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Who Stays and Who Leaves? Father Accessibility Across Children's First 5 Years

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SYNOPSIS

Objective—This longitudinal investigation examines whether fathers' prenatal involvement (e.g., attending doctor appointments and discussing pregnancy with mother) and residence status at infant's birth predict the first time a father becomes inaccessible to his child (defined as seeing child fewer than a few times per month) at six developmental time points in children's first 5 years.

Design—Data were gathered from 2,160 ethnically diverse mothers (i.e., European American, African American, and Latin American) who participated in the National Early Head Start Research and Evaluation Project. Survival analysis was used to predict the timing of father inaccessibility based on interviews.

Results—By prekindergarten, fathers' residence at birth and prenatal involvement decreased their risk of *being inaccessible* to their children for the first time by 71% and 47%, respectively, after adjusting for all other variables in the model. Residence at birth was a stronger predictor of the timing of father inaccessibility than was prenatal involvement for European American and Latin American fathers; for African American fathers, prenatal involvement was a stronger predictor of the timing of father inaccessibility than nonresidential status at birth. Nearly 65% of fathers who were engaged in both prenatal activities remained consistently accessible to their child through child age of 63 months, whereas nearly 50% of fathers who were not prenatally involved were already inaccessible by the time infants were 3 months.

Conclusion—These findings have implications for early intervention programs aimed at strengthening the role of fathers in their families from the prenatal period.

INTRODUCTION

By the time children in low-income families reach toddlerhood, a measurable proportion of fathers who are initially committed and involved become disengaged from their children's lives (Lerman, 1993; Perloff & Buckner, 1996). Children living without their fathers are at risk for low school achievement and behavioral or emotional problems (Astone & McLanahan,

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1991; Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Gabel, 1992). The decline in father involvement over time has been documented, but less attention has been paid to factors that explain why some men remain involved with their children while others do not. One explanation is that men who are less involved at the transition to fatherhood, a time of joyful anticipation but also heightened stress, may disengage quicker is because they feel less connected to their infants and partners. Research indicates that fathers who are involved in their partners' pregnancy are more likely to stay involved than those who are not (Cabrera, Fagan, & Farrie, in press; Cook, Dick, Jones, & Singh, 2005; Palkovitz, 1985). A possible explanation is that men who are prenatally involved are more committed to their partners and children, thus marking a trajectory of continued involvement and desire to do "the right thing", which can lead to long-term involvement (Marsiglio, 2004).

It is also commonplace that many men who disengage from their children at some point return at a later point, especially when the relationship with their child's mother is more positive (Cabrera et al., 2004). The first instance of inaccessibility is important because it marks the beginning of instability in the child's life. Instability, measured as inconsistent living arrangements, can have negative effects on children because children thrive and optimally develop in stable and predictable environments (Adam, 2004). Moreover, fathers who are "in and out" of their children's lives might be more likely to be unmarried than married. It is reasonable to expect that, if a father is "out" of the household early on in the child's life (e.g., shortly after birth), he is more likely to stay out of the child's life longer than if he left later. Leaving early during the first 2 years of life does not afford fathers the opportunity to connect with their children and become emotionally invested. Consequently, fathers might be less likely to support their children and mothers emotionally and economically. Economic hardship during the first years of life is more detrimental to children's wellbeing than economic difficulties at a later point in time (Duncan & Brooks-Gunn, 1997).

Studies indicate that fathers' prenatal involvement leads to more committed relationships, which, in turn predict increased paternal engagement 3 years after the birth of the child (Cabrera et al., in press). Another study showed that fathers who displayed high prenatal involvement were more actively involved in caring for and playing with their infants at 1 and 6 months and were more likely to eat meals, spend time alone and share activities with their children at 14 months and beyond than fathers who were less involved prenatally (Tamis-LeMonda, Yoshikawa, & Kahana Kalman, in press). Thus, if prenatal involvement predicts fathers' direct involvement with children early in development, it might also predict the timing of fathers' disengagement, that is when in children's development fathers are no longer regularly accessible to their children. Here, we investigate the role of prenatal involvement in predicting father accessibility over children's first 5 years, and also examine other contextual influences such as the mother-father relationship status and father ethnicity that may play a role in fathers' prenatal involvement and patterns of accessibility over time.

Theoretical Framework

According to the life course perspective, individuals' lives are constantly changing, and these changes follow trajectories that have developmental implications for the individual (Elder, 1998). A man becoming a parent, for example, can experience several life-altering changes (life transitions) including a commitment to be involved in his child's life. Depending on social and historical circumstances, these life transitions may be stressful or exciting and may lead to positive or negative changes that set the father on a path of more or less involved parenting (Elder, 1998). Central to the life course perspective is the concept of *timing* of life events (Burton & Snyder, 1998; Elder, 1998), including the point in time during a particular transition when an individual chooses to take action. A man transitioning to parenthood who decides to be involved early in the transition (before or at birth) by supporting his partner (e.g., buying

supplies, attending prenatal visits) is more likely to be involved with his child than a man who chooses not to (Cabrera et al., 2006). Men who choose to stay involved in their child's life might make some adjustments to their life styles and their perception of themselves as responsible fathers, which would result in more involvement and accessibility to their children. For fathers in less stable relationships with their partners (cohabiting), being prenatally involved may increase their odds of staying involved with their children over time. Therefore, we hypothesized that prenatal involvement—fathers' support for their partner during the pregnancy—would delay the first time that fathers become inaccessible to their children, but also that this pattern of prediction would be affected by aspects of the mother-father relationship (e.g., father residency) as well as fathers' ethnicity.

Mother-father relationship status—Fathers who are involved with their partners during the pregnancy may be more likely to stay involved with their partner and child because of their relationship with them than those who are not. Findings from the Fragile Families study indicate that fathers who are co-resident and those who are involved romantically but are not resident are more likely to be involved before and after the pregnancy than fathers who are not romantically involved (Teitler, 2001). Thus, we hypothesized that fathers who reside with their child's mother at the time of birth are less likely to become inaccessible early on in the child's life than fathers who do not reside with their child's mother at the child's birth.

Differences in patterns of prenatal involvement by ethnicity—Because different ethnic groups vary in terms of individual characteristics, family social circumstances, cultural practices and beliefs, and community context (e.g., neighborhood environment) (Hofferth, 2003), parenting behaviors are also likely to be different. Studies have shown that patterns of paternal engagement vary by ethnicity, which is primarily explained by the status and quality of mother-father relationship (Cabrera, Ryan, Mitchell, Shannon, & Tamis-LeMonda, 2008; King, Harris, & Heard, 2004). For example, recent findings have shown that Latin American fathers are warm and nurturing, especially with young children, and spend more time in direct interactions with their children than fathers of other ethnic groups (Mirande, 1991; Toth & Xu, 1999). However, we know of no studies that have examined whether there is variation in patterns of father prenatal involvement by ethnicity and how this earlier involvement predicts fathers' continued accessibility across the early childhood years.

One study using the Fragile Families dataset found that African American fathers are moderately involved prenatally (Cabrera et al., in press). We know of only one study that has examined the association between prenatal involvement and father involvement in Latin American families. Cabrera and her colleagues (2008) found that Latin American fathers were highly prenatally involved. Given differences in patterns of father involvement across ethnic groups, we hypothesize that there would also be differences in patterns of prenatal involvement by ethnicity. However, given the lack of research in this area we do not hypothesize about variation across ethnic groups in the association between prenatal involvement and timing of fathers' inaccessibility.

Control variables—Variation in father involvement has been related to a host of variables including participation in family services (e.g., EHS), fathers' and mothers' age and education, and child characteristics (gender, firstborn status). A father's age at the birth of his first child is related to his ability to provide for his child and stay involved in his child's and partner's life (Pleck, 1997). Fathers who have children from other unions may be at risk for decreased engagement with their children (Manning & Smock, 1999). Moreover, women's age may encourage union formation, cohabitation, or marriage (Carlson, McLanahan & England, 2002). Parents' level of education consistently predicts their involvement with children of all ages and across ethnic groups (Cabrera et al., 2004; Coley & Chase-Lansdale, 1999; Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004). Also, although evidence is mixed, some studies

find that fathers are more involved with their sons than daughters (Easterbrooks & Goldberg, 1984; Kelley, Smith, Green, Berndt, & Rogers, 1998). In this study, to isolate the independent effects of prenatal involvement and mother-father relationship status on father accessibility, we control for these variables: EHS treatment, child gender and firstborn status, and father age and education.

Current Study

In this study we asked the following research questions: What are the long-term patterns of father accessibility (measured as father presence at their children's birth and seeing their children a few times a month or more) in low-income, ethnically diverse fathers? Do fathers' residence at birth and prenatal involvement predict the timing of fathers' first disengagement (inaccessibility) in the period spanning infants' birth to 5 years? Do patterns of accessibility vary by ethnicity?

This research extends previous studies in several ways. First, unlike past studies that have been for the most part atheoretical, we draw from the life course perspective that explains how events, such as the birth of a baby, that precipitate transitions may lead to significant changes and reorganization in individual's lives (Elder, 1998). Second, the longitudinal nature of this study enabled us to investigate men's behaviors prior to the transition to a new infant (i.e., prenatally) through the next 5 years of children's lives. We use Survival Analysis to examine father prenatal involvement and patterns of father accessibility (regular contact a few times a month), beginning at birth through the first 5 years of children's lives. Survival analysis enables researchers to model changing patterns of father involvement across successive child ages, and is a valuable analytic tool in developmental research given its emphasis on the timing of meaningful events (see Tamis-LeMonda, Bornstein, & Baumwell, 2001). Finally, in contrast to prior research, these analyses are conducted separately for European American, African American and Latin American fathers to examine whether patterns of prediction vary by ethnic group.

We expected that fathers who were prenatally involved would be more likely to remain accessible to their children over the 5-year period (and so be less likely to experience the "event" of inaccessibility early on) than fathers who were less involved prenatally, but that such predictive patterns would also be influenced by other contextual factors. To address questions regarding predictors of father inaccessibility over time, we consider fathers' prenatal involvement in the context of other influential factors, including the status of the mother-father relationship and fathers' education. Extant research suggests that a father's education and his relationship with his partner predict his commitment to and involvement with his child (Cabrera, Shannon, West, & Brooks-Gunn, 2006; Cook et al., 2005; Cummings, Goeke-Morey, & Raymond, 2004; Pleck, 1997; Tamis-LeMonda et al., 2004). We therefore expected fathers with less education and those not residing with the mothers of their children to become inaccessible to their children earlier in children's development.

METHODS

Participants

Participants for this study were drawn from families who were part of the National Early Head Start evaluation study (EHS), a longitudinal study of infants and toddlers in low-income families, which studied the impacts of the EHS program. EHS is a comprehensive, two-generation program that provides intensive services to families with children from before birth until 3 years of age. It includes 3,001 families (95% of primary caregivers were biological mothers) living in 17 communities across the country that met the EHS income eligibility criteria and had a child younger than 12 months of age. To determine eligibility based on

income, programs used the poverty guideline, which is a version of the federal poverty measure. The guidelines are used to determine financial eligibility for certain federal programs (e.g., $14,494 for a family of 3 in 2002) (see Administration for Children and Families, 2002).

As part of the experimental research design, families who applied to EHS were randomly assigned either to the EHS study group or to the control group and received other services available in their communities. Data on family demographics and service needs were collected prior to random assignment. The study included measures of a broad range of child and family outcomes and obtained extensive information about the programs and the individual families' experiences with them. Families were interviewed at 6, 15, and 26 months after random assignment and at program exit. Child assessments, parent–child interaction assessments, and parent interviews were conducted when the children were 15-, 25-, and 37-months-old and at prekindergarten. Mothers were given $20 and a small gift for their children.

From the initially 3,001 recruited sample, 2,300 biological mothers were interviewed during the first scheduled home visit (15 months). For purposes of this study, we restricted the sample to include mothers who informed the biological father about the pregnancy prior to child's birth (19 fathers were never informed about the pregnancy, 18 fathers were told after their child's birth, and 3 had missing data), reported their child and the father as living (1 child and 14 fathers were deceased), had full information on fathers' prenatal involvement (14 had missing prenatal data), and fathers who were European American (37%), African American (37%) or Latin American (24%) (74 fathers were bi-racial, Asian American or Native American). Therefore, the final sample included 2,160 biological mothers who informed the biological father of the pregnancy.

Participating mothers were more likely to be married, older, and educated, and more likely to be European American and Latin American than mothers who did not participate (see Cabrera et al., 2004, for complete bias analyses).

Complete data were available for 80% (n = 1,727) of interviewed mothers; 20% (n = 433) had missing data on father age, education, and/or ethnicity. To determine whether there were substantial and systematic differences between these two groups of mothers a series of chi square and independent-sample t-test analyses was conducted. Analyses revealed a few systematic differences related to observed variables in the data. Specifically, mothers and fathers with complete data were more likely to be European American or Latin American [χ^2 (3, N = 2,160) = 52.24; χ^2 (3, N = 2,160) = 40.16, $p < .001$, respectively] and older [t(2,160) = 2.74; t(2,160) = 3.10, $p < .01$] than parents with incomplete data. Mothers were more likely to report residing with their child's father at birth [χ^2 (1, N = 2,160) = 156.79, $p < .001$] and less likely to report fathers as being involved prenatally than those with incomplete data [χ^2 (2, N = 2,160) = 65.41, $p < .001$]. No other significant differences between the groups were identified based on program status and child characteristics.

Missing data reported on father age (.3%), education (5.6%), ethnicity (16.7%), were imputed using the Expectation-Maximization (EM) algorithm, a statistical technique that uses an iterative estimation procedure to impute missing values using maximum-likelihood estimation (McLachlan & Krishnan, 1997). EM estimation depends on the assumption that the pattern of missing data is related only to the observed data or missing at random (MAR) and is recommended for handling missing data over other estimation methods that employ case deletion when the assumption of MAR is satisfied (Schafer & Graham, 2002). The proportion of missing data rates for the 2,160 participants who met sample inclusion criteria was within acceptable limits for implementation of this imputation method. Therefore, analyses reported include imputed data with the sample of 2,160 mothers interviewed at 15-, 25-, 37-month visits and Prekindergarten (results available from first author on request).

Measures

Father accessibility—Given the scope of this study, we focus on father accessibility (Lamb, Pleck, Charnov, & Levine, 1987) by assessing whether fathers remained accessible (0) or became inaccessible (1) to their children at discrete points in time: at infant birth, at 15, 25, 37, and 63 months based on mother report. Although there is some evidence that fathers are better informants of their own behavior than are mothers (Coley & Hernandez, 2006), we use mother report of father accessibility because of the large number of missing data on father report of involvement, which would have reduced our sample size by more than half.

The measure of father presence (accessibility) at birth was based on mothers' report of whether the target child's biological father was present at the child's birth and if he visited them at the hospital. This was asked during the 15-month interview. Those fathers reported seeing their children at one or both postpartum hospital visits were coded as 1 *accessible at that time point*. Those fathers who were reported not seeing their child at the hospital were coded as 0 *inaccessible*.

Father accessibility at 3 months was based on mothers' report of how often their child's father saw their child within the first 3 months of their child's birth, again asked during the 15 month interview. Father accessibility at 15 months was based on mother report of how often the child's father had seen the child in the 3 months prior to the 15-month interview. Similarly, during each of the 25-, 37-month, and 63-month (prekindergarten) visits mothers were asked how often the child's biological father saw the child in the 3 months preceding the visit. Responses were rated using a 6-point Likert scale that ranged from father: *never* seeing the child = 1, seeing the child *a few times a month* = 4, seeing the child *every day or almost every day* = 6. Mothers who reported that their child's father saw their child a *few times a month or more* were coded as *1 accessible at that time point*. Those fathers who were reported to see their child *less than a few times month* were coded as *0 inaccessible*. Results with *inaccessibility* being defined by mothers as fathers *never seeing their children* were essentially the same as results with inaccessibility defined as fathers' report *seeing their children less than a few times a month*. Therefore, analyses reported are based on father *accessibility* defined as *seeing their children a few times a month or more* (results available from first author on request).

The dichotomous format of these repeated measures of father accessibility presents suitable data for survival analysis as they can then be used to calculate the child age at which fathers first became inaccessible to their children (for those fathers who experience the event). For purposes of survival analysis, these six accessibility time points were recoded into two new variables: (1) *Inaccessible*, that is, the age of child when the father was reported as *first* being inaccessible to his child: Time 1: at child's birth, Time 2: between birth to 3 months, Time 3: between 12 to 15 months, Time 4: between 22 to 25 months, Time 5: between 34 to 37 months, or Time 6: between 60 to 63 months; and (2) *Censored* (1 = still accessible or mother dropped out of study, 0 = inaccessible). Although father accessibility at infant birth is the only time period not coded over a 3-month time period, research suggests the importance of keeping this event as its own initial time point rather than making it a part of the birth to 3-month time period or using it as a predictor of timing of father inaccessibility (see Cabrera et al, in press).

Residence at birth—During the 15-month interview, mothers were asked if their child's father lived with the family at the time of the child's birth (1 = *resident at birth*). Marital status at birth was not gathered.

Fathers' prenatal involvement—To determine fathers' prenatal involvement, mothers were asked 3 questions (during the 15-month interview). First, to determine whether the father was aware of the pregnancy, mothers were asked "When did you inform your child's father of

your pregnancy?" Responses were rated: 1 = *informed father within 1 week*, 2 = *within 1 month*, 3 = *more than 1 month late* r, 4 = *after child's birth*, 5 = *never informed father*.

Mothers who informed fathers of the pregnancy prior to child's birth were asked two questions that assessed father support or involvement with the mother during the pregnancy: (1) Did father discuss with you how your pregnancy was going? (2) Did father attend any prenatal appointments? Responses were rated: 1 = *Yes*, 0 = *No*. Because these two items were highly correlated ($r = .51$, $p < .001$) a composite score of prenatal involvement was created by summing the two items. Scores ranged from 0 (*engaged in no prenatal involvement*) to 2 (*engaged in both types of prenatal involvem*ent). The distribution was as follows: 18% never engaged in prenatal involvement, 21% engaged in 1 type of prenatal involvement, 61% engaged in both types of prenatal involvement.

Control variables—We include the following controls because they have been linked to father involvement: participation in family services (e.g., EHS) (Love et al., 2005), fathers' and mothers' age (Carlson et al., 2002) and education, (Cabrera et al., 2004; Coley & Chase-Lansdale, 1999; Tamis-LeMonda et al., 2004), and child characteristics (gender, firstborn status; Easterbrooks & Goldberg, 1984; Kelleyet al., 1998; Manning & Smock, 1999). Because mother and father age and education were moderately to highly correlated ($r = .72$, and .38, ps $< .05$, respectively), only father age and education were included as controls in the Cox regression models.

Program status was measured at the site level (1 = *treatment*). During baseline interviews with the mothers, information was gathered on mothers' and fathers' ethnicity (1 = European American, 2 = African American, 3 = Latin American, and 4 = Other; Asian American, Native American, bi-racial), age at child's birth, and years of education (0 = *less than high school educ*ation, 1 = *high school graduate/GED*, 2 = *some college/college graduate*). Income was not included because of the large number of missing data for mothers and fathers. Child gender (1 = *boy*) and first born status (1 = *first born child*) were also gathered from mother report.

Data Analytic Strategy

Survival analysis (also known as event history analysis) was used to address our research questions. This statistical technique uses discrete and/or continuous variables at one point in time to predict the onset of a discrete event at a later point in time and provides metrics that are conceptually and empirically useful in isolating predictors of those events (see Willett & Singer, 1991, 1993, for review). In addition, survival analysis enables researchers to work with censored data, that is to estimate the effect of predictors on the timing of events even when not all data are available and/or when not all people have experienced the event (in this case, becoming inaccessible to the child).

Our aim in this study was to examine the predictive validity of fathers' prenatal involvement and father residency at birth on the timing of the event of fathers' inaccessibility (defined as not seeing their children at birth and/or seeing their children less than a few times per month at subsequent assessments). That is, the dichotomous variable of whether fathers were accessible or whether they were not assessed at infant birth, between birth to 3 months, 12 to 15 months, 22 to 25 months, 34 to 37 months, or 60 to 63 months. The timing of a shift to *first inaccessibility* (although not necessarily indicating that fathers remained inaccessible) was thus the event of interest. Consequently, attrition due to fathers exiting families was an outcome variable of substantive interest, as opposed to a threat to internal validity.

Using this approach it is possible to ask "What is the probability that a father will no longer see his child regularly at 15 months, 25 months, and through the end of the study, if he has regularly seen his child to date?" The set of conditional probabilities of the target event

occurring (risk) across the specified ages is termed the baseline hazard function. If the event is equally likely to occur at any given age, the hazard function will be flat, as the probability for father accessibility does not depend on child age. To the extent that the baseline hazard function peaks at a specific age, it suggests that fathers are more likely to become inaccessible at that particular age than at other ages.

From baseline hazard probabilities, the baseline survivor function can be calculated. The survivor function represents the cumulative probability of an event occurring in a group of fathers at successive ages. As a hypothetical example, 100% of fathers will be present at infants' births; by 15 months 70% will still be present; by 37 months the percentage might asymptote at 65%.

Importantly, baseline hazard and survivor functions can be compared to fitted hazard and survivor functions which provide estimates about the displacement of an event (i.e., its movement forward or backward in time) in the presence of predictors (Willett & Singer, 1991, 1993). If a variable is found to be a significant predictor of the timing of fathers' inaccessibility, it is possible to contrast estimates of median lifetimes for subgroups of fathers. For our study, survival analysis makes it possible to estimate how fathers' prenatal involvement will shift the timing of fathers becoming inaccessible to their children, and thus whether the proportion of fathers who remain accessible to their children at discrete ages (e.g., the outcome point of study at prekindergarten) differs for fathers who were and were not involved prenatally.

RESULTS

First, descriptive results of family demographics and father prenatal involvement are presented for the full sample, followed by comparisons of these variables by father ethnicity. Second, the baseline survival and hazard functions are presented for the dependent variable (the time father was reported to first be inaccessible) for the full sample and by ethnicity. Next, the Cox proportional hazards regression model of survival analysis was used to test the contributions of the control variables (i.e., program status, child gender and firstborn status, and father age and education), and the predictors (i.e., fathers' residence at child's birth and prenatal involvement) to the risk of fathers' first becoming inaccessible to their children up to 63 months for the full sample and by ethnicity. Finally, survivor and hazard functions are compared based on subgroups of fathers: by father residency (i.e., those residing with their children at birth versus those not residing with their children); and by their level of prenatal involvement (i.e., involvement in both types of prenatal activities, involvement in 1 type versus involvement in neither prenatal activity).

Descriptive Statistics: Full Sample and by Ethnicity

Full sample—Descriptive statistics for all variables are presented in Table 1. Half of the mothers were participating in the intervention group. Most of the children were firstborn, and half were boys. On average, mothers were 23 and fathers were 25 years old at the birth of their child. More than half of mothers had a high school degree or more, whereas fewer than half of fathers were reported to have a high school degree or more.

Almost sixty percent of fathers (59%) were residing with the child's mother at the child's birth. Most mothers (76%) informed fathers of their pregnancy within the first week they knew they were pregnant. Only 12% informed the father after the first week but within the first month, and another 12% informed fathers after the first month. The majority of mothers reported that fathers discussed their pregnancy (77%) with them and accompanied them to doctor visits (66%). Fathers were more likely to discuss the pregnancy with mothers than accompany them to doctor visits, χ^2 (1, N= 2,160) = 550.44, $p < .001$. In the full sample, more than half of fathers (57%) were reported to be consistently accessible to their children from birth through

prekindergarten, and only 7% were inaccessible across their child's first 5 years. The remaining 35% of fathers were reported to be "in and out" of their child's life, with 34% of these men being accessible to their children again by prekindergarten. This pattern changed by ethnicity (see Table 1).

Comparisons by ethnicity—European American parents were more likely to have completed high school than either African American or Latin American parents. European American and Latin American fathers were more likely to be older, and have more than one child and reside with their child at birth than African American fathers. African American mothers were more likely to wait to let fathers know about the pregnancy, and African American fathers were less likely to attend prenatal appointments than both the European American and Latin American fathers. African American fathers were reported to be less consistently accessible to their children than European American or Latin American fathers (42% versus 64% and 68%, respectively); however, less than 8% of fathers from each group were consistently inaccessible. African American fathers were also more likely to be "in and out" and "out and in" of their children's life than the other two groups of men.

Baseline Survival and Hazard Functions of Father Accessibility for the Full Sample and by Ethnicity

Full sample—Our sample includes all fathers who were aware of the pregnancy. Although men were aware of the pregnancy, not all men were actually accessible at the start of the study; therefore, the starting points in all survival and hazard plots do not begin at 1 and 0, respectively. For example, in Figure 1A, the starting point begins at .82 on the survival plot, which reflects the percentage of fathers who were present at their infants' births (Time 1). Survival and hazard plots were measured at infant birth, between birth and 3 months, 12 and 15, 22 and 25, 34 and 37, and 60 and 63 months of age.

The survival plot presents the percentage of children who survive, that is did not experience the event; these were children whose fathers were consistently accessible to them from their birth at the hospital through prekindergarten (see Figure 1A). Most fathers (82%) were present at infant birth (Time 1) and for the most part remained present by the time infants were 3 months of age (77% remained accessible). Between 12 and 15 months 70% of fathers were consistently accessible to their children, by 22 to 25 months 65% were consistently accessible, and between 34 and 37 months 60% of fathers were consistently accessible. When children were between 60 and 63 months of age, 51% of the initial 2,160 fathers were reported to be consistently accessible to their children (i.e., they saw their children a few times a month or more). The estimated median lifetime of the timing of father inaccessibility is more than 63 months (indicating that a little more than half of fathers remained accessible through the final study wave at prekindergarten).

Figure 1B presents the corresponding hazard function, which estimates the conditional probability that a father will become inaccessible to his child at a specific time period if he had not already done so (i.e., calculated for the group of fathers who were accessible up to that time). The size of the hazard indicates the risk associated with each time period. Although a large majority of fathers were at their infant's birth, the hazard indicates this as the riskiest time (i.e., more unstable time) period of father inaccessibility for the first time. After the infant's birth the hazard declines and levels off across the successive age points as indicated by the flat line from time 2 (between birth and 3 months) to time 5 (between 34 and 37 months), and then peaks again at prekindergarten

Comparisons by ethnicity—The survival and hazard lines were split by ethnicity to examine patterns of first-time inaccessibility within the 3 ethnic groups (see Figures 2A and

2B). The largest proportion of fathers who are likely to remain accessible across the 6 age points are Latin Americans. The largest proportion of men becoming inaccessible at each discrete age were African Americans. The estimated median lifetime of father inaccessibility (i.e., the period when half of fathers is inaccessible) was less than 3 months for African American fathers and more than 63 months for both European American and Latin American fathers. Within all 3 groups, the child's birth was the riskiest time period, followed by the prekindergarten period.

Fathers' Residence and Prenatal Involvement Predicting to First Inaccessibility: The Full Sample and by Ethnicity

A series of Cox proportional hazards regression models was tested to examine the unique prediction from fathers' residence at birth and prenatal involvement to the timing of first inaccessibility from child birth through prekindergarten. In each model, control variables (i.e., program status, child gender and firstborn status, and father education and age) were entered as a block in Step 1. Father residence at child's birth was entered in Step 2. Mothers' report of fathers' prenatal involvement (discussing the pregnancy and attending prenatal doctor appointments) was entered in Step 3. Four separate models were run, one for the full sample of fathers and one for each of the 3 primary ethnic groups (i.e., European American, African American, and Latin American) (see Table 2).

Full sample of fathers—Together, the control variables, father residency at child's birth and fathers' prenatal involvement improved model fit predicting the hazard function (risk of fathers' first time being inaccessibility), χ^2 (9, N = 2,160) = 923.84, $p < .001$. Fathers who reportedly were not residing with their children at birth or not involved with their child prenatally had a greater risk of becoming inaccessible (i.e., seeing their children less than a few times a month) to their children by prekindergarten than those who were resident at birth and involved prenatally, after accounting for control variables. Specifically, by prekindergarten, fathers' residence at birth decreased the risk of father inaccessibility by 71% and their prenatal involvement decreased the risk by 47%, after adjusting for all other variables in the model.

European American fathers—Father residency at birth and their prenatal involvement were each significantly associated with the timing of father inaccessibility, after accounting for all other variables in the model, with residential status being the stronger predictor (see Table 2). In particular, the estimated risk of European American father's inaccessibility at prekindergarten decreased by 78% if the father was living with his child at birth and European American father's prenatal involvement reduced the estimated risk of his inaccessibility at prekindergarten by 52%.

African American fathers—African American fathers' nonresidential status at child birth and prenatal involvement were also significantly associated with the timing of father inaccessibility by prekindergarten. However, prenatal involvement was strongly associated with inaccessibility than nonresidential status at birth. Specifically, the estimated risk of African American father inaccessibility at prekindergarten decreased by 45% if the father was residing with his child at birth, after adjusting for all other variables. The estimated risk of his inaccessibility by prekindergarten decreased by 50% if he was prenatally involved with his child.

Latin American fathers—Father residency at birth and prenatal involvement were both significantly associated with the timing of Latin American father inaccessibility by prekindergarten. In contrast to European Americans and African Americans, residency at birth appeared to be a much stronger predictor of inaccessibility than prenatal involvement. For

example, the estimated risk of Latin American father's inaccessibility at prekindergarten decreased by 82% if the father was residing with his child at birth, and his estimated risk in accessibility at prekindergarten only decreased by 36% if he was prenatally involved.

Statistical Modeling of Survivor and Hazard Functions: Father Accessibility based on Residence at Birth and Level of Prenatal Involvement

In survival analysis, subgroups of the population can be compared on their survivor and hazard functions. These subgroups are typically defined by significant predictors in models (e.g., contrast of fathers who were high versus low in prenatal involvement) and present estimates of how much events are displaced over time as a function of the predictor. As predictors better explain the timing of father accessibility, the median lifetimes (i.e., the average age of event occurrence) of the subgroups will diverge in the presence of those predictors (Willett & Singer, 1991, 1993).

To examine more closely where drops in father inaccessibility occurred based on residency at birth and level of prenatal involvement, in the next set of analyses, we plotted fitted survivor functions of father inaccessibility based on residence at birth and prenatal involvement for the full sample.

Residence at birth—As indicated in Figure 3, the two survival plots of fathers' resident status noticeably diverged. In particular, the survival plot of fathers residing with their infants at birth was consistently higher than nonresident fathers at birth. The estimated median lifetime of inaccessibility was more than 63 months for fathers residing with infants at birth (meaning they remained consistently accessible through the study end), whereas nonresident fathers had an estimated median lifetime of inaccessibility less than 3 months. The hazard plots (not shown) indicate that, across all time periods, the estimated hazard for nonresident fathers was greater than that for resident fathers, with the riskiest period for nonresident fathers occurring at the child's birth.

Prenatal involvement—The 3 survival plots of fathers' level of prenatal involvement are visibly distinct and separate (see Figure 4). Specifically, the survival plot of mothers who reported that fathers engaged in *both* prenatal activities were consistently higher than the survival plot for fathers reported to engage in only one or neither prenatal activity. The plot of fathers engaged in at least one prenatal activity was also always higher than the plot of fathers who engaged in no activity. Thus, fathers' earlier commitment during transition to parenthood led to fathers staying consistently accessible to their children for longer duration. For fathers engaged in both types of prenatal involvement, the estimated median lifetime of inaccessibility is more than 63 months; for fathers engaged in one type it is 22 to 25 months, and fathers engaged in neither had an estimated median lifetime of less than 3 months.

The hazard plots (not shown) indicate that across all time periods, the estimated hazard function for fathers who were not prenatally involved was consistently larger than that for fathers engaged in one or both prenatal activities. The period when fathers were at greatest risk of becoming inaccessible was at infant birth. Fathers involved in 1 prenatal activity had multiple risky periods occurring within the first year and then again at prekindergarten. Fathers engaged in both types of prenatal involvement had the biggest drop in their accessibility when their children were in prekindergarten.

DISCUSSION

Results from this prospective, 5-year longitudinal study highlight the importance of fathers' behaviors at the transition to parenthood for continued father involvement, measured in this study as father accessibility over children's preschool years. Fathers who were resident at the

time of their child's birth and were involved prenatally (e.g., by attending doctor visits) were less likely to become inaccessible to their children over the 5-year period than fathers who were not living with their child at birth and were not prenatally involved. Importantly, each of these measures maintained their predictive validity above control variables (e.g., father age and education) as well as relative to one another.

There are some caveats to this study that may influence the interpretation of findings. First, this sample of ethnically diverse (i.e., European American, African American and Latin American) low-income fathers is not nationally representative. The sample is based on families participating in the Early Head Start national evaluation who were mostly living in poverty and had self-selected into the national study when applying for Head Start services for their children. Also, participating mothers are more likely to be married, older and educated, and European American or Latin American than mothers who do not participate. Thus, our findings cannot be generalized to all low-income minority families of young children.

Second, the focus of this study was on the timing of when fathers first became inaccessible to their children defined by fathers not seeing their children at birth or no longer seeing their children at least monthly after birth. This cut point is somewhat arbitrary and therefore does not necessarily indicate that fathers who experience the event are no longer committed to their children or that they will not resume more regular contact with their children in the future. Moreover, the use of a more stringent criterion of father involvement (e.g., seeing the child weekly) would lead to even reduced numbers of father accessibility, whereas the use of a more lenient criterion (e.g., never seeing the child in a few months) would result in higher levels of accessibility.

Third, we rely on maternal report of father prenatal involvement and accessibility because fathers' reports of prenatal behaviors were not asked and there was a large number of missing data on fathers' reports of their own accessibility. Preferably, we would have liked to use fathers' report of their own involvement because father report has been found to be more accurate than mothers' report (Coley & Hernandez, 2006).

Fourth, marital status information was not gathered at birth, so we were unable to separate how fathers' commitment to the mother (assessed in terms of marital status) relates to their level of commitment to their children prior to birth. Perhaps, fathers who were cohabiting at birth were more likely to first be inaccessible to their children during the infants first few months of life relative to fathers who were married at birth (see Edin, 2000). Also, maternal report of fathers' prenatal involvement and accessibility at birth and between birth and 3 months were gathered retrospectively, which may have been affected by mothers' circumstances or relationship with the child's father at the 15 month visit. Nevertheless, even if mothers' reports are biased regarding their relationship with their child's father, we have no reason to expect that mothers in one ethnic group would be more biased than another.

Finally, the current emphasis on fathers' contact with their children does not capture other ways that fathers might remain involved with their children, for example through financial provisioning, phone calls, or letters. Nonetheless, to the extent that a father's regular and continued contact with his child early in development fosters a positive father-child relationship and strengthens his commitment to the fatherhood role, the findings from this longitudinal study have important implications for research, practice, and policy.

As a group, fathers were moderately to highly involved with their infants prenatally; however, there were notable ethnic differences. Within African American families, less than half (41%) and only two-thirds of mothers reported fathers to live with them at child's birth and accompany them to prenatal appointments, respectively. Similar levels of prenatal involvement have also been reported in low-income African American samples participating in the Fragile Families

study (Cabrera et al., in press). In contrast, European American and Latin American fathers were more likely to live with their infants at birth (70% and 71%, respectively), and most were prenatally involved, which is consistent with findings from a national sample of Latin American fathers in the ECLS-B study (Cabrera, Shannon, Mitchell, & West, under review). These differences by ethnicity may reflect family structures and relationship patterns that are specific to ethnic groups. For example, it may be normative among African Americans, especially low-income samples, to be in a cohabiting relationship (McAdoo, 1988). These unions tend to be unstable and thus the father may be more likely to be "in and out" of his child's life, which is supported by our findings. However, it is also the case that the current measure of father accessibility was not solely defined by residency, but rather by fathers seeing their children on a monthly basis.

This study has further extended earlier findings on the link between fathers' prenatal involvement to their later involvement by applying survival analysis to examine the first time fathers' become inaccessible to their children over a 5-year period. Among fathers who might be "in and out" of their children's lives, fathers who disengage early on may be more likely to become completely disengaged over time. Baseline hazard and survival functions, which depict changes to fathers' accessibility over time in the absence of predictors, revealed telling patterns of change to father accessibility across the 3 ethnic groups. While *level* changes in the survival function were noted as a result of ethnic and prenatal predictors, differences across these subgroups in the *shape* of the function were not reported.

The repeated measures approach identified periods in early childhood where the risk (hazard) of fathers' transitioning from accessible to inaccessible were greatest. Two periods of high risk were at birth and another was at the prekindergarten period (when children were 60 to 63 months of age). Risks at intermediate points were relatively stable, although at each age assessed there was a decline in the percent of fathers who were regularly accessible to their children. Also, the time lag between successive waves varied, and therefore it is unclear whether the precipitous drop in father accessibility at the prekindergarten wave reflects the larger time window from the prior assessment wave.

Nonetheless, these findings suggest the importance of intervening with fathers at the transition to fatherhood by encouraging their involvement before the child is born as well as at their children's transition to kindergarten. This transition is an important developmental milestone for children because their academic achievement at kindergarten will be pivotal in determining the future academic success. It is plausible that fathers' presence and involvement during this time eases the difficulty of the child's transition to kindergarten.

As hypothesized, father residency at birth and prenatal involvement were significantly associated with the first time fathers became inaccessible to their children during children's first 5 years. Specifically, by prekindergarten, fathers' residence at birth and prenatal involvement decreased their risk of being inaccessible to their children for the first time by 71% and 47%, respectively, after adjusting for all other variables in the model. A father's presence at birth might signify a commitment to his new role as well as to his partner and a desire to do the right thing by this child and stay involved. This early commitment provides an important opportunity for a father to bond with his child, which might be a factor in how involved he remains in his child's life over time.

The application of survival analytic methods allowed us to further model father accessibility over time in subgroups of fathers who differed in their early prenatal involvement and residency. These analyses indicated that overall patterns of change in father accessibility varied substantially among fathers who differed in residential status at birth and prenatal involvement. For example, fathers who were cohabiting with the mothers of their children displayed limited

declines in their accessibility over the 5-year period, with 57% of fathers who had been resident at the child's birth remaining accessible to their children by prekindergarten. By contrast, only 12% of fathers who had not resided with the mothers of their infants at infant birth remained accessible by prekindergarten. The largest number of fathers in this group became inaccessible at their infant's birth (i.e., 38%).

Similarly, in examining patterns of accessibility based on prenatal involvement, 65% of men committed to supporting mother during pregnancy by discussing the pregnancy and accompanying her on prenatal appointments were consistently accessible to their children through prekindergarten. Contrary, only 14% of fathers were still accessible to their children at prekindergarten if they reportedly had not engaged in these prenatal behaviors. Fewer than 50% of these men were accessible at their infant's birth. It appears that a father's sense of commitment to his child is closely tied to the status of his relationship with the child's mother around the birth of the child, a finding which may reflect fathers' intentionality in the pregnancy or his commitment to his partner. These findings also extend the findings that fathers' involvement in their children's lives is closely linked to their relationship with their partners (Cabrera et al., 2006; Cumming et al., 2004). Furthermore, findings suggest the need for practitioners to understand how periods of risk for decline in father disengagement intersect with other aspects of parenthood such as the mother-father relationship.

Although father residency and prenatal involvement were strong predictors of the timing of father inaccessibility, the strength of these associations varied by father ethnicity. Residence at birth was a stronger predictor of first-time inaccessibility for European American and Latin American fathers than prenatal involvement. The estimated risk of fathers' inaccessibility at prekindergarten decreased by 78% for European American fathers and by 82% for Latin American fathers if they were residing with the mothers of their children at infant birth, with the biggest drop off rates occurring at birth up to 3 months of age. Conversely, African American fathers' prenatal involvement was the stronger predictor of first time inaccessibility than nonresidential status at birth (i.e., there was a 50% decreased risk of father inaccessibility if they were prenatally involved versus 45% decreased risk if residing with infant at birth). These differences in the relative contributions of predictors might reflect historical and current norms regarding family structure and roles and expectations. Given that African American fathers are more likely to be nonresident than other fathers, it makes sense that levels of prenatal involvement might surface as an important factor. For this group of fathers, intervention strengthening the investments of fathers in their partners and unborn children may make a difference in terms of how involved fathers remain over time.

In summary, this longitudinal study highlights the importance of father involvement in the prenatal period in predicting the timing of father inaccessibility across early childhood. Fathers who were prenatally involved and living with their infants at birth were less likely to disengage from their children's lives early on. Also, the riskiest period that fathers were *first* inaccessible to their children occurred at their infants' birth. Prenatal involvement and residence at birth were predictive across the ethnic groups, with prenatal involvement being more important for African American fathers and residence at birth being more important for European American and Latin American fathers. Practitioners and policy makers should support early intervention programs that strengthen the role of fathers in their families beginning at the prenatal period.

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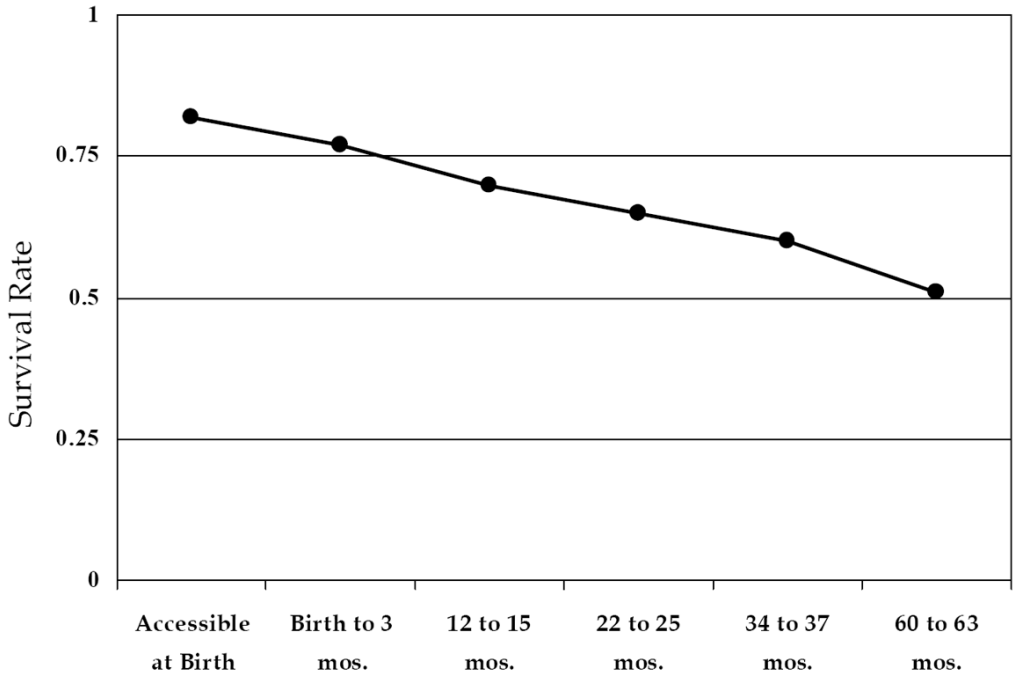


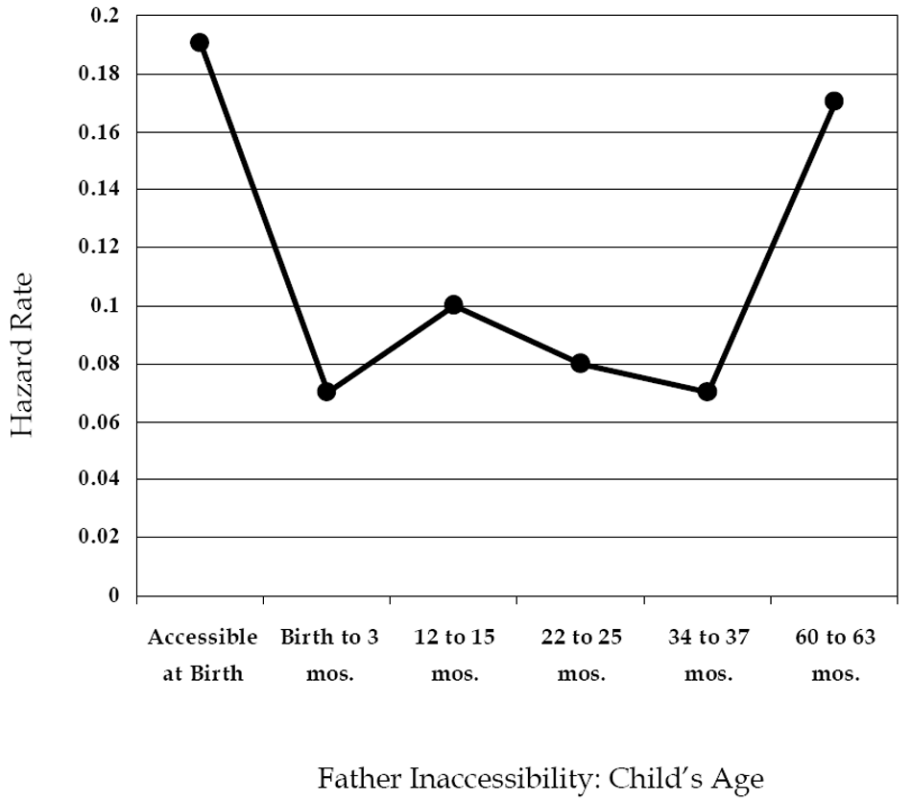
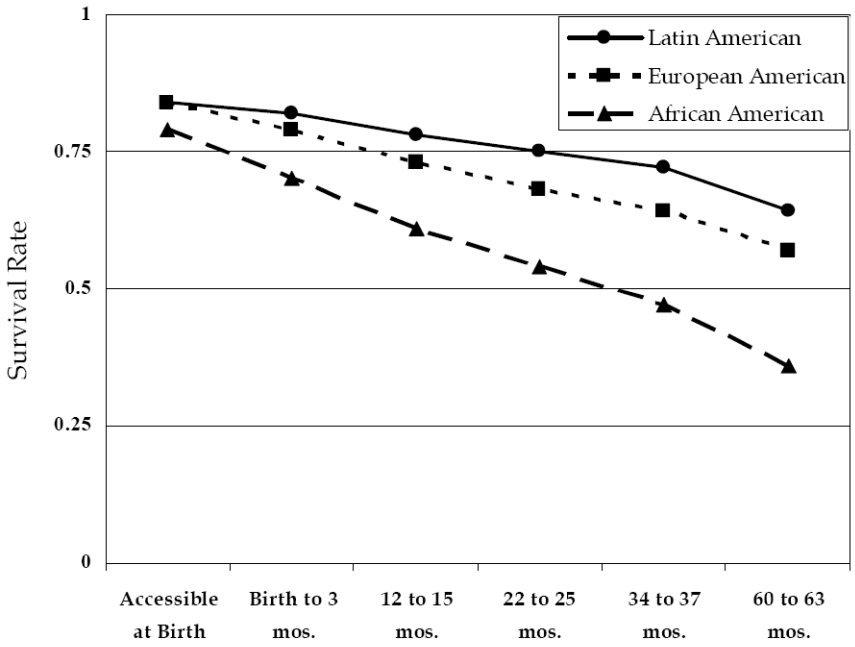


FIGURE 1.
A Survival Function for Father Accessibility: Full Sample

Note: Although men were aware of the pregnancy, not all men were actually accessible at the start of the study; therefore, the starting point in the survival plot does not begin at 1.

B Hazard Function for Fathers' *First time being inaccessible* to their Children: Full Sample

Note: Although men were aware of the pregnancy, not all men were actually accessible at the start of the study; therefore, the starting point for the hazard plot does not begin at 0.



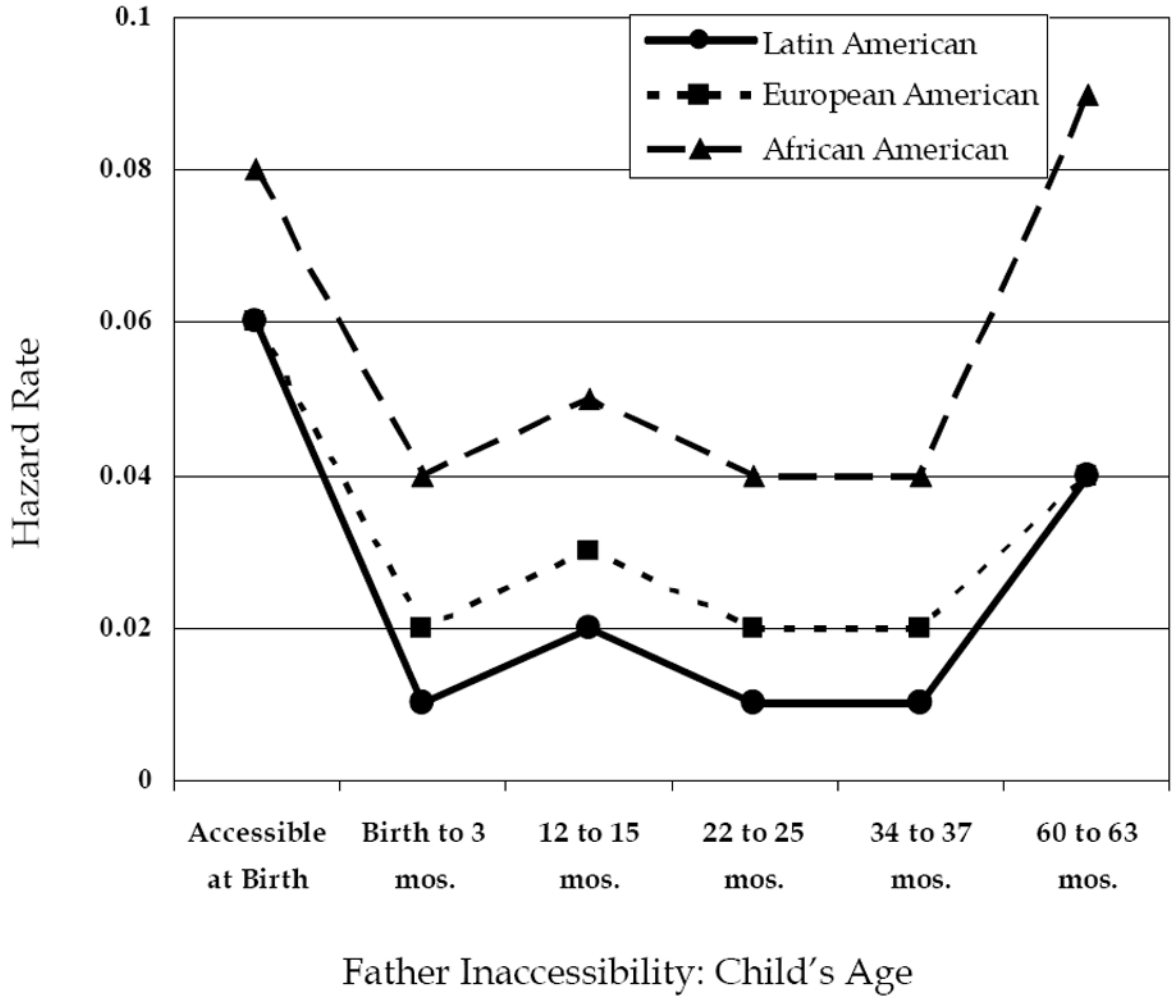


FIGURE 2.

A Survival Function for Father Accessibility: By Ethnicity

Note: Although men were aware of the pregnancy, not all men were actually accessible at the start of the study; therefore, the starting points in the survival plots do not begin at 1.

B Hazard Function for Fathers' *First time being inaccessible* to their Children: By Ethnicity

Note: Although men were aware of the pregnancy, not all men were actually accessible at the start of the study; therefore, the starting points for the hazard plots do not begin at 0.

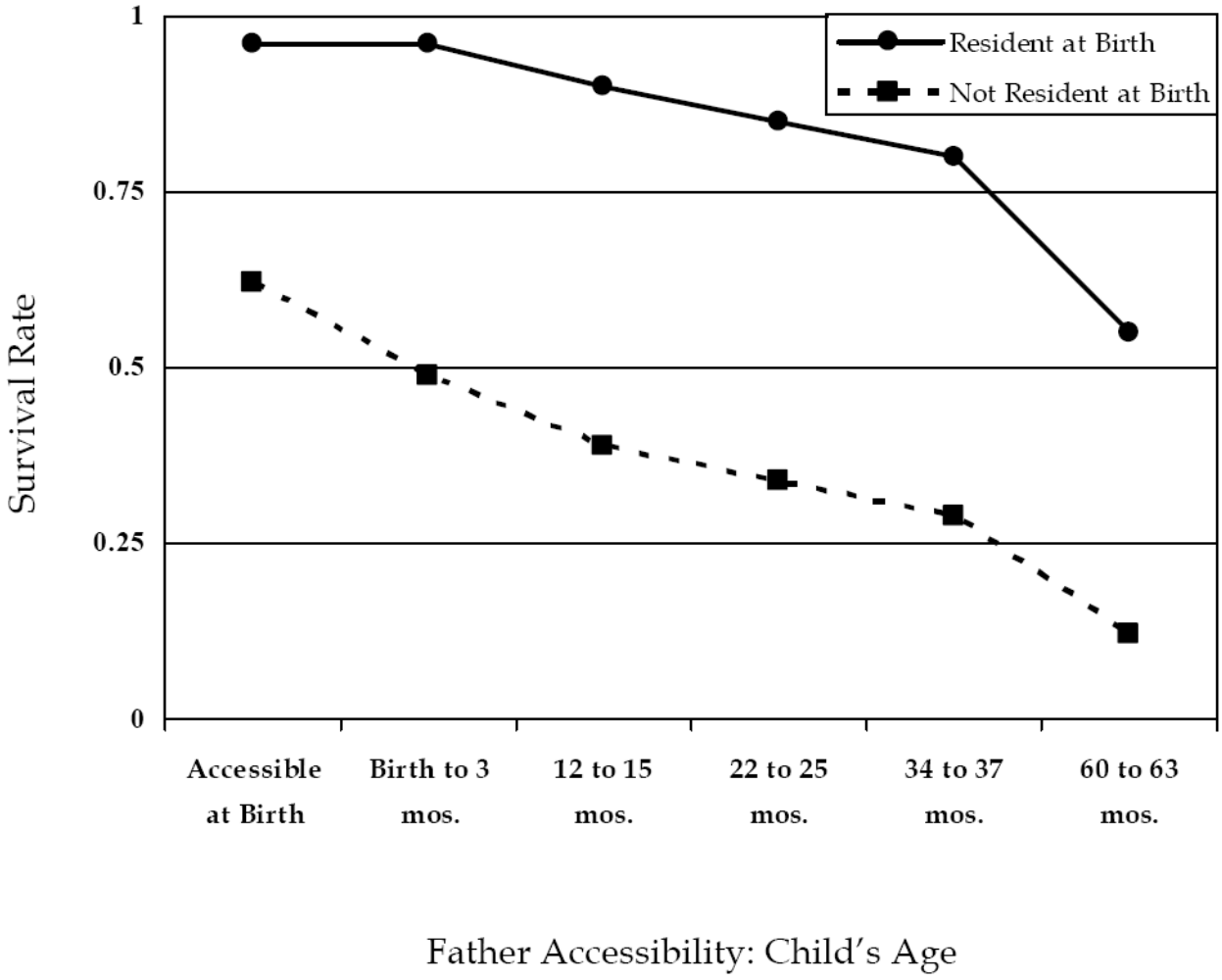


FIGURE 3.
Survival Function for Father Accessibility by Fathers' Residence at Birth
Note: Although men were aware of the pregnancy, not all men were actually accessible at the start of the study; therefore, the starting points in the survival plots do not begin at 1.

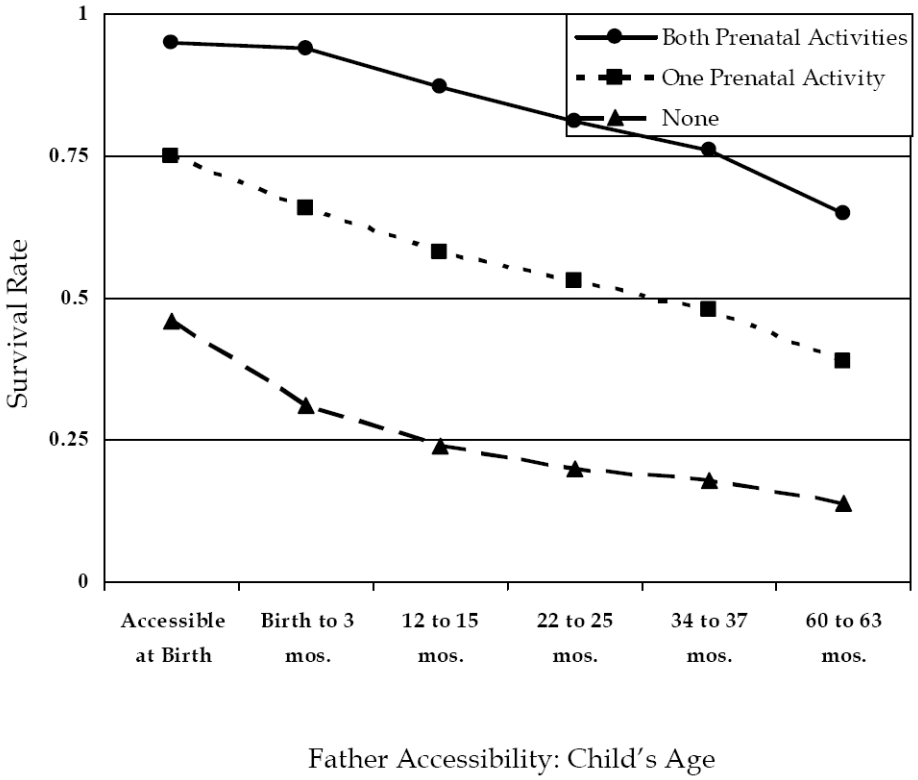


FIGURE 4.

Survival Function for Father Accessibility by Fathers' Level of Prenatal Involvement

Note: Although men were aware of the pregnancy, not all men were actually accessible at the start of the study; therefore, the starting points in the survival plots do not begin at 1.

TABLE 1

Descriptive Statistics for Demographics, Residence at Birth and Prenatal Involvement: Full Sample and by Ethnicity

Variables	Full Sample	European American	African American	Latin American	F/χ^2
	***N* = 2,160**	***N* = 797**	***n* = 796**	***n* = 567**	
Demographics					
EHS Program	51%	49%	51%	52%	0.89
Child is Male	51%	49%	52%	53%	2.09
Child is Firstborn	62%	59% ^{b}	69% ^{a}	55% ^{b}	29.08 ***
Mother's Age at Birth	22.4(5.7)	23.0(5.4) ^{a}	21.0(5.4) ^{b}	23.5(6.0) ^{a}	37.56 ***
Mother Education					194.40 ***
HS Graduate/GED	35%	39% ^{a}	39% ^{a}	23% ^{b}	
More than HS Ed	27%	36%	24%	16%	
Father's Age at Birth	25.3(6.5)	25.8(6.6) ^{a}	24.1(6.3) ^{b}	26.2(6.5) ^{a}	21.80 ***
Father Education					174.19 ***
HS Graduate/GED	21%	30% ^{a}	19% ^{a}	11% ^{b}	
More than HS Ed	22%	30%	20% ^{b}	13% ^{c}	
Resident at Child's Birth	59%	70% ^{a}	41% ^{b}	71% ^{a}	94.60 ***
When Father was Aware of Pregnancy					76.35 ***
Within 1 week after mom knew	76%	86% ^{a}	69% ^{b}	72% ^{b}	
Within 1 month after mom knew	12%	8%	14%	15%	
More than 1 month after mom knew	12%	6%	17%	13%	
Father's Prenatal Involvement	1.43(.77)	1.44(.77)	1.37(.79) ^{a}	1.50(.74) ^{b}	4.35 **
Father's Consistent Accessibility: From Infant's Birth to Prekindergarten ^{c}					103.40 ***
Consistently Accessible	57%	64% ^{a}	41% ^{b}	68% ^{a}	
Consistently Inaccessible	7%	8%	7%	6%	
"In & Out"	23%	18%	35%	16%	
"Out & In"/"In & Out & In"	13%	10%	17%	10%	

Note.

[a, b] Different letters indicate significant pairwise group differences at $p < .05$ in either bonferroni post-hoc adjustments or pairwise chi-square tests.

[c] Sample = 1,581.

* $p < .05$

** $p < .01$;

*** $p < .001$.

TABLE 2

Models of Demographics and Father Residence at Birth and Prenatal Involvement on the Hazard Function, *Fathers' First Time Inaccessible*: Full Sample and by Ethnicity

	Full Sample		By Ethnicity					
			European American		African American		Latin American	
	N = 2,160		*n* = 797		*n* = 796		*n* = 567	
Predictors	**β(SE)**	***Hazard Ratio***	**β(SE)**	***Hazard Ratio***	**β(SE)**	***Hazard Ratio***	**β(SE)**	***Hazard Ratio***
Step 1	$\Delta\chi^2$ = 70.66 ***		$\Delta\chi^2$ = 54.02 ***		$\Delta\chi^2$ = 12.11		$\Delta\chi^2$ = 18.36 **	
EHS Program	.-.03(.18)	.98	-.11(.12)	1.11	-.03(.09)	.97	-.20(.15)	.82
Child Male	.03(.18)	1.03	-14(.12)	.87	.06(.09)	1.06	.22(.16)	1.24
Child First Born	.06(.21)	1.06	.07(.13)	1.08	.02(.11)	1.01	.03(.18)	1.03
Father Age at Child's Birth	-.01(.02)	.99	.00(.01)	1.00	-.01(.01)	1.00	-.02(.01)	.98
Father Education (HS)	.01(.24)	1.01	-.12(.14)	.89	-.07(.13)	.93	.02(.24)	1.02
Father Education (HS+)	-.16(.24)	.85	.50(.16) **	.61	-.13(.13)	.88	.16(.24)	.1.17
Step 2	$\Delta\chi^2$ = 498.18 ***		$\Delta\chi^2$ = 238.60 ***		$\Delta\chi^2$ = 82.91 ***		$\Delta\chi^2$ = 146.15 ***	
Father Resident at Child's Birth	-1.25(.08) ***	.29	-1.51(.14)	.22	-.60(.11) ***	.55	-1.71(.18) ***	.18
Step 3	$\Delta\chi^2$ = 228.40 ***		$\Delta\chi^2$ = 90.27 ***		$\Delta\chi^2$ = 124.34 ***		$\Delta\chi^2$ = 21.06 ***	
Prenatal Involvement	-.64(.04) ***	.53	-.73(.08) ***	.48	-.69(.07) ***	.50	-.45(.19) **	.64
Total χ^2	923.84 ***		477.59 ***		251.76 ***		233.18 ***	

p ≤ .05,

** *p* ≤ .01,

*** *p* ≤ .001.

Note: Standardized beta weights and Hazard Ratios presented are from the final Cox Proportional Hazard models.