenatal behaviors may have no causal effects on child outcomes, especially in the first years of life as children age and given the trend of declining father involvement over time. Some growing evidence suggests that unmarried fathers' financial support of the mother during pregnancy is associated with a lower likelihood of children's low birth weight (Padilla & Reichman, 2001), which reduces the likelihood that children will experience physical and cognitive disabilities (Reichman, 2005), suggesting that men's prenatal behaviors may have more of a direct association with young children's mental proficiency compared to other developmental outcomes. Given the paucity of work on this subject, we explore whether prenatal behaviors represent an indirect pathway through which male pregnancy intentions influence child outcomes, and we hypothesize the following:

> *Hypothesis 2:* Male prenatal behaviors will *mediate* the association between pregnancy intentions and child outcomes. Males who exhibit positive pregnancy intentions will have more positive prenatal behaviors (be supportive during pregnancy and at birth), which will result in higher mental proficiency and more secure attachment for young children. Male prenatal behaviors may also work *indirectly* through father involvement or the father-mother relationship to influence outcomes for young children. Specifically, positive prenatal involvement will be associated with higher levels of postbirth father involvement and more positive father-mother relationships, which in turn will both be associated with more positive outcomes for young children.

The Father-Mother Relationship as a Mediator

The family systems perspective emphasizes the importance of the couple relationship in shaping other family relationships. As such, it is not unlikely that the father-mother relationship may mediate the association between pregnancy intentions and child outcomes in a number of ways – through *direct*

associations with child outcomes, or *indirectly* through father engagement. Fathers' pregnancy intentions may be directly linked to how fathers interact with their partners. Recent work suggests that women are more likely to report wanting a pregnancy if their relationship is of higher quality, a concept which includes partner communication, sexual fidelity, and relationship satisfaction (Wilson & Koo, 2006). However, some research also suggests that individuals in conflicted relationships may plan pregnancies in an attempt to improve the relationship (Hoffman & Manis, 1979), suggesting that parents may report wanting a pregnancy even if they have higher levels of relationship conflict. Work done with married couples suggests that after an unplanned pregnancy, both partners' marital satisfaction is lower (Cox, Paley, Burchinal, & Payne, 1999), and parents who have a birth resulting from an unplanned pregnancy are more likely to have higher levels of relationship conflict and unhappiness (The National Campaign to Prevent Teen and Unplanned Pregnancy, 2008). These findings suggest a direct link between pregnancy intentions and father-mother relationship quality following a birth.

The quality of the couple relationship may also be linked to fathers' interactions with infants following a birth. Findings from previous research suggest that the transition to parenthood is even more challenging for men than for women because men lack the reinforcement of the physical pregnancy and are often limited to serving as support people to their pregnant mate. New fathers, whether married or unmarried, often lack models and guides for how to be an involved father (Jordan, Stanley, & Markman, 1999). Mothers play a key role in either bringing their mates into the experience of pregnancy and parenting or limiting their involvement to a supportive role (or perhaps to no role).

Similarly, the quality of the mother-father relationship may have direct links to child outcomes. A sizable body of work on married couples has found that a positive father-mother relationship is generally associated with children's cognitive, social and emotional, and physical wellbeing (Frosch, Mangelsdorf, & McHale, 2000; Howes & Markman, 1989; Katz & Gottman, 1996). In contrast, marital conflict and hostility have been found to be associated with poorer child outcomes and child functioning (Gable, Belsky, & Crnic, 1992; Grych & Fincham, 1990; Howes & Markman, 1989; Katz & Gottman, 1996), and

these effects may persist over time (Frosch et al., 2000). An indirect association may also exist between father-mother relationship quality and child outcomes. Relationship conflict may "spill over" or "carry over" into the parent-child relationship, leading to less sensitive and responsive parenting and in turn affecting children's social and emotional well-being (Erel & Burman, 1995; Katz & Gottman, 1996). Levels of father involvement in shared activities with their children, including cognitively stimulating activities, may also be lower if the father-mother relationship is of poorer quality (Lamb, 1997; Levine Coley & Hernandez, 2006), which is likely to impair children's early cognitive development (compared to other developmental outcomes). On the basis of the available research, we hypothesize the following:

> *Hypothesis 3:* The father-mother relationship will *mediate* the association between pregnancy intentions and child outcomes. Males who exhibit positive pregnancy intentions will have more positive father-mother relationships post birth, which will result in higher mental proficiency and more secure attachment outcomes for young children. The father-mother relationship may also work *indirectly* through father involvement to influence outcomes for young children. Specifically, a positive father-mother relationship will be associated with higher levels of postbirth father involvement, which will be associated with higher mental proficiency and attachment security for young children.

Father Involvement as a Mediator

Men's postbirth father involvement is defined as their engagement with children, and is one element of a three-dimensional framework of father involvement developed by Lamb et al., 1987 (Lamb, 1986, 1997b; Lamb, Pleck, Charnov, & Levine, 1987). *Engagement* measures the extent to which fathers engage in direct contact and shared interactions with their children in the context of caregiving, play or leisure (Lamb, 1997b). Father engagement may represent an indirect link through which men's pregnancy intentions may influence child outcomes as levels of father involvement are likely to be a function of how a father perceives a birth. To date, the evidence base regarding the link between male pregnancy intentions and father involvement is scant, but for two exceptions (Bronte-Tinkew, Ryan et al., 2007;

Rogers & Speizer, 2007). For the most part, the bulk of this research has focused on female pregnancy intentions and women's parenting post birth. Men's pregnancy intentions may have implications for their levels of involvement with children and for how they manage their paternal roles (Bronte-Tinkew, Ryan et al., 2007; Parke, 2002). In short, unintended births or a refusal to acknowledge or support a pregnancy may adversely affect the quantity and quality of a father's involvement in a child's later life (Brown & Eisenberg, 1995). Parents who do not want a child are less likely than other parents to invest their time and emotional resources in that child (Berlin, Cassidy, & Belsky, 1995; Zuravin, 1991). Unintended fatherhood may adversely affect the quantity and quality of a father's involvement in the child's life as men may feel a reduced sense of responsibility for children resulting from unplanned births because they typically feel that they have less control over contraception and birth planning than do women (Bachrach & Sonenstein, 1998). Given this reduced sense of responsibility, men may invest less in their offspring (Brien & Willis, 1997; Federal Interagency Forum on Child and Family Statistics, 1998).

A large body of research also provides evidence of a direct link between father involvement and child well-being, suggesting that positive father involvement is associated with positive outcomes for children (Bronte-Tinkew, Carrano, Horowitz, & Kinukawa, 2008; Lamb, 1997a; Lamb, Hwang, Ketterlinus, & Fracasso, 1999). Resident fathers' sensitivity, and nurturance have been found to predict children's problem solving, literacy and mental proficiency at 2 and 3 years of age (Black, Dubowitz, & Starr, 1999; Gleason, 1975; Perlmann & Gleason, 1993; Shannon, Tamis-Le Monda, London, & Cabrera, 2002). Similarly, studies that have examined the influence of father involvement on social and emotional development have emphasized the influence of fathers on sex-role identification, and have linked father absence to behavioral problems and social competence (Black et al., 1999; Chuang, Lamb, & Cabrera, 2002; Clarke-Stewart, 1980; Lewis, Feiring, & Weinraub, 1981). These findings confirm a direct link between father involvement and child outcomes. On the basis of these earlier studies, we hypothesize the following:

Hypothesis 4: Father involvement will *mediate* the association between pregnancy intentions and child outcomes. Specifically, fathers who wanted the birth will be more involved with their children after birth, which in turn will be associated with higher mental proficiency and higher attachment security among young children.

Differences in the Influence of Fathers' Pregnancy Intentions by Mothers' Pregnancy Intentions

Do the effects of fathers' pregnancy intentions on child outcomes differ by mothers' pregnancy intentions? Some preliminary studies suggest that parents' joint pregnancy intentions may influence mothers' prenatal behaviors such as initiation of prenatal care or postnatal behaviors such as the duration of breastfeeding both of which are linked to infant health (Korenman et al., 2002; Sangi-Haghpekyar et al., 2005), but no prior studies have examined how parents' agreement or disagreement in pregnancy intentions directly influences child outcomes such as mental proficiency or attachment security. Given the negative consequences for children of having one parent that did not intend the pregnancy, it is likely that children are at an even greater risk for negative outcomes if both parents (fathers and mothers) did not intend the pregnancy. A limitation of prior research that examines agreement or disagreement in mothers' and fathers' reports of pregnancy intendedness, however, is that these studies have used maternal reports of fathers' pregnancy intentions, rather than fathers' reports of their own intentions. We examine differences in association between fathers' pregnancy intentions and children's mental proficiency and attachment security according to mothers' intentions and using father reports, and on the basis of available evidence, hypothesize the following:

Hypothesis 5: The effects of fathers' pregnancy intentions on child mental proficiency and attachment security will differ by mother's pregnancy intentions. Specifically, the negative effects of fathers' mistimed or unwanted pregnancy will be stronger if mothers also report a mistimed or unwanted pregnancy as opposed to if mothers intended or wanted the pregnancy.

The Influence of Additional Socio-demographic Factors

Although male pregnancy intentions may influence child outcomes, additional father characteristics, mother characteristics, household characteristics, and child characteristics are also likely influences on both pregnancy intentions and child outcomes. To better isolate the relationship between intentions and child outcomes, we account for these potentially confounding factors.

Father Characteristics. We include father's age as a control variable because older individuals report fewer mistimed or unwanted pregnancies (Pulley et al., 2002), and father's age has been found to be either insignificantly or inversely related to involvement with children (Pleck, 1997). Father's race/ethnicity is included because some studies of both resident and nonresident fathers suggest differences in father involvement (Pleck, 1997; King, Harris, and Heard 2004), and racial/ethnic differences in the likelihood of an unintended, unwanted, or mistimed pregnancy (Zabin, Huggins, Emerson, & Cullins, 2000). We consider paternal education and employment status as fathers with higher levels of education are more involved with their children (Nord & Brimhall, 1997) and less educated individuals report having more unintended pregnancies (Joyce, Kaestner, R., & Korenman, S., 2000). We include father's employment status because some studies suggest that employed resident fathers spend less time with their children and feel less strongly about childrearing practices (Easterbrooks & Goldberg, 1985), and, similar to paternal education, employment may be associated with lower rates of unintended pregnancy among men (Hellerstedt, Pirie, Lando, Curry, & al., 1998).

We include measures of father's psychological wellbeing because some prior research of resident fathers suggests that depressed males tend to have lower levels of father-child engagement (Bronte-Tinkew, Moore, Matthews, & Carrano, 2007). Additionally, men facing unintended pregnancies have poorer mental health, although this association may be reciprocal (Bouchard, 2005). We also include men's perceptions of the father role as 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). We consider a measure of fathers' marital status because,

compared to unmarried resident fathers, married fathers have been found to be more positively involved with children (Hofferth & Anderson, 2003) and are more likely to report that a pregnancy was intended (Zabin et al., 2000).

Mother Characteristics. We account for mothers' pregnancy intentions because the effect of pregnancy intentions on outcomes may differ for mothers and fathers (Korenman et al., 2002). Mother and fathers' pregnancy intentions may also be positively correlated, so that the effect of fathers' pregnancy intentions on his parenting behaviors may be partly due to mothers' intentions. We also account for mother's age because age has been identified as a factor that influences female pregnancy intentions, with younger women reporting higher levels of pregnancy mistiming or unwantedness (Abma & Mott, 1994; Rubin & East, 1999). Fathers are also more involved with their children when mothers are older (Pleck, 1997). We consider a measure of maternal employment because resident fathers have been found to increase their levels of involvement when mothers work more hours (Network, 2000) and employed mothers have been found to report lower levels of pregnancy unwantedness (Hellerstedt et al., 1998).

Household Characteristics. We account for poverty status as the quality of father engagement is higher among fathers with a higher income due to a greater number of financial and social resources (Pleck, 1997), and individuals with lower incomes are more likely to report an unintended pregnancy (Henshaw, 1998; Kost & Forrest, 1995; Rubin & East, 1999; L.B. Williams, 1991). We also consider the number of children in the household as having more children means that resident fathers have less time to spend with each child (Harris & Morgan, 1991), and at higher parities, couples are less likely to want additional children (Baydar, 1995).

Child Characteristics. We include controls for the focal child's age and gender, since these factors are likely to influence father involvement (Lamb, 1987; Pleck, 1997; Yeung, Sandberg, Davis-Kean, & Hofferth, 2001)). Differences in father involvement have been found to vary by the age of the child and the type of involvement (Bronte-Tinkew, Moore, & Carrano, 2006; Cooksey & Craig, 1998). Studies also

suggest that marital interactions in the postpartum period are more negative when parents have an unplanned daughter than when they have an unplanned son or a planned child (Cox, Paley, Burchinal, & Payne, 1999).

DATA AND METHODS

Data

These analyses use data from the ECLS-B 9-month and 24-month surveys. The ECLS-B is the first longitudinal study in the United States to track a nationally representative sample of children from infancy to the time they enter first grade in order to assess prospectively their experiences in a variety of domains (Nord et al., 2004). The study assesses children's transitions to nonparental care, early education programs, kindergarten, and first grade. The full sample consists of more than 10,000 children born in 2001, and it includes oversamples of important populations such as Asians and American Indians, low- to moderately low-birthweight infants, and twins. Data collection is occurring in five waves: at approximately 9 months after birth, 24 months, 48 months, entrance to kindergarten, and first grade. The primary modes of data collection are in-person interviews and direct child assessments that occur during home visits. Information is also drawn from birth certificates; from interviews with the child's parents, child care providers, and teachers; and from assessments of children themselves.

The ECLS-B provides one of the first opportunities to understand paternal influences of resident fathers on young children because it includes surveys with fathers who live in the same household as the sampled children (resident fathers). Fathers are asked about their pregnancy intentions and behaviors, including the quality and quantity of their involvement with their child. At each data collection point, resident fathers are asked to complete a 20-minute self-administered questionnaire. The resident father was identified as the spouse or partner of the respondent to the parent interview and in most cases (98.1%) is the biological father of the focal child. Other persons meeting the criteria to be included as resident fathers were stepfathers, adoptive, or foster fathers provided that they were identified by the primary respondent to the parent interview (Nord et al., 2004). At the completion of the 9-month resident father

data collection, the ECLS-B had 6,300 completed questionnaires from resident fathers of children sampled at the base year collection.

Sample for Analyses. Our final analytic sample includes 5,300 cases for which there were valid data for biological resident fathers at 9 months and valid data on mental proficiency and attachment security for children at 24 months. Of the original sample of 6,300 cases for which there was a completed 9-month resident father questionnaire, 100 men were not the biological father of the focal child and were eliminated, and an additional 900 cases did not have valid outcome data or weight variables at 24 months and so could not be included in the analyses. This left us with a final analytic sample of 5,300 cases. The vast majority of the resident biological fathers in our analytic sample (92%) were living with the child's mother prior to conception, and 98% were resident at the time of the child's birth. At 24 months, nearly all (94%) of the fathers in the analytic sample continued to reside with their child. The fathers excluded from the analytic sample were slightly more likely to report a wanted pregnancy (59.5%, compared to 56.8% in the analytic sample). Excluded fathers reported similar levels of prenatal behaviors (5.2, compared to 5.1 in the analytic sample) and mother-father relationship conflict (8.4, compared to 8.5 in the analytic sample). Children of fathers excluded from our sample reported similar levels of mental proficiency (127.2, compared to 127.7 in the analytic sample) and attachment security (60% compared to 64% in the analytic sample). Table 1 provides further details of the analytic sample.

In recognition of the fact that our analytic sample of resident fathers may be a highly select group of men, we also compared this sample to a sample of nonresident fathers in terms of their pregnancy intentions and background characteristics. While information for nonresident fathers was not collected on their pre-natal behaviors, the mother-father relationships and father involvement (the key mediators used in the analyses), some other demographic variables were available. Table 2 shows that resident fathers reported 10% more wanted pregnancies compared to nonresident fathers, and nonresident fathers were more likely to feel that the pregnancy was mistimed (28.2% among nonresident fathers versus 20.2% among resident fathers) or unwanted (46.3% versus 56.8%). Resident fathers were younger (31.7 years

old on average compared to an average age of 50.9 among nonresident fathers), more likely to be white (66.3% versus 34.1% among nonresident fathers), more likely to be employed (91.0% of resident fathers were employed versus 71.2% of nonresident fathers), and had higher levels of education compared to nonresident fathers (56.2% of resident fathers had at least some college experience compared to only 14.6% of nonresident fathers). Resident fathers in our analytic sample were also less likely than nonresident fathers to have a partner that did not want the pregnancy (15.7% versus 30.1%) and had partners that were slightly older than nonresident fathers' partners (an average of 29 years of age compared to 24 years of age among the nonresident father sample).

Analytic Strategy

We first present descriptive statistics for our variables of interest. Second, we used path analysis with a covariance estimation for mediational analyses that allowed us to test direct and indirect effects of men's pregnancy intentions on child outcomes (Bryk & Raudenbush, 1992). Additionally, Sobel tests (Sobel, 1982) were conducted to determine the statistical significance of each of the intervening, or mediating, variables on the mental proficiency and attachment security outcomes. Third, we tested interaction effect models to determine a joint hypothesis that the effects of father's pregnancy intentions would differ based on mother's intentions (i.e. whether the effects of fathers' intentions would change if mothers intended or did not intend the pregnancy). Analyses were conducted using Mplus, which allows for the use of sampling weights, adjusts for complex sampling designs, and includes procedures to handle missing data (Muthén & Muthén, 2006). All analyses were conducted using sample weights to correct for the different probabilities of sample selection resulting from factors such as clustering and oversampling in the ECLS-B.

Measures

Dependent Variables

Mental Proficiency. Toddlers' mental proficiency was measured at 24 months using the Bayley Short Form - Research Edition (BSF-R) Mental Scale (Nord et al., 2004). This scale was designed to

retain the psychometric properties of the full BSID-II, a recognized direct assessment measure for children from infancy to preschool age (Bayley, 1993). The BSID-II has been found to have high internal consistency ($\alpha = 0.88$) and test-retest reliability ($\alpha = 0.83$) (Andreassen & Fletcher, 2005; Bayley, 1993). The Mental Scale was administered during the 24-month home visit and includes items designed to assess early cognitive and language ability as manifested in memory, expressive and receptive vocabulary, reasoning and problem solving, and concept attainment. Children were presented with tasks that involved naming pictures, verbal comprehension, discriminating between objects and pictures, comparing sizes, and matching colors (Nord et al., 2004). In these analyses, the BSF-R was operationalized as a continuous variable (*mean* = 127.7; *range* = 92.6 - 173.3), with higher scores indicating higher mental proficiency.

Attachment Security. The measure of social and emotional wellbeing used at 24 months in the ECLS-B is the Toddler Attachment Sort-45 (TAS-45), a modified version of the Attachment Q-Sort (AQS). The original version of the AQS consisted of 100 items (Waters & Deane, 1985), and a revised version consisted of 90 items (45 of which had been included in the original AQS and 45 of which were new items) (Waters et al., 1995). To score the AQS, a trained observer sorts cards into one of nine piles identifying how characteristic a behavior is of an observed caregiver-child interaction. To identify items to be included in the TAS-45, datasets using the 145 unique items included in the two versions of the AQS were mapped using multidimensional scaling (MDS) and facet cluster analysis. This mapping allowed for the identification of eights characteristics of child attachment behaviors: comfortably cuddly, cooperative, enjoys company, independent, attention-seeking, upset by separation, avoids others/not sociable, and demanding. Four to six items with the strongest association to each characteristic were chosen from the 145 items, for a total of 39 items. After field testing, an additional six items were selected from a pool of 42 items associated with disorganized attachment styles. In total, 45 items were included. In order to facilitate ease of assessment, observers were trained to divide these items into four piles, as opposed to the nine piles in the original AQS. Observers first divided the cards into two piles: the

"applies" pile and the "not applies" pile; each of these piles was subsequently divided into two piles. Using this four-pile sort, categories ranged from "almost always applies" to "rarely or hardly ever applies." Correlations between the nine-pile and the four-pile solutions for each item included in the TAS-45 ranged from 0.95 to 0.99. Observations for the TAS-45 were made on the basis of interactions lasting for approximately two hours, and sorting took approximately 10 minutes. Based on the TAS-45, children were sorted into one of four attachment styles (*secure, avoidant, ambivalent,* or *disorganized*) by correlating children's profiles based on the sorting, with the ideal profiles for each of the four attachment styles and assigning the classification with the highest correlation. Inter-rater reliability for the TAS-45 varied by specific attachment type, but on average interviewers had 82 percent agreement on attachment categorizations. This exceeds the 80 percent agreement threshold established by the developer of the TAS-45 (Andreassen & Fletcher, 2007). Classifications were then used to create a dichotomous variable to indicate secure attachment vs. insecure attachment, with securely attached toddlers coded as 0 and all other children (i.e., those with *disorganized*, *avoidant*, or *ambivalent* attachment styles) coded as 1.

Primary Predictor

Pregnancy Intentions. This is a categorical measure that captures whether a pregnancy was (a) unwanted, (b) mistimed or (c) wanted. The ECLS-B survey directly asks respondents (both fathers and mothers) if they felt that the baby was wanted and, if so, if the birth was properly timed or mistimed. Fathers who reported that the focal pregnancy was not wanted at any time were coded as *unwanted*; fathers who reported that the pregnancy occurred sooner than they preferred were coded as *mistimed*; and fathers who reported that the pregnancy occurred later than they preferred or at the right time were coded as *wanted*. These measures are obtained directly from men and probe feelings at the time of conception, recalled when the baby is 9 months old (reported retrospectively). This timing is important because previous research on mothers' pregnancy intentions indicates that feelings can change over the course of a pregnancy (Brown & Eisenberg, 1995; Miller, 1974). Although these reports are retrospective, they represent the first of their kind in a database containing information on fathers' and child development.

Mediators

Prenatal Behaviors. We measure prenatal behaviors, based on fathers' reports in the 9-month survey, using a dichotomous variable assessing whether the father was involved in six activities prior to the child's birth: discussed with the mother how the pregnancy was going, saw a sonogram or ultrasound of the baby, listened to the baby's heartbeat, felt the baby move, attended childbirth classes or Lamaze classes with the child's mother, and bought things for the baby. For these items, fathers indicated whether they did or did not do these things. Fathers who indicated that they were involved in all six of these activities were coded as 1 (high involvement), and fathers who indicated that they were involved in fewer than six of these activities were coded as 0 (low involvement).

Relationship Conflict. We created a 10-item index of father's report of how often he and the child's mother argued about the following topics: chores and responsibilities; children; money; showing love and affection; sex; religion; leisure time; drinking; other men or women; and in-laws. For these items, fathers indicated whether they argued about these things *never*, *hardly ever*, *sometimes*, or *often*. We added scores from each item to create an index of relationship conflict with higher scores representing greater levels of conflict (*mean* = 8.5; *range* = 0 - 30; α = 0.81).

Father Involvement. We operationalized father involvement using a measure of fathers' involvement in *cognitively stimulating activities* which consisted of three items that asked fathers about the frequency with which they: 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 (*mean* = 4.0; α = 0.80).

Additional Socio-demographic Controls

We include several measures of father, mother, and child characteristics in our analyses to control for potentially confounding influences.

Father Characteristics. We include categorical variables for fathers' race (*non-Hispanic White*, *non-Hispanic Black*, *Hispanic*, or *other* race/ethnicity), fathers' education (*less than high school, high school/GED, some college, college degree or more*), employment status (*employed or unemployed*), and relationship status (*married or unmarried*) all measured at the time of the 9-month survey. Fathers' age is measured as a continuous variable at the time of the 9-month survey. We also include a measure of fathers' role perceptions. We created a 7-item index of father's agreement with regard to views on: it being essential for the child's wellbeing that fathers spend time playing with their children; it being difficult for men to express affectionate feelings towards 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 (0) *strongly agreed* (1) *agreed* (2) *disagreed* (3) *strongly disagreed*. 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 7 items (*mean* = 17.8; α = 0.61). Higher scores indicate a more positive perception of the role as a father.

Fathers' depressive symptoms were measured at the time of the 9-month survey using the 12-item abbreviated version of the Center for Epidemiological Studies of Depression Scale (CES-D) (Radloff, 1977). The CES-D was designed to measure the frequency of depressive symptoms that have been identified in the clinical literature on depression, as well as in other existing depression inventories, and is well known for its psychometric properties (Radloff, 1977). Fathers were asked how often in the past week they: felt bothered by things that don't usually bother them; did not feel like eating or had a poor appetite; could not shake off the blues; had trouble keeping their mind on what they were doing; felt depressed; felt that everything they did was an effort; felt fearful; had restless sleep; talked less than usual; felt lonely; felt sad; or felt that they could not get going. For each item, fathers who reported

feeling this way *rarely* or *never* were coded as (0); fathers who reported feeling this way *sometimes* or a *little of the time* were coded as (1); fathers who reported feeling this way *occasionally* were coded as (2); and fathers who reported feeling this way *most* or *all of the time* were coded as (3), and responses for each item were summed to create a single scale. Total scores on the scale ranged from 0 to 36 (*mean* = 3.6; α = 0.83). Higher scores indicate higher levels of depressive symptoms.

Mother Characteristics. Covariates for mothers' sociodemographic characteristics include a continuous variable for mother's age and a categorical variable for mother's employment status (*employed or unemployed*), both measured at the time of the 9-month survey. We also control for mothers' pregnancy intentions (*wanted, mistimed, unwanted*) as reported at the time of the 9-month survey. We control for these factors to address the possibility that the father's behaviors may reflect characteristics of the mother.

Household Characteristics. We measure household poverty status as a categorical variable (*at or above 100% of the federal poverty line or below the poverty line*) at the time of the 9-month survey. We also include a continuous measure of the number of children that the resident father has, as reported at the time of the 9-month survey.

Child Characteristics. We include a dummy variable indicating the child's gender (*male or female*). We also include a continuous measure of child's age at the time of the 24-month survey administration. We account for this at the 24-month survey because child development may vary greatly depending upon when the child assessments were conducted.

RESULTS

Descriptive Statistics

Table 1 presents weighted descriptive statistics for all variables used in the analyses. Roughly 56.8% of fathers reported that the pregnancy was wanted, 20.2% reported that the pregnancy was mistimed, and 22.9% reported that the pregnancy was unwanted. Parents had relatively low levels of relationship conflict with a mean of 8.5 on a scale ranging from 0 – 30. The majority of fathers (63.3%)

had low prenatal involvement. Fathers reported a mean of 4.0 on the measure of cognitively stimulating activities (*range* = 0 - 9), suggesting that fathers have moderate levels of engagement with their children. Fathers were, on average, 31.7 years old at the time of the 9-month survey administration (*range* = 16 - 73). Sixty-three percent of fathers were non-Hispanic White, 11.2% were non-Hispanic Black, 21.2% were Hispanic, and 4.5% were of another race. One in three fathers (36.7%) reported high levels of prenatal behaviors. Children were, on average, 24.3 months old (*range* = 20.1 - 38.2). Slightly more than half of these children (51.7%) were male. Approximately 64% of the children in the analytic sample exhibited secure attachments, and children scored an average of 127.7 on the mental proficiency scale (*range* = 92.6 – 173.3).

To better understand how resident fathers differ from nonresident fathers in terms of their pregnancy intentions and background characteristics, we also compared our analytic sample to a sample of nonresident fathers from the ECLS-B. The results presented in Table 2 show that resident fathers reported 10% more wanted pregnancies compared to nonresident fathers, and nonresident fathers were more likely to feel that the pregnancy was mistimed or unwanted. Resident fathers were younger, more likely to be white, more likely to be employed, and had higher levels of education compared to nonresident fathers. Resident fathers in our analytic sample were also less likely than nonresident fathers to have a partner that did not want the pregnancy and had partners that were slightly older.

Multivariate Analyses

Question 1: Are men's pregnancy intentions associated with mental proficiency and attachment security outcomes for young children, and are these associations mediated by men's prenatal behaviors, the father-mother relationship, and post-birth father involvement?

Mental Proficiency. Table 3 presents results of the path analysis examining whether fathers' pregnancy intentions are associated with mental proficiency among toddlers. Models 1 through 3 estimated the effect of fathers' pregnancy intentions on each of the three mediators, and suggest that

having an unwanted or mistimed pregnancy is negatively associated with fathers' prenatal behaviors and father engagement, and is positively associated with father-mother relationship conflict.

Model 4 estimated the overall direct effects of having an unwanted or mistimed pregnancy on mental proficiency (without mediators and accounting for mother's intentions). This model showed that fathers' reports of unwanted or mistimed pregnancy were negatively associated with children's mental proficiency (net of mothers' intentions and other socio-demographic controls). In Model 4, the effect sizes for an unwanted pregnancy and a mistimed pregnancy were -0.113 and -0.114 respectively, suggesting that although the results were significant, the actual magnitude of the association between fathers' pregnancy intentions and children's mental proficiency was small.

To evaluate the contribution of the mediators to the mental proficiency outcome, each mediator was entered one at a time in Models 5 through 7. Model 7 (the full model) showed the full effects of an unwanted or mistimed pregnancy on mental proficiency including mediators; this model showed that both an unwanted or mistimed pregnancy were negatively associated with children's mental proficiency at 24 months. Again, the effect sizes for both an unwanted pregnancy (0.102) and a mistimed pregnancy (0.11) were small in the full model. The inclusion of prenatal behaviors, the father mother relationship, and father involvement in Model 7 reduced the unstandardized coefficients for the relationship between unwanted and mistimed pregnancy and child mental proficiency, suggesting that these factors mediate the effects of pregnancy intentions. Collectively, the three mediators reduced the coefficient for an unwanted pregnancy by 9% and reduced the coefficient for a mistimed pregnancy by approximately 14%. These reductions suggest that fathers' prenatal behaviors, father engagement, and mother-father relationship conflict mediated some of the association between fathers' pregnancy intentions and children's mental proficiency.

Additional Sobel tests (MacKinnon, Lockwood, Hoffman, West & Sheets, 2002) for these mediators showed that having an unwanted or mistimed pregnancy exerted a significant indirect effect through prenatal behaviors ($Z = -2.30$, $p < .02$ unwanted; $Z = 2.05$, $p < .02$ mistimed), through father

involvement ($Z = 2.01$; $p < .02$ unwanted; $Z = 2.01$; $p < .02$ mistimed),and through the father-mother relationship ($Z = 2.05$; $p < .02$ unwanted; $Z = 3.23$; $p < .04$ mistimed) to influence mental proficiency. Small effect sizes were also found for prenatal behaviors (0.138), the father-mother relationship (0.1043), and for father involvement (0.151).

[Table 3 about here]

Insecure Attachment. Table 4 presents results of the path analysis examining whether fathers' pregnancy intentions are associated with insecure attachment among toddlers. Models 1 through 3 estimated the associations between fathers' pregnancy intentions and each of the three mediators. Model 4 estimated the overall direct effect of having an unwanted or mistimed pregnancy on attachment security (without mediators and accounting for mother's intentions). This model showed that fathers' reports of unwanted or mistimed pregnancy were positively associated with children's insecure attachment (net of mothers' intentions and other socio-demographic controls). In Model 4, the effect sizes for an unwanted pregnancy and a mistimed pregnancy are 0.102 and 0.101 respectively, suggesting that although the results were significant, the actual magnitude of the association between fathers' pregnancy intentions and children's attachment security were also small.

To evaluate the contribution of the mediators to the attachment security outcome, each mediator was entered one at a time in Models 5 through 7. Model 7 (the full model) shows the full effects of an unwanted or mistimed pregnancy on attachment security including mediators; this model shows that both an unwanted or mistimed pregnancy were positively associated with insecure attachment at 24 months. Again, the effect sizes for both an unwanted pregnancy (0.10) and a mistimed pregnancy (0.10) were small in the full model. The inclusion of prenatal behaviors, the father mother relationship, and father involvement in Model 7 reduced the unstandardized coefficients for the relationship between unwanted and mistimed pregnancy and children's insecure attachment, suggesting that these factors mediate the effects of pregnancy intentions. Collectively, the three mediators reduced the coefficient for an unwanted pregnancy by 10.8% and reduced the coefficient for a mistimed pregnancy by approximately 11.7%.

These reductions suggest that fathers' prenatal behaviors, father engagement, and mother-father relationship conflict mediated some of the association between fathers' pregnancy intentions and children's attachment security. Additional Sobel tests (MacKinnon, Lockwood, Hoffman, West & Sheets, 2002) for these mediators showed that having an unwanted or mistimed pregnancy exerted a significant indirect effect only through father involvement ($Z = 2.0$; $p < .04$ unwanted; $Z = 2.11$; $p < .05$ mistimed),and through the father-mother relationship ($Z = 2.15$; $p < .04$ unwanted; $Z = 3.23$; $p < .05$ mistimed) to influence attachment security. No significant indirect associations were found for pre-natal behaviors as a mediator. Small effect sizes were also found for the father-mother relationship (0.1033), and for father involvement (0.121).

[Table 4 about here]

Question 2: Do associations between fathers' pregnancy intentions and children's mental proficiency and attachment security differ according to mothers' pregnancy intentions?

Table 5 presents the results of interaction models between mothers' and fathers' pregnancy intentions for both the mental proficiency and attachment security outcomes. The results indicate that the interaction term was not significant for the mental proficiency outcome, but was significant for the attachment security outcome. Table 5 shows that the strength of the association between fathers' pregnancy intentions and toddlers' attachment security was stronger and more negative if one or both parents did not intend the pregnancy.

[Table 5 about here]

DISCUSSION

Using a nationally representative sample of young children and their biological resident fathers, we had two goals in the present study: 1) to explore associations and the direct and indirect pathways through which fathers' pregnancy intentions influenced children's mental proficiency and attachment security in toddlerhood; and 2) to determine whether the influence of father's pregnancy intentions differed according to mothers' pregnancy intentions. We used a sample of biological resident fathers who

participated in the 9-month wave of the ECLS-B and whose children's mental proficiency and attachment security were assessed in the 24-month wave. Overall our analyses suggest that fathers' pregnancy intentions "matter" in that they are predictive of children's mental proficiency and attachment security in toddlerhood – although these effects tend to be small. We surmise that men's pregnancy intentions are useful for predicting cognitive and social and emotional outcomes for young children (even when accounting for mother's pregnancy intentions).

Direct Associations Between Men's Pregnancy Intentions and Child Outcomes: We hypothesized that having an intended (wanted) pregnancy would be directly associated with more positive outcomes (higher mental proficiency and more secure attachment) for toddlers. This hypothesis was supported for both outcomes. Our analyses revealed a significant negative association between having an unwanted pregnancy or mistimed pregnancy, and mental proficiency and attachment security for toddlers (net of mothers' pregnancy intentions and other socio-demographic controls). These findings confirm existing research done on women's pregnancy intentions, which has generally found negative associations between mother's pregnancy intentions and later child wellbeing (Axinn et al., 1998; Baydar, 1995; Brown & Eisenberg, 1995; Bumpass, 1987, 1994, October; Rindfuss, Morgan, & Swicegood, 1988; Thomson, 1997; Westoff & Ryder, 1977; Lindy B. Williams, 1994). Here fathers' pregnancy intentions are seen to have small (but not trivial) effects on both mental proficiency and attachment security outcomes for young children (accounting for mothers' intentions). These findings add to a growing body of research suggesting that the effects of fathers' intentions affect child well-being in the early years of life, and extend this body of research to outcomes in the cognitive and socio-emotional domains.

Prenatal Behaviors as a Mediator. We hypothesized that male prenatal behaviors would *mediate* the association between pregnancy intentions and child mental proficiency and attachment security. This hypothesis was supported, but only for the mental proficiency outcome, and the effect of this mediator was small. Nevertheless, this finding emphasizes that a planned pregnancy may be a proxy for men's readiness (emotional, financial, and lifestyle) and commitment to fulfill the parenting role, beginning in

the prenatal period (Feinberg, 2002), and in the context of an unplanned birth, this diminishes father's involvement even prenatally, with negative implication for the mental proficiency of toddlers. These findings lend additional support to the idea that fathers' prenatal involvement may be a predictor of continued involvement after the birth and as the child grows up, and reinforces the tenets of the life course perspective on family transitions, as decisions made regarding conception influence later behaviors surrounding the birth (Joyce, Kaestner, & Korenman, 2000).

Father-Mother Relationship Conflict as a Mediator. We hypothesized that father-mother relationship conflict would *mediate* the association between pregnancy intentions and child mental proficiency and attachment security. This hypothesis was supported for both the mental proficiency and attachment security outcomes, although again, the size of the effects was small. These findings are in keeping with the tenets of the family systems perspective which suggest that the father-mother dyad exerts an influence on the well-being of the children (Cox, Paley, Burchinal, & Payne, 1999). The strain of an unwanted pregnancy is seen here to negatively influence the quality of the couple relationship (Cox et al., 1999; Crouter, Bumpus, Head, & McHale, 2001), which in turn negatively influences child well-being in both the cognitive and social and emotional domains. The role of fathers' pregnancy intentions in influencing the later adult couple relationship and behaviors, and ultimately child outcomes, highlights the importance of the life course perspective and timing of the onset of fatherhood in determining men's relationships with partners. An unplanned birth is a key life course transition with long term implications for fathers' relationship with partners. An unplanned pregnancy may be a non-normative experience if fathers did not intend to have a child and are unprepared for the changes that occur during this family transition (Cowan and Hetherington, 1991). The implications as are evident here have negative implications for the couple relationship and ultimately child well-being.

Father Involvement as a Mediator. We hypothesized that father involvement would *mediate* the association between father's pregnancy intentions and child mental proficiency and attachment security. This hypothesis was supported for both the mental proficiency and attachment security outcomes,

although the effects of father involvement as a mediator of child outcomes were also small. The fact that father involvement mediates this association is not surprising as other work suggests that parents with unwanted pregnancies are less involved with their children (Axinn et al., 1998), and fathers reporting unintended births are less likely to be involved in some types of interactions with infants (Bronte-Tinkew, Ryan et al., 2007);(Cabrera, 2002; Clarke-Stewart, 1980; Lamb, 1997a). On a cautionary note, it should be acknowledged that while higher levels of father engagement were found to be associated with more secure attachment, this finding must be interpreted with caution due to the fact that only about 2 percent of the primary caregivers involved in the observational component for the attachment security measure were fathers. The implications of higher levels of *father* involvement on children's interactions with and behaviors towards *mothers* are unclear as prior research only assesses involvement and attachment to the caregiver who is the primary focus of the parent-child interactions (e.g., mother involvement and attachment to mothers). Fathers that are more involved in the day-to-day physical care and supervision of children may actually be the primary caregiver for their children, or may be compensating for a lack of mother involvement.

The small effects of father involvement as a mediator may reflect the fact that father involvement is only one component of a larger network of relationships in the family, and so this accounts for a small amount of this association. For fathers, the associations between pregnancy intentions and their direct engagement with children are embedded in a host of other family relationships, and so father-child interactions represent one aspect of a larger network of interactions between family members that may influence child well being. The family systems framework, used to guide these analyses, reinforces the idea that the father-child dyad is not isolated but is dependent upon the functioning of other dyads such as the mother-father dyad and other family relationships. That father's engagement in and of itself was positively associated with toddlers' mental proficiency and attachment security, is consistent with our hypothesis and prior studies that have also found that father involvement is associated with positive outcomes for young children (Bronte-Tinkew et al., 2008; Clarke-Stewart, 1980; Lamb, 1997a).

Differences by Mother's Intentions. We hypothesized that although the effects of fathers' unintended pregnancy would be negative for children's mental proficiency and attachment security, these effects would be more negative if mothers' also reported that the pregnancy was unwanted and mistimed (i.e., both unintended), and so we tested for interaction effects by mothers' intentions. Our results indicated that this interaction was not significant for mental proficiency but was significant for attachment security. In short, the effects of pregnancy intentions are negative for children's attachment security if one or bother parents did not intend the pregnancy. It does not matter which parent did not intend the pregnancy as it has negative consequences for children's attachment security. The significant finding for attachment security supports and reinforces the notion that parents' disagreements over the desirability of the pregnancy do exacerbate the severity of father's intentions in terms of consequences for children—in this case their socio-emotional development. The negative association between fathers' pregnancy intentions and attachment security was exacerbated when fathers disagreed with their partners about the intendedness of the pregnancy, or when both parents did not intend the pregnancy. Children with fathers that did not intend the pregnancy were not protected by mothers' positive pregnancy intentions. The nonsignificant interaction for children's mental proficiency suggests that the association between fathers' negative pregnancy intentions and children's lower mental proficiency are the same regardless of how mothers felt about the pregnancy.

Limitations of Current Study. While the results of this study are promising, like other studies, it also has its limitations. First, we rely upon fathers' retrospective reports of pregnancy intentions at nine months, which may make the answers offered subject to distortion and recall error (Brown & Eisenberg, 1995). Previous work suggests that pregnancy intentions may change over the course of a pregnancy (Brown & Eisenberg, 1995; Miller, 1974) as well as after a child's birth (Axinn et al., 1998). However, because the ECLS-B does not survey parents prior to the birth of a child, we must rely upon retrospective accounts and these data represent the first of their kind in a nationally representative survey of children. Second, although we categorize fathers' evaluations of their pregnancy intentions as wanted, mistimed, or

unwanted, men's experiences and desires are probably more complicated than this simple trichotomy (Barber, Axinn, & Thornton, 1999). Third, we do not account for parents' cognitive ability, which is likely correlated with both parenting behaviors and child mental proficiency. Regrettably, the ECLS-B did not capture measures of parents' cognitive ability, and so we cannot account for in these analyses. Fourth, our analyses of children's insecure attachment were mainly restricted to attachment to mothers making it difficult to assess the association between father involvement and offspring's attachment to the father himself. Ideally, it would have been preferable to have measures of the child's attachment to both mothers and fathers as two secure attachments are often best for child well-being. However, it is also possible that secure attachment with either parent may have been affected by intendedness. Future research would benefit from observational assessments of children's behaviors toward both parents rather than just the primary caregiver, especially research that is primarily interested in understanding the role of fathers for children's well-being. Moreover, we relied on the only measure of attachment security available in the ECLS-B, the TAS-45. However, we recognize the existence of other widely used measures of attachment security such as the Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978), which is a standardized laboratory based assessment technique that consists of more specific (less broad) criteria for assessing secure attachment than the TAS-45, and which represents a fruitful measure that may be used in future research. Fifth, in our analyses we did not focus on non-resident fathers. We restricted our analyses to focus on resident fathers only because the patterns and predictors of pregnancy intentions as well as father involvement are structurally different for resident fathers versus non-resident fathers. In addition, nonresident fathers only represent 10% of all fathers in the ECLS-B, and represent a select sample of men. In addition, the key mediators considered in these analyses were not measured for nonresident fathers. The reliance on a sample of resident fathers may have created some bias in our findings. As such, the observed negative associations between resident fathers' pregnancy intentions and children's mental proficiency and attachment security may be even stronger for children with non-resident fathers as such fathers are likely to have lower levels of prenatal behaviors and father engagement (Amato

& Gilbreth, 1999; Amato & Sobolewski, 2004), and poorer relationships with the mothers of their children (McLanahan & Carlson, 2004; Stewart, 1999). Further, experiencing an unintended pregnancy may have motivated some fathers to leave the household and become non-resident fathers, suggesting that another risk factor associated with unintended pregnancies is family instability and father absence. The resident fathers we examined in our study remained in the household with their children even if they had not intended the pregnancy. Nonresident fathers also differed from the resident fathers in our sample in terms of their demographic and socio-economic status, which is likely to influence whether a pregnancy is intended or unintended, and whether experiencing an unintended pregnancy is associated with lower well-being for children. We found that the non-resident fathers in the ECLS-B were older, less likely to be white, less likely to be employed, and had lower levels of education compared to resident fathers. These differences may further exacerbate the negative associations between fathers' pregnancy intentions and child well-being among nonresident father families. Thus, the group of resident fathers in our sample may represent a group of men who are especially committed to the mothers of their children or to the father role, even if they had not planned on becoming a father when they did. This greater commitment to the family may likely have reduced some of the negative consequences of having an unintended pregnancy for resident fathers in our analyses. Replicating these analyses with a sample of nonresident fathers represents a fruitful avenue for future research. In addition, while the ECLS-B provides a nationally representative sample of children born in 2001 and efforts were made to identify and recruit fathers, the ECLS-B sample of men likely over-represents resident married fathers and fathers with strong attachments to children and under-represents fathers who are uninvolved in their child's life at an early age. Sixth, our analyses revealed that mother's negative pregnancy intentions were significantly associated with greater insecure attachment (prior to adding fathers' pregnancy intentions), but not lower mental proficiency, which is inconsistent with some prior research showing a significant link between mother's pregnancy intentions and children's cognitive abilities (Crissey, 2006; Korenman, Kaestner, & Joyce, 2001). However, more recent research, some of which uses similar data from the ECLS-B,

suggests that the observed negative effects of mother's experiencing an unintended pregnancy on children's cognitive abilities are largely due to important background characteristics and social risk factors such as low birthweight and poverty which are more common among women with unintended pregnancies (Hummer, Hack, & Raley, 2004; The National Campaign to Prevent Teen and Unplanned Pregnancy, 2008). It is also possible that the children in the ECLS-B are too young to exhibit impaired mental proficiency due to mother's negative pregnancy intentions, and that more negative outcomes may be observed at later ages. A final explanation for the lack of an association between mother's negative pregnancy intentions and lower mental proficiency prior to adding fathers' intentions is that the group of mothers that reported the pregnancy to be unwanted may represent a select group of mothers given that they delivered an unwanted pregnancy and still reside with the child (i.e., did not give the child up for adoption). Although these mother's report that the pregnancy was unwanted, they may have a greater commitment to their children than mothers that experienced an unwanted pregnancy but sought an abortion or gave the child up for adoption. The latter groups of mothers were not included in these analyses, as this is a study of births rather than pregnancies. Finally, because of the large sample sizes used in our analyses, it is possible that even very small effects are likely to be significant. Our power analyses indicated that we were able to detect effects as small as .10. It is possible that these analyses may overestimate the significance of these findings, and this is an issue that should be noted.

Contributions of Present Study. Despite these limitations however, this study extends previous research by using a large, nationally representative sample of infants and their biological resident fathers to analyze how men's pregnancy intentions, recalled retrospectively when the child is nine months of age, are associated with child mental proficiency and attachment security at 24 months. It examines a model that articulates the linkages between pregnancy intentions for men and mental proficiency and attachment security outcomes for their children. Most prior research has focused on mothers' pregnancy intentions, using mother's reports of fathers' intentions, and our purpose was to address this gap in existing research. To the best of our knowledge, no other studies have examined the associations between men's pregnancy

intentions and child outcomes by examining both the direct and indirect links and mechanisms through which pregnancy intentions influences cognitive, social, and emotional outcomes using a large nationally representative sample of young children.

Policy Implications. This study adds to the knowledge base used in the development of appropriate public policy that encourages stable family formation and supports men's roles in families even before the birth of a child, and provides information for designing policies aimed at both improving child outcomes and promoting stronger families. The findings presented here indicate that resident fathers' pregnancy intentions are important in understanding child outcomes, in addition to mothers' pregnancy intentions. Our findings suggest the need for policies that help men and women experience fertility according to their timing desires. Findings also suggest that prenatal involvement and relationships between fathers and mothers are critical for father engagement and later child wellbeing, suggesting that programs designed to increase expectant fathers' involvement as well as to strengthen relationships of expectant parents and new parents of infants may improve child wellbeing.

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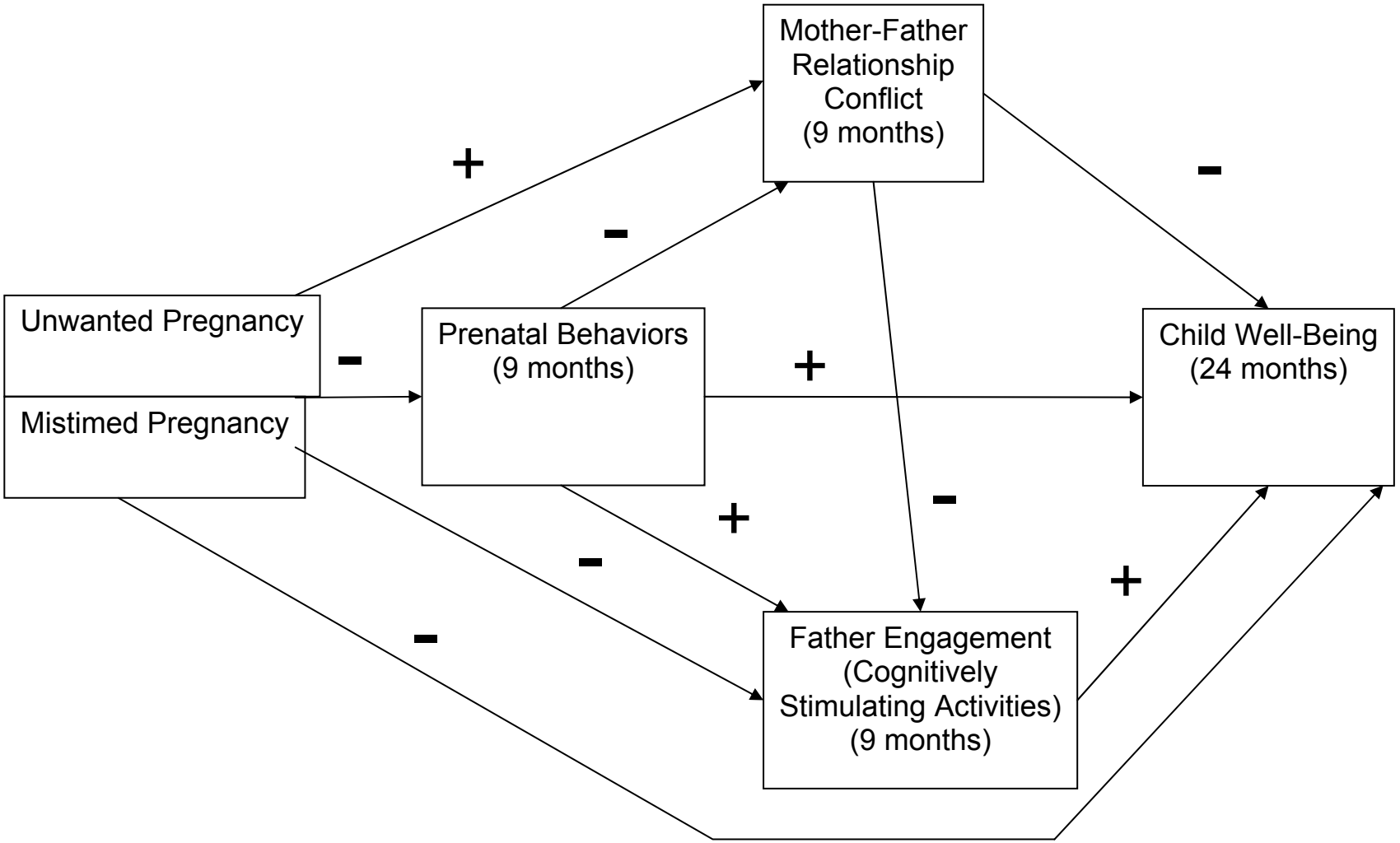
Figure 1: Conceptual Framework



Note: The figure shows that father's pregnancy intentions may be directly associated with child well-being, or may be indirectly associated with child well-being through prenatal behaviors, mother-father relationship conflict, and father engagement (net of mothers' pregnancy intentions and accounting for socio-demographic characteristics).

Table 1

Descriptive Statistics of Variables Used in the Analyses, ECLS-B 9-Month and 24-Month Surveys (N = 5,300)

Measure	Mean or Frequency	*SD*	Range	α
Father's Pregnancy Intentions, *%* (9-month)				
Unwanted Pregnancy	22.9	—	—	
Mistimed Pregnancy	20.2	—	—	
Wanted Pregnancy	56.8	—	—	
Mediators				
Relationship Conflict, (9-month)	8.5	12.3	0 - 30	0.81
Prenatal Behaviors, *%* (9-month)				
High Involvement	36.7	—	—	
Low Involvement	63.3	—	—	
Father Engagement, (9-month)				
Cognitively Stimulating Activities	4.0	5.1	0 - 9	0.63
Father Characteristics				
Father's Age in Years, (9-month)	31.7	15.4	16 - 73	0.80
Mental Health, (9-month)	3.6	10.6	0 - 36	0.82
Perceptions of the Father Role, (9-month)	17.8	5.4	9 - 21	0.81
Father's Race, *%* (9-month)				
Non-Hispanic White	66.3	—	—	
Non-Hispanic Black	8.2	—	—	
Hispanic	21.0	—	—	
Other	4.6	—	—	
Father's Employment Status, *%* (9-month)				
Employed	91.0	—	—	
Not Employed	9.0	—	—	
Father's Marital Status, *%* (9-month)				
Married	83.5	—	—	
Not Married	16.5	—	—	
Father's Education Level, *%* (9-month)				
Less than High School	21.0	—	—	
High School/GED	23.0	—	—	
Some College	26.8	—	—	
College Degree or More	29.4	—	—	
Mother Characteristics				
Mother's Pregnancy Intentions, *%* (9-month)				
Unwanted Pregnancy	15.7	—	—	
Mistimed Pregnancy	27.6	—	—	
Wanted Pregnancy	56.7	—	—	
Mother's Age in Years, (9-month)	29.2	14.0	15 - 51	
Maternal Employment, *%* (9-month)				
Employed	52.7	—	—	
Not Employed	47.3	—	—	
Household Characteristics				
Poverty Level, *%* (9-month)				
Below 100% of Federal Poverty Line	15.3	—	—	
At or Above 100% of Federal Poverty Line	84.7	—	—	
Number of Children, (9-month)	2.1	3.0	0 - 33	
Child Characteristics				
Child's Age in Months, (24-month)	24.3	2.6	20.1 - 38.2	
Child Gender, *%* (9-month)				
Male	51.7	—	—	
Female	48.3	—	—	
Dependent Variable				
Attachment Security, % (24-month)				
Insecure Attachment	36.0	—	—	
Secure Attachment	64.0	—	—	
Mental Proficiency, (24-month)	127.7	25.2	92.6 – 173.3	

Table 2. *Sample characteristics of resident fathers versus nonresident fathers, ECLS-B*

Measure	Resident Fathers	Non-resident Fathers
	M/%	M/%
Father's Pregnancy Intentions		
Unwanted Pregnancy	22.90	25.6
Mistimed Pregnancy	20.20	28.2
Wanted Pregnancy	56.80	46.3
Father Characteristics		
Father's Age in Years, (9-month)	31.70	50.9
Mental Health, (9-month)	3.60	6.6
Father's Race, % (9-month)		
Non-Hispanic White	66.30	34.1
Non-Hispanic Black	8.20	41.1
Hispanic	21.0	21.1
Other	4.60	3.7
Father's Employment Status, % (9-month)		
Employed	91.0	71.2
Not Employed	9.0	28.8
Father's Education Level, % (9-month)		
Less than High School	21.0	44.8
High School/GED	23.0	40.7
Some College	26.80	.9
College Degree or More	29.40	13.7
Number of Children, (9-month)	2.10	1.9
Mother Characteristics		
Mother's Pregnancy Intentions, % (9-month)		
Unwanted Pregnancy	15.70	30.1
Mistimed Pregnancy	27.60	44.7
Wanted Pregnancy	56.70	25.2
Mother's Age in Years, (9-month)	29.20	24.0
Maternal Employment, % (9-month)		
Employed	52.70	50.5
Not Employed	47.30	49.5
Child Characteristics		
Child's Age in Months, (24-month)	24.30	24.2
Child Gender, % (9-month)		
Male	51.70	49.7
Female	48.30	50.3
N	5,300	700

Table 3. Standardized path coefficients for analyses describing relationships between father's pregnancy intentions and children's mental proficiency at 24 months (N = 5,300)

	Prenatal Behaviors Mediator 1 (*Model 1*)			Mother-Father Relationship Conflict Mediator 2 (*Model 2*)			Father Involvement Mediator 3 (*Model 3*)			Mental Proficiency Child Outcome *(Model 4)*			Mental Proficiency Child Outcome *(Model 5)*			Mental Proficiency Child Outcome *(Model 6)*			Mental Proficiency Child Outcome (*Model 7*)		
Variable	B	SE	*B*	B	SE	*B*	B	SE	*B*	B	SE	*B*	B	SE	*B*	B	SE	*B*	B	SE	*B*
Primary Predictor																					
Father's Pregnancy Intentions																					
Unwanted Pregnancy	-0.08	0.02	-0.07***	-1.08	0.31	-0.09***	-0.16	0.12	-0.03*	-1.23	0.47	-0.05**	-1.19	0.47	-0.04*	-1.15	0.47	-0.05*	-1.12	0.47	-0.05*
Mistimed Pregnancy	-0.10	0.02	-0.09***	-1.57	0.31	-0.12***	-0.02	0.13	-0.004*	-1.35	0.45	-0.05**	-1.27	0.45	-0.05**	-1.23	0.47	-0.05**	-1.16	0.47	-0.05**
(Wanted Pregnancy)																					
Mediators																					
Pre-Natal Behaviors																					
High Involvement				0.50	0.21	0.05*	0.56	0.09	0.13***				1.60	0.36	0.07***	1.62	0.36	0.07***	1.53	0.36	0.07***
(Low Involvement)																					
Father-Mother Relationship Conflict							-0.02	0.01	-0.06**							-0.04	0.04	-0.02	-0.05	0.04	-0.02*
Father Involvement																			0.17	0.08	0.03*
Controls																					
Mother's Pregnancy Intentions																					
Unwanted Pregnancy	-0.06	0.04	-0.03	-0.71	0.46	-0.03	-0.24	0.18	-0.03	-0.42	0.76	-0.01+	-0.33	0.77	-0.01	-0.37	0.73	-0.01	-0.32	0.76	-0.01
Mistimed Pregnancy	-0.02	0.02	-0.01	-0.09	0.25	-0.01	-0.12	0.10	-0.03	-0.80	0.45	-0.03	-0.76	0.46	-0.03	-0.76	0.46	-0.03	-0.79	0.46	-0.03
(Wanted Pregnancy)																					
Father's Race/Ethnicity																					
(Non-Hispanic White)																					
Non-Hispanic Black	-0.06	0.03	-0.03	-0.62	0.13	-0.03	0.27	0.15	0.03	-2.81	0.67	-0.07***	-2.71	0.67	-0.07***	-2.69	0.67	-0.07***	-2.74	0.66	-0.07***
Hispanic	-0.09	0.03	-0.08***	1.35	0.33	0.11***	0.02	0.12	0.00	-4.10	0.70	-0.16***	-3.95	0.72	-0.15***	-3.90	0.73	-0.15***	-3.91	0.73	-0.15***
Other Race/Ethnicity	-0.07	0.02	-0.03**	0.34	0.23	0.01	0.07	0.10	0.01	-2.94	0.47	-0.06***	-2.84	0.47	-0.06***	-2.82	0.47	-0.06***	-2.83	0.47	-0.06***
Father's Age	0.00	0.00	-0.01	0.06	0.03	0.08*	0.02	0.01	0.05	-0.08	0.04	-0.05*	-0.08	0.04	-0.05	-0.08	0.04	-0.05	-0.08	0.04	-0.05
Father's Educational Attainment																					
Less Than High School	-0.20	0.03	-0.17***	0.60	0.39	0.05	0.16	0.18	0.03	-3.98	0.68	-0.15***	-3.67	0.69	-0.14***	-3.64	0.69	-0.14***	-3.67	0.68	-0.14***
High School/GED	-0.20	0.03	-0.17***	0.56	0.29	0.06	-0.26	0.13	-0.05*	-3.51	0.49	-0.14***	-3.20	0.48	-0.13***	-3.18	0.48	-0.13***	-3.13	0.48	-0.13***
Some College/Vocational School	-0.10	0.03	-0.09***	-0.05	0.22	-0.01	-0.02	0.10	0.00	-2.14	0.46	-0.09***	-1.98	0.46	-0.08***	-1.98	0.46	-0.08***	-1.97	0.46	-0.08***
(Bachelor's Degree or Higher)																					
Perceptions of the Father Role	0.01	0.00	0.04*	-0.32	0.06	-0.14***	0.15	0.02	0.15***	0.20	0.09	0.04*	0.18	0.09	0.04*	0.19	0.09	0.04*	0.17	0.09	0.04
Father's Number of Children	-0.07	0.02	-0.18***	-0.13	0.12	-0.03	-0.15	0.05	-0.09***	-0.38	0.17	-0.05*	-0.28	0.16	-0.03	-0.28	0.16	-0.03	-0.26	0.16	-0.03
Father's Employment Status																					
(Employed)																					
Unemployed	0.03	0.03	0.02	0.00	0.41	0.00	-0.25	0.17	-0.03	-0.20	0.76	-0.01	-0.24	0.75	-0.01	-0.25	0.75	-0.01	-0.21	0.75	-0.01
Father-Mother Relationship Status																					
Married	0.06	0.03	0.05*	0.39	0.34	0.03	0.04	0.11	0.01	1.04	0.60	0.04	0.94	0.60	0.03	0.96	0.59	0.03	0.95	0.59	0.03
(Cohabiting)																					
Household Poverty Status																					
Below Poverty Line	0.01	0.03	0.01	0.22	0.34	0.02	0.18	0.14	0.03	-1.63	0.53	-0.06**	-1.64	0.53	-0.06**	-1.63	0.53	-0.06**	-1.66	0.54	-0.06**
(At or Above Poverty Line)																					
Mother's Employment Status																					
(Unemployed)																					
Employed	0.07	0.02	0.07***	-0.59	0.18	-0.06***	0.18	0.08	0.04*	1.26	0.37	0.06***	1.15	0.37	0.06**	1.12	0.37	0.05**	1.09	0.37	0.05*
Mother's Age	0.00	0.00	0.00	-0.06	0.03	-0.06*	-0.01	0.01	-0.02	0.10	0.05	0.05	0.10	0.05	0.05	0.09	0.05	0.05	0.10	0.05	0.05
Child's Age	0.00	0.01	0.00	0.09	0.09	0.02	0.10	0.04	0.05*	1.78	0.20	0.18***	1.78	0.20	0.18***	1.79	0.20	0.18***	1.77	0.20	0.18***
Child's Gender																					
(Female)																					
Male	0.02	0.02	0.02	-0.02	0.21	-0.02	-0.15	0.07	-0.04*	-3.77	0.33	-0.18***	-3.79	0.34	-0.18***	-3.81	0.34	-0.18***	-3.78	0.34	-0.18***
R^2		0.23			0.26			0.28			0.11			0.19			0.23			0.39	
F for change in R^2		163.4**			165.6**			166.5**			171.3**			182.1**			175.3**			170.2**	

Note: Estimates are adjusted for survey design effects.
+p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 4. Standardized path coefficients for analyses describing relationships between father's pregnancy intentions and children's insecure attachment at 24 months (N = 5,300)

	Prenatal Behaviors Mediator 1 *(Model 1)*			Mother-Father Relationship Conflict Mediator 2 *(Model 2)*			Father Involvement Mediator 3 *(Model 3)*			Insecure Attachment Child Outcome *(Model 4)*			Insecure Attachment Child Outcome *(Model 5)*			Insecure Attachment Child Outcome *(Model 6)*			Insecure Attachment Child Outcome *(Model 7)*		
Variable	B	SE	*B*	B	SE	*B*	B	SE	*B*	B	SE	*B*	B	SE	*B*	B	SE	*B*	B	SE	*B*
Primary Predictor																					
Father's Pregnancy Intentions																					
Unwanted Pregnancy	-0.08	0.02	-0.09***	1.07	0.31	0.09***	-0.03	0.18	-0.004*	1.20	0.13	0.01**	1.16	0.03	0.01*	1.11	0.01	0.01*	1.07	0.01	0.02*
Mistimed Pregnancy	-0.10	0.02	-0.07***	1.57	0.31	0.12***	-0.31	0.24	-0.04*	1.19	0.13	0.01*	1.15	0.03	0.02*	1.07	0.02	0.01*	1.05	0.02	0.01*
(Wanted Pregnancy)																					
Mediators																					
Pre-Natal Behaviors																					
High Involvement				-0.50	0.21	-0.05*	0.63	0.16	0.09***				-1.02	0.02	-0.02	-1.02	0.02	-0.02	-1.01	0.02	-0.01
(Low Involvement)																					
Father-Mother Relationship Conflict							0.04	0.01	0.05**							0.03	0.01	0.01*	0.03	0.02	0.01**
Father Involvement																			-0.02	0.01	-0.01*
Controls																					
Mother's Pregnancy Intentions																					
Unwanted Pregnancy	-0.06	0.04	-0.03*	-0.72	0.46	-0.03*	0.29	0.27	0.02*	1.04	0.04	0.02*	1.04	0.04	0.02*	1.29	0.27	0.02*	1.72	0.46	0.03**
Mistimed Pregnancy	-0.02	0.02	-0.02*	-0.09	0.25	-0.01*	0.29	0.17	0.04*	1.05	0.02	0.05**	1.05	0.02	1.05**	1.29	0.17	0.04*	1.09	0.25	0.01**
(Wanted Pregnancy)																					
Father's Race/Ethnicity																					
(Non-Hispanic White)																					
Non-Hispanic Black	-0.06	0.03	-0.03	0.61	0.40	0.03	0.74	0.25	0.06**	0.07	0.04	0.04	0.08	0.04	0.05*	0.74	0.25	0.06**	0.61	0.40	0.03
Hispanic	-0.09	0.03	-0.08***	1.34	0.33	0.11***	0.42	0.25	0.05	-0.02	0.03	-0.02	-0.02	0.03	-0.02	0.42	0.25	0.05	1.34	0.33	0.11***
Other Race/Ethnicity	-0.07	0.02	-0.03***	0.33	0.23	0.01	0.62	0.15	0.04***	0.03	0.02	0.01	0.03	0.02	0.01	0.62	0.15	0.04***	0.33	0.23	0.01
Father's Age	0.00	0.00	-0.01	0.06	0.03	0.08*	-0.03	0.01	-0.05*	0.00	0.00	0.05	0.00	0.00	0.04	-0.03	0.01	-0.05*	0.06	0.03	0.08*
Father's Educational Attainment																					
Less Than High School	-0.20	0.03	-0.17***	0.60	0.39	0.05	0.44	0.27	0.05	0.10	0.03	0.08**	0.10	0.03	0.09***	0.44	0.27	0.05	0.60	0.39	0.05
High School/GED	-0.20	0.03	-0.17***	0.57	0.29	0.05	0.14	0.16	0.02	0.10	0.03	0.09***	0.10	0.03	0.09***	0.14	0.16	0.02	0.57	0.29	0.05
Some College/Vocational School	-0.10	0.03	-0.09***	-0.05	0.22	-0.01	0.11	0.17	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.11	0.17	0.01	-0.05	0.22	-0.01
(Bachelor's Degree or Higher)																					
Perceptions of the Father Role	0.01	0.00	0.04*	0.32	0.06	0.14***	0.24	0.03	0.15***	0.00	0.00	0.02	0.00	0.00	0.02	0.24	0.03	0.15***	0.32	0.06	0.14***
Father's Number of Children	-0.07	0.02	-0.18***	-0.13	0.12	-0.03	-0.11	0.07	-0.04	-0.02	0.01	-0.04	-0.02	0.01	-0.04	-0.11	0.07	-0.04	-0.13	0.12	-0.03
Father's Employment Status																					
(Employed)																					
Unemployed	0.03	0.03	0.02	0.00	0.41	0.00	-1.31	0.27	-0.11***	-0.04	0.03	-0.02	-0.05	0.03	-0.03	-1.31	0.27	-0.11***	0.00	0.41	0.00
Father-Mother Relationship Status																					
Married	0.06	0.03	0.05*	0.39	0.34	0.03	-0.13	0.26	-0.01	-0.07	0.03	-0.06*	-0.07	0.03	-0.06*	-0.13	0.26	-0.01	0.39	0.34	0.03
(Cohabiting)																					
Household Poverty Status																					
Below Poverty Line	0.01	0.03	0.01	0.22	0.34	0.02	0.53	0.26	0.05*	0.01	0.04	0.01	0.02	0.04	0.01	0.53	0.26	0.05*	0.22	0.34	0.02
(At or Above Poverty Line)																					
Mother's Employment Status																					
(Unemployed)																					
Employed	0.07	0.02	0.07***	-0.59	0.18	-0.06***	1.04	0.16	0.15***	-0.03	0.02	-0.03	-0.02	0.02	-0.02	1.04	0.16	0.15***	-0.59	0.18	-0.06***
Mother's Age	0.00	0.00	0.00	-0.06	0.03	-0.06*	-0.04	0.02	-0.06*	-0.01	0.00	-0.06	-0.01	0.00	-0.06*	-0.04	0.02	-0.06*	-0.06	0.03	-0.06*
Child's Age	0.00	0.01	0.00	0.09	0.09	0.02	0.24	0.06	0.07***	-0.01	0.01	-0.01	0.00	0.01	-0.01	0.24	0.06	0.07***	0.09	0.09	0.02
Child's Gender																					
(Female)																					
Male	0.02	0.02	0.02	-0.24	0.21	-0.02	0.44	0.11	0.06***	0.11	0.02	0.12***	0.12	0.02	0.12***	0.44	0.11	0.06***	-0.24	0.21	-0.02
R^2		0.13			0.07			0.12			0.31			0.32			0.33			0.34	
F for change in R^2		160.5*			161.2*			161.8*			179.1*			181.2**			183.4**			185.6**	

Note: Estimates are adjusted for survey design effects.
+p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 5. Effect of Interaction between Father's Pregnancy Intentions and Mother's Pregnancy Intentions on Toddlers' Mental Proficiency and Insecure Attachment

	Mental Proficiency			Insecure Attachment		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Reference: (Both Intended)						
Father Unintended when Mother Intended	-1.223	0.529	-0.050	1.200*	0.480	0.050
Father Intended when Mother Unintended	-1.119+	0.460	-0.480	1.100*	0.460	0.460
Both Unintended	-1.142	0.570	-0.054	1.260*	0.048	0.049

Note: Model includes mediators and controls for all father, mother, household and child characteristics.
+p<0.10, *p<0.05, **p<0.01, ***p<0.001