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Does Father Absence Place Daughters at Special Risk for Early Sexual Activity and Teenage Pregnancy?

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The impact of father absence on early sexual activity and teenage pregnancy was investigated in longitudinal studies in the United States ($N = 242$) and New Zealand ($N = 520$), in which community samples of girls were followed prospectively from early in life (5 years) to approximately age 18. Greater exposure to father absence was strongly associated with elevated risk for early sexual activity and adolescent pregnancy. This elevated risk was either not explained (in the U.S. study) or only partly explained (in the New Zealand study) by familial, ecological, and personal disadvantages associated with father absence. After controlling for covariates, there was stronger and more consistent evidence of effects of father absence on early sexual activity and teenage pregnancy than on other behavioral or mental health problems or academic achievement. Effects of father absence are discussed in terms of life-course adversity, evolutionary psychology, social learning, and behavior genetic models.

In modern Western societies, adolescent girls face a biosocial dilemma. On the one hand, the biological capacity to reproduce ordinarily develops in early adolescence; on the other hand, girls who realize this capacity before adulthood often experience a variety of negative life outcomes. Specifically, adolescent childbearing is associated with lower educational and occupational attainment, more mental and physical health problems, inadequate social support networks for parenting, and increased risk of abuse and neglect for children born to teen mothers (e.g., Furstenberg, Brooks-Gunn, & Chase-Lansdale, 1989; Konner & Shostak, 1986; Woodward & Fergusson, 1999). Despite these consequences, the United States and New Zealand have the first and second highest rates of teenage pregnancy among Western industrialized countries. Approximately 10% of girls in the United States and 7% of girls in New Zealand between the ages of 15 and 19 years become pregnant each year, with around half of these pregnancies culminating in a live birth (Cheesbrough, Ingham, & Massey, 1999; Dickson, Sporle, Rimene, & Paul, 2000). Given these costs to adolescents and their children, it is critical to identify life experiences and pathways that place girls at increased risk for early sexual activity and adolescent pregnancy.

Many studies have identified the absence of the biological father from the home as a major risk factor for both early sexual activity (e.g., Day, 1992; Kiernan & Hobcraft, 1997; Newcomber & Udry, 1987) and teenage pregnancy (e.g., Geronimus & Korenman, 1992; Hogan & Kitagawa, 1985; McLanahan, 1999). This finding is consistent with life-course adversity models of early sexual activity and teenage pregnancy, which posit that a life history of familial and ecological stress provokes earlier onset of sexual activity and reproduction (e.g., Belsky, Steinberg, & Draper, 1991; Coley & Chase-Lansdale, 1998; Fergusson & Woodward, 2000a; Robbins, Kaplan, & Martin, 1985; Scaramella, Conger, Simons, & Whitbeck, 1998). Life-course adversity models, however, do not attribute any special causal significance to father absence. Instead, these models conceptualize father absence as just one of many factors that can undermine the quality of family environments. According to life-course adversity models, it is not father absence per se but various

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other stressors associated with father absence (e.g., divorce, poverty, conflictual family relationships, erosion of parental monitoring and control) that foster early sexual activity and pregnancy in daughters (see Belsky et al., 1991, p. 658; Chisholm, 1999, p. 162; McLanahan, 1999, p. 119; Robbins et al., 1985, p. 568; Silverstein & Auerbach, 1999, p. 403).

In addition to the effects of life-course adversity, underlying personality traits may account for the relation between father absence and early sexual outcomes in daughters. Specifically, certain personality traits that predispose girls toward early sexual activity and teenage pregnancy may covary with father absence. Differences between children in externalizing behavior problems—those behaviors considered to be aggressive, disruptive, or oppositional—derive in part from individual differences in temperamental characteristics such as negative emotionality and resistance to control (Bates, Pettit, Dodge, & Ridge, 1998; Rothbart & Bates, 1998). Children who display externalizing behavioral problems early in life are at elevated risk for a variety of negative psychosocial outcomes in adolescence, including early sexual activity and teenage pregnancy (e.g., Bardone, Moffitt, Caspi, Dickson, & Silva, 1996; Quinton, Pickles, Maughan, & Rutter, 1993; Woodward & Fergusson, 1999). Moreover, individuals who have a history of externalizing disorders are not only at increased risk of becoming single parents or absent parents (e.g., Emery, Waldron, Kitzmann, & Aaron, 1999; Sampson & Laub, 1990) but also may transmit a genetic disposition toward externalizing behavioral problems and associated personality characteristics to their children (Rhee & Waldman, 2002; personality characteristics associated with both sexual risk taking and other forms of delinquent behavior in adolescence are discussed in Kotchick, Shaffer, Forehand, & Miller, 2001). Thus, girls from father-absent homes may be at elevated risk for early sexual activity and teenage pregnancy because of higher genetic loading for externalizing behavior problems.

In contrast to the life-course adversity and personality trait models, evolutionary models suggest that early onset of father absence places daughters at special risk for early sexual activity and adolescent pregnancy. Specifically, evolutionary psychologists have hypothesized that the developmental pathways underlying variation in daughters' reproductive strategies are especially sensitive to the father's role in the family and the mothers' sexual attitudes and behavior in early childhood (Draper & Harpending, 1982, 1988; see also Ellis, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999). Consistent with Hetherington's (1972) work on the effects of early father absence on personality development in adolescent daughters, the evolutionary model suggests that girls detect and internally encode information about parental reproductive strategies during approximately the first 5 years of life as a basis for calibrating the development of motivational systems, which make certain types of sexual behavior more or less likely in adolescence. The model thus posits a direct effect of quality of early paternal investment (e.g., father presence vs. absence, quality of paternal care giving, father–mother relationships) on early onset of sexual and reproductive behavior.

In light of these theoretical considerations, the current research examined the following set of questions:

Goals of the Current Research

1. Is earlier onset of biological father absence associated with increasing risk of early sexual activity and teenage pregnancy in daughters?

Despite voluminous research on father absence, very few studies have examined the relation between timing of onset of father absence and daughters' sexual outcomes. In a small observational study, Hetherington (1972) found that adolescent girls from early father-absent homes (divorced before age 5) tended to initiate more contact with, and seek more attention from, adult males than did girls from late father-absent homes (divorced after age 5). In a large retrospective survey, however, McLanahan (1999) did not find statistically significant relations between timing of onset of father absence and rates of teenage childbearing in daughters. The current research is the first to measure prospectively the timing of onset of father absence throughout early and middle childhood and then test for its effects on early sexual activity and pregnancy in adolescence.

2. Does earlier onset of biological father absence uniquely increase risk for early sexual activity and adolescent pregnancy in daughters, independent of both early externalizing behavior problems and familial and ecological stressors that covary with father absence? That is, does more exposure to father absence place daughters at special risk for early sexual outcomes—regardless of whether girls are rich or poor, Black or White, cooperative or defiant in kindergarten, born to teenage or adult mothers, grow up in violent or safe neighborhoods, experience many or few stressful life events, have warm-supportive or harsh-rejecting parents, are exposed to functional or dysfunctional marriages, are closely or loosely monitored by parents, and so forth?

A number of studies have found that father absence uniquely predicts early sexual activity

(Day, 1992; Devine, Long, & Forehand, 1993; Miller et al., 1997; Upchurch, Aneshensel, Sucoff, & Levy-Storms, 1999) and adolescent pregnancy or childbearing (Hogan & Kitigawa, 1985; Robbins et al., 1985), after controlling for such confounding variables as race, socioeconomic status (SES), neighborhood danger, and parental monitoring and control. All of these studies, however, began when daughters were already in early to late adolescence and thus were unable to assess familial and ecological stressors before daughters' risk for involvement in sexual activity. The current research is the first to assess prospectively life-course adversity throughout early and middle childhood, and control for its effects when testing for the relation between timing of father absence and rates of early sexual activity and adolescent pregnancy.

3. Does earlier onset of biological father absence discriminantly increase risk for early onset of sexual activity and teenage pregnancy—but not for adolescent behavioral and mental health problems more generally—independent of early externalizing problems and life-course adversity? In other words, is greater exposure to father absence a general risk factor for the development of psychopathology, or is it specific to sexual development?

To our knowledge, only Newcomer and Udry (1987) have explicitly addressed this question. In a short-term longitudinal study of White adolescents, Newcomer and Udry found that the effect of father absence on a composite measure of age-graded minor delinquencies (e.g., smoking, drinking alcohol, cheating on a test) was statistically significant and about equal in magnitude to the effect of father absence on onset of first sexual intercourse in girls. Newcomber and Udry, however, did not control for potentially confounding third variables (e.g., race, SES, mother's age at first birth) that could account for the correlation between father absence and delinquency. The current research examined the unique effects of timing of father absence on a variety of psychosocial and educational outcomes, after controlling for the effects of child conduct problems and familial and ecological stressors during childhood.

This set of questions was investigated in two independent longitudinal studies in the United States and New Zealand. In the U.S. study, a community sample of girls was followed prospectively from the summer before kindergarten through to the 12th grade. In the New Zealand study, a birth cohort of girls was followed prospectively from infancy through to age 18.

Method: United States

Participants and Overview

The United States data were collected as part of the ongoing Child Development Project, a multisite longitudinal study of socialization factors in children's and adolescents' adjustment (see Dodge, Bates, & Pettit, 1990; Pettit, Bates, & Dodge, 1997). Participating families were initially recruited from three geographical areas (Nashville and Knoxville, Tennessee, and Bloomington, Indiana). At the time of kindergarten preregistration in the summers of 1987 (Cohort 1) and 1988 (Cohort 2), parents of matriculating children were solicited at random (in person at the child's school or by mail) to become involved in the study. About 75% agreed. A total of 585 families agreed to participate in the study. Of these 585 families, 281 of the children were girls. The analyses reported in this article are based on this female subsample, which was demographically diverse and representative of the geographic regions (81% White, 17% African American, 2% other; 28% lived with a single mother at the beginning of the study). The Hollingshead (1975) Four-Factor Index of Social Status was computed from demographic information provided by the parents of the girls. The mean family score on the index at the beginning of the study was 38.85 ($SD = 14.0$), indicating a predominantly middle-class sample. Data on girls' early externalizing behavioral problems and on familial and ecological stressors were collected in Years 1 through 9 of the study (ages 5–13). Data on adolescent sexual activity, pregnancy, internalizing and externalizing behavioral problems, academic performance, and violence were collected in Years 10 through 13 of the study (ages 14–17). At the completion of the study in Year 13, the average age of the girls was 17.3 years ($SD = .34$). Of the original 281 girls, 242 (86%) participated in the Years 10 through 13 data collections. This subset was generally representative of the original sample (16% African American; 25% from single-mother homes; mean SES = 39.45). Other analyses have shown that attrition has not significantly biased the sample on either initial child adjustment or family socialization variables (see Pettit et al., 1997; Pettit, Bates, Dodge, & Meece, 1999). Nonetheless, there was a slight but statistically nonsignificant trend for the 242 girls in the current analyses to underrepresent girls from socially disadvantaged backgrounds (low SES, African American, single-mother homes).

Following recruitment, mothers were interviewed at home in the summer before daughters' entry into

kindergarten (see Dodge, Pettit, & Bates, 1994), when most children were 5 years of age. The 90-min audiorecorded interview included both open-ended and structured questions about each of two eras in the child's life (a period from 12 months of age up to 12 months ago, and the past 12 months). Questions concerned the child's development and child-care history, family stressors, parental behavior, exposure to socializing factors, and current functioning. Reliability was assessed through independent ratings of 41 randomly selected families made by a second coder who sat in with the interviewer. Additional home interviews with the mothers were conducted in Years 7 and 9 of the study (when daughters were approximately ages 11 and 13). Questions concerned family changes and adjustment, child's involvement in after-school care settings, parenting practices, and neighborhood characteristics over the past year.

In addition, mothers annually completed child behavior-problem questionnaires and provided family demographic data. Behavior-problem questionnaires were also completed by daughters in Years 11 through 13 of the study (approximate ages 15–17). Daughters answered questions about sexual behavior and pregnancy at this time. Also at this time, research staff requested permission to view the participants' academic records.

Timing of Onset of Father Absence

To determine timing of onset of father absence, household composition data were collected during Years 1 through 9 of the study (ages 5–13). Because Hetherington (1972) and Draper and Harpending (1982) suggest that the first 5 years of life constitute a sensitive period for the effects of father absence on daughters' sexual development, *early onset of father absence* was defined in this study as absence of the "birth father" (either the biological father or an adoptive father present from birth) from the home at or before age 5. This cutoff was also chosen to allow comparison with past studies, which have commonly defined early father absence as occurring in the first 5 years (e.g., Bereczkei & Csanaky, 1996; Blain & Barkow, 1988; Hetherington, 1972). Girls were thus classified as early father absent if they were either born into single-mother families or born into intact two-parent families but subsequently experienced birth father absence at or before age 5. *Late onset of father absence* was defined as birth father presence in the home through age 5 but subsequent absence of the birth father from the home beginning sometime during ages 6 through 13. We chose age 13 as the cutoff for late father absence to complete measurement of father absence before the onset of first pregnancy in daughters. *Father presence* was defined as birth father presence in the home through age 13. Classification of girls into the father-present or father-absent groups was based solely on birth father status and did not take stepfathers into account (33% = early father absent, 12% = late father absent, 55% = father present).

Adolescent Sexual Outcomes

Early sexual activity. In Year 12 (age 16), girls were asked whether they had ever had sexual intercourse. Girls who responded "no" were coded as 0 for early sexual activity (60%); girls who responded "yes" were coded as 1 for early sexual activity (40%). The age 16 cutoff has been commonly used in past studies to demarcate early onset of sexual activity (e.g., Fergusson & Woodward, 2000b; Kiernan & Hobcraft, 1997; Paul, Fitzjohn, Herbison, & Dickson, 2000).

Adolescent pregnancy. In Years 10 through 13 (ages 14–17), girls were asked annually whether they had become pregnant in the last year. Girls who reported no pregnancies over this period were coded as 0 for adolescent pregnancy (85%); girls who reported at least one pregnancy over this period were coded as 1 for adolescent pregnancy (15%).

Covariate Factors

To assess the extent to which associations between timing of father absence and adolescent sexual outcomes could be explained by the effects of early externalizing problems and familial and ecological stressors, the following 10 variables were included as covariates in the analysis. The measures of familial and ecological stress were chosen as covariates on the basis of past research indicating (a) covariation with father absence and (b) prediction to early sexual activity and adolescent pregnancy (see reviews by Kotchick et al., 2001; Miller, Benson, & Galbraith, 2001). The covariates were measured repeatedly and prospectively from the beginning of each study through age 13.

Externalizing behavior problems (early childhood). During Years 1 and 2 of the study (ages 5–6), mothers completed the Child Behavior Checklist (CBCL; Achenbach, 1991). The 33-item externalizing problems score, which has been reported to have excellent psychometric properties (Achenbach, 1991), was used to index daughters' early externalizing problems. A composite externalizing behavioral

problems score was computed by averaging over Years 1 and 2 (Á = .81, $M = 10.63$, $SD = 6.47$).

Mother's age at first birth. Mothers reported how old they were when they first gave birth to a child ($M = 23.23$, $SD = 4.82$).

Race. Race was coded as a dummy variable: 0 = Caucasian (83%), 1 = non-Caucasian (17%). Of the 42 non-Caucasian participants, 38 were African American.

SES. SES was computed on the basis of mothers' and fathers' occupation and years of education (Hollingshead, 1975; full description in Dodge et al., 1994). Because the rank-ordering of SES between families was highly stable over time, a composite childhood SES score was computed by averaging SES scores from Year 1 (age 5) and Year 9 (age 13; $\alpha = .84$, $M = 38.11$, $SD = 12.78$).

Family life stress (early childhood). Family life stress was assessed during the Year 1 interview on the basis of questions concerning changes and adjustments in the home and their perceived impact on the child during each era (see Dodge et al., 1994). Interviewers completed ratings of the extent of stressful, challenging events faced by the child and family (1 = *minimum challenge*, 5 = *severe frequent challenges*). The rating from the two eras were averaged to yield a score for family life stressors ($\alpha = .64$, proportion agreement between independent raters of the same protocol = .79, $M = 3.04$, $SD = .94$).

Dyadic adjustment (early childhood). During the Year 1 interview, mothers were asked to recall each era and answer questions concerning the kinds of family strife and violence the child was exposed to (see Ellis et al., 1999). Interviewers then completed ratings of the severity of conflict within the parental dyad (1 = *rarely even shout*; 5 = *physical fights, more than once*). The rating from the two eras were averaged to yield an overall score ($\alpha = .74$, inter-rater agreement = .80, $M = 2.19$, $SD = 1.03$). Mothers were also asked questions concerning levels of help and emotional support from their partners during each era (see Ellis et al., 1999). Interviewers then completed ratings of level of supportiveness in the parental dyad, and the ratings from the two eras were averaged to yield an overall score ($\alpha = .88$, inter-rater agreement = .86, $M = 2.37$, $SD = .57$). A composite measure of dyadic adjustment was computed by standardizing and then averaging the measures of "severity of conflict within the parental dyad" (reverse-scored) and "supportiveness in the parental dyad" (α across the two measures = .55).

Harshness of discipline (early childhood). During the Year 1 interview, mothers were asked about their use of discipline practices and whether the child had ever been harmed by an adult during each era (see Dodge et al., 1994). Interviewers then completed ratings of the degree of restrictive discipline received by the child (1 = *nonrestrictive, mostly prosocial guidance*; 5 = *severe, strict, often physical*) and whether the target child had been severely harmed (1 = *definitely not*, 5 = *authorities involved*). These four ratings (two ratings for each of two life eras) were averaged to derive the early childhood harshness of discipline score ($\alpha = .81$, inter-rater agreement = .78, $M = 2.05$, $SD = .67$).

Harshness of discipline (preadolescence). Harshness of discipline was also assessed during the Years 7 and 9 interviews. Using a 4-point scale (1 = *never*, 4 = *frequently*), mothers rated how often they used each of six harsh disciplinary tactics (e.g., scold, slap or hit with hand, use belt/paddle). A composite harshness of discipline measure was computed by averaging the Year 7 ($\alpha = .67$) and Year 9 ($\alpha = .67$) measures (α across the two measures = .77, $M = 2.06$, $SD = .42$).

Parental monitoring (preadolescence). Parental monitoring was assessed during the Years 7 and 9 home interviews with the mothers. Although the two measures had slightly different content, both employed 5-point frequency scales and focused on parents' awareness of their children's activities and companions. A composite measure of parental monitoring was computed by standardizing and then averaging the Year 7 ($\alpha = .73$, $M = 4.65$, $SD = .34$; see Pettit et al., 1999) and Year 9 ($\alpha = .67$, $M = 4.32$, $SD = .45$; see Pettit, Laird, Dodge, Bates, & Criss, 2001) measures (α across the two measures = .66).

Neighborhood danger (preadolescence). Neighborhood danger was assessed during the Years 7 and 9 home interviews with the mother. During the Year 7 interview, mothers responded to a set of six items (adapted from the Self-Care Checklist; see Posner & Vandell, 1994) describing their general appraisal of neighborhood and family safety. Items were rated on a 6-point scale (*very safe* to *very unsafe*) and averaged to form an overall neighborhood safety score ($\alpha = .90$, $M = 2.01$, $SD = .86$). In addition, immediately following the Year 7 and Year 9 interviews, the interviewer completed a 4-point rating of overall neighborhood safety (*very safe* to *very unsafe*; Ms = 1.82 and 1.71, SDs = .85 and .77, respectively). A composite measure of neighborhood danger was computed by standardizing and then averaging the mother-report and two interviewer-report measures (Á across the three measures = .78).

Measures of Psychosocial Adjustment and Educational Achievement (Adolescence)

To assess the extent to which timing of father absence discriminantly predicted early sexual activity and adolescent pregnancy (but not other behavioral and mental health problems), the following educational and psychosocial outcome variables were investigated. These outcomes were measured concurrently with assessment of timing of sexual activity and adolescent pregnancy from ages 14 to 18.

High school grade point average (GPA). Data on high school GPA were drawn from archival school records (Grades 9–11). Staff members examined each child's file and noted the grades earned in math, language, science, and social studies. Conventional grade conversions were used (i.e., A = 4, B = 3, C = 2, D = 1, E = 0). A composite GPA was calculated for each child by averaging the grades received across the four subjects across the three years ($\alpha = .89$, $M = 2.50$, $SD = .96$).

Violent acts (adolescence). Data on violent acts were collected in Years 12 and 13 (approximate ages 16–17). Girls in each year reported how often they had performed each of seven violent acts in the last 12 months (e.g., "How many times have you been physically cruel to someone else [causing harm]?" "How many times have you *started* a fight with someone else, where you hurt that person?" "How many times have you used a weapon that can cause serious physical harm to others [like a bat, brick, broken bottle, knife, or gun]?"). Girls who reported no violent acts in either year were coded as 0 for violent acts (76%); girls who reported at least one violent act in either year were coded as 1 for violent acts (24%).

Externalizing behavior problems (adolescence). Self-report and mother reports of externalizing behavior problems were assessed in Years 11 through 13 (ages 15–17) using the Youth Self-Report (YSR) and CBCL, respectively (Achenbach, 1991). The highly reliable externalizing problems score (30 and 33 items in the YSR and CBCL, respectively) was used to index daughters' adolescent externalizing problems. A composite self-report externalizing behavioral problems score was computed by averaging self-reports over Years 11 through 13 (α across the three scores = .87, $M = 10.72$, $SD = 6.29$) and a composite mother-report externalizing behavioral problems score was computed by averaging mother reports over Years 11 through 13 (α across the three scores = .90, $M = 7.91$, $SD = 7.39$). The composite self-report and mother-report externalizing scores were moderately correlated, $r\,(241) = .52$, $p < .001$. To facilitate comparison with rates of early sexual activity and teenage pregnancy, both self-reports and mother reports of both externalizing behavior problems were dichotomized (bottom 85% = 0, top 15% = 1).

Internalizing behavior problems (adolescence). Self-report and mother reports of internalizing behavior problems—those behaviors considered to be anxious, withdrawn, or depressed—were also assessed in Years 11 through 13 using the YSR and CBCL (Achenbach, 1991). The highly reliable internalizing problems score (32 items in both the YSR and CBCL) was used to index daughters' adolescent internalizing problems. A composite self-report internalizing behavioral problems score was computed by averaging self-reports over Years 11 through 13 (α across the three scores = .86, $M = 11.39$, $SD = 7.40$) and a composite mother-report internalizing behavioral problems score was computed by averaging mother reports over Years 11 through 13 (α across the three scores = .84, $M = 7.18$, $SD = 5.98$). The composite self-report and mother-report internalizing scores were moderately correlated, $r\,(241) = .46$, $p < .001$. Again, to facilitate comparison with rates of early sexual activity and teenage pregnancy, both self-reports and mother reports of both internalizing behavior problems were dichotomized (bottom 85% = 0, top 15% = 1).

Method: New Zealand

Participants and Overview

The New Zealand data were collected as part of the Christchurch Health and Development Study (CHDS). The CHDS is an ongoing longitudinal study of an unselected birth cohort of 1,265 children (635 males, 630 females) born in the Christchurch, New Zealand, urban region during a 4-month period in mid-1977 (Fergusson & Horwood, 2001; Fergusson, Horwood, Shannon, & Lawton, 1989). The current research is based on this female subsample, which was demographically diverse and representative of the geographic region (13% Maori/Polynesian, 25% father unemployed or in low-skill occupation, 8% living with a single mother at birth). The girls and their families have been studied at birth, 4 months, 1 year, and at annual intervals to age 16 years, and again at ages 18 and 21 years. In the vast majority of cases (typically > 95%) follow-up assessments have been conducted within 4 weeks of the sample member's birthday. Data have been collected from

a combination of sources including: parental interviews (birth–16 years), self-report (8–21 years), psychometric testing (8–13 years), teacher reports (6–13 years), medical records (birth–21 years), and police records (13–21 years). In general terms the aims of the study have been to build up a running record of the life history, social circumstances, health, and development of a large cohort of New Zealand children growing up in the 1980s and 1990s. In particular, the study has gathered a wealth of information on family composition, social and family functioning in childhood, and psychosocial outcomes in adolescence.

The present analyses are based on the sample of 520 female cohort members for whom information on the timing of father absence and adolescent outcome measures was available. This sample represented 83% of the original cohort of 630 females and was generally representative of the original sample (13% Maori/Polynesian, 23% father unemployed or in low-skill occupation, and 7% living with a single mother at birth). Comparison of the analysis sample of 520 females with the remaining 110 sample members from the original female cohort on a range of sociodemographic measures collected at birth suggested slight but statistically significant ($p < .05$) tendencies for the analysis sample to underrepresent girls from socially disadvantaged backgrounds (low paternal occupational status, low maternal education). This raises the issue of the extent to which study findings could be influenced by the effects of sample-selection bias. To examine this issue, all analyses were repeated using the data-weighting method described by Carlin, Wolfe, Coffey, and Patton (1999) to adjust for possible selection effects resulting from the pattern of sample attrition. These analyses produced essentially identical results to those based on the unweighted data, suggesting that the small biases detected in the sample are unlikely to affect study conclusions. Because the two sets of results were mutually consistent, in the interests of simplicity, the results reported here are based on the unweighted sample data.

Timing of Onset of Father Absence

Comprehensive data were gathered on family composition at annual intervals to age 13, including information on the relationship between the daughter and any adult males in the home. Classification of girls into the three father-absent and father-present groups (early father absent, late father absent, and father present) was based on the same coding procedures used in the U.S. sample (16% = early father absent, 11% = late father absent, 73% = father present).

Adolescent Sexual Outcomes

Early sexual activity. At each assessment from ages 14 to 16, sample members were questioned concerning their sexual behavior, including their experience of consensual sexual intercourse since the previous assessment. At age 18 sample members were again questioned concerning their previous experience of sexual intercourse, and those who reported such experience were asked to report their age at first experience of consensual intercourse. Young women were classified as having engaged in early sexual activity if they had ever reported involvement in consensual sexual intercourse before age 16. Overall, 33% of the sample reported early sexual activity.

Adolescent pregnancy. At age 14, the mothers of female sample members were asked whether their daughter had ever been pregnant. From age 15 onwards sample members themselves were questioned about any pregnancies since the previous assessment and, in particular, the timing and outcome of these pregnancies. Young women were classified as having an adolescent pregnancy if they had ever been reported as being pregnant before age 18. Overall, 8% of young women had been pregnant before age 18.

Covariate Factors

To assess the extent to which associations between timing of father absence and adolescent sexual outcomes could be explained by the effects of child conduct problems and familial and ecological stressors, we included the following 10 variables as covariates in the analysis.

Early conduct problems (6 years). When sample members were age 6, maternal and teacher reports of the child's tendencies to conduct disordered and oppositional behaviors were obtained using the 9-item mother- and teacher-report versions of the Rutter Behavior Rating Scale (Rutter, Tizard, & Whitmore, 1970). For the present analysis the maternal and teacher reports were summed to produce an overall scale measure reflecting the extent to which the child was reported to be exhibiting conduct problems at age 6 ($\alpha = .83$, $M = 20.44$, $SD = 3.21$).

Maternal age at first childbirth. The mother's age at first childbirth was assessed during the initial parental interview at the time of the survey child's

birth. The mean age at first childbirth was 23.7 years ($SD = 4.2$).

Race. The sample member's ethnicity was coded as a dummy variable: 0 = European New Zealander (87%), 1 = Maori/Polynesian (13%).

Maternal education. The mother's education level was assessed at the time of the survey child's birth and coded into a three-level classification: no formal educational qualifications (50.0% of the sample), high school qualifications (28.3%), and postsecondary certificate or degree (21.7%). Higher scores indicated higher levels of educational achievement.

Father's occupational status. Father's occupational status was classified at the time of the survey child's birth using the Elley–Irving (1976) scale of occupational status for New Zealand. This scale classifies families into six groups on the basis of paternal occupation. In the present analysis, the Elley–Irving coding was reduced to a three-level classification as follows: Levels 1, 2 (professional, managerial: 22.5% of the sample); Levels 3, 4 (clerical, technical, skilled: 54.4%); and Levels 5, 6 (semiskilled, unskilled, unemployed: 23.1%). This variable was reverse-scored so that higher scores represent higher occupational status.

Family living standards (0–10 years). At each assessment from ages 1 to 10 years, a measure of the quality of the family's standard of living was obtained on the basis of an interviewer rating of family living standards. Ratings were made on a 5-point scale (1 = *family obviously poor/very poor*, 5 = *family obviously affluent and well-to-do*). These ratings were averaged over the 10-year period to provide an overall measure of the quality of family living standards during this period (α across the 10 ratings = .92, $M = 2.16$, $SD = .45$).

Family life stress (0–10 years). At each assessment up to the child's age 10, parents were questioned about the occurrence of adverse family life events during the preceding year using a 20-item life events inventory based on the Holmes and Rahe (1967) Social Readjustment Rating Scale. For each year, a life events score was calculated for the family based on a count of the number of adverse events reported. To provide an overall measure of the family's exposure to adverse life stress from birth to 10 years, the annual life events scores were summed over the 10-year period (α across the 10 ratings = .80, mean number of adverse life events = 20.80, $SD = 12.22$).

Marital conflict (0–10 years). At annual intervals up until the children were age 10, parents were questioned using three items that described the quality of the marital relationship over the previous 12 months. For each item, a count of the number of positive reports over the 10-year period was calculated, and the resulting count measures were combined to produce a scale measure of the extent to which sample members were exposed to parental conflict from birth to age 10 years (Fergusson, Horwood, & Lynskey, 1992; $\alpha = .66$, $M = 4.24$, $SD = 8.98$).

Early mother–child interaction (3 years). To provide an assessment of the quality of early mother–child interactions, when sample members were age 3, mothers were assessed on the 10-item Maternal Emotional Responsiveness and 5-item Maternal Punitiveness subscales of the Home Observation for Measurement of the Environment (HOME) Inventory (Bradley & Caldwell, 1977; Elardo, Bradley, & Caldwell, 1977). Each item is scored 0 or 1 to indicate the absence or presence of the target behavior. The Maternal Emotional Responsiveness subscale provides an index of the frequency with which the mother makes positive emotional responses to her child and was scored so that a high score indicates more positive responses ($\alpha = .69$, $M = 8.44$, $SD = 1.41$). The Maternal Punitiveness subscale provides an index of the frequency with the which the mother is observed to make punitive responses to her child's behavior and was scored so that a high score implies more punitive responses ($\alpha = .71$, $M = .82$, $SD = .80$).

Measures of Psychosocial Adjustment and Educational Achievement (14–18 years)

At ages 15 and 16, sample members were interviewed by trained survey interviewers on a comprehensive mental health interview that examined various aspects of the young person's psychosocial adjustment over the preceding 12 months. A parallel interview was administered to parents. At age 18, a similar interview was administered to sample members that assessed the individual's mental health, psychosocial adjustment, and educational achievement from 16 to 18 years. Using this information, the following additional outcome measures were constructed.

School qualifications. School Certificate is a national series of examinations that is undertaken by most New Zealand students in their third year of high school. Students may sit examinations in any number of subjects (typically four or five), and performance in each subject is graded from A to E, with a grade of C or better implying a pass in that subject. For the present analysis, a young woman was classified as having left school without qualifications if she had left school by age 18 years without

at least one pass grade in School Certificate: This criterion was met by 16.5% of the sample.

Mood disorder. At ages 15 and 16, information on the young person's experience of depressive symptomatology was obtained using items from the child and parent versions of the Diagnostic Interview Schedule for Children (DISC; Costello, Edelbrock, Kalas, Kessler, & Klaric, 1982). This information was used to classify young people according to the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev. [*DSM–III–R*], American Psychiatric Association, 1987) symptom criteria for major depression (Fergusson, Horwood, & Lynskey, 1993). At age 18 years, the assessment of depressive symptomatology was based on the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed. [*DSM–IV*], American Psychiatric Association, 1994) criteria for major depression assessed using items from the Composite International Diagnostic Interview (CIDI; World Health Organization, 1993). For the present analysis, young women were classified as having a mood disorder from 14 to 18 years if they met the relevant *DSM* criteria for major depression on the basis of self- or parent-report at any time during the 4-year period: This criterion was met by 37.3% of the sample.

Anxiety disorder. Parallel to the assessment of major depression, at ages 15 and 16 sample members and their parents were also questioned about the young person's history of anxiety symptomatology in the previous 12 months using items from the DISC. This information was used to classify young people on *DSM–III–R* criteria for the following anxiety disorders: separation anxiety, overanxious disorder, generalized anxiety disorder, social phobia, simple phobia, agoraphobia, and panic disorder. As part of the age 18 interview, items from the CIDI were used to assess *DSM–IV* symptom criteria for the following anxiety disorders: generalized anxiety disorder, social phobia, specific phobia, agoraphobia, and panic disorder. For the present analysis, young women were classified as having an anxiety disorder if they met *DSM* criteria for any of the preceding disorders over the 4-year period: This criterion was met by 44.6% of the sample.

Suicide attempts. At ages 15, 16, and 18, sample members were questioned about their experience of suicidal thoughts since the previous assessment. Those reporting suicidal thoughts were further questioned about any suicide attempts and the frequency, nature, and outcome of any such attempt(s). Overall, 7.1% of the sample reported making at least one suicide attempt during the 4-year period. All respondents who reported suicidal behavior or other mental health problems were offered assistance in obtaining a referral to an appropriate treatment service.

Violent offending. At ages 15 and 16, the young person's involvement in criminal offending over the previous year was assessed using the Self Report Early Delinquency inventory (SRED; Moffitt & Silva, 1988). Similar questioning was conducted at age 18 using the Self Report Delinquency Inventory (SRDI; Elliott & Huizinga, 1989). Using these data, young women were classified as being violent offenders if they reported committing any violent offence (including physical assault, getting into fights, using a weapon or strong-arm tactics to commit a robbery, threatening behavior, and related offenses) over the 4-year period: This criterion was met by 13.7% of the sample.

Conduct disorder. At ages 15 and 16, sample members were assessed on *DSM–III–R* symptom criteria for conduct disorder based on self-reports and parent reports on the SRED (Fergusson et al., 1993). At age 18, *DSM–IV* criteria for conduct disorder were derived from items in the SRDI. Young women were classified as conduct disordered if they met *DSM* criteria for conduct disorder on the basis of self-report or parental report at any time during the 4-year period: This criterion was met by 7.5% of the sample.

Results

Statistical Analyses

As described previously, there were 16 dependent variables to be analyzed: early sexual activity, teenage pregnancy, and six other measures of psychosocial adjustment and educational achievement in each of the two samples. With one exception (GPA in the U.S. sample), all outcomes were dichotomous. Analysis of the associations between father absence and the dependent variables was conducted in several stages.

Before conducting the primary data analysis, preliminary analyses were carried out to test the linearity of the associations between the three-level timing of onset of father absence measure and the dependent variables. For the 15 dichotomous dependent variables, these tests were conducted using the Mantel-Haenszel chi-square test of linearity. Comparison of the Mantel-Haenszel results with the alternative Pearson's chi-square test of independence showed that, in all cases, the linear model appeared to provide the best fitting and most parsimonious representation of the association. For

the measure of GPA, similar tests of linearity were conducted within an ANOVA framework. These tests also suggested that a linear model most accurately represented the association. We thus concluded that the relations between timing of onset of father absence and all outcome measures were essentially linear. In all subsequent analyses, therefore, father absence was treated as a continuous (linear) variable, which was coded so that higher scores indicated earlier onset of father absence (0 = father presence, 1 = late onset of father absence, 2 = early onset of father absence).

Treating father absence in this manner is conceptually similar to analyzing age at onset of father absence. Although age at onset might be a more appropriate metric for analysis, detailed information on this variable was available only in the New Zealand sample. Thus, for consistency we have used the same three-level classification of timing of onset of father absence across the two samples. However, further analysis of the New Zealand data indicated that age at onset of father absence correlated in excess of .97 with the current three-level measure. This suggests that similar conclusions would be drawn if more accurate assessments of the timing of father absence were available in both samples.

The principal data analyses were based on a series of regression analyses examining the relations between the timing of father absence and the 16 dependent variables before and after adjustment for child, family, and ecological factors. For binary dependent variables, these analyses were conducted using logistic regression methods in which the log odds of the dependent variable was modeled as a linear function of the timing of father absence and covariates (where applicable). The full covariate adjusted model fitted to the data was of the form:

$$\text{logit}\,[\text{pr}(Yi)] = B0i + B1iX1 + \Sigma BjiZj$$

where logit[pr(Yi)] was the log odds of the ith dependent variable, $X1$ was the continuous measure of timing of father absence, and Zj was the set of child, family, and ecological covariates. The parameter $B1i$ represents the effect of father absence on the log odds of the ith dependent variable. A measure of effect size is provided by the odds ratio between the timing of father absence and the dependent variable. The odds ratio represents the multiplicative effect of a one-unit shift in the three-level father absence variable. The corresponding analyses for the continuous dependent variable (GPA) were based on standard linear regression, and the measure of effect size is provided by the standardized regression coefficient (beta) for the timing of father absence measure.

To illustrate the extent of the association between the timing of father absence and the binary outcome measures after adjustment for covariates, estimates of the adjusted rates for each outcome were computed using the parameters of the fitted logistic regression models. The adjusted rates were computed using the method described by Lee (1981) and can be interpreted as the hypothetical rates of each outcome that would have been observed had all sample members experienced their existing mix of covariate factors but varied in their exposure to father absence.

Rates of Early Sexual Activity and Adolescent Pregnancy by Timing of Father Absence

Do rates of early sexual activity and adolescent pregnancy differ according to timing of onset of father absence? We expected a dose–response relationship in which early father-absent girls would have the highest rates of early sexual activity and teenage pregnancy, followed by late father-absent girls, followed by father-present girls.

Figure 1 shows rates of early sexual activity and teenage pregnancy in both the U.S. and New Zealand samples according to timing of father absence: Early father absence (beginning ages 0–5), late father absence (beginning ages 6–13), and father presence (ages 0–13). For each father-absent and father-present group, the solid lines in the figure show the percentage of girls who had sexual intercourse by age 16 and the percentage of girls who experienced an adolescent pregnancy. Logistic regression of the data in Figure 1 showed that earlier onset of father absence was associated with a corresponding increase in girls' rates of both early sexual activity and adolescent pregnancy in both samples. For early sexual activity in the U.S. sample: $N = 227$, $B(SE = .16) = .70$, $\chi^2 = 20.51$, $p < .0001$, odds ratio = 2.01; and for early sexual activity in the New Zealand sample: $N = 520$, $B(SE = .12) = .76$, $\chi^2 = 38.04$, $p < .0001$, odds ratio = 2.14. For adolescent pregnancy in the U.S. sample: $N = 242$, $B(SE = .23) = 1.15$, $\chi^2 = 24.97$, $p < .0001$, odds ratio = 3.15; and for adolescent pregnancy in the New Zealand sample: $N = 520$, $B(SE = .19) = 1.16$, $\chi^2 = 38.28$, $p < .0001$, odds ratio = 3.19. As expected, early father-absent girls had the highest rates of both early sexual activity and adolescent pregnancy, followed by late father-absent girls, followed by father-present girls (Figure 1). For example, adolescent pregnancy rates were approximately 7 times

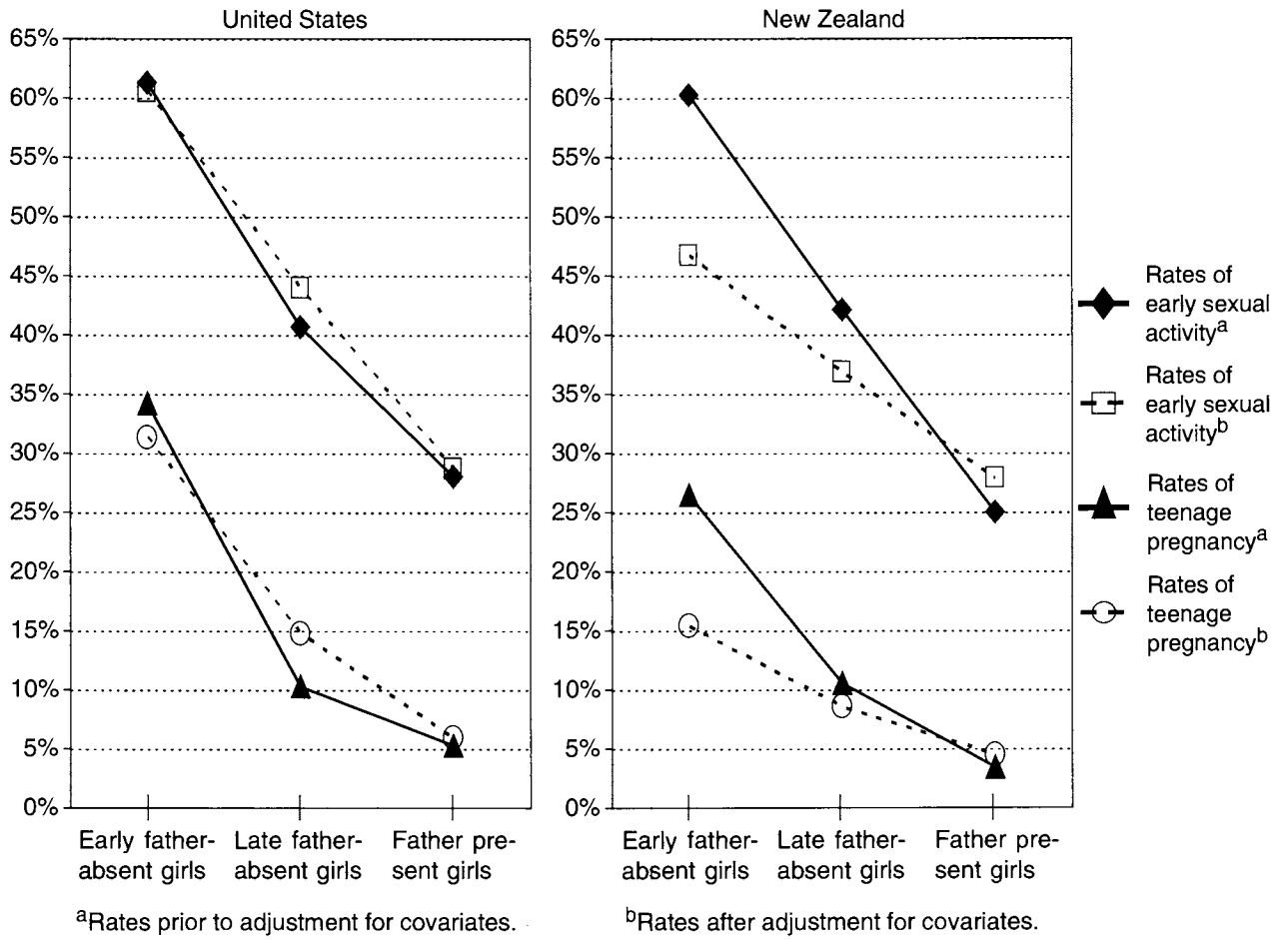

Figure 1. Rates of early sexual activity and teenage pregnancy, before and after adjustment for covariates.

higher in the U.S. sample and 8 times higher in the New Zealand sample among early father-absent girls than among father-present girls. In addition, there was remarkable similarity between the U.S. and New Zealand samples in both the ordering of results across groups and the base rates for early sexual activity and teenage pregnancy within each group (despite the overall base rates' being higher in the U.S. sample).

Child, Family, and Ecological Factors Associated With Timing of Father Absence, Early Sexual Activity, and Adolescent Pregnancy

Although the results in Figure 1 indicate that earlier onset of father absence was associated with increased risk of early sexual activity and adolescent pregnancy, it is possible that these associations are due to contextual factors that correlate with both the timing of father absence and early sexual activity and adolescent pregnancy. To examine this issue, Table 1 displays mean levels of child conduct problems and familial and ecological stressors in relation to (a) the timing of father absence, (b) occurrence of early sexual activity, and (c) occurrence of an adolescent pregnancy. For ease of data presentation, all measures (except for race and mother's age at first birth) have been expressed in standardized form. Mean differences were tested using the *F* statistic.

Table 1 demonstrates the presence of a pervasive relationship between earlier timing of father absence and more exposure to familial and ecological stressors. Across both samples, girls whose birth fathers were absent from an earlier age were more likely to come from socially disadvantaged backgrounds characterized by young motherhood, minority racial status, lower SES, more family life stress, poor parental relationships (i.e., low dyadic adjustment, high marital conflict), and low-quality parental investment (i.e., harsh discipline, lack of parental monitoring, low maternal emotional

Table 1

Mean Levels of Child Conduct Problems and Familial and Ecological Stressors by Timing of Father Absence, Early Sexual Activity, and Adolescent Pregnancy: United States and New Zealand

	Father absence status				Sexual activity			Pregnancy status		
Variable	Early father absence	Late father absence	Father presence	*F*	Early sexual activity	No early sexual activity	*F*	Pregnant	Not pregnant	*F*
					United States					
Externalizing problems (ages 4–6)	0.20	−0.24	−0.08	2.86	0.22	−0.13	6.66*	0.48	−0.09	10.77***
Mother's age at first birth	20.82	22.30	24.84	19.80***	22.69	23.63	1.98	21.68	23.51	4.24*
Race (% other)	32%	21%	8%	19.28***	24%	13%	4.33*	41%	13%	16.65***
SES (ages 4–13)	−0.58	−0.07	0.40	28.78***	−0.19	0.18	7.71**	−0.59	0.15	17.48***
Family life stress (ages 1–5)	0.43	0.23	−0.35	18.55***	0.17	−0.13	5.30*	0.33	−0.08	4.38*
Dyadic adjustment (ages 1–5)	−0.79	0.09	0.42	46.26***	−0.34	0.27	21.72***	−0.67	0.15	21.72***
Harsh discipline (ages 4–5)	0.38	−0.21	−0.19	9.00***	0.22	−0.14	7.52**	0.58	-0.11	15.76***
Harsh discipline (ages 10–13)	0.25	−0.25	−0.08	3.69*	0.07	−0.06	0.87	0.45	−0.07	7.83**
Parental monitoring (ages 10–13)	-0.47	−0.04	0.30	15.10***	−0.22	0.21	10.14**	−0.66	0.13	18.67***
Neighborhood danger (ages 10–13)	0.57	−0.08	−0.31	29.39***	0.20	−0.13	7.68**	0.55	−0.11	18.10***
					New Zealand					
Conduct problems (age 6)	0.38	0.20	−0.11	9.25***	0.16	−0.08	6.12*	0.52	−0.05	12.17***
Mother's age at first birth	21.01	22.70	24.43	27.07***	22.29	24.38	30.47***	21.67	23.88	11.03***
Race (% Maori/Polynesian)	28%	19%	8%	26.52***	15%	12%	.94	29%	11%	10.63***
Father's occupation (at birth)	−0.54	−0.20	0.15	18.84***	−0.32	0.16	27.28***	−0.63	0.05	18.50***
Mother's education (at birth)	−0.46	−0.31	0.15	16.43***	−0.32	0.15	26.93***	−0.54	0.05	13.70***
Standard of living (ages 0–10)	−0.77	−0.23	0.20	38.27***	−0.24	0.12	15.43***	−0.64	0.06	19.67***
Family life stress (ages 0–10)	0.73	0.58	−0.23	42.78***	0.34	−0.16	27.72***	0.79	−0.07	26.79***
Mom emotional responsiveness (age 3)	−0.49	−0.07	0.11	12.61***	−0.16	0.08	6.20*	−0.24	0.02	2.59
Mom punitiveness (age 3)	0.40	−0.19	−0.05	8.15***	0.10	−0.05	2.32	0.48	−0.04	10.14**
Marital conflict (ages 0–10)	1.18	0.59	−0.32	111.10***	0.32	−0.15	23.87***	0.86	−0.07	31.71***

Note. All variables standardized, except race and mother's age at first birth. *F* statistic and *p* values for comparison of means using one-way ANOVA. Comparison of percentages by race are based on the χ^2 test. For the U.S. sample, *Ns* = 213–243; for the New Zealand sample, *Ns* = 468–520.

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

responsiveness). The strong pattern of covariation between timing of father absence and girls' exposure to familial and ecological stressors was similar across the two samples (Table 1).

Table 1 also demonstrates, in both the U.S. and New Zealand samples, that early conduct problems and exposure to familial and ecological stressors during childhood were associated with precocious sexual outcomes. That is, girls who displayed early conduct problems; who were from socially disadvantaged backgrounds characterized by young motherhood, minority racial status, lower SES, and more family life stress; who were exposed to dysfunctional parental relationships; and who received low-quality parental investment were more likely to engage in early sexual activity and become pregnant as adolescents (Table 1). The overall pattern of relations between girls' early behavioral, familial, and ecological characteristics and their subsequent involvement in early sexual and reproductive activity was again similar across the two samples (Table 1).

Rates of Early Sexual Activity and Adolescent Pregnancy by Timing of Father Absence, After Adjustment for Covariates

Next, we examined whether timing of father absence contributed to subsequent risk of early sexual activity and teenage pregnancy, even after controlling for early child conduct problems and familial and ecological stressors. That is, we examined whether father absence constituted an independent path to early sexual and reproductive activity.

The results presented in Figure 1 and Table 1 indicate that although father absence was associated with elevated risk of early sexual activity and adolescent pregnancy, the behavioral, familial, and ecological profiles of father-absent girls were comparatively disadvantaged. Moreover, early conduct problems and exposure to familial and ecological stressors consistently predicted early sexual activity and adolescent pregnancy. Thus, girls' behavioral, familial, and ecological profiles could potentially account for the relations between timing of father absence and subsequent sexual outcomes.

To address this issue, we conducted logistic regressions to estimate the strength of the association between timing of father absence and rates of early sexual activity and adolescent pregnancy after adjustment for child conduct problems and familial and ecological stressors. Ten covariates were simultaneously controlled for in the analyses. These covariates are listed in the first column of Table 1 (see upper section of table for covariates in the U.S. study and lower section of table for covariates in New Zealand study).

As shown by the broken lines in Figure 1, after statistical adjustment for all covariates, there continued to be a linear logistic association between earlier onset of father absence and higher rates of both early sexual activity and adolescent pregnancy in both samples. For early sexual activity in the U.S. sample: $N = 197$, $B(SE = .23) = .72$, $\chi^2 = 9.54$, $p = .002$, odds ratio = 2.04; and for early sexual activity in the New Zealand sample: $N = 466$, $B(SE = .17) = .45$, $\chi^2 = 6.75$, $p = .009$, odds ratio = 1.57. For adolescent pregnancy in the U.S. sample: $N = 207$, $B(SE = .33) = .1.07$, $\chi^2 = 10.45$, $p = .001$, odds ratio = 2.91; and for adolescent pregnancy in the New Zealand sample: $N = 466$, $B(SE = .26) = .74$, $\chi^2 = 7.89$, $p = .005$, odds ratio = 2.09. Thus, even after simultaneously controlling for all covariates, early father-absent girls continued to have the highest rates of both early sexual activity and adolescent pregnancy, followed by late father-absent girls, followed by father-present girls (Figure 1). For example, after covariate adjustment, adolescent pregnancy rates were approximately 5 times higher in the U.S. sample and 3 times higher in the New Zealand sample among early father-absent girls than among father-present girls (Figure 1).

There was one notable difference between the U.S. and New Zealand samples. Whereas the effects of father absence on sexual activity and adolescent pregnancy remained largely unchanged after covariate adjustment in the U.S. sample, these effects were substantively reduced after covariate adjustment in the New Zealand sample (as shown in Figure 1). To examine which covariates caused this reduction, additional logistic regression analyses were conducted in the New Zealand sample in which father absence was entered into the equation simultaneously with each covariate. This enabled us to calculate the degree to which individual covariates caused a reduction in the effect of father absence (as indicated by change in the odds ratio) on early sexual activity and adolescent pregnancy. For early sexual activity, the following covariates each caused a reduction in the odds ratio at least 10%: mothers' age at first birth, family life stress, father's occupational status, maternal education, and marital conflict. Similarly, for adolescent pregnancy, reductions in the odds ratio of at least 10% were caused by family living standards, family life stress, father's occupational status, maternal education, maternal punitiveness, and marital conflict.

Finally, to examine which group of covariates uniquely predicted early sexual activity and teenage pregnancy after controlling for timing of father absence, we again performed the logistic regression analyses using forward stepwise procedures, forcing the entry of the father absence variable into the equation on the first step and then allowing free entry of all covariates into the equation on subsequent steps. In the U.S. sample, in prediction of both early sexual activity and adolescent pregnancy, only early childhood externalizing problems entered the equation after controlling for timing of father absence. None of the measures of familial or ecological stress, therefore, predicted early sexual outcomes after controlling for timing of father absence and early externalizing problems. In the New Zealand sample, in prediction of both early sexual activity and adolescent pregnancy, both maternal education and family life stress entered the equation after controlling for timing of father absence. In addition, father's occupational status entered the equation for predicting early sexual activity.

Rates of Behavioral Problems and Academic Performance by Timing of Father Absence, Before and After Adjustment for Covariates

Next, we examined whether father absence discriminantly increased risk for adolescent sexual outcomes but not for behavioral and mental health problems in general. To address this question, we conducted the same regression analyses that were conducted in the preceding section, but we substituted different outcome variables for early sexual activity and teenage pregnancy. The outcome measures examined in the U.S. sample included externalizing behavioral problems (ages 15–17; mother report and child report), internalizing behavior problems (ages 15–17; mother report and child report), violent acts (ages 16–17), and high school GPA. The outcome measures examined in the New Zealand sample included *DSM–III–R* diagnoses for conduct disorder, mood disorder, and anxiety disorder (all ages 14–18); violent offending (ages 14–18); attempted suicide (ages 14–18); and failure to attain at least one pass in School Certificate before leaving high school. As in the previous analyses, the effect of timing of onset of father absence on each outcome variable was examined before and after adjustment for all covariates listed in Table 1.

The key analysis concerns the effect of timing of father absence after adjustment for covariates. As shown in Table 2 (adjusted rates in parentheses), after statistical adjustment for all covariates, there were no substantively meaningful linear relations between timing of father absence and any of the measures of behavioral problems (all p values $> .33$) in the U.S. sample, as indicated by both the low odds ratios (*range* = 1.05–1.35) and relatively flat rates of behavioral problems across the two father-absent and one father-present groups. In addition, after statistical adjustment for all covariates, there was not a substantively meaningful relation between father absence and high school GPA ($N = 177$, $\beta = -.11$, $t = -1.43$, $p = .16$).

As noted in the Method section, the four measures of externalizing and internalizing behavior problems were dichotomized (to facilitate comparison with other outcome variables). Because dichotomization attenuates the power to detect relations with other variables (MacCallum, Zhang, Preacher, & Rucker, 2002), we also performed the analyses using standard linear regression with continuous measures of the four dependent variables (as described in the Method section). After controlling for the full set of covariates, the effects of timing of onset of father absence on both mother- and daughter-reported externalizing and internalizing behavior problems remained uniformly small and statistically nonsignificant ($N = 203$; βs range from .01 to .16, all $ps > .05$).

The pattern of results was different for the New Zealand sample. As shown in Table 3 (adjusted rates in parentheses), after statistical adjustment for all covariates, there was a pattern of modest associations between father absence and the measures of

Table 2
Rates of Behavioral Problems and Academic Performance by Timing of Father Absence, Before and After Adjustment for Covariates: United States

Variable	Timing of onset of father absence			B (SE)	χ^2	p	Odds ratio
	Early onset of father absence	Late onset of father absence	Father presence				
Externalizing problems							
Mother report	25.6%	10.3%	9.8%	.58 (.20)	8.55	.003	1.79
	(15.8%)	(13.3%)	(11.1%)	.30 (.36)	0.69	.41	1.35
Child report	15.6%	24.1%	11.3%	.20 (.20)	1.02	.31	1.22
	(17.5%)	(14.7%)	(12.3%)	.28 (.36)	0.61	.44	1.32
Internalizing problems							
Mother report	14.1%	24.1%	12.9%	.08 (.20)	0.15	.70	1.08
	(14.1%)	(13.7%)	(13.2%)	.05 (.31)	0.02	.89	1.05
Child report	15.6%	27.6%	12.8%	.14 (.19)	0.52	.47	1.15
	(18.9%)	(16.3%)	(13.9%)	.22 (.31)	0.49	.49	1.24
Violent acts	39.0%	29.6%	15.3%	.63 (.17)	14.22	<.001	1.88
	(28.1%)	(23.8%)	(20.1%)	.25 (.26)	0.94	.33	1.28

Note. Percentages after covariate adjustment are shown in parentheses. $N = 240$ and 203 (mother report externalizing and internalizing), $N = 239$ and 202 (child report externalizing and internalizing), and $N = 236$ and 202 (violent offending), before and after covariate adjustment, respectively.

behavioral and mental health problems, as indicated by both the odds ratios (*range* = 1.36–1.59) and the modest decline in rates of these outcome variables across the two father-absent and one father-present groups. Most of these associations obtained at least marginal statistical significance.

In sum, in the U.S. sample, after statistically controlling for all covariates, timing of onset of father absence remained strongly associated with early sexual activity and teenage pregnancy but not with other behavioral problems and academic performance. Although the direction of the effects indicated that earlier onset of father absence was associated with more behavioral and academic problems in the U.S. sample, the size of the effects were small and did not approach statistical significance. By contrast, in the New Zealand sample, after statistically controlling for all covariates, there was still a pattern of at least trend associations between timing of father absence and the measures of adolescent adjustment, with odds ratios ranging from 1.36 to 2.09. Although early sexual activity and teenage pregnancy occupied the upper end of this range, and although the odds ratio for teenage pregnancy was substantially higher than for any other variable (+.50 or greater), there was not a clear divide between the effects of father absence on early sexual activity and other behavioral and mental health outcomes. Specifically, after covariate adjustment, the odds ratio for early sexual activity (1.57) was about the same as for conduct disorder (1.59), violent offending (1.56), and no school qualifications (1.50).

Discussion

Does father absence uniquely and discriminantly increase daughters' risk for early sexual activity and teenage pregnancy, independent of early externalizing behavior problems and exposure to familial and ecological stressors during childhood? In addressing this question, the current research had several important strengths. First, the use of a cross-national research design enabled us to replicate key findings across diverse samples in different countries. Second, in conducting two studies, we were able to carry out independent tests of the hypotheses using different measures and methods. The similarity in results across the U.S. and New Zealand samples underscores the robustness and generalizability of the findings. Nonetheless, it will be important to replicate these findings in non-Western samples (see Waynforth, 2002). Third, the longitudinal nature of the research—in which girls were prospectively studied throughout their entire childhoods—enabled us to examine child and family variables that preceded risk for involvement in sexual activity and pregnancy in adolescence. Finally, the use of multiple informants, in which antecedent child and family data were collected from mothers and adolescent sexual outcome data were collected from daughters, makes it less likely that the current findings are an artifact of method variance.

Does Father Absence Place Daughters at Special Risk for Early Sexual Activity and Teenage Pregnancy?

Although the current research cannot demonstrate causation, three converging lines of evidence suggest that the answer to this question is yes. First, in both the U.S. and New Zealand samples, there was a dose–response relationship between timing of onset of father absence and early sexual outcomes: Early father-absent girls had the highest rates of both early sexual activity and adolescent pregnancy, followed by late father-absent girls, followed by father-present girls. This dose–response relationship suggests that past research, which has consistently treated father absence as a dichotomous yes–no variable, has underestimated the impact of father absence on daughters' sexual outcomes. This issue may be especially relevant to predicting rates of teenage pregnancy, which were 7 to 8 times higher among early father-absent girls, but only 2 to 3 times higher among late father-absent girls, than among father-present girls.

Second, in both the U.S. and New Zealand samples, father absence constituted a unique and independent path to early sexual activity and adolescent pregnancy. Although measures of early conduct problems and life-course adversity covaried with both timing of father absence and adolescent sexual outcomes, these measures either did not account for (in the U.S. sample) or only partially accounted for (in the New Zealand sample) the links between father absence and early sexual activity and teenage pregnancy. The relations between father absence and teenage pregnancy were particularly robust. For example, after controlling for all of the covariates, early father-absent girls were still about 5 times more likely in the U.S. sample and 3 times more likely in the New Zealand sample to experience an adolescent pregnancy than were father-present girls. In total, these data suggest that father absence may affect daughters' sexual development through processes that operate independently of life-course adversity and go beyond mere continuation of early conduct problems.

Third, in the U.S. sample, father absence was discriminantly associated with early sexual activity and teenage pregnancy. This association was specific to sexual outcomes and, after controlling for early conduct problems and familial and ecological stressors, did not extend to academic, behavioral, or mental health problems more generally. In the New Zealand sample, however, the picture was less clear. After covariate adjustment, there was still a pattern of at least trend associations between timing of father absence and the measures of adolescent adjustment, with early sexual activity and adolescent pregnancy occupying the upper end of this range of associations. Considering the U.S. and New Zealand findings together, after controlling for measures of early conduct problems and life-course adversity, the effects of father absence on sex and pregnancy (a) were generally stronger than were the effects of father absence on other outcome variables and (b) clearly replicated across the two studies whereas other effects of father absence were more equivocal and replicated only in the sense of being in the same direction. In sum, after covariate adjustment, there was stronger and more consistent evidence of effects of father absence on early sexual activity and teenage pregnancy than on other behavioral or mental health problems or academic achievement.

It is worth reiterating that all of these conclusions are based on the linear model, which provided the best fitting and most parsimonious representation of the associations between father absence and the outcome variables. Power would have been low, however, to detect nonlinearity in the U.S. sample (given the use of dichotomous dependent variables and the relatively small sample size in the late father-absent group). The base rates shown in Table 2 indicate nonlinear trends in the U.S. data, with late father-absent girls displaying higher rates of internalizing problems (both child and mother reports) and externalizing problems (child reports only) than either early father-absent or father-present girls. These nonlinear trends did not replicate in the New Zealand data (see Table 3). Nonetheless, the possibility that late father absence places daughters at special risk for some outcome variables deserves further consideration in future research with larger sample sizes.

Implications for the Life-Course Adversity Model

In the literature on early sexual activity and teenage pregnancy, the life-course adversity model occupies a dominant position. It proposes that a life history of familial and ecological stress—poverty, exposure to violence, inadequate parental guidance and supervision, lack of educational and career opportunities—makes early sexual activity and adolescent pregnancy more likely (e.g., Coley & Chase-Lansdale, 1998; Rindfuss & St. John, 1983).

Table 3
Rates of Behavioral and Mental Health Problems by Timing of Father Absence, Before and After Adjustment for Covariates: New Zealand

Variable	Timing of onset of father absence			*B* (*SE*)	χ^2	*p*	Odds ratio
	Early onset of father absence	Late onset of father absence	Father presence				
Conduct disorder	16.9%	15.8%	4.2%	.78 (.19)	17.85	<.001	2.19
	(12.6%)	(8.5%)	(5.7%)	.46 (.27)	3.03	.082	1.59
Mood disorder	54.2%	49.1%	31.8%	.49 (.12)	17.04	<.001	1.64
	(48.1%)	(40.9%)	(34.1%)	.31 (.17)	3.29	.070	1.36
Anxiety disorder	59.0%	54.4%	40.0%	.41 (.12)	11.72	.001	1.50
	(56.5%)	(48.8%)	(41.0%)	.33 (.17)	3.80	.051	1.39
Violent offending	31.3%	14.0%	9.7%	.71 (.15)	23.12	<.001	2.03
	(21.4%)	(15.2%)	(10.5%)	.44 (.21)	4.28	.039	1.56
Suicide attempt	14.5%	8.8%	5.3%	.56 (.19)	8.33	.004	1.74
	(10.9%)	(8.3%)	(6.3%)	.32 (.27)	1.40	.237	1.38
No school qualifications	35.8%	37.5%	9.3%	.90 (.14)	41.09	<.001	2.45
	(23.7%)	(18.5%)	(14.1%)	.40 (.21)	3.62	.057	1.50

Note. Percentages after covariate adjustment are shown in parentheses. For school qualifications, $N = 515$ and 461 before and after covariate adjustment, respectively; for all other variables, $N = 520$ and 466 before and after covariate adjustment, respectively.

The life-course adversity model has gained wide acceptance through consistent empirical support. Rates of teenage pregnancy have been found to covary positively with family stress, conflict, and disruptions (e.g., Fergusson & Woodward, 2000a; Hanson, Myers, & Ginsburg, 1987; Robbins et al., 1985); with low parental warmth or support, lack of parental control and monitoring, and maternal punitive behavior (e.g., Fergusson & Woodward, 2000a; Hansen et al., 1987; Scaramella et al., 1998; reviewed in Miller et al., 2001); with low SES (e.g., Fergusson & Woodward, 2000a; Geronimus & Korenman, 1992; Robbins et al., 1985); with high neighborhood mortality rates (Geronimus, 1996; Wilson & Daly, 1997); and with minority racial or ethnic status (Cheesbrough et al., 1999; Dickson et al., 2000). The results presented in Table 1 are consistent with this body of research.

As discussed in the Introduction, the life-course adversity model has incorporated father absence as one of many stressors that can influence sexual outcomes. Indeed, as shown in Table 1, timing of father absence significantly covaried with all of the measures of familial and ecological stress in both the U.S. and New Zealand studies. Proponents of the life-course adversity model have recurrently stated that father absence predicts early sexual outcomes because it covaries with these stressors (Belsky, et al., 1991, p. 658; Chisholm, 1999, p. 162; McLanahan, 1999, p. 119; Robbins et al., 1985, p. 568; Silverstein & Averbach, 1999, p. 403).

The current research suggests that the opposite interpretation is equally plausible: Measures of life-course adversity may predict early sexual outcomes primarily because they covary with timing of father absence. In the U.S. sample, father absence predicted early sexual activity and adolescent pregnancy after controlling for early conduct problems and all of the measures of familial and ecological stress; however, none of the measures of familial and ecological stress predicted either early sexual activity or adolescent pregnancy after controlling for timing of father absence and early conduct problems. The results in the New Zealand sample were more equivocal: Both father absence and some measures of familial and ecological stress (i.e., maternal education and family life stress) independently predicted early sexual outcomes.

Evolutionary and Social Learning Models

Given that the life-course adversity model does not appear to explain the current results, the question then becomes: What are the psychological mechanisms and processes that account for the relations between increasing exposure to father absence and greater risk for early sexual activity and adolescent pregnancy? From a social learning perspective, increasing duration of father absence is associated with increasing exposure of daughters to their mothers' dating and repartnering behaviors, and these exposures may encourage earlier onset of sexual behavior in daughters, with consequent increased risk of teenage pregnancy. As Thornton and Camburn (1987, p. 325) suggest, "We expect that many children know whether their parents are sexually active after a marital dissolution and that formerly married parents who continue to be sexually active serve as behavioral models for their maturing children, thus increasing the children's levels of permissiveness." The social learning model thus posits that the effect of father absence on daughters' sexual outcomes will be mediated by mothers' dating and repartnering behaviors. This hypothesis deserves careful consideration in future research.

Another possibility is that mothers' dating and repartnering behaviors do not fully mediate the relation between father absence and precocious sexual outcomes in daughters. Rather, as discussed earlier, quality of paternal investment may have a direct effect on daughters' sexuality. The current evolutionary model posits that the motivational systems underlying variation in timing of sexual and reproductive behavior are especially sensitive to the father's role in the family in early childhood. According to Draper and Harpending (1982, 1988), girls whose early family experiences are characterized by father absence tend to develop sexual psychologies that are consistent with the expectation that male parental investment is unreliable and unimportant; these girls are hypothesized to develop in a manner that accelerates onset of sexual activity and reproduction, reduces reticence in forming sexual relationships, and orients the individual toward relatively unstable pair-bonds (see also Ellis & Garber, 2000; Ellis et al., 1999). This evolutionary model posits an early sensitive period (approximately the first 5 years of life) for the effects of father absence on daughters' sexual development. Although the current results—that earlier onset of father absence was associated with greater risk for early sexual activity and teenage pregnancy—are consistent with the sensitive period hypothesis, they do not clearly support it because timing of father absence was confounded with length of father absence in the current research. In total, the current results are equally consistent with

either a sensitive period or linear dose–response interpretation.

Alternative Behavior Genetic Explanations

Perhaps the major weakness of the current research design was that it was not genetically informative. As noted in the Introduction, one plausible behavior-genetic explanation for the current findings is that, through genetic transmission, mothers and fathers who have a history of externalizing disorders not only tend to have daughters who experience externalizing behavioral problems (including increased rates of early sexual activity and teen pregnancy) but also tend to disproportionately expose their daughters to father absence and accompanying maternal dating and repartnering behaviors because externalizing disorders predict divorce. A second plausible behavior-genetic explanation is that mothers who experience early age of first sex and pregnancy not only tend to have daughters who experience early age of first sex and pregnancy (through genetic transmission; see Dunne et al., 1997; Rodgers, Rowe, & Buster, 1999) but also tend to expose disproportionately their daughters to father absence and maternal dating and repartnering because young mothers are less likely to form stable relationships with the fathers of their children (e.g., Amato, 1996; Bennett, Bloom, & Miller, 1995).

Consistent with these behavior genetic models, in the current research both early childhood conduct problems in daughters and earlier age at first birth in mothers generally predicted early sexual activity and adolescent pregnancy in daughters. It is important, though, that controlling for both early conduct problems and mothers' age at first birth (along with the other covariates) either did not account for (in the U.S. sample) or only partially accounted for (in the New Zealand sample) the relations between father absence and elevated rates of early sexual activity and adolescent pregnancy. Although these results do not rule out the possibility that common genetic influences underlie the covariation between father absence and precocious sexual outcomes (see especially Comings, Muhleman, Johnson, & MacMurray, 2002), they do make it less likely that the current findings can be accounted for by the specific genetic pathways outlined above.

Conclusion

Over the last 25 years the field of developmental psychology has experienced a fundamental shift away from a social address perspective, in which variables such as father absence and social class were studied without explicitly considering how they influenced child functioning, to a developmental process perspective, in which intervening pathways and mechanisms have become of fundamental interest (discussed in Bronfenbrenner & Crouter, 1983). Critiques of the father absence literature (reviewed in Phares, 1996) partly motivated this change. A widely held assumption is that it is not father absence per se that is harmful to children but the stress associated with divorce, family conflict, loss of a second parent, loss of an adult male income, and so on. The current research suggests that, in relation to daughters' sexual development, the social address of father absence is important in its own right and not just as a proxy for its many correlates. This does not imply that process is unimportant, but rather that relevant processes are likely to be father driven (e.g., father–daughter processes, father–mother relationships, exposure to stepfathers; see Ellis et al., 1999).

In conclusion, father absence was an overriding risk factor for early sexual activity and adolescent pregnancy. Conversely, father presence was a major protective factor against early sexual outcomes, even if other risk factors were present. These findings may support social policies that encourage fathers to form and remain in families with their children (unless the marriage is highly conflictual or violent; Amato & Booth, 1997).

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EXHIBIT 38

June 15, 2008

Obama's Speech on Fatherhood

Barack Obama

Apostolic Church of God
Chicago, IL

Good morning. It's good to be home on this Father's Day with my girls, and it's an honor to spend some time with all of you today in the house of our Lord.

At the end of the Sermon on the Mount, Jesus closes by saying, "Whoever hears these words of mine, and does them, shall be likened to a wise man who built his house upon a rock: and the rain descended, and the floods came, and the winds blew, and beat upon that house, and it fell not, for it was founded upon a rock." [Matthew 7: 24-25]

Here at Apostolic, you are blessed to worship in a house that has been founded on the rock of Jesus Christ, our Lord and Savior. But it is also built on another rock, another foundation - and that rock is Bishop Arthur Brazier. In forty-eight years, he has built this congregation from just a few hundred to more than 20,000 strong - a congregation that, because of his leadership, has braved the fierce winds and heavy rains of violence and poverty; joblessness and hopelessness. Because of his work and his ministry, there are more graduates and fewer gang members in the neighborhoods surrounding this church. There are more homes and fewer homeless. There is more community and less chaos because Bishop Brazier continued the march for justice that he began by Dr. King's side all those years ago. He is the reason this house has stood tall for half a century. And on this Father's Day, it must make him proud to know that the man now charged with keeping its foundation strong is his son and your new pastor, Reverend Byron Brazier.

Of all the rocks upon which we build our lives, we are reminded today that family is the most important. And we are called to recognize and honor how critical every father is to that foundation. They are teachers and coaches. They are mentors and role models. They are examples of success and the men who constantly push us toward it.

But if we are honest with ourselves, we'll admit that what too many fathers also are is missing - missing from too many lives and too many homes. They have abandoned their responsibilities, acting like boys instead of men. And the foundations of our families are weaker because of it.

You and I know how true this is in the African-American community. We know that more than half of all black children live in single-parent households, a number that has doubled - doubled - since we were children. We know the statistics - that children who grow up without a father are five times more likely to live in poverty and commit crime; nine times more likely to drop out of schools and twenty times more likely to end up in prison. They are more likely to have behavioral problems, or run away from home, or become teenage parents themselves. And the foundations of our community are weaker because of it.

How many times in the last year has this city lost a child at the hands of another child? How many times have our hearts stopped in the middle of the night with the sound of a gunshot or a siren? How many teenagers have we seen hanging around on street corners when they should be sitting in a classroom? How many are sitting in prison when they should be working, or at least looking for a job? How many in this generation are we willing to lose to poverty or violence or addiction? How many?

Yes, we need more cops on the street. Yes, we need fewer guns in the hands of people who shouldn't have them. Yes, we need more money for our schools, and more outstanding

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teachers in the classroom, and more afterschool programs for our children. Yes, we need more jobs and more job training and more opportunity in our communities.

But we also need families to raise our children. We need fathers to realize that responsibility does not end at conception. We need them to realize that what makes you a man is not the ability to have a child - it's the courage to raise one.

We need to help all the mothers out there who are raising these kids by themselves; the mothers who drop them off at school, go to work, pick up them up in the afternoon, work another shift, get dinner, make lunches, pay the bills, fix the house, and all the other things it takes both parents to do. So many of these women are doing a heroic job, but they need support. They need another parent. Their children need another parent. That's what keeps their foundation strong. It's what keeps the foundation of our country strong.

I know what it means to have an absent father, although my circumstances weren't as tough as they are for many young people today. Even though my father left us when I was two years old, and I only knew him from the letters he wrote and the stories that my family told, I was luckier than most. I grew up in Hawaii, and had two wonderful grandparents from Kansas who poured everything they had into helping my mother raise my sister and me - who worked with her to teach us about love and respect and the obligations we have to one another. I screwed up more often than I should've, but I got plenty of second chances. And even though we didn't have a lot of money, scholarships gave me the opportunity to go to some of the best schools in the country. A lot of kids don't get these chances today. There is no margin for error in their lives. So my own story is different in that way.

Still, I know the toll that being a single parent took on my mother - how she struggled at times to the pay bills; to give us the things that other kids had; to play all the roles that both parents are supposed to play. And I know the toll it took on me. So I resolved many years ago that it was my obligation to break the cycle - that if I could be anything in life, I would be a good father to my girls; that if I could give them anything, I would give them that rock - that foundation - on which to build their lives. And that would be the greatest gift I could offer.

I say this knowing that I have been an imperfect father - knowing that I have made mistakes and will continue to make more; wishing that I could be home for my girls and my wife more than I am right now. I say this knowing all of these things because even as we are imperfect, even as we face difficult circumstances, there are still certain lessons we must strive to live and learn as fathers - whether we are black or white; rich or poor; from the South Side or the wealthiest suburb.

The first is setting an example of excellence for our children - because if we want to set high expectations for them, we've got to set high expectations for ourselves. It's great if you have a job; it's even better if you have a college degree. It's a wonderful thing if you are married and living in a home with your children, but don't just sit in the house and watch "SportsCenter" all weekend long. That's why so many children are growing up in front of the television. As fathers and parents, we've got to spend more time with them, and help them with their homework, and replace the video game or the remote control with a book once in awhile. That's how we build that foundation.

We know that education is everything to our children's future. We know that they will no longer just compete for good jobs with children from Indiana, but children from India and China and all over the world. We know the work and the studying and the level of education that requires.

You know, sometimes I'll go to an eighth-grade graduation and there's all that pomp and circumstance and gowns and flowers. And I think to myself, it's just eighth grade. To really compete, they need to graduate high school, and then they need to graduate college, and they probably need a graduate degree too. An eighth-grade education doesn't cut it today. Let's give them a handshake and tell them to get their butts back in the library!

It's up to us - as fathers and parents - to instill this ethic of excellence in our children. It's up to us to say to our daughters, don't ever let images on TV tell you what you are worth, because I expect you to dream without limit and reach for those goals. It's up to us to tell our sons, those songs on the radio may glorify violence, but in my house we live glory to achievement, self respect, and hard work. It's up to us to set these high expectations. And that means meeting those expectations ourselves. That means setting examples of excellence in our own lives.

The second thing we need to do as fathers is pass along the value of empathy to our children. Not sympathy, but empathy - the ability to stand in somebody else's shoes; to look at the world through their eyes. Sometimes it's so easy to get caught up in "us," that we forget about our obligations to one another. There's a culture in our society that says remembering these obligations is somehow soft - that we can't show weakness, and so therefore we can't show kindness.

But our young boys and girls see that. They see when you are ignoring or mistreating your wife. They see when you are inconsiderate at home; or when you are distant; or when you are thinking only of yourself. And so it's no surprise when we see that behavior in our schools or on our streets. That's why we pass on the values of empathy and kindness to our

children by living them. We need to show our kids that you're not strong by putting other people down - you're strong by lifting them up. That's our responsibility as fathers.

And by the way - it's a responsibility that also extends to Washington. Because if fathers are doing their part; if they're taking our responsibilities seriously to be there for their children, and set high expectations for them, and instill in them a sense of excellence and empathy, then our government should meet them halfway.

We should be making it easier for fathers who make responsible choices and harder for those who avoid them. We should get rid of the financial penalties we impose on married couples right now, and start making sure that every dime of child support goes directly to helping children instead of some bureaucrat. We should reward fathers who pay that child support with job training and job opportunities and a larger Earned Income Tax Credit that can help them pay the bills. We should expand programs where registered nurses visit expectant and new mothers and help them learn how to care for themselves before the baby is born and what to do after - programs that have helped increase father involvement, women's employment, and children's readiness for school. We should help these new families care for their children by expanding maternity and paternity leave, and we should guarantee every worker more paid sick leave so they can stay home to take care of their child without losing their income.

We should take all of these steps to build a strong foundation for our children. But we should also know that even if we do; even if we meet our obligations as fathers and parents; even if Washington does its part too, we will still face difficult challenges in our lives. There will still be days of struggle and heartache. The rains will still come and the winds will still blow.

And that is why the final lesson we must learn as fathers is also the greatest gift we can pass on to our children - and that is the gift of hope.

I'm not talking about an idle hope that's little more than blind optimism or willful ignorance of the problems we face. I'm talking about hope as that spirit inside us that insists, despite all evidence to the contrary, that something better is waiting for us if we're willing to work for it and fight for it. If we are willing to believe.

I was answering questions at a town hall meeting in Wisconsin the other day and a young man raised his hand, and I figured he'd ask about college tuition or energy or maybe the war in Iraq. But instead he looked at me very seriously and he asked, "What does life mean to you?"

Now, I have to admit that I wasn't quite prepared for that one. I think I stammered for a little bit, but then I stopped and gave it some thought, and I said this:

When I was a young man, I thought life was all about me - how do I make my way in the world, and how do I become successful and how do I get the things that I want.

But now, my life revolves around my two little girls. And what I think about is what kind of world I'm leaving them. Are they living in a county where there's a huge gap between a few who are wealthy and a whole bunch of people who are struggling every day? Are they living in a county that is still divided by race? A country where, because they're girls, they don't have as much opportunity as boys do? Are they living in a country where we are hated around the world because we don't cooperate effectively with other nations? Are they living a world that is in grave danger because of what we've done to its climate?

And what I've realized is that life doesn't count for much unless you're willing to do your small part to leave our children - all of our children - a better world. Even if it's difficult. Even if the work seems great. Even if we don't get very far in our lifetime.

That is our ultimate responsibility as fathers and parents. We try. We hope. We do what we can to build our house upon the sturdiest rock. And when the winds come, and the rains fall, and they beat upon that house, we keep faith that our Father will be there to guide us, and watch over us, and protect us, and lead His children through the darkest of storms into light of a better day. That is my prayer for all of us on this Father's Day, and that is my hope for this country in the years ahead. May God Bless you and your children. Thank you.

Barack Obama is a Democratic Senator from Illinois and a candidate for the Democratic presidential nomination.

EXHIBIT 39

A Report Released Internationally by the Commission on Parenthood's Future

my daddy's name is DONOR

A New Study of Young Adults Conceived Through Sperm Donation

ELIZABETH MARQUARDT, NORVAL D. GLENN, AND KAREN CLARK, CO-INVESTIGATORS

INSTITUTE FOR AMERICAN VALUES

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This report is released internationally under the auspices of the Commission on Parenthood's Future, an independent, nonpartisan group of scholars and leaders who have come together to investigate the status of parenthood and make recommendations for the future.

The lead co-investigator of this report, Elizabeth Marquardt, is director of the Center for Marriage and Families at the Institute for American Values. The Center's online site for engagement is WWW.FAMILYSCHOLARS.ORG.

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EXECUTIVE SUMMARY

In 1884, a Philadelphia physician put his female patient to sleep and inseminated her with sperm from a man who was not her husband. The patient became pregnant and bore a child she believed was the couple's biological offspring.

Today, this event occurs every day around the world with the willing consent of women and with the involvement of millions of physicians, technicians, cryoscientists, and accountants. The United States alone has a fertility industry that brings in $3.3 billion annually. Meanwhile, "fertility tourism" has taken off as a booming global trade. A number of nations bill themselves as destinations for couples who wish to circumvent stricter laws and greater expense in their own countries in order to become pregnant using reproductive technologies. The largest sperm bank in the world, Cryos, is in Denmark and ships three-quarters of its sperm overseas.

In the U.S., an estimated 30,000-60,000 children are born each year through sperm donation, but this number is only an educated guess. Neither the industry nor any other entity in the U.S. is required to report on these vital statistics. Most strikingly, there is almost no reliable evidence, in any nation, about the experience of young adults who were conceived in this way.

This study is the first effort to learn about the identity, kinship, well-being, and social justice experiences of young adults who were conceived through sperm donation. The survey research firm Abt SRBI of New York City fielded our survey through a web-based panel that includes more than a million households across the United States. Through this method we assembled a representative sample of 485 adults between the ages of 18 and 45 years old who said their mother used a sperm donor to conceive them. We also assembled comparison groups of 562 young adults who were adopted as infants and 563 young adults who were raised by their biological parents.

We learned that, on average, young adults conceived through sperm donation are hurting more, are more confused, and feel more isolated from their families. They fare worse than their peers raised by biological parents on important outcomes such as depression, delinquency and substance abuse. Nearly two-thirds agree, "My sperm donor is half of who I am."

Nearly half are disturbed that money was involved in their conception. More than half say that when they see someone who resembles them they wonder if they are related. Almost as many say they have feared being attracted to or having sexual relations with someone to whom they are unknowingly related. Approximately two-thirds affirm the right of donor offspring to know the truth about their origins. And about half of donor offspring have concerns about or serious objections to donor conception itself, even when parents tell their children the truth.

The title of this report, *My Daddy's Name is Donor*, comes from a t-shirt marketed to parents of babies who were donor conceived. The designers of the shirt say it's just meant to be funny. But we wondered how the children feel when they grow up.

This unprecedented, large, comparative, and very nearly representative study of young adults conceived through sperm donation responds to that question. The extraordinary findings reported in the stories, tables and figures that follow will be of concern to any policy maker, health professional, civic leader, parent, would-be parent, and young or grown donor conceived person, anywhere in the world. An extensive list of recommendations is found at the conclusion.

We aim for nothing less than to launch a national and international debate on the ethics, meaning, and practice of donor conception, starting now.

FIFTEEN MAJOR FINDINGS

from My Daddy's Name is Donor: A New Study of Young Adults Conceived Through Sperm Donation

Elizabeth Marquardt, Norval D. Glenn, and Karen Clark, co-investigators

1. Young adults conceived through sperm donation (or "donor offspring") experience profound struggles with their origins and identities.

Sixty-five percent of donor offspring agree, "My sperm donor is half of who I am." Forty-five percent agree, "The circumstances of my conception bother me." Almost half report that they think about donor conception at least a few times a week or more often.

The role of money in their conception disturbs a substantial number of donor offspring. Forty-five percent agree, "It bothers me that money was exchanged in order to conceive me." Forty-two percent of donor offspring, compared to 24 percent from adoptive families and 21 percent raised by biological parents, agree, "It is wrong for people to provide their sperm or eggs for a fee to others who wish to have children."

When they grow up, donor offspring are more likely to agree, "I don't feel that anyone really understands me," with 25 percent of them agreeing strongly, compared to 13 percent of the adopted and nine percent of those raised by biological parents.

2. Family relationships for donor offspring are more often characterized by confusion, tension, and loss.

More than half (53 percent) agree, "I have worried that if I try to get more information about or have a relationship with my sperm donor, my mother and/or the father who raised me would feel angry or hurt." Seventy percent agree, "I find myself wondering what my sperm donor's family is like," and 69 percent agree, "I sometimes wonder if my sperm donor's parents would want to know me."

Nearly half of donor offspring (48 percent) compared to about a fifth of adopted adults (19 percent) agree, "When I see friends with their biological fathers and mothers, it makes me feel sad." Similarly, more than half of donor offspring (53 percent, compared to 29 percent of the adopted adults) agree, "It hurts when I hear other people talk about their genealogical background."

Forty-three percent of donor offspring, compared to 15 percent of adopted persons and six percent of those raised by their biological

parents, agree, "I feel confused about who is a member of my family and who is not."

Almost half of donor offspring (47 percent) agree, "I worry that my mother might have lied to me about important matters when I was growing up," compared with 27 percent of the adopted and 18 percent raised by their biological parents. Similarly, 43 percent of donor offspring, compared to 22 percent and 15 percent, respectively, of those raised by adoptive or biological parents, agree, "I worry that my father might have lied to me about important matters when I was growing up."

When they grow up, well over half (57 percent) of donor offspring agree, "I feel that I can depend on my friends more than my family" – about twice as many as those who grew up with their biological parents.

3. Donor offspring often worry about the implications of interacting with – and possibly forming intimate relationships with – unknown, blood-related family members.

Well over half of donor offspring—58 percent—agree, "When I see someone who resembles me I often wonder if we are related," compared to 45 percent of adopted adults and 14 percent raised by their biological parents.

Nearly half—46 percent—of donor offspring, but just 17 percent of adopted adults and 6 percent of those raised by their biological parents, agree, "When I'm romantically attracted to someone I have worried that we could be unknowingly related." Similarly, 43 percent of adult donor offspring, and just 16 percent of adopted adults and 9 percent of those raised by their biological parents, agree, "I have feared having sexual relations unknowingly with someone I am related to."

4. Donor offspring are more likely to have experienced divorce or multiple family transitions in their families of origin.

The married heterosexual parents of the donor offspring are unusually likely to have divorced, with 27 percent of donor offspring reporting that their parents divorced before the respondent was age 16, compared to 14 percent of those who were adopted and 25 percent of those raised by their biological parents. (The comparison between the parents of donor

offspring and those of the adopted is apt, because in both cases the parents would likely have turned to donor conception or adoption later in their marriages, when marriages on average are more stable.) See Figure 4. (p. 117)

Overall, 44 percent of donor offspring experienced one or more "family transitions" between their birth and age 16, compared to 22 percent of the adopted, and 35 percent of those raised by their biological parents. See Figure 3a. (p. 116)

5. Donor offspring are significantly more likely than those raised by their biological parents to struggle with serious, negative outcomes such as delinquency, substance abuse, and depression, even when controlling for socio-economic and other factors.

Donor offspring and those who were adopted are twice as likely as those raised by biological parents to report problems with the law before age 25.

Donor offspring are about 1.5 times more likely than those raised by their biological parents to report mental health problems, with the adopted being closer to twice as likely as those raised by biological parents to report the same thing.

Donor offspring are more than twice as likely as those raised by biological parents to report substance abuse problems (with the adopted falling between the two groups). See Figure 1. (p. 115)

6. Donor offspring born to heterosexual married couples, single mothers, or lesbian couples share many similarities.

In our survey, 262 of the donor offspring report they were born to heterosexual married couples, 113 to single mothers, and 39 to lesbian couples.

While at first glance the number of those born to lesbian couples might seem rather small, this study is notable for having even 39 respondents who grew up with this experience. Most studies of the offspring of lesbian or gay parents are based on a smaller or similar number of respondents, and they typically lack the comparison groups that our survey offers. However, we must caution that due to the size of the sample of offspring of lesbian

couples, most reported findings related to that particular group can only suggest differences or similarities, although where significant differences emerge they are noted.

All three groups of donor offspring appear fairly similar in a number of their attitudes and experiences. For example, they are all about equally likely to agree that they feel confused about who is a member of their family and who is not, that they fear being attracted to or having sexual relations with someone they are unknowingly related to, that they worry their mother might have lied to them about important matters, and that they have worried about hurting their mother's or others' feelings if they tried to seek out their sperm donor biological father. See Table 2. (p. 109)

Donor offspring born to single mothers:

7. At the same time, there appear to be notable differences between donor offspring born to heterosexual married couples, single mothers, and lesbian couples.

Overall, donor conceived persons born to single mothers seem to be somewhat more curious about their absent biological father, and seem to be hurting somewhat more, than those born to couples, whether those couples were heterosexual or lesbian.

Donor offspring born to single mothers are more likely than the other two groups to agree, "I find myself wondering what my sperm donor's family is like." Most (78 percent) born to single mothers agree, compared to two-thirds of those born to lesbian couples or married heterosexual parents. With regard to "My sperm donor is half of who I am," 71 percent of those born to single mothers agree, compared to 46 percent born to lesbian couples and 65 percent born to married heterosexual parents.

Regarding family transitions, the single mothers by choice appear to have a higher number of transitions, although if the single mother married or moved in with someone, that would count as at least one transition. Still, with about half (49 percent) of the offspring of single mothers by choice in our sample reporting one or more family transitions between their birth and age 16, it's clear that family change was not uncommon for them. See Figure 3b. (p. 116)

Regarding troubling outcomes, even with controls, the offspring of single mothers who used a sperm donor to conceive are almost 2.5 times as likely as those raised by biological parents to report problems with the law before age 25. Similarly, even with controls, the offspring of single mothers who used a sperm donor to conceive are more than 2.5 times as likely as those raise by biological parents to report struggling with substance abuse. See Figure 2. (p. 115)

Donor offspring born to lesbian couples:

Meanwhile, compared to those born to single mothers or heterosexual couples, those born to lesbian couples seem overall to be somewhat less curious about their absent biological father, and somewhat less likely to report that they are hurting. However, substantial minorities of those born to lesbian couples still do report distressing experiences and outcomes, for example agreeing that the circumstances of their conception bother them, that it makes them sad to see friends with biological fathers and mothers, and that it bothers them that money was exchanged in their conception. Nearly half (46 percent) of the donor offspring born to lesbian couples in our study agree their sperm donor is half of who they are, and more than half (59 percent) say they sometimes wonder if their sperm donor's family would want to know them. Finally, more than one-third of donor offspring born to lesbian couples in our study agree it is wrong deliberately to conceive a fatherless child. See Table 2. (p. 109)

Regarding family transitions, the donor conceived born to lesbian mothers appear only slightly less likely to have had one or more family transitions before age 16, compared to the donor conceived born to heterosexual married parents. See Figure 3b. (p. 116)

Regarding troubling outcomes, even with controls, the offspring of lesbian couples who used a sperm donor to conceive appear more than twice as likely as those raised by their biological parents to report struggling with substance abuse. See Figure 2. (p. 115)

8. Donor offspring broadly affirm a right to know the truth about their origins.

Depending on which question is asked, approximately two-thirds of grown donor offspring support the right of offspring to have non-identifying information about the sperm donor biological father, to know his identity,

to have the opportunity to form some kind of relationship with him, to know about the existence and number of half-siblings conceived with the same donor, to know the identity of half-siblings conceived with the same donor, and to have the opportunity as children to form some kind of relationship with half-siblings conceived with the same donor.

In recent years Britain, Sweden, Norway, the Netherlands, Switzerland, and some parts of Australia and New Zealand have banned anonymous donation of sperm and eggs. Croatia has recently considered such a law. In Canada, a class-action suit has been launched seeking a similar outcome. This study affirms that a majority of donor offspring support such legal reforms.

9. About half of donor offspring have concerns about or serious objections to donor conception itself, even when parents tell the children the truth about their origins.

Of the donor conceived adults we studied, a sizeable portion – 44 percent – are fairly sanguine about donor conception itself, so long as parents tell their children the truth. But another sizeable portion – 36 percent – still have concerns about donor conception even if parents tell the truth. And a noticeable minority – 11 percent – say that donor conception is hard for the kids even if the parents handle it well. Thus about half of donor offspring – about 47 percent – have concerns about or serious objections to donor conception *itself*, even when parents tell their children the truth.

10. Openness alone does not appear to resolve the complex risks that are associated with being conceived through sperm donation.

In our study, those donor offspring whose parents kept their origins a secret (leaving the donor offspring to find out the truth in an accidental or unplanned way) were substantially more likely to report depression or other mental health issues (51 percent), having struggled with substance abuse (36 percent) or having had problems with the law (29 percent). These differences are very large and striking. See Table 4 (p. 112)

Still, while they fared better than those whose parents tried to keep it a secret, those donor offspring who say their parents were always open

with them about their origins (which are 304 of the donor offspring in our study) still exhibit an elevated risk of negative outcomes. Compared to those raised by their biological parents, the donor offspring whose parents were always open with them are significantly more likely to have struggled with substance abuse issues (18 percent, compared to 11 percent raised by their biological parents) and to report problems with the law (20 percent, compared to 11 percent raised by their biological parents).

11. While a majority of donor offspring support a right to know the truth about their origins, significant majorities also support, at least in the abstract, a strikingly libertarian approach to reproductive technologies in general.

Well over half (61 percent) of donor offspring say they favor the practice of donor conception (compared to 39 percent of adopted adults and 38 percent raised by their biological parents).

The majority of donor offspring – about three-quarters – agree, "I think every person has a right to a child;" "Artificial reproductive technologies are good for children because the children are wanted;" "Our society should encourage people to donate their sperm or eggs to other people who want them;" and "Health insurance plans and government policies should make it easier for people to have babies with donated sperm or eggs." These numbers are substantially higher than those from adoptive or biological parent families who agree with the same statements. Moreover, in a particularly startling finding, a majority of donor offspring (64 percent) agree, "Reproductive cloning should be offered to people who don't have any other way to have a baby," compared to 24 percent who are adopted and 24 percent raised by their biological parents.

12. Adults conceived through sperm donation are far more likely than others to become sperm or egg donors or surrogates themselves.

In another startling finding, a full 20 percent of donor offspring in our study said that, as adults, *they themselves had already donated* their own sperm or eggs or been a surrogate mother. That's compared to 0 percent

of the adopted adults and just 1 percent of those raised by their biological parents – an extraordinary difference.

13. Those donor offspring who do not support the practice of donor conception are more than three times as likely to say they do not feel they can express their views in public.

We asked donor offspring whether they favor, oppose, or neither favor nor oppose the practice of donor conception. Of those who favor donor conception, just 14 percent say they do *not* feel they can express their positive views about donor conception in "society at large." By contrast, of those who oppose it, 46 percent said they do *not* feel they can express these negative views about donor conception in "society at large."

More than one-third of donor offspring in the study (37 percent), compared to 19 percent of adopted adults and 25 percent raised by their biological parents, agree, "If I had a friend who wanted to use a sperm donor to have a baby, I would encourage her *not* to do it."

14. Donor conception is not "just like" adoption.

Adoption is a good, vital, and positive institution that finds parents for children who need families. There are some similarities between donor conception and adoption, but our study reveals there are also many differences. And, if anything, the similarities between the struggles that adopted people and donor conceived people might share should prompt caution about intentionally denying children the possibility of growing up with their biological father or mother, as happens in donor conception.

15. Today's grown donor offspring present a striking portrait of racial, ethnic, and religious diversity.

A full one-fifth – 20 percent – of the donor offspring in our sample said they are Hispanic, compared to just six percent of those from adoptive families and seven percent of those raised by biological parents. The donor offspring are also well represented among races in general. Many of them grew up with Catholic, Protestant, or Jewish religious identities and/or identify with those traditions today. This striking diversity helps to illustrate the complexity of their experience and the reality of their presence in every facet of American life today.

EXHIBIT 40

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In tables 61, 74, 77, 80, and 85-96, data by "Metropolitan Residence" are revised.
In Appendix II, the definition of "Metropolitan Residence" is revised.

Vital and Health Statistics
Series 23, Number 25
December 2005

Fertility, Family Planning, and Reproductive Health of U.S. Women: Data From the 2002 National Survey of Family Growth

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics

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Data From the National Survey of Family Growth

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics

Hyattsville, Maryland
December 2005
DHHS Publication No. (PHS) 2006-1977

Table 69. Number of married women 15–44 years of age and percent distribution by infertility status, according to selected characteristics: United States, 2002

Characteristic	Number in thousands	Total	Surgically sterile	Infertile	Fecund
		Percent distribution			
Total[1]	28,327	100.0	34.8	7.4	57.8
Age					
15–29 years	7,246	100.0	12.2	6.3	81.5
30–34 years	6,351	100.0	26.0	8.1	65.9
35–39 years	6,989	100.0	45.6	5.7	48.7
40–44 years	7,740	100.0	53.4	9.4	37.3
Parity and age					
0 births	5,142	100.0	9.1	16.6	74.3
15–29 years	2,364	100.0	1.6	11.0	87.4
30–34 years	1,279	100.0	2.4	16.9	80.7
35–39 years	684	100.0	33.1	22.6	44.3
40–44 years	815	100.0	21.0	27.4	51.6
1 or more births	23,185	100.0	40.5	5.4	54.2
15–29 years	4,882	100.0	17.4	4.0	78.6
30–34 years	5,072	100.0	32.0	5.9	62.1
35–39 years	6,305	100.0	46.9	3.9	49.2
40–44 years	6,925	100.0	57.2	7.2	35.6
Medical help to become pregnant					
Yes, at least once in last year	1,180	100.0	14.2	30.5	55.3
Yes, but not within last year	4,311	100.0	33.4	14.0	52.6
No	22,836	100.0	36.1	4.9	58.9
Education[2]					
No high school diploma or GED[3]	2,764	100.0	44.1	10.4	45.5
High school diploma or GED[3]	8,092	100.0	44.0	6.5	49.5
Some college, no bachelor's degree	8,198	100.0	37.9	6.6	55.5
Bachelor's degree or higher	8,521	100.0	23.0	8.4	68.6
Percent of poverty level[4]					
0–149 percent	5,590	100.0	37.5	7.4	55.1
150–299 percent	8,306	100.0	38.7	5.7	55.7
300 percent or more	14,233	100.0	31.9	8.4	59.7
Hispanic origin and race and parity					
Hispanic or Latina	4,138	100.0	34.5	7.7	57.8
0 births	470	100.0	*	24.3	72.5
1 or more births	3,668	100.0	38.5	5.6	55.9
Not Hispanic or Latina:					
White, single race	20,061	100.0	35.1	7.0	57.9
0 births	4,068	100.0	9.9	15.9	74.2
1 or more births	15,992	100.0	41.5	4.7	53.8
Black or African American, single race	2,133	100.0	44.2	11.5	44.3
0 births	248	100.0	*	27.7	61.6
1 or more births	1,885	100.0	48.6	9.4	42.1

* Figure does not meet standard of reliability or precision.

[1]Includes women of other or multiple race and origin groups, not shown separately.

[2]Limited to women 22–44 years of age at time of interview.

[3]GED is General Educational Development high school equivalency diploma.

[4]Limited to women 20–44 years of age at time of interview.

NOTES: Percentages may not add to 100 due to rounding. Roughly comparable data for 1995 are shown in reference 16, table 51.

EXHIBIT 41

National Health Statistics Reports

Number 67 ■ August 14, 2013

Infertility and Impaired Fecundity in the United States, 1982–2010: Data From the National Survey of Family Growth

by Anjani Chandra, Ph.D., and Casey E. Copen, Ph.D., National Center for Health Statistics; and Elizabeth Hervey Stephen, Ph.D., Georgetown University

Abstract

Objectives—This report presents nationally representative estimates and trends for infertility and impaired fecundity—two measures of fertility problems—among women aged 15–44 in the United States. Data are also presented on a measure of infertility among men aged 15–44.

Methods—Data for this report come primarily from the 2006–2010 National Survey of Family Growth (NSFG), which consisted of 22,682 interviews with men and women aged 15–44, conducted from June 2006 through June 2010. The response rate for women in the 2006–2010 NSFG was 78%, and for men was 75%. Selected trends are shown based on prior NSFG years.

Results—The percentage of married women aged 15–44 who were infertile fell from 8.5% in 1982 (2.4 million women) to 6.0% (1.5 million) in 2006–2010. Impaired fecundity among married women aged 15–44 increased from 11% in 1982 to 15% in 2002, but decreased to 12% in 2006–2010. Among all women, 11% had impaired fecundity in 2006–2010. Both infertility and impaired fecundity remain closely associated with age for nulliparous women. Among married, nulliparous women aged 35–44, the percentage infertile declined from 44% in 1982 to 27% in 2006–2010, reflecting greater delays in childbearing over this period. Among married women in 2006–2010, non-Hispanic black women were more likely to be infertile than non-Hispanic white women. Some form of infertility (either subfertility or nonsurgical sterility) was reported by 9.4% of men aged 15–44 and 12% of men aged 25–44 in 2006–2010, similar to levels seen in 2002.

Keywords: current fertility problems • nonsurgical sterility • male fertility problems • demographic trends

Introduction

As part of its overall mission to collect data on fertility and the intermediate factors that explain birth rates in the United States, the National Survey of Family Growth (NSFG) has provided two population-based, nationally representative measures for fertility problems: infertility (since 1973) and impaired fecundity (since 1982) (1–4). Infertility is defined as a lack of pregnancy in the 12 months prior to survey, despite having had unprotected sexual intercourse in each of those months with the same husband or partner. Impaired fecundity is defined as physical difficulty in either getting pregnant or carrying a pregnancy to live birth. NSFG data are used to monitor the prevalence and correlates of infertility and to evaluate the use, efficacy, and safety of infertility services and treatments. The survey is also used in research on the causes of infertility and provides information to guide programs for the primary and secondary prevention of infertility among women and men (4,5).

This report presents trends and national estimates for both NSFG-based measures of fertility problems among women, and one measure of infertility among men, in the United States, using the most recently available data from the 2006–2010 NSFG. By using a standardized approach to monitoring the prevalence of impaired fecundity among all women aged 15–44 since 1982, and 12-month infertility among married women since 1973, NSFG provides demographic ‘‘snapshots’’ of the impact of societal trends such as delayed marriage and childbearing, and tracks

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the potential demand for infertility-related medical services.

Data from the 2002 NSFG showed that an estimated 12% of women (7.3 million) in the United States had impaired fecundity or difficulties conceiving or bringing a pregnancy to term (1). This represented a significant increase from both the percentage (8.4%) and number (4.5 million) seen in 1982 (2,6). In 2002, 7.4% of married women aged 15–44 (2.1 million) were infertile for at least 12 consecutive months, a slight decrease from 8.5% seen in 1982 (1). The reasons for these disparate trends in infertility and impaired fecundity are not completely understood, but both measures are likely affected by the upward shifts in age at first marriage and age at first birth among women (1,2,7–12), as well as trends in surgical sterilization (13–15). In addition, the past two decades have seen an increasing range and availability of medical treatment options for infertility (4). Amidst these societal trends, it is widely recognized that estimates of infertility will vary, sometimes significantly, based on the definitions and study methodology used, particularly with regard to defining the ''at-risk'' population (16–21).

Despite uncertainty as to how many individuals are affected by infertility in the United States, considerable research has focused on several known or potential causes of infertility or impaired fecundity, apart from the well-documented decline in natural fecundity with female age (22–25). These include sexually transmitted infections such as chlamydia, pelvic inflammatory disease, environmental toxins, and certain lifestyle factors closely associated with fertility problems, such as smoking and obesity (4,26). In addition, there are known disparities in the diagnosis and treatment of infertility by socioeconomic and demographic factors that may raise questions about differential access to infertility services and potentially unmet need for these services (27–31). In this context, NSFG data are useful for measuring and monitoring infertility and fecundity status consistently over time.

This report focuses on the most recent trends in infertility and impaired fecundity through 2010. Topics include:

- Trends in the overall numbers and percentages of women, by fecundity and infertility status (the table and Figures 1 and 2 in the main text, plus Table 1 on p. 13).
- Fecundity and infertility status, by selected sociodemographic characteristics such as age, parity, and education (Tables 2–4 and Figures 3–6).
- Multivariate analysis for infertility and impaired fecundity (Table 5).
- Infertility status among men aged 15–44 (Table 6).

A companion report on the use of infertility services is forthcoming.

Methods

Data source

NCHS has conducted NSFG seven times: in 1973 and 1976 with samples of married and formerly married women; in 1982, 1988, and 1995 with samples of women of all marital status categories; and in 2002 and 2006–2010 with national samples of both women and men aged 15–44. Each time, the interviews were conducted in person by trained female interviewers in the selected persons' homes.

The current report is based primarily on interviews conducted with women from June 2006 through June 2010. The 2006–2010 NSFG was based on 22,682 face-to-face interviews—12,279 with women and 10,403 with men, aged 15–44, in the household population of the United States. The 2006–2010 sample is a nationally representative multistage area probability sample. The response rate for the 2006–2010 NSFG was 77% overall: 78% for women and 75% for men. Further details on the methods and procedures of NSFG have been published previously (32–34).

Infertility and impaired fecundity measures

To present population-based trends over time for fertility problems, this report uses two measures that have been consistently defined for women since the 1982 NSFG: infertility status and fecundity status.

Infertility status among women

Infertility status, as coded in the INFERT variable, reflects a measure typically used by physicians and others to identify couples who may warrant medical evaluation to see whether fertility treatment services could help them have a baby. The INFERT variable is constructed based on answers to detailed questions on contraceptive use, sexual activity, and marital or cohabiting status. When neither the respondent nor her current husband or cohabiting partner is surgically sterile, a woman is defined as infertile at time of interview if, during the previous 12 months or longer, she and her husband or partner were continuously married or cohabiting, were sexually active each month, had not used contraception, and had not become pregnant.

This measure has traditionally been limited to married or cohabiting women because infertility is a couple-based phenomenon; unless he or she is completely sterile, either partner may potentially achieve pregnancy with a different partner. This measure does not attempt to distinguish whether the infertility stems from the female or male partner. Also, the measure requires at least 12 months of sexual relationship with the same partner and reliable reporting of contraception and pregnancy, and married or cohabiting women's reporting of these experiences is less prone to misreporting.

Infertility status, as shown in Tables 1 and 4, has three categories: surgically sterile, infertile, and presumed fertile. The ''presumed fertile'' category is a residual category indicating that the married or cohabiting woman is neither surgically sterile nor infertile at the time of interview.

Fecundity status among women

Fecundity status, as coded in the FECUND variable, describes the physical ability of a woman to have a

child and not simply to conceive a pregnancy. This measure is defined for all women, regardless of their relationship status. As with the infertility measure, married or cohabiting women are classified as surgically sterile on FECUND if their husbands or cohabiting partners are surgically sterile. In addition, married or cohabiting women are asked separate questions about fertility problems encountered by each member of the couple, whereas single, noncohabiting women can report only about their own impaired fecundity. For the purposes of the fecundity status measure, this means that a married or cohabiting woman could be classified as surgically sterile or as having impaired fecundity solely on the basis of her husband's or cohabiting partner's status.

As shown in this report, fecundity status has three main categories: surgically sterile, having impaired fecundity, and presumed fecund. As with the INFERT variable, the FECUND variable is constructed based on responses to NSFG survey questions, not by a medical examination. Also, the ''presumed fecund'' category is a residual category indicating that the woman does not meet the conditions of surgical sterility or impaired fecundity.

Women were classified as *surgically sterile* if they (or their current husband or cohabiting partner) had an unreversed sterilizing operation, for example, a tubal sterilization, hysterectomy, or vasectomy. The category is further divided into contraceptive and noncontraceptive subcategories, based on the reasons reported for the sterilizing operation.

Impaired fecundity includes women in the following three subgroups: nonsurgically sterile, subfecund, and long interval without conception.

Nonsurgically sterile—Women who have not reported any sterilization operations for themselves or their current husband or cohabiting partner are asked the following questions, and are defined as nonsurgically sterile if they answer ''no'' to either question:

- *Some women are not physically able to have children. As far as you know, is it physically possible for you, yourself, to have (a/another) baby?*
- If the woman is married or cohabiting: *What about [HUSBAND/PARTNER]? As far as you know, is it physically possible for him to father a baby in the future?*

Subfecund—Women not already responding as surgically or nonsurgically sterile are asked the following questions about physical difficulties having a baby, and a ''yes'' answer on any question is considered subfecundity:

- *Some women are physically able to have (a/another) baby, but have difficulty getting pregnant or carrying the baby to term. As far as you know, would you, yourself, have any difficulty getting pregnant (again) or carrying (a/another) baby (after this pregnancy)?*
- If the woman is married or cohabiting: *As far as you know, does [HUSBAND/PARTNER] have any difficulty fathering a baby?*
- *At any time has a medical doctor ever advised you never to become pregnant (again)?*

Long interval without conception (or 36-month infertility)—Women not already classified as surgically sterile, nonsurgically sterile, or subfecund could be defined as having a ''long interval without conception'' if they had been continuously married or cohabiting, were sexually active in each month, had not used contraception, and had not had a pregnancy for 36 consecutive months or longer.

Presumed fecund is a residual category (as was ''presumed fertile'' with infertility status) and means that the woman—or couple, if married or cohabiting—was not surgically sterile and did not have impaired fecundity. The percentage of currently married women with impaired fecundity is higher than the percentage of married women with 12-month infertility because impaired fecundity includes problems carrying pregnancies to live birth in addition to problems conceiving, whereas infertility includes only problems conceiving. However, 12-month infertility is not strictly a subset of impaired fecundity for married women or cohabiting women, as explained below.

Relationship between infertility and impaired fecundity

Despite the broader definition of impaired fecundity that includes problems carrying pregnancies to live birth, not all married or cohabiting women with 12-month infertility will necessarily have impaired fecundity. The main reason for this is that impaired fecundity includes a component of 36-month infertility, rather than 12-month infertility. Some married or cohabiting women who have not been infertile as long as 36 months may be categorized as presumed fecund on the impaired fecundity measure, based on their answers to the questions about nonsurgical sterility and subfecundity. Because of this potential but incomplete overlap of the two measures of fertility problems for married or cohabiting women, some analyses of infertility services focus on women with ''current fertility problems,'' defined as having either infertility or impaired fecundity (Table 5). For example, among the 3.53 million married women aged 15–44 with current fertility problems in 2006–2010, 31% had both impaired fecundity and 12-month infertility, 57% had only impaired fecundity, and 12% had only 12-month infertility. A similar extent of overlap in these measures was seen among married women aged 15–44 with current fertility problems in 1995 and 2002.

Infertility status among men

Although a completely analogous measure of infertility cannot be constructed for men as for women, NSFG does include data from which to construct a fairly comparable measure (Table 6). Infertility status among men is based on directly asked questions about

surgical sterility and men's physical ability to father a child. Men are coded into four categories based on responses they give for themselves or their current wives or cohabiting partners:

Surgically sterile—If they reported an unreversed vasectomy or some other reason for surgical sterility, or they reported that their wives or cohabiting partners are surgically sterile

Nonsurgically sterile—If they responded ''no'' to the following question that parallels the question women are asked about nonsurgical sterility:

Some men are not physically able to father children. As far as you know, is it physically possible for you, yourself to biologically father a child in the future?

Men are also coded in this category if their current wives or cohabiting partners are nonsurgically sterile.

Subfertile—If they respond ''yes'' to the following question about their subfertility, paralleling the question women are asked about subfecundity:

Some men are physically able to father a child, but would have difficulty doing so. As far as you know, would you have any difficulty fathering a child?

Presumed fertile—A residual category indicating that he (or his current wife or cohabiting partner) did not meet the definitions for the other categories.

Demographic and behavioral variables

The data on infertility and impaired fecundity presented in this report are shown with respect to several key social or demographic characteristics, including age, parity (or number of biological children fathered by men), marital or cohabiting status, educational attainment, percent of poverty level of household, and Hispanic origin and race. These characteristics have been chosen because prior studies have documented their association either with fertility problems or with timing of attempts to have a child. For example, prior literature (22–25) has demonstrated the marked decline in women's physical ability to have a child (fecundity) with increasing age, particularly among those trying to have their first child. Factors such as educational attainment have been correlated with fertility impairments, but by way of their association with older ages when women first try to have a child (10).

All characteristics reflect the respondent's status at the time of interview. Parity—the number of live births a woman has had—is dichotomized as 0, or 1 or more. Similarly for men, their number of biological children is shown as 0, or 1 or more. Primary infertility or primary impaired fecundity is defined as physical difficulties having a first child, and childless (nulliparous) women who are infertile would be said to have primary infertility. Secondary infertility or impaired fecundity would be defined among those who have had at least one child at the time of interview and are experiencing physical difficulties having another child.

The measure of marital or cohabiting status used in this report is based only on relationships with opposite-sex spouses or partners, in keeping with the marital or cohabiting status variables that have been defined across all NSFG surveys to date. The measure of education used here is generally limited to those aged 25–44, to enable showing a top category of Master's degree or higher; younger respondents may still be attending school to earn these degrees. Where sample sizes did not permit this level of detail (Table 5 and Figure 3), the top category used was Bachelor's degree or higher, and results were based on the larger group of women aged 22–44. Percent of poverty level is based on a comparison of each respondent's household income with the poverty thresholds for a family of this size, as defined by the U.S. Census Bureau; adjustments are not made for variations in cost of living in the place where the respondent resides. This measure is shown only for respondents aged 20–44, to exclude potentially misreported or incompletely reported household incomes for teenagers. The definitions of Hispanic origin and race used in this report comply with the 1997 guidelines from the Office of Management and Budget (35), taking into account multiple-race reporting. In selected tables where sample sizes permit, Asian persons are shown separately.

The 2006–2010 NSFG and earlier NSFG surveys offer several strengths for studying infertility and impaired fecundity in the U.S. household population. In addition to rigorous quality control measures and good response rates (32–34), NSFG includes detailed data on sexual activity, contraception, pregnancy, marriage, and cohabitation, such that reliable and consistent measures of fertility problems can be defined over time. Although the NSFG age range of 15–44 excludes measurement of fertility problems among older women who may still be pursuing childbearing, using nationally representative survey data—rather than non-probability-based samples of women or couples ''trying to conceive'' or those seeking medical help for infertility—allows NSFG to derive a more generalizable estimate of the prevalence of fertility problems in the U.S. household population in this age group.

Although NSFG collects information on fertility intentions and desires, its two measures of fertility problems are not contingent on these factors. This is both a strength and a limitation for understanding the population-based estimates. On the one hand, NSFG measures may provide a more accurate snapshot of the fecundity and infertility status of the general reproductive-age population, independent of any sociodemographic selectivity or temporal trends associated with who ''seeks pregnancy'' and when they do so in their life course. On the other hand, these measures can be misconstrued as direct indicators of the need (or unmet need) for infertility services (36). Some data users may not recognize that an individual or couple

can remain infertile or fulfill the definition of impaired fecundity for years after they have stopped trying to have a child. In sum, NSFG measures for women can be used in conjunction with fertility intentions and desires to provide population-based estimates of potential demand for infertility services and to assess the extent to which this demand is met.

For men, first included in NSFG in 2002, the time trend for providing nationally representative estimates is shorter than for women. Also, given that a significant association with age and male infertility is not generally seen until ages beyond the NSFG upper bound of 44, it is unlikely that the NSFG-based estimates of male infertility will show the same prevalence or differentials seen among women. However, these data can still provide a useful estimate of infertility for the general population from the male perspective.

Statistical analysis

All estimates in this report are based on sampling weights designed to produce unbiased estimates of men and women aged 15–44 in the United States. The statistical package SAS, version 9.3 (http://www.sas.com), was used to produce all estimates of percentages and numbers in this report. SAS SURVEYFREQ procedures were used to estimate the sampling errors of the statistics because these procedures take into account the use of weighted data and the complex design of the sample in calculating estimates of standard errors and in performing significance tests. Each table in this report (with the exception of Table 5, which shows logistic regression results for women) includes standard errors as a measure of the precision of each point estimate (percentage) presented.

The significance of differences among subgroups was determined by standard two-tailed *t* tests using point estimates and their standard errors. For selected comparisons, Wald chi-square tests of overall association were also performed within SAS PROC SURVEYFREQ, and symbols denoting these test results are included in selected tables. No adjustments were made for multiple comparisons. Terms such as ''greater than'' and ''less than'' indicate that a statistically significant difference was found. Terms such as ''similar'' or ''no difference'' indicate that the statistics being compared were not significantly different. Lack of comment regarding any difference does not mean that significance was tested and ruled out.

In the description of the results below, when the percentage being cited is below 10%, the text will cite the exact percentage to one decimal point. To make reading easier and to remind the reader that the results are based on samples and subject to sampling error, percentages above 10% will generally be shown rounded to the nearest whole percent. Percentages are not shown if the denominator is fewer than 100 cases or the numerator is fewer than 5 cases. When a percentage or other statistic is not shown for this reason, an asterisk footnote (*) is inserted to signify that the statistic does not meet standards of reliability or precision. For most statistics presented in this report, the denominators are much larger than 100.

Although this report is primarily intended to provide basic descriptive statistics for key population subgroups that may guide future multivariate analyses, Table 5 shows multiple logistic regression (PROC SURVEYLOGISTIC) results for 12-month infertility, impaired fecundity, and a combined measure indicating either of these measures. Adjusted odds ratios (AORs) for these infertility measures among women aged 22–44 are shown, controlling for age, parity, marital or cohabiting status, education, percent of poverty level, and Hispanic origin and race. Table 5 shows 95% confidence intervals for each AOR, along with a *p* value indicating the statistical significance of the AOR.

Results

Trends in infertility and impaired fecundity

Table 1 shows the percent distribution, by fecundity and infertility status, for all women and for married women aged 15–44 in the United States for NSFG years 1982, 1988, 1995, 2002, and 2006–2010.

- Among all women aged 15–44, the percentage with impaired fecundity increased significantly, from 8.4% in 1982 and 1988 to 10% in 1995. After reaching 12% in 2002, the percentage remained stable at 11% in 2006–2010.
- Among married women aged 15–44, a similar pattern was seen for impaired fecundity, although with higher percentages through 2002: 11% of married women in 1982 and 1988 had impaired fecundity; the percentage rose to a high of 15% in 2002, and fell in 2006–2010 to 12%.
- The key subgroup of impaired fecundity that appears to drive the increase from 1982 to 2002 is the subfecund group—those for whom it is physically difficult or dangerous to have a baby. There was no significant change over time in the nonsurgically sterile or long interval without conception subgroups of impaired fecundity. In 1982, 6.7% of married women aged 15–44 were subfecund. After reaching a high of 11% subfecund in 2002 when impaired fecundity was at its highest point (15%), the percentage subfecund among married women was 10% in 2006–2010.
- A higher percentage of married women (or their husbands or partners) were surgically sterile for contraceptive reasons, compared with the levels seen among all women regardless of marital status. For example, in 2006–2010 35% of married women aged 15–44 were surgically sterile for contraceptive reasons, compared with 21% of women in that age group as a whole.

As a result of these higher levels of surgical sterilization and impaired fecundity among married women, a smaller proportion (roughly one-half) were in the residual category ''presumed fecund.''

Figure 1 and the bottom panel of Table 1 show that the percentage of married women who were infertile has

EXHIBIT 42

Child TRENDS RESEARCH BRIEF

Publication #2011-29

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Childbearing Outside of Marriage: Estimates and Trends in the United States

By Elizabeth Wildsmith, Ph.D., Nicole R. Steward-Streng, M.A., and Jennifer Manlove, Ph.D. November 2011

Overview. *Having children outside of marriage—nonmarital childbearing—has been on the rise across several decades in the United States. In 2009, 41 percent of all births (about 1.7 million) occurred outside of marriage, compared with 28 percent of all births in 1990 and just 11 percent of all births in 1970.[12,20] Preliminary data suggest that this percentage has remained stable in 2010.[6] There are several reasons to be concerned about the high level of nonmarital childbearing. Couples who have children outside of marriage are younger, less healthy, and less educated than are married couples who have children.[14] Children born outside of marriage tend to grow up with limited financial resources; to have less stability in their lives because their parents are more likely to split up and form new unions; and to have cognitive and behavioral problems, such as aggression and depression.[13] Indeed, concerns about the consequences of nonmarital childbearing helped motivate the major reform of welfare that occurred in 1996,[17] and continue to motivate the development of federally funded pregnancy prevention programs among teenagers and marriage promotion programs among adults.[17,19]*

This Research Brief *draws from multiple published reports using data through 2009, as well as from Child Trends' original analyses of data from a nationally representative survey of children born in 2001, to provide up-to-date information about nonmarital childbearing; to describe the women who have children outside of marriage; and to examine how these patterns have changed over time. As nonmarital childbearing has become more commonplace, the makeup of women having children outside of marriage has changed, often in ways that challenge public perceptions. For example, an increasing percentage of women who have a birth outside of marriage live with the father of the baby in a cohabiting union and are over the age of twenty.[7,21] Moreover, the percentage of women having a birth outside of marriage has increased faster among white and Hispanic women than among black women.[7,20]*

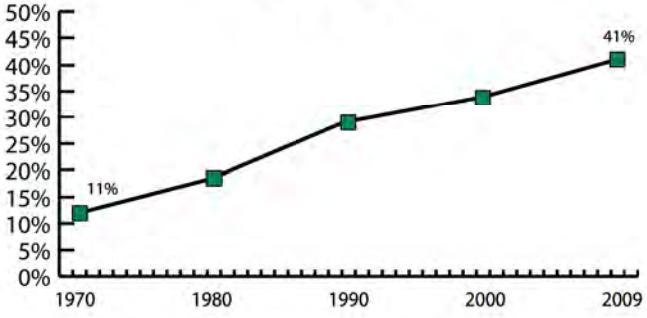
Trends in Nonmarital Childbearing

The percentage of births outside of marriage rose steeply from 1970 to 2009 for all age groups. Between 1970 and 2009, the percentage of all births that took place outside of marriage (the nonmarital birth ratio) increased from 11 to 41 percent (see Figure 1). This increase occurred within every age category (see Figure 2).[12,21]

- Nonmarital births to teens rose from 30 percent in 1970 to 67 percent in 1990, to 87 percent in 2009.
- Nonmarital births to women ages 20-24 rose from 9 percent in 1970 to 37 percent in 1990, to 62 percent in 2009.

Figure 1

Percent of Births to Unmarried Women, 1970-2009



Source: 1970-1999, Ventura SJ, Bachrach CA. Nonmarital childbearing in the United States, 1940-1999. National vital statistics reports; vol 48 no 16. Hyattsville, Maryland: National Center for Health Statistics. 2000.
Martin JA, Hamilton BE, Ventura SJ, Osterman MJK, Kirmeyer S, Mathews TJ, Wilson EC. Births: Final data for 2009. National vital statistics reports; vol 60 no 1. Hyattsville, MD: National Center for Health Statistics. 2011.

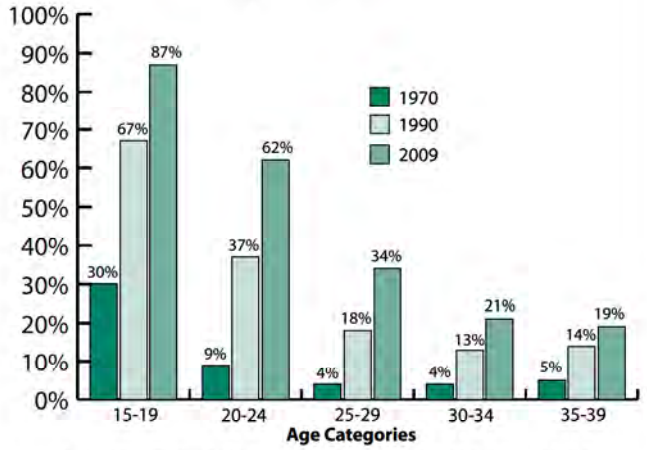
ABOUT THE DATA SOURCE FOR THIS BRIEF

Statistics used for this brief came from two primary sources: birth data (through 2009) that were collected and reported by the National Center for Health Statistics as part of the National Vital Statistics Reports,[12,21] and data Child Trends analyzed from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) that were collected by the National Center for Education Statistics within the U.S. Department of Education. The ECLS-B is a nationally representative sample of approximately 10,700 children born in 2001. The study was designed to gather information on children's early life experiences from birth through kindergarten entry. The analyses presented in this brief used data from the first phase of data collection, a sample of about 10,500 children who lived with their biological or adoptive mothers, who answered the nine-month parent survey. All analyses of the ECLS-B were weighted and accounted for survey design effects. Statistically significant differences presented in this brief are significant at $p<.05$.

Two of the most common measures of nonmarital childbearing are the nonmarital birth ratio, i.e., the percentage of all births that occur to unmarried women; and the nonmarital birth rate i.e., the number of births for every 1,000 unmarried women between the ages of 15 and 44 (or within specific age categories) in any given year. Although different from one another, these two measures are closely related.

Figure 2

Percent of Births to Unmarried Women, 1970, 1990, & 2009



Sources:Ventura SJ and Bachrach, CA. Nonmarital Childbearing in the United States, 1940-99. National vital statistics reports; vol 48 no 16. Hyattsville, MD: National Center for Health Statistics. 2000. Martin JA, Hamilton BE, Ventura SJ, Osterman MJK, Kirmeyer S, Mathews TJ, Wilson EC. Births: Final data for 2009. National vital statistics reports; vol 60 no 1. Hyattsville, MD: National Center for Health Statistics. 2011.

- Nonmarital births to women ages 25-29 rose from 4 percent in 1970 to 18 percent in 1990, to 34 percent in 2009.
- Nonmarital births to women ages 30-34 rose from 4 percent in 1970 to 13 percent in 1990, to 21 percent in 2009.
- Nonmarital births to women ages 35-39 rose from 5 percent in 1970 to 14 percent in 1990, to 19 percent in 2009.

The percentage of births outside of marriage also increased for all major racial and ethnic groups. Since 1990, the percentage of all births occurring outside of marriage increased for all major racial and ethnic groups. Although the percentage of nonmarital births is still highest among black women, the greatest increases were seen among white and Hispanic women (see Figure 3).[12]

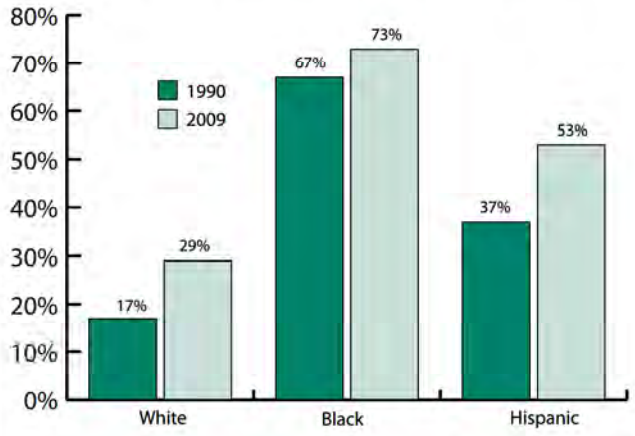
- In 1990, 17 percent of births to white women, 67 percent of births to black women, and 37 percent of births to Hispanic women were nonmarital.
- In 2009, 29 percent of births to white women, 73 percent of births to black women, and 53 percent of births to Hispanic women were nonmarital.

Women in their twenties have the highest rate of births outside of marriage. A common misperception is that teen women have the highest nonmarital birth rate. However, the number of births among unmarried women in their twenties and thirties increased substantially over the past 20 years, while births to teens have declined overall (in spite of an increase in the mid-2000s). In 2009:

- Women aged 20-24 had a nonmarital birth rate of 74.6 births per 1,000 unmarried women.
- Women aged 25-29 had 72.7 births per 1,000 unmarried women.
- In comparison, teen women aged 15-17 had 19.3 births per 1,000 unmarried women and teen

Figure 3

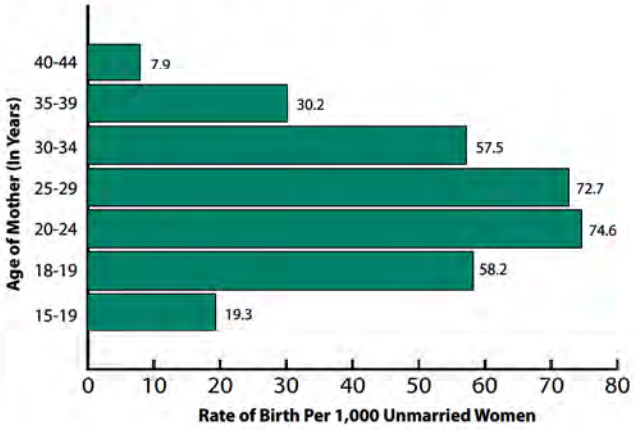
Percent of Births to Unmarried Women by Race and Ethnicity, 1990 & 2009



Source: Martin JA, Hamilton BE, Ventura SJ, Osterman MJK, Kirmeyer S, Mathews TJ, Wilson EC. Births: Final data for 2009. National vital statistics reports; vol 60 no 1. Hyattsville, MD: National Center for Health Statistics. 2011.

Figure 4

Nonmarital Birth Rate (per 1,000 women) by Age, 2009



Source: Martin JA, Hamilton BE, Ventura SJ, Osterman MJK, Kirmeyer S, Mathews TJ, Wilson EC. Births: Final data for 2009. National vital statistics reports; vol 60 no 1. Hyattsville, MD: National Center for Health Statistics. 2011.

women aged 18-19 had 58.2 births per 1,000 unmarried women.

- Although nonmarital birth rates for women 30 and older are increasing, these rates remain lower than rates for women in their twenties: 57.5 among women aged 30-34, 30.2 among women aged 35-39, and 7.9 among women aged 40-44 (see Figure 4).

Teen women account for a diminishing share of all births outside of marriage. Although teen women accounted for almost one-half (49 percent) of all nonmarital births in 1970, by 2009 they were responsible for less than one-quarter of nonmarital births (21 percent). By contrast, in 2009, women in their twenties accounted for the majority (62 percent) of nonmarital births[12,21] (see Figure 5).

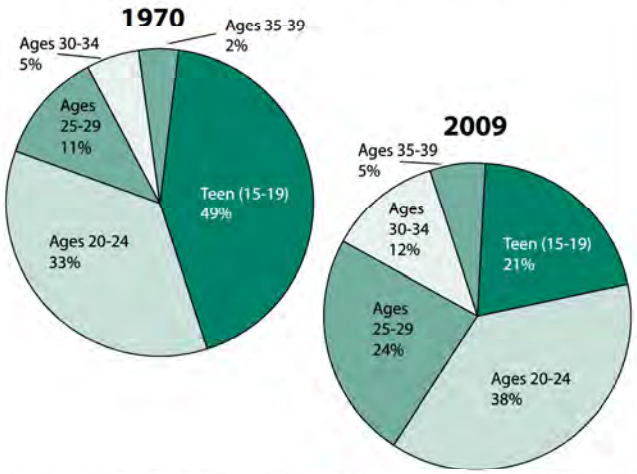
- Women aged 20-24 accounted for 33 percent of nonmarital births in 1970 and 38 percent in 2009.
- In 1970, slightly less than one-fifth (18 percent) of all nonmarital births were to women aged 25 and older; however, by 2009 women in this age group accounted for 41 percent of all nonmarital births.

Less than one-half of all nonmarital births are first births. Despite the common perception that firstborns account for most nonmarital births, more than one-half of all births in 2009 that occurred outside of marriage (59 percent) were second- or higher-order births (results not shown).[16]

- Fifty-seven percent of births to unmarried women aged 20-24, three-quarters (75 percent) of births to unmarried women aged 25-29, and

Figure 5

Percent of Nonmarital Births to Women in Each Age Category, 1970 and 2009



Sources: Ventura SJ and Bachrach, CA. Nonmarital Childbearing in the United States, 1940-99. National vital statistics reports; vol 48 no 16. Hyattsville, MD: National Center for Health Statistics. 2000. Martin JA, Hamilton BE, Ventura SJ, Osterman MJK, Kirmeyer S, Mathews TJ, Wilson EC. Births: Final data for 2009. National vital statistics reports; vol 60 no 1. Hyattsville, MD: National Center for Health Statistics. 2011.

82 percent of births to unmarried women aged 30-39 were higher-order births.

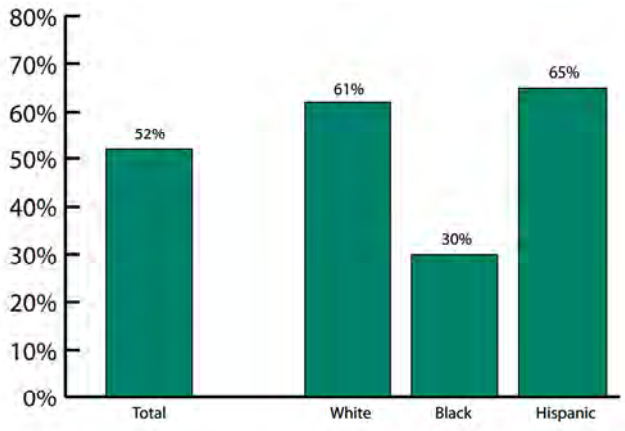
- Even among teen women aged 15-19, almost one-quarter (24 percent) of nonmarital births were second- or higher-order.

More than one-half of nonmarital births occur within cohabiting relationships. A majority of children born outside of marriage are born into families headed by two unmarried parents. In 2001, 52 percent of all nonmarital births took place within a cohabiting union, compared with 38 percent in the early 1990s.[7,15] However, the likelihood that a woman will have a baby within a cohabiting relationship varies substantially by race and ethnicity. Results from Child Trends' analyses of data from the ECLS-B show that almost two-thirds of nonmarital births in 2001 to white (61 percent) and Hispanic (65 percent) women took place within cohabiting unions, compared with less than one-third (30 percent) of nonmarital births to black women (see Figure 6).

The majority of nonmarital births are unintended. Unintended births are those that, at the time of conception, were either mistimed (the mother wanted the pregnancy to occur earlier or later than it did) or unwanted (the mother did not want it to occur at that time or any time in the future). Child Trends' analyses of ECLS-B data indicate that 65 percent of births to women who were not living with or married to the father of their baby and 50 percent of births to women who were living with their baby's father were unintended, compared with just 20 percent of births to married women (see Figure 7). Additional research suggests that men may be more likely than are women to report that births outside of marriage are unintended. For example, 62 percent of unmarried fathers aged 15-24 identified their most recent birth as unintended.[11]

Figure 6

Percent of Unmarried Mothers Cohabiting at Birth of Child, by Race and Ethnicity



Source: Child Trends' analyses of Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2001-02

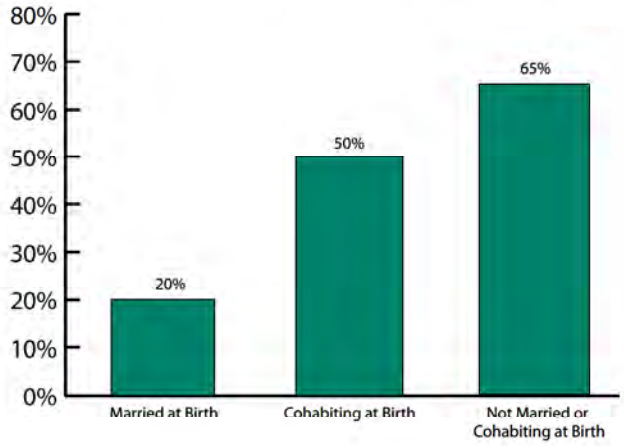
Summary and Discussion

This *Research Brief* has highlighted several important trends that have implications for the well-being of children and the parents who bring them into this world.

Nonmarital childbearing has increased substantially, particularly among women in their twenties. Preliminary data from 2010 suggest small declines in the nonmarital birth rate since 2008, as well as no continued increase in the percentage of births that occur outside of marriage.[6] However, the overall increase over the past several decades in both the nonmarital birth rate and the percent of births that occur outside of marriage indicate striking changes in the context of childbearing in the United States. The most profound change in the prevalence of nonmarital childbearing has been among women over the age of 19. In 2009, women in their twenties were responsible for the largest share of nonmarital births (62 percent) and had the highest nonmarital birth rates.[12] The per-

Figure 7

Percent of Women who Report that Their Pregnancy was Unintended by Relationship Status at Birth



Source: Child Trends' analyses of Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2001-02

centage of nonmarital births among teen women, however, has declined substantially, as have teen birth rates. The decline in birth rates among teen women has been attributed to a combination of delays in sexual initiation and increased use of contraception.[18]

Increases in nonmarital births have been more dramatic among white and Hispanic women than among black women. Although the proportion of nonmarital births remains highest among black women, the proportion of births occurring outside of marriage has increased the most for white and Hispanic women. This trend may be explained partly by greater economic strains, growing acceptance of nontraditional family forms, and increased barriers to marriage, particularly among people of lower socioeconomic status.[3,5,14] In fact, some researchers suggest that disadvantaged white and Hispanic women are merely following the pattern of nonmarital childbearing set by disadvantaged black women in earlier decades.[5]

The rise in the number of children being born outside of marriage—among all groups—is linked to broader changes in family structure, most notably cohabitation. More than one-half of all nonmarital births occur to couples who live together in one household, but are not legally married. In fact, much of the increase in nonmarital childbearing since the 1980s reflects a shift from births to married couples to births to cohabiting couples, rather than an increase in births to women who are either in dating relationships or are single.[7,8] However, although cohabiting couples with children have very high expectations of marriage, the likelihood that these couples will marry remains low.[13] Additionally, cohabiting unions generally fail to provide the same level of economic security that marriages do and tend to be of shorter duration than marriages.[13] Thus, children born to cohabiting parents are more likely than are those born to married parents to be poor and to see their parents' union end.

Births that occur outside of marriage are often second- or higher-order births. More than one-half of all babies born to unmarried couples are not firstborns. Some of these babies represent repeat births to the same unmarried couple. However, many children born outside of marriage do not share the same father as their siblings. In fact, research finds that two-thirds (66 percent) of new unmarried mothers with more than one child had at least one child who was fathered by someone other than the father of the new baby.[13] This type of family complexity can introduce additional stresses and strains into family life.[14]

Births that occur outside of marriage also are often unintended. Child Trends' findings indicate that many nonmarital births are unintended, that is, the woman did not intend the baby at that time and maybe did not want to have a baby. Such circumstances, in turn, are associated with negative outcomes for children. For example, children born to women who did not intend to get pregnant have been found to have lower birthweight, poorer mental and physical health, lower educational attainment, and more behavioral problems than do children whose births were intended.[9]

Conclusion

Reducing nonmarital childbearing and promoting marriage among unmarried parents remain important goals of federal and state policies and programs designed to improve the well-being of women and children and to reduce their reliance on public assistance.[14,17] In general, research suggests that marriage would bring some economic advantages to unmarried women (and their children), particularly for those from the most disadvantaged backgrounds.[8,14] However, research also finds that when unmarried mothers do marry, their marriages are relatively unstable, with particularly negative economic outcomes for women and children if they do dissolve.[8]

Some existing government programs, such as The Healthy Marriage Initiative, aim to promote healthy marriages among currently married couples and couples contemplating marriage by fostering effective communication, respect, and conflict management skills.[4] For those couples who do not marry, programs focused on promoting healthy relationships may still enhance children's well-being. For example, research finds that the better the quality of the biological parents' relationship at birth, the better the parenting skills they demonstrate one year after the birth; and this pattern holds across all relationship types, even among parents who do not live together.[1] Similarly, positive co-parenting behavior—a component of healthy relationships—is associated with increased involvement of nonresident fathers in children's lives.[2]

It is likely that many children will continue to be born outside of marriage into a variety of living

situations. Given this likelihood, it is in everyone's best interest to encourage the promotion of healthy relationships among all family members, including those living outside the household, and for the research community to continue to explore factors associated with the positive development of children born to unmarried parents. In addition, efforts to help couples prevent unintended pregnancies continue to be critical; and these efforts need to recognize that many of these couples are not teens—but young adults.

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The relative stability of cohabiting and marital unions for children *

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Abstract. Children are increasingly born into cohabiting parent families, but we know little to date about the implications of this family pattern for children's lives. We examine whether children born into premarital cohabitation and first marriages experience similar rates of parental disruption, and whether marriage among cohabiting parents enhances union stability. These issues are important because past research has linked instability in family structure with lower levels of child well-being. Drawing on the 1995 National Survey of Family Growth, we find that white, black and Hispanic children born to cohabiting parents experience greater levels of instability than children born to married parents. Moreover, black and Hispanic children whose cohabiting parents marry do not experience the same levels of family stability as those born to married parents; among white children, however, the marriage of cohabiting parents raises levels of family stability to that experienced by children born in marriage. The findings from this paper contribute to the debate about the benefits of marriage for children.

Keywords: Children, Cohabitation, Divorce, Family structure, Marriage, Race and ethnicity

Cohabitation has become an increasingly common family form in the United States. Over half of young adults have cohabited, and cohabitation is now the typical path to marriage (Bumpass & Lu 2000; Bumpass 1998). While cohabitation is popularly viewed as a childless union, increasingly children are being born or raised in cohabiting parent families (Casper & Bianchi 2002; Manning 2001; Bumpass & Lu 2000). Estimates suggest that approximately two-fifths of all children will live in a cohabiting family at some point before adulthood (Bumpass & Lu 2000).

Despite the increase in children's experience of cohabitation, relatively little is known about the implications of cohabitation for children's well-being (Manning 2002; Smock 2000). One fundamental dimension of well-being to evaluate is the relative stability of cohabitation and marriage from the viewpoint of children. A large body of literature demonstrates that family

* An earlier draft of this paper was presented at the annual meeting of the National Council on Family Relations in Minneapolis, Minnesota on 11 November 2000.

structure has important effects on children, with deleterious ones for children who experience parental separation (McLanahan & Sandefur 1994; Seltzer 1994). While some of this effect is due to changes in income and other factors, there is also some evidence that the number of changes in family structure is important (Wu 1996; Wu & Martinson 1993). The fewer the changes, the better for children.

The issue of union stability is particularly relevant for assessing the implications of the dramatic rise in cohabitation for children's well-being in the United States. A well-known difference between cohabitation and marriage is that cohabiting unions are generally quite short-lived. Although a substantial proportion of cohabitations lead to marriage, many end in separation (Bramlett & Mosher 2002; Bumpass 1998), and marriages begun by cohabitation face higher risks of dissolution (Lillard et al. 1995; Axinn & Thornton 1992; DeMaris & Rao 1992; Schoen 1992; Teachman & Polonko 1990; Bennett et al. 1988; Bumpass & Sweet 1989;).

To date, however, there is little direct knowledge about how cohabitation compares to marriage in terms of stability for children. Only a handful of studies have examined this issue, and none have used nationally representative samples to explicitly compare trajectories for white, black and Latino children born within cohabiting versus marital unions (e.g., Bumpass & Lu 2000; Graefe & Lichter 1999; Landale & Hauan 1992). This paper thus examines the early life course of children born into premarital cohabiting unions, contrasting the stability of their parents' unions to those of children born in first marriages. We determine whether and to what extent being born into a cohabiting couple increases the likelihood of experiencing the end of parents' unions, as well as whether the marriage of cohabiting parents promotes stability and equalizes the experiences of children born to cohabiting versus married parents. Throughout, we focus on similarities and differences for Hispanic, black and white children because of evidence that the prominence and role of cohabitation in family formation varies by race and ethnicity.

1. Background and significants

The trend in children's experience of cohabitation is upwards. Overall, the proportion of cohabitations with children present increased from 28 to 41% between the early 1978 and 2000 (Casper & Bianchi 2002; Fields & Casper 2001). However, the percentage of children *born* within cohabiting unions increased much more dramatically, doubling between 1980–84 and 1990–94, and now accounting for almost one in eight births in the US (Bumpass & Lu 2000). In fact, cohabitation accounts for much of the recent trend in nonmarital childbearing; the share of births to unmarried mothers who were

cohabiting increased substantially more between the early 1980s and early 1990s than did the share to noncohabiting, unmarried mothers (Bumpass & Lu 2000).

Given the importance of family structure stability for children, an important empirical issue then becomes the stability of cohabitation for children. As is well known, cohabitations are generally of short duration. Over 50% of cohabiting unions in the US, whether or not they are eventually legalized by marriage, end by separation within five years compared to roughly 20% for marriages (Bumpass & Lu 2000; Bumpass & Sweet 1989). In addition, marriages preceded by cohabitation–a growing proportion of marriages–are more likely to end than those not prefaced by cohabitation (Hall & Zhao 1995; Lillard et al. 1995; DeMaris & MacDonald 1993; Axinn & Thornton 1992; DeMaris & Rao 1992; Schoen 1992; Thomson & Colella 1992; Teachman et al. 1991; Teachman & Polonko 1990; Booth & Johnson 1988; Rao & Trussell 1989; Bennett et al. 1988).

At the same time, we currently have limited knowledge about the stability of cohabitation from the perspective of children because most extant research focuses on cohabitation generally rather than on cohabiting unions with children. While one can extrapolate from the above findings that cohabitation is less stable than marriage for children, there are two limitations to this approach. The most obvious is that not all cohabitations contain children–about 60% do not (Fields & Casper 2001). Second, of those that do, half are cases in which children are not biologically related to both cohabiting partners (Acs & Nelson 2001; Fields 2001). As seen, there are two routes through which children may experience parental cohabitation: the first is by being born to a cohabiting couple and the second is when a custodial parent, typically a mother, enters a cohabiting relationship, making the arrangement akin to a step-family.

When grappling with the issue of whether, and to what extent, marriage is better for children (e.g., Waite & Gallagher 2000), we argue that it is important to focus on children born within cohabiting unions and compare their experiences to those of children born within marriages. While most research aggregates both kinds of cohabiting families, this is problematic when investigating the implications of cohabitation versus marriage for children. This is because cohabiting families are much more likely to contain a nonbiological parent than married families. Given the high levels of instability of stepfamilies in general (Bumpass et al. 1995), and the higher prevalence of stepfamilies among cohabiting compared to married families, the appropriate comparison would be between the different types of two-parent biological families (Manning 2002). We start from the premise that it is important to focus on cohabiting unions in which the child resides with both biological

parents because these may be potentially more stable than unions in which the child does not have biological ties to both cohabiting partners.

Past research has generally not directly compared prospects for family stability for children born into cohabiting versus married couple families. Bumpass and Lu (2000) aggregate children born in cohabiting and marital unions in their analysis of instability, but greater instability among children born to cohabiting parents can be inferred based on children's time spent in single mother families. Similarly, Raley and Wildsmith (2001) provide important descriptive findings that show white and black children from the 1980-1984 birth cohort born to married mothers experience fewer family transitions than children born to cohabiting mothers. In another study, Wu, Bumpass and Musick (2001) focus on women who had a first birth between 1980 and 1984, finding that 16% who were married at birth and one-third (31%) of mothers cohabiting at birth were separated four years later. These findings are supported when the period is extended beyond 1980 and 1984 (Wu & Musick 2002). These results are suggestive that marriages are more stable than cohabiting unions for children, but the focus of their work is on first-time mothers, rather than on children. Moreover, over half of women who had children during cohabitation were not first-time mothers (McLanahan & Carlson 2002). Graefe and Lichter (1999), drawing on a sample of children born to young mothers from the National Longitudinal Survey of Youth, estimate the percentage of children born to cohabiting and married mothers who will experience instability. They find that about one-fifth of children born to cohabiting couples will experience a transition within one year and 88% will experience a transition by age five. However, this study defines the marriage of cohabiting mothers as instability, thus counting the legalization of cohabiting unions as instability. From the perspective of children, however, the transition to marriage is a continuation, and a possible strengthening, of their parents' relationships.

An exception is Landale and Hauan (1992), who examine the family life courses of Puerto Rican children born in the mid-1980s. They find that children born in cohabiting unions have almost twice the odds of experiencing the breakup of their parents' unions (whether or not the relationship was transformed into marriage) as children born in marriage, although the gap narrowed with the inclusion of characteristics of the mother, father and the union (see Marcil-Gratton et al. (2000) for a similar study of Canadian children). Our study uses a similar approach but focuses on children from a range of racial and ethnic groups.

1.1. *Racial and ethnic variation*

Past research on the issue of union stability for children has focused on one ethnic group (Landale & Hauan 1992) or has not focused explicitly on variation by race and ethnicity (Wu et al. 2001; Bumpass & Lu 2000; Marcil-Gratton & LeBourdais 1995). Yet patterns of cohabitation instability may differ substantially across racial and ethnic groups.

While cohabitation has become an increasingly prominent feature of the lives of American children, this is especially so for minority children. Children are much more likely to be present in minority cohabiting couple households (67 and 70% among blacks and Hispanics, respectively) than in white cohabiting households (35%) (McLanahan & Casper 1995). Further, estimates suggest that about half (55%) of black children, two-fifths (40%) of Hispanic children, and three-tenths (30%) of white children are expected to experience a cohabiting-parent family and more time in such a family (authors' calculations from Bumpass and Lu 2000).

Similarly, there are racial and ethnic differentials in the proportion of children being born to cohabiting parents. Among whites, only about one in ten children are now born into cohabiting-parent families compared to nearly one in five black and Hispanic children (Bumpass & Lu 2000). These differentials are consistent with Astone et al.'s (1999) study of a cohort of black men in Baltimore, which finds that a good deal of fatherhood among blacks is occurring in the context of cohabitation. They are also consistent with results from the Fragile Families Project (e.g., McLanahan & Carlson 2002; Waller 1999).

It is difficult to formulate expectations about racial and ethnic variation a priori. For all children, we expect that those born into cohabiting relationships will face less stability than those born into marriage. However, based on past research on both cohabitation and marriage, we expect that black children will experience the most instability, whether born to cohabiting or married parents. Blacks more commonly separate from their cohabiting partners than Hispanics or whites, and experience higher levels of marital instability (Bramlett & Mosher 2002; Brown 2000b; Manning & Smock 1995). On the other hand, marriage is less common among blacks than whites or Hispanics so that the marriages that do occur may be most 'selective'. Thus, the marriage of cohabiting parents may be protective in terms of stability for black children.

Patterns may be more similar for whites and Hispanics. On the one hand, there are indications that cohabitation is more 'normative' for Hispanics. Hispanic women are more likely to give birth to children while cohabiting than either white or black women, are more likely to state that their children were planned if born while cohabiting, and appear to experience a cultural context

relatively supportive of cohabitation (Landale & Fennelly 1992; Manning 2001; Musick 2002). The upshot could be that children born to cohabiting Hispanic parents would experience levels of stability closer to that of children born to married parents. On the other hand, recent evidence suggests that levels of union instability are very similar for Hispanics and whites; this is the case for both marital and cohabiting unions (Bramlett & Mosher 2002). This is at least suggestive that the relative stability of being born to cohabiting and married parents may be similar for Hispanic and white children.

2. Current investigation

This paper has three goals. First, we compare the trajectories of children born into cohabiting versus married couple families with a measure that begins at birth and includes marriage among cohabiting couples as part of the process. Our approach acknowledges that while cohabitation can 'end' in two ways, marriage or separation, marriage represents movement into a potentially more stable family form. Thus, our measure of instability focuses on parental separation, defining the end of the relationship as when the couple stops living together rather than when the cohabitation ends. It is vital to incorporate the marital years because a substantial share of cohabitations results in marriage; for example, within three years nearly 60% of first cohabiting unions end in marriage (Bramlett & Mosher 2002).

Our second goal is to evaluate how marriage among cohabiting parents influences stability. Specifically, we assess whether children of cohabiting couples who marry share similar trajectories as children born to married parents and cohabiting parents, a significant issue for evaluating the benefits of marriage in a time of increasing cohabitation. Overall, there are several reasons to expect that children born into cohabiting unions may experience more instability, even if marriage occurs, than those born into marriages. First, cohabitation tends to be selective of people of slightly lower levels of educational attainment and income than is marriage, and this generalization holds when comparing the situations of children in married couple and cohabiting households (Casper & Bianchi 2002; Bumpass & Lu 2000; Morrison & Ritualo 2000; Cohen 1999; Hao 1996; Manning & Lichter 1996; Nock 1995; Thornton et al. 1995; Waite 1995). Similarly, a large body of research suggests that union stability is positively correlated with socioeconomic status. Although we attempt to control for socioeconomic status in our analysis, our measures are restricted due to data limitations. Second, cohabitors report slightly lower levels of happiness, relationship quality, and satisfaction than married people (Waite & Joyner 2001; Brown 2000a; Waite & Gallagher 2000; Booth & Brown 1996). These indicators are associated

with relationship stability and suggest that cohabiting couples may be less successful at maintaining their relationships than married couples. Third, cohabitors may have experienced more relationship instability than married parents, suggesting that cohabiting parents may form less stable families than married parents. Prior work indicates that only about half of cohabiting unions result in marriage (Bumpass & Lu 2000) and marriages that start out in cohabitation are more unstable than marriages that are not preceded by cohabitation (e.g., Lillard et al. 1995; Bennett et al. 1988). We tap into prior relationship instability in our analyses by including variables that measure cohabitation experience prior to a child's biological parents' marriage or cohabitation. Fourth, childbearing within cohabitation is not normative. Cohabiting women are substantially less likely to have children than married women (Raley 2001; Loomis & Landale 1994). Moreover, mothers are more likely to report that children born during cohabitations are unplanned than children born during marriage (Manning 2001). Fifth, cohabitation is not 'institutionalized' in the United States (Manning 2002; Smock & Gupta 2002). Cohabitation is not broadly sanctioned by government or society, and some argue that it lacks defined family roles and even language to refer to family members, leading to unique stresses (Nock 1995). Concomitantly, the legal rights and obligations of cohabiting partners to their children and one another are not clearly identified or uniform (Durst 1997; Seff 1995; Wiesensale & Heckert 1993).

Our third goal is to investigate potentially important race and ethnic similarities and differences in family stability for children. We expect the effects of cohabitation to operate differently for blacks, whites and Latinos, because of race and ethnic differentials in childbearing, planning status of children, and propensity to marry (Musick 2002; Manning 2001; Bumpass & Lu 2000). We present results separately for whites, blacks, and Hispanics and formally test for interactions between our union status variables and race and ethnicity.

3. Data and methods

3.1. *Data*

We draw on Cycle 5 of the National Survey of Family Growth (NSFG), a recently collected, large, and nationally representative data source. Collected in 1995 and including 10,847 women of reproductive age (15–44), these data are valuable because they include birth, pregnancy, marriage, and cohabitation histories; Cycle 5 also includes complete cohabitation histories for the first time. No other data source has such high quality data on both fertility behavior and cohabitation experiences.

This project relies on the child as the unit of analysis. We restrict the sample to children who were born into either a premarital cohabitation or a first marriage. The restriction to children born in a premarital (rather than postmarital) cohabitation reflects the typical experience in these data; the vast majority (80%) of children born in cohabiting unions were born to women who had never been married. Also, prior work indicates that among some women the effect of cohabitation on childbearing operates differently among previously married than never married women (Loomis & Landale 1994). Indeed, stepfamilies face unique fertility decision-making processes (e.g., Stewart 2002; Thomson 2002). Thus, our analyses are limited to children born to never-married cohabiting mothers or mothers in first marriages and may reflect greater differences between cohabiting and married parent families than analyses that include previously married mothers.

Children in our sample were born between 1980 and 1995. We also limit our sample to women who were less than 30 when their child was born. This is a necessary restriction because of the upper age limit of the NSFG; women over age 30 in 1980 were not included in the 1995 interview because they were older than the upper age limit of 44. This has only a minimal effect on our analyses because we are focusing on children born during or prior to first marriages. Based on the experiences of 4,013 women, our final sample consists of 1,001 children born in cohabiting unions and 5,577 children born into first marriages.

3.2. *Variables*

Our dependent variable is the disruption of mothers' cohabiting unions or marriages, measured by date of separation. Our measure of instability is based on the break-up of the couples' relationship and not simply whether the cohabiting union ended. If cohabiting parents marry, we continue to count them as stable until the breakup of the marriage. If they do not marry, then instability is marked by the date of the end of the cohabitation.

Table 1 shows the variable distributions for the total sample and for each race and ethnic group separately. Our central independent variables are mother's union status at birth, and, for cohabiting mothers, whether and when she marries her cohabiting partner. Slightly under 13% of the children in this sample were born into cohabiting unions and 87% were born into marriages. The proportion of children born in cohabitation is highest among black children (36%), in contrast to one-fifth of Hispanic children and 8% of white children. Of these, about 36% of Hispanic children's parents eventually married, compared to 46% for whites and 28% for blacks (not in table).

We also include several characteristics of the mother and of the child as independent variables. These measures have been found to be important

Table 1. Distribution of independent variables for child born in unions, marriage and cohabitation

	Total	Hispanic	Black	White
Union status at birth				
Born in cohabitation	12.7	19.5	36.3	8.2
Born in marriage	87.3	80.5	63.6	91.8
Mother's characteristics				
Race/ethnicity				
Black	9.5			
Hispanic	16.1			
Other	4.8			
White	69.6			
Family background				
Single	9.9	12.1	22.3	7.6
Step	8.2	6.0	12.1	8.5
Other	4.8	4.8	13.6	3.5
Two biological	77.1	77.1	52.0	80.4
Religiosity (mean)	2.55	2.53	2.28	2.59
Education				
<12	25.5	46.7	29.9	18.4
12	56.1	45.7	55.9	60.7
13+	18.4	7.6	14.2	20.9
Employment				
Part	7.9	7.4	7.7	8.1
Full	55.3	38.5	44.1	61.7
Not	36.8	54.1	58.2	30.2
Prior cohabitation				
No	68.4	75.7	73.3	65.8
Yes	31.6	24.3	26.7	34.2
Age at birth (mean)	24.2	23.2	23.6	24.5
Parity(mean)	0.8	0.9	1.1	0.7
Child's characteristics				
Preunion conception				
No	86.8	84.9	79.5	88.3
Yes	13.2	15.1	20.5	11.7
Unplanned				
No	73.2	70.1	62.7	75.5
Yes	26.8	29.9	37.3	24.5
Birth Cohort				
1980–84	34.3	29.9	36.0	35.4
1985–89	32.9	33.1	34.6	32.4
1990–95	32.8	37.0	29.4	32.2
N	6578	1410	1128	3800

Note: 1995 NSFG unweighted N's and weighted means and proportions.

control variables in other studies examining marital or cohabitation dissolution (e.g., Bramlett & Mosher 2002; Bumpass & Lu 2000; Graefe & Lichter 1999; Smock & Manning 1997; Landale & Huan 1992). Characteristics of the mother include race and ethnicity, family background, and religiosity. As shown in Table 1, roughly 10% of the sample is black, 16% are Latino or Hispanic, 70% is white and 5% belong to some other race or ethnic group. Family background refers to the mother's family structure at age 14 (two biological married parents, step-family, single-parent, and other family type). Past research has found that individuals who lived with both of their biological parents face lower risks of union dissolution. The majority of the sample is from two biological parent families, with 10% having lived with a single parent at age 14. Religiosity is based on a question with a five-category response option about attending services at age 14 'greater than once per week' to 'never', and is included as an indicator of a traditional upbringing. The mean is 2.55, indicating the mother attended religious services between less than once a month and 1–3 times per month.

We also use two variables – educational attainment and employment status – to attempt to capture the mother's socioeconomic status. Both are measured at the time of union formation (among women who cohabited and then married, this is measured at time of cohabitation) to avoid problems associated with the simultaneity of decisions about employment, education and union instability. Education is coded into three categories: less than high school, high school, and more than high school. Overall, roughly half of the sample has 12 years of education, with one-quarter having less than 12 years of schooling. Employment status is categorized into not employed, employed part-time, employed full-time. Only 8% of the mothers were employed part-time, 55% were employed full-time and 37% were not employed at the time of union formation.

Three variables are included in our models that tap the mother's fertility and union experiences. First, we account for whether the mother cohabited prior to the current cohabitation or marriage. This measure taps into a history of relationship instability. Nearly one-third (32%) of the sample had cohabited prior to their current cohabitation or marriage. In our sample, most women (97%) who cohabited prior to marriage lived with their husband (results not shown). Second, we include a variable indicating the mother's parity at the time of the focal child's birth; as indicated in Table 1, the mean number of children born prior to the focal child was 0.8. Nearly half (47%) of the mothers had no prior children at the time of the focal child's birth (results not shown). Third, mother's age at time of the child's birth is included in the model. The mean is 24 (22 for the mothers of children born in cohabitation and 25 for the mothers of children born in marriage).

Finally, three characteristics of the child are included in analyses. One is whether or not the child was conceived prior to the formation of the current union. Only 13% of the children were conceived prior to union formation, although these levels are higher among cohabitors (24%) than married women (11%) (results not shown). Second, we include the planning status of the child. 'Unplanned' indicates whether a child was unwanted or mistimed. Overall, about one-quarter of the children were unplanned, although almost half of those born in cohabitation compared to one-quarter born in marriage were unplanned (results not shown). Third, the child's birth cohort is divided into three time periods: 1980–84, 1985–89, and 1990–95. Children are distributed fairly evenly across the birth cohorts.

3.3. *Analyses*

Our analysis consists of two parts: life tables estimates and event history analyses. We construct both single and multiple decrement cohort life tables, which represent the experiences of actual cohorts of children.[1] Conceptually similar to competing risk models, multiple decrement tables take into account the odds of experiencing both possible 'exits': in this case, parental marriage or separation for children born to cohabiting parents (e.g., Graefe & Lichter 1999). As discussed earlier, these double decrement tables are less appropriate for our research question because they assume that the couple is no longer at risk of separation after marriage and that the marriage of cohabiting partners is an exit. Thus, we present single decrement tables, which counts separation as the only exit and follows couples beyond the time of marriage, and present the single decrement tables. Our life table results are based on the total sample of children born into premarital cohabiting and first marital unions and separately by race and ethnicity.

We use event history models to compare instability for children born in premarital cohabiting versus first marital union and to take account of the effects of our independent variables. Specifically, we use Cox proportional hazard techniques, which do not require us to assume a particular probability distribution and allow the use of time-varying variables (Allison 1984). Our event history analyses are applied to a data file converted to person-months; mothers either end their union or are censored by the interview. We adjust our results to account for the fact that the sample includes more than one birth from the mother. This issue is important because dependence among observations create downwardly biased standard errors (Allison 1995). We obtain robust standard error estimates using the covsandwich option in SAS, and we are able to adjust the standard errors for our time-varying analyses by adopting a counting process style of input.

Our first set of models evaluates whether being born in a cohabiting union raises the risk of instability compared to being born in a marriage. We estimate models with zero-order effects and then include the covariates in the model. A second set of models examines whether and how marriage among cohabiting parents influences family stability for children. To do so, we first assess whether children born to cohabitors who later marry share similar risks of parental stability as children born to married parents by including a time-varying measure of marriage among the cohabiting parents; the reference category here is children born to married parents. Second, we estimate a nearly identical model that alters the reference category to children born to cohabiting parents who do not marry; this allows us to specifically examine whether children whose cohabiting parents marry experience higher levels of stability than those whose parents do not legalize their unions.

To investigate racial and ethnic differences, our models are estimated for the total sample and separately for each race and ethnic group. We used statistical tests analogous to the Chow test to determine whether models should be estimated separately for race and ethnic groups (DeMaris 2002). The tests suggested that they should. Contrasting log likelihood ratios for models of all children with no interactions to models that include crossproducts of all covariates with race and ethnicity also indicated the need for separate models.[2]

4. Results

4.1. *Life tables*

Figure 1 presents the single decrement life tables, allowing cohabiting parents to remain at risk of dissolution after they marry. Of the total sample, 15% of children born into premarital cohabiting unions experience the end of their parents' union by age 1, half by age 5, and two-thirds by age 10. Estimates for children born into first marital unions reveal substantially more stability. As Figure 1 shows, 4% of children born to married parents experienced parental instability within one year and 15% by age 5. Figure 1 also shows that black children born to cohabiting and married parents experience considerably more instability, and instability at somewhat younger ages, than white or Hispanic children. For example, by the time a child turns five years old, two-fifths of Hispanic and white children versus three-fifths of black children born into cohabiting-parent families are no longer living with both parents.

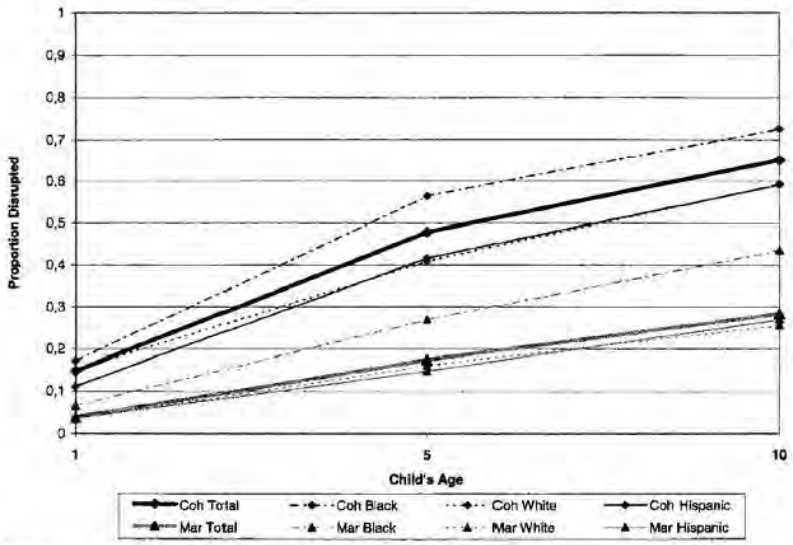

Figure 1. Cumulative proportion of children born in cohabiting and married unions experiencing parental disruption

4.2. *Event history analyses*

Table 2 shows the effects of union status at birth on the odds of parental separation for the total sample as well as for each race and ethnic group separately. Children born in cohabiting unions have significantly higher odds of experiencing their parent's break-up than children born in marriage. Children born to cohabiting parents have 119% (2.19–1.00) higher odds of separation than children born to married parents. In bivariate models, we observe a significant negative effect of cohabitation on union stability, children born to cohabiting parents have 246% greater odds of experiencing parental disruption than children born to married parents (results not shown). This indicates that our sociodemographic covariates are not accounting for all of the relationship between parental union status at birth and parental separation, but the effect of cohabitation is reduced by 37% in the multivariate model.

We generally find a similar relationship of union status at birth for black, white and Hispanic children in both bivariate and multivariate models. Although, somewhat unexpectedly, in the multivariate model the positive effect of being born to cohabiting parents on the odds of experiencing parental breakup is statistically similar for Hispanic, black and white children (results not shown). Yet, the sociodemographic variables explain a greater share of

Table 2. Relative risk of parental separation among children born in marriage and cohabitation

	Total	Hispanic	Black	White
Union status at birth				
Born in cohabitation	2.19**	2.81**	2.20**	1.87**
(Born in marriage)				
Mother's characteristics				
Race/ethnicity				
Black	1.62**			
Hispanic	0.88			
Other	1.03			
(White)				
Family background				
Single	1.15	1.17	1.14	1.05
Step	1.32	1.26	0.94	1.61**
Other	1.11	1.51	0.78	1.51
(Two biological)				
Religiosity	1.03	1.06	0.98	1.04
Education				
<12	1.12	0.85	1.27	1.04
(12)				
13+	0.96	1.3	0.94	0.96
Employment				
Part	0.87	1.27	1.1	0.57**
Full	1.10	1.63**	0.98	0.96
(Not)				
Prior cohabitation	1.43**	1.50*	1.15	1.46**
Age at birth	0.91**	0.89**	0.94**	0.88**
Parity	1.07	1.20**	1.02	1.11
Child's Characteristics				
Preunion conception	1.10	1.17	1.12	1.05
Unplanned	1.25**	1.28*	1.06	1.39**
Birth cohort				
1980–84	0.78**	0.82	0.64**	0.85
1985–89	0.87	0.92	0.79	0.89
(1990–95)				
–2 log likelihood	29456.8	4656.7	6717.3	13210.2
N	6578	1410	1128	3800

Source: NSFG 1995.
Note: Reference category in parentheses.
*$p \leq 0.05$; **$p \leq 0.01$.

the effect of parental cohabitation status at birth among white (45%) than Hispanic (15%) or black (17%) children (results not shown).

The effects of other variables are largely as expected from prior research. These variables are all significantly related to union stability at the zero-order level. The first column of Table 2 shows that black children are more likely to experience their parents' separation than white children; analyses not shown suggest that black children face higher odds of instability than Hispanic children as well. We do not find significant differences in the odds of instability according to mother's family background, religiosity, education or employment. Yet we do find some of these factors influence instability among racial and ethnic groups. For instance, growing up in a stepfamily has a positive effect on instability among whites. Also employment influences parental union stability among white and Hispanic children. Unfortunately, we lack information about the spouse/partner's employment at the time of union formation and cannot assess how the family's overall economic circumstances influence stability.

We find that mother's relationship and childbearing histories (prior cohabitation, mother's age, and parity) influence relationship stability. Children whose mothers have prior cohabitation experience have higher odds of experiencing parental break-up than mothers who had no prior cohabitation experience. We observe this relationship only among white and Hispanic children, and find that mother's prior cohabitation is not associated with parental instability among black children. We include an interaction term to test whether prior cohabitation has a more negative effect on parental stability among children born to cohabiting rather than married parents. We find a similar negative effect of mother's prior cohabitation among children born in cohabiting and marital unions (results not shown). We also tap into instability by evaluating whether children born to married parents who cohabited prior to the child's birth experienced similar odds of instability as children born to cohabiting parents as well as married parents who never cohabited. We find that white and Hispanic children born to married parents who cohabited prior to marriage had higher odds of parental disruption than children born to married parents who never cohabited and lower odds of parental disruption than children born to cohabiting parents (results not shown). Our second measure, age of mother, shows that for each race and ethnic group, children born to older mothers face lower odds of union instability. Lastly, the mother's parity at the time of the focal child's birth is not associated with union dissolution. Yet, we do find a positive effect of parity on union instability among Hispanic children. We find that parity has a similar effect on instability for children born to married and cohabiting parents (results not shown).

Table 3. Relative risks of parental separation among children born in marriage and cohabitation

	Total	Hispanic	Black	White
Union status				
Parents cohabit at birth	2.48**	3.09**	2.39**	2.47**
Parents cohabit at birth & married	1.62**	2.10**	1.73**	1.16
(Parents married at birth)				
Mother's characteristics				
Race/ethnicity				
Black	1.60**			
Hispanic	0.87			
Other	1.02			
(White)				
Family background				
Single	1.15	1.17	1.15	1.06
Step	1.33**	1.25	0.96	1.63**
Other	1.09	1.48	0.77	1.51
(Two biological)				
Religiosity	1.03	1.06	0.98	1.04
Education				
<12	1.11	0.84	1.25	1.03
(12)				
13+	0.96	1.28	0.95	0.96
Employment				
Part	0.88	1.24	1.10	0.57**
Full	1.10	1.60**	0.97	0.97
(Not)				
Prior cohabitation	1.43**	1.51*	1.14	1.47**
Age at birth	0.90**	0.89**	0.93**	0.88**
Parity	1.06	1.19**	1.00	1.11
Child's characteristics				
Preunion conception	1.1	1.19	0.94	1.04
Unplanned	1.26**	1.28*	1.21*	1.38**
Birth cohort				
1980–84	0.78**	0.82	0.66**	0.86
1985–89	0.87	0.92	0.85	0.91
(1990–95)				
-2 log likelihood	29439.2	4653.7	5557.9	13195.0
N	6933	1507	1055	3930

Source: NSFG 1995.
Note: Reference category in parentheses.
*$p \leq 0.05$; **$p \leq 0.01$.

The next covariates in Table 2 are characteristics of the child. Children who were conceived prior to the union have similar odds of disruption as those conceived during the union, although children who were unplanned have substantially higher odds of experiencing the end of their parent's union; this is true for Hispanics and whites. Finally, children born during the cohabitation in the early 1980s have lower odds of parental separation than the latest cohort, but children born in the mid 1980s experience similar odds of separation as their counterparts born in the early 1990s. We find that this relationship operates among blacks but not Hispanics or whites.

Table 3 presents the model that includes a time-varying variable indicating whether or not the parents are married to assess how the marriage of cohabiting parents influences parental union stability. Children are categorized into three groups: born to cohabiting parents who do not marry, born to cohabiting parents who do marry, and born to married parents. The reference category is children born into marriage.

Our bivariate results indicate that the risk of parental disruption is 292% greater among children whose cohabiting parents do not marry than children born to married parents and 151% greater among children whose cohabiting parents marry than children born into marriage (results not shown). These parental union status effects persist in the multivariate model, but are reduced by almost one-half. The effects of parental union status cannot be explained completely by the parent and child's sociodemographic characteristics. The first column and first row of Table 3 show that children born to cohabiting parents who do not marry have 148% (2.48–1.00) higher odds of experiencing parental separation than children born to married parents. The second row shows that cohabiting parents who marry have 62% (1.62–1.00) higher odds of dissolution than parents who gave birth to their children in marriage. Thus, while the marriage of cohabiting parents appears to increase levels of stability, children in this situation still face significantly higher odds of instability than children born to married parents.

At the same time, there are important racial and ethnic differences. The remaining columns in Table 3 present the results for race and ethnic groups separately. Hispanic, black and white children born to cohabiting parents have higher odds of parental instability than children born to married parents. Hispanic and black children born to cohabiting parents who marry have significantly higher odds of dissolution than children born to married parents. In contrast, the multivariate results indicate that white children whose cohabiting parents marry experience statistically similar odds of separation as white children born to married parents. At the bivariate level we find that white children born to cohabiting parents who marry have higher odds of parental disruption than children born to married parents, but these differences

among white children are explained by the mother's age at birth (results not shown). Thus, marriage after the birth of a child appears to provide some buffer against instability among white cohabiting parents.

We re-estimate the same models but shift the reference category to more closely examine the extent to which children born to cohabiting parents are benefited by their parents' marriage (results not shown). We find that children born to cohabiting parents who later marry have 35% lower odds (significant at the $p < 0.001$ level) of experiencing union dissolution than children whose parents do not marry. Again, however, we observe different patterns according to race and ethnicity. White children whose cohabiting parents marry do experience greater parental stability than those born to cohabitors who do not marry. That is, white children born to cohabitors who marry have statistically lower odds of parental separation as those born to cohabitors who do not ultimately marry. In contrast, our multivariate models indicate that black and Hispanic children born to cohabiting couples experience statistically similar odds of parental separation if their parents marry. This effect of marriage among cohabiting parents is significantly greater for white than black children. Yet, at the bivariate level, Hispanic children born to cohabiting parents who marry experience lower odds of instability than children born to cohabiting parents who do not marry. We find that this bivariate relationship is explained by mother's age at birth. Generally, marriage appears to provide a stability benefit for white and Hispanic children but at the multivariate level this relationship holds true for only white children.

5. Discussion

Our goal was to compare the prospects for family stability for children born to cohabiting and married parents. We limited our analyses to children's experiences during or before their mothers' first marriage. Using life tables and event history analyses, we adopted an analytic approach that treats cohabiting parents who marry as intact families that remain at risk of dissolution. This approach allows us to take the child's standpoint by focusing on the stability of the parental relationship itself. We also examined how the marriage of cohabiting couples influences the experiences of children born to married and cohabiting couples by including a time-varying union status variable.

There are several key findings. Most broadly, our results indicate that children born to never-married cohabiting mothers face significantly higher odds of instability than children born to first-time married mothers. Life table results show that, by age 5, two-fifths of Hispanic and white children and three-fifths of black children born into cohabiting-parent families are no longer living with both parents; this compares to disruption levels of 14% for

Hispanic, 16% for white and 25% for black children born to married parents. Our multivariate analyses indicate that, even after controlling for potentially important sociodemographic factors, children born into cohabiting families face approximately double the odds of experiencing their parents' break up than those born to married couples. This holds true across racial and ethnic groups.

Second, our research suggests that significant racial and ethnic differences are masked in models that simply control for race and ethnicity. While, overall, white children face the lowest odds of experiencing instability, separate models show that the marriage of cohabiting parents significantly enhances stability for white children; in fact, marriage is associated with improved prospects for stability among children born in cohabiting unions. For Hispanics and blacks, this does not appear to be the case, with children born in cohabiting unions facing significantly higher prospects of instability even if their parents legalize the union. At the same time, it is important to underscore that proportionately fewer black and Hispanic children born in cohabitation have parents who ultimately marry compared to whites (e.g., 28% of black and 36% of Hispanic children compared to 46% of white children born in cohabitation). These findings may speak to racial and ethnic differences of selection into marriage. For example, the education gap between married and cohabiting white parents is much greater than the education gap of cohabiting and married minority parents (Manning & Brown 2003). This suggests that white children may potentially benefit more from their parents marriage because the educational (and economic) requirements for entry into marriage are much higher among whites than nonwhites.

Third, mothers with a history of relationship instability have lower odds of stability in their current relationship, and we find statistically similar negative effects among children born to cohabiting and married mothers. However, we only observe this relationship among white and Hispanic children and not black children. Black children's mothers' prior relationship instability does not appear to influence parental disruption. In a similar vein, white and Hispanic children born to married mothers with some prior cohabitation experience exhibit greater odds of instability than children born to mothers whose marriages were not preceded by cohabitation. Thus, our findings only partially echo prior studies that suggest premarital cohabitation has a negative influence on marital stability (e.g., Lillard et al. 1995; Axinn & Thornton 1992; DeMaris & Rao 1992; Schoen 1992; Bennett et al. 1988).

Our study has several limitations. First, the measures available in the NSFG for this analysis do not allow us to include a number of potentially relevant factors that may affect union stability. In particular, we lack detailed measures of income and economic well-being. Racial/ethnic differences in

family patterns, as well as differences between cohabitation and marriage as a context for childbearing and childrearing, have, in part, an economic basis. Blacks and most Hispanic groups, for example, have lower incomes and higher poverty rates than whites, and research shows that, in comparison to marriage, cohabitation tends to be more prevalent among the less advantaged (Bumpass & Lu 2000; Morrison & Ritualo 2000; Clarkberg 1999; Cohen 1999; Smock & Manning 1997; Hao 1996; Manning & Lichter 1996; Nock 1995; Thornton et al. 1995; Waite 1995). Moreover, research has demonstrated that the occurrence and stability of unions (especially marriage) are consequences, and not just causes, of good economic circumstances (e.g., Smock et al. 1999; Smock & Manning 1997; Oppenheimer 1994; Lichter et al. 1992; Mare & Winship 1991; Testa et al. 1989).

Thus, it is quite possible that better measures would reduce the instability disadvantage for children born to cohabiting, rather than married, parents. Better measures might also reduce the higher level of overall instability experienced by black children. However, economics probably does not explain all of this variation. Manning and Smock (2002), for example, examine the marriage intentions of white, black, and Hispanic cohabiting women. They find that black cohabiting women are less likely than white or Hispanic women to expect to marry their partners, even after controlling for the education of both the women and their partners and their partners' income (see, also, Astone et al. 1999; Clarkberg 1999; Oropesa 1996; Raley 1996; Manning & Smock 1995; Oropesa et al. 1994). We do tap into relationship instability and find that this does not explain differences between children born to cohabiting and married mothers. Other factors, and ones nearly impossible to measure, might also help to account for the cohabitation disadvantage (i.e., lack of institutionalization).

A second limitation, and related to the first, is that we cannot assess causality in this study; we are just showing associations. Without good longitudinal data with strengths in several domains (e.g., fertility, union transitions, cohabitation, partner characteristics, detailed income measures), it will be difficult to fully understand the sources of the cohabitation effect on instability.

Third, it is unfortunate that sample size limitations in the NSFG precluded our ability to subdivide Hispanics. Grouping all Hispanics together, for example, may obscure substantial variation that is potentially relevant to the stability of cohabiting and marital unions (e.g., Lichter & Landale 1995; Bean & Tienda 1987). For example, Puerto Ricans have high cohabitation rates as well as high levels of poverty – on par with the poverty rate for blacks – and Mexican Americans and whites have similar family patterns, but the former have substantially lower socioeconomic status than whites.

Nonetheless, our findings contribute to the effort to understand the implications of cohabitation for children. Increasingly, children are born into cohabiting parent families, and documenting the implications of this context for childbirth for children's early family life course is a fundamental concern; parental stability is associated with improved education, economic, and developmental outcomes (e.g., McLanahan & Sandefur 1994; Wu & Martinson 1993). While our findings appear to strengthen the 'case for marriage' (Waite & Gallagher 2000), because they show quite clearly that children born into first marriage enjoy much higher chances of a stable childhood, they also challenge that case. For never-married cohabiting Hispanic and black mothers, marriage after the birth of child does not provide an advantage in terms of stability; they face statistically similar odds of instability as children born to never-married cohabiting parents who remain cohabiting. In light of recent policy discussions surrounding welfare, our research suggests that efforts to encourage marriage among low-income parents, many of whom are already cohabiting (McLanahan & Carlson 2002), may not be an effective strategy for assuring child well-being. Hispanic and black children appear to face the same odds of experiencing their parents' breakup as they would have had the parents not married. More broadly, we would argue that future research on the implications of family structure for children's well-being needs to incorporate instability not only as a key aspect of family experience, but directly as an indicator, in its own right, of child well-being.

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Notes

1. We also estimated period life tables and the results mirror closely those reported for the cohort life tables.
2. For the model presented in Table 2, for example, the Chow test for group differences is significant with 3530.4 = (29,480.8 – (6739.5 + 13210.2 + 4657.7 + 517.4) and 64((16 + 16 + 16 + 16) – 19) degrees of freedom. The model chi-square for the complete interaction model is 4356 with 45 degrees of freedom. The complete interaction model adds to the fit

of the model with a difference in the −2 log likelihoods of 179.7 (29321.1–29480.8) and a difference of 48 (64–19) degrees of freedom, indicating significance at the $p < 0.01$ level.

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EXHIBIT 44

ELSEVIER

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Contraception

Original research article

Unintended pregnancy in the United States: incidence and disparities, 2006

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Abstract

Background: The incidence of unintended pregnancy is among the most essential health status indicators in the field of reproductive health. One ongoing goal of the US Department of Health and Human Services is to reduce unintended pregnancy, but the national rate has not been estimated since 2001.

Study Design: We combined data on women's pregnancy intentions from the 2006–2008 and 2002 National Survey of Family Growth with a 2008 national survey of abortion patients and data on births from the National Center for Health Statistics, induced abortions from a national abortion provider census, miscarriages estimated from the National Survey of Family Growth and population data from the US Census Bureau.

Results: Nearly half (49%) of pregnancies were unintended in 2006, up slightly from 2001 (48%). The unintended pregnancy rate increased to 52 per 1000 women aged 15–44 years in 2006 from 50 in 2001. Disparities in unintended pregnancy rates among subgroups persisted and in some cases increased, and women who were 18–24 years old, poor or cohabiting had rates two to three times the national rate. The unintended pregnancy rate declined notably for teens 15–17 years old. The proportion of unintended pregnancies ending in abortion decreased from 47% in 2001 to 43% in 2006, and the unintended birth rate increased from 23 to 25 per 1000 women 15–44 years old.

Conclusions: Since 2001, the United States has not made progress in reducing unintended pregnancy. Rates increased for nearly all groups and remain high overall. Efforts to help women and couples plan their pregnancies, such as increasing access to effective contraceptives, should focus on groups at greatest risk for unintended pregnancy, particularly poor and cohabiting women.

Keywords: Unintended pregnancy; Reproductive health; Disparities; Abortion; Demographics; United States

1. Introduction

Preventing unintended pregnancy is a personal goal for most couples, and reducing the national level of unintended pregnancy is one of the most important reproductive health goals identified by the US Department of Health and Human Services [1]. Women who have an unintended pregnancy are also at risk for unintended childbearing, which is associated with a number of adverse maternal behaviors and child health outcomes, including inadequate or delayed initiation of prenatal care, smoking and drinking during pregnancy, premature birth and lack of breast-feeding, as well as negative physical and mental health effects on children [2–9].

While the unintended pregnancy rate in the United States decreased between the late 1980s and mid 1990s [10], it stalled by 2001, the last year for which estimates are available [11]. Recent decreases in births and abortions have occurred among some population subgroups (e.g., teens) [12], but it is unclear if unintended pregnancy rates have also changed. The recent release of new data on pregnancy intentions has made it possible to determine the incidence of unintended pregnancy for 2006. We calculated unintended pregnancy rates for all women of reproductive age and for key population subgroups, including race and ethnicity and relationship status, because previous studies indicate strong associations between unintended pregnancy and these groups [11]. We also present information on outcomes of unintended pregnancy, including the percentage of unintended pregnancies that ended in abortion and the rate of births that followed unintended pregnancy. These estimates are some of the most

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essential indicators in the field of reproductive health, and periodic trend assessments provide valuable information for public health officials and policy makers who monitor progress toward reducing unintended pregnancy.

2. Materials and methods

2.1. Overview

For all US women and by key population subgroups (age, educational attainment, race and ethnicity, income, relationship status, parity and religious affiliation), we determined the number of pregnancies that ended in birth, induced abortion and miscarriage[1]; calculated the proportion of each of these outcomes that were unintended; and then divided the total number of unintended pregnancies by the population of women aged 15–44 years to obtain an unintended pregnancy rate per 1000 women.

2.2. Counts and intendedness of pregnancies by outcome

2.2.1. Births

We relied on data from the National Center for Health Statistics (NCHS) [13–15] to obtain the number of US births that occurred in 2001 and 2006 overall and by the mother's age, educational attainment, race and ethnicity, relationship status (not including cohabitation) and parity (2006 only). We distributed births by other subgroups (including cohabiting status) using the National Survey of Family Growth (NSFG), a nationally representative survey of US women aged 15–44 years conducted by the NCHS.

Women's pregnancy intentions were obtained from the NSFG, which asked women a series of retrospective questions to determine whether each of the pregnancies they had had were intended or unintended at the time it occurred. Intended pregnancies were those that occurred to women who wanted a baby at the time they became pregnant or sooner or who were indifferent about conceiving; unintended pregnancies were conceptions that were mistimed (i.e., the woman wanted to become pregnant at some point in the future, but not when she conceived) or unwanted (i.e., she did not want to become pregnant at the time of conception nor in the future). We focused on the births in the 5 years preceding the 2006–2008 (n=2044) and 2002 (n=2618) interviews.

2.2.2. Abortions

The total number of surgical and medication abortions performed in 2001 and 2006 came from a census of US abortion providers [16] conducted by the Guttmacher Institute. Counts by age came from the Centers for Disease Control and Prevention's 2001 and 2006 abortion surveillance reports [17,18], and estimates for all other subgroups were based on interpolations of distributions from two nationally representative Abortion Patient Surveys (APS) conducted by the Guttmacher Institute in 2000 (n=10,683) [19] and 2008 (n=9493) [20].

Abortions are underreported in the NSFG. Therefore, pregnancy intentions among women obtaining abortions for *both* 2006 and 2001 were based on distributions from the 2008 APS, which, for the first time, asked women the same set of questions that were used in the NSFG. Use of these data enabled us to identify the proportion of abortions that followed *intended* pregnancies, rather than assuming that all abortions followed *unintended* pregnancies, an approach used in previous analyses.[2]

2.2.3. Miscarriages

There is no "gold standard" count of miscarriages. Official statistics are limited to fetal deaths at 20 weeks of gestation or later [21] and, hence, miss those that occur earlier in pregnancy. We estimated the number of miscarriages for 2006 by calculating the ratio of miscarriages to births [22] overall and by subgroup that occurred in the 7 years preceding the last two NSFG rounds (2002 and 2006–2008) and multiplying that ratio by the total number of US births in 2006 overall and by subgroup. Women in their teens and those 40 years or older had relatively fewer pregnancies, so we increased the sample size by including data from a third round of the NSFG (1995) to improve the validity of the estimate.[3] To estimate the number of miscarriages for 2001, we applied the same ratio calculated from all three NSFG surveys combined to the 2001 birth counts.

Information on the intendedness of pregnancies ending in miscarriage came from miscarriages in the 5 years preceding the 2006–2008 (n=560) and 2002 (n=729) NSFG interviews. In previous analyses, we relied directly on women's reports of intendedness, but subgroup sample sizes for 2006 were inadequate. Because miscarriages are pregnancies that would otherwise end in either birth or abortion, we would expect that the proportion of miscarriages that were intended would fall between the proportion of births that were intended and the proportion of abortions that were intended. For the entire NSFG sample, this assumption was accurate.[4] Therefore, for subgroups, we calculated the proportion of miscarriages that were intended by constraining it to fall between the proportion of births and abortions intended.[5]

2.3. Population denominators and calculations

Denominators for pregnancy, birth and abortion rates for all women aged 15–44 years and by age and race and

[1] Miscarriage refers to spontaneous fetal loss or stillbirth.

[2] This change resulted in lower unintended pregnancy estimates for 2001 than were previously reported [11].

[3] The ratio of miscarriages to births has not changed much between 1995 and 2006, so use of earlier 1995 data should not be problematic.

[4] In 2006, 57% of miscarriages followed intended pregnancies, compared with 64% of births and 5% of abortions.

[5] For example, in 2006, the proportion of miscarriages that were intended within each subgroup was calculated as $A+(0.884\times[B–A])$, where A is the proportion of abortions in that subgroup that were intended, B is the proportion of births in that subgroup that were intended and 0.884 is (57%–5%)/(64%–5%), based on the overall proportions for the sample population mentioned in the previous footnote.

ethnicity were obtained from population estimates published by the US Census Bureau [23]. Population distributions by educational attainment, poverty and relationship status came from the Annual Social and Economic Supplements of the Current Population Survey. The population distributions for women by cohabitation status, religious affiliation and parity were based on interpolations of the 1995, 2002 and 2006–2008 NSFG. Distributions by education were limited to the population of women 20 years and older who were likely to have completed or mostly completed schooling.

When calculating the percentage of unintended pregnancies that ended in abortion, we excluded miscarriages from the denominator in order to better represent pregnancies with outcomes decided by the woman.

3. Results

3.1. Proportion of unintended pregnancies and unintended pregnancy rates

There were 6.7 million pregnancies in the United States in 2006 (Table 1), up from 6.4 million in 2001 (data not shown). Some 3.2 million pregnancies were unintended in 2006, compared with 3.1 million in 2001 (data not shown). The percentage of pregnancies that were unintended increased slightly between 2001 (48%) and 2006 (49%), and the unintended pregnancy rate also increased during this time period: In 2006, there were 52 unintended pregnancies for every 1000 women aged 15–44 years, compared with 50 in 2001. In other words, about 5% of women of reproductive age had an unintended pregnancy in 2006. When looking at unintended pregnancy by timing, 29% of all pregnancies were mistimed and 19% were unwanted (data not shown). The intended pregnancy rate stayed nearly the same, and the overall pregnancy rate increased.

3.1.1. Age

The proportion of pregnancies that were unintended generally decreased with age, with more than four out of five pregnancies unintended among women 19 years and younger. Between 2001 and 2006, this percentage decreased for women aged 15–17 years and increased or stayed nearly the same for all other women. The unintended pregnancy rate was highest for women 20–24 years old due to an increase between 2001 and 2006.

3.1.2. Educational attainment

Women with the fewest years of education had the highest unintended pregnancy rate, and rates decreased as years of education attained increased. Unintended pregnancy rates increased the most among women with no college experience.

3.1.3. Race and ethnicity

Black women had the highest unintended pregnancy rate among all racial and ethnic subgroups, more than double that of non-Hispanic white women. Rates changed little between 2001 and 2006.

3.1.4. Income

Poor and low-income women's unintended pregnancy rates increased substantially, while the rate for higher-income women decreased. The rate for poor women was more than five times the rate for women in the highest income level. While there was little difference by education among women in the highest income bracket (Fig. 1A), minorities had the highest unintended pregnancy rates regardless of income level (Fig. 1B).

3.1.5. Relationship status

Unintended pregnancy rates increased among cohabitors and formerly married women. Cohabiting women exhibited both the highest rate and the greatest increase among all individual subgroups measured in this analysis. Rates were even higher among cohabiting women who were under 25 years old (Fig. 2A), poor or low-income (Fig. 2B).

3.1.6. Parity

Women with one previous birth had an unintended pregnancy rate that was roughly twice as high as the rate for women who had never given birth and women with two or more previous births.

3.1.7. Religious affiliation

Women with no religious affiliation reported the highest unintended pregnancy rate, followed by Catholics, Protestants, and women with other affiliations.

3.2. Outcomes of unintended pregnancies

Forty-three percent of unintended pregnancies ended in abortion[6] in 2006, a decline from 47% in 2001 (Table 2). In 2006, the unintended birth rate[7] was 25 per 1000 women aged 15–44 years, up from 23 in 2001.

3.2.1. Age

Between 2001 and 2006, the proportion of unintended pregnancies ending in abortion increased for women aged 15–17 years and declined or stayed the same for all other women. The greatest declines were exhibited among women aged 18–24 years. As a result, the unintended birth rate decreased for women aged 15–17 years and increased the most for women aged 18–24 years. Rates for women aged 18–24 years were more than twice the national rate.

3.2.2. Educational attainment

Women with some college but no degree were most likely to end an unintended pregnancy by abortion; these women were also more likely to still be enrolled in school. Those without a high school diploma were most likely to continue an

[6] As described above, this calculation excludes miscarriages.

[7] The phrase "unintended birth rate" is shorthand for the rate of births that followed unintended pregnancies.

Table 1
Number of pregnancies, percentage of pregnancies unintended and pregnancy rate by intention for all women and by demographic characteristics

Characteristics	No. of pregnancies (000), 2006		Percentage of pregnancies unintended		Total pregnancy rate[a]		Intended pregnancy rate[a]		Unintended pregnancy rate[a]	
	Total	Unintended	2001	2006	2001	2006	2001	2006	2001	2006
All women	6658	3240	48	49	104	108	54	55	50	52
Age (years)[b]										
<15	21	21	98	98	3	2	0	0	2	2
15–19	769	629	82	82	82	74	14	13	67	60
15–17	263	209	89	79	47	42	5	9	42	33
18–19	505	420	79	83	133	124	28	21	105	103
20–24	1716	1094	59	64	172	168	72	61	101	107
25–29	1751	715	40	41	171	174	102	103	69	71
30–34	1334	440	33	33	131	139	88	93	43	46
35–39	832	230	28	28	68	80	49	58	19	22
≥40	235	112	49	48	18	21	9	11	9	10
Educational attainment[c]										
Not HS graduate	853	445	49	52	146	154	74	74	72	80
HS graduate/equivalent	1709	826	47	48	113	122	60	63	53	59
Some college/associate degree	1565	813	52	52	90	94	43	45	47	49
College graduate	1742	459	24	26	105	113	80	84	26	30
Race and ethnicity[d]										
White non-Hispanic	3471	1392	40	40	87	89	52	53	34	36
Black non-Hispanic	1193	805	67	67	138	136	45	44	93	91
Hispanic	1551	824	54	53	147	155	67	72	80	82
Income as a percentage of poverty										
<100%	1970	1221	61	62	196	214	77	82	120	132
100%–199%	1786	1026	54	57	146	157	66	67	79	90
≥200%	2902	993	37	34	74	70	46	46	28	24
Relationship status										
Currently married	3404	966	28	28	120	122	86	88	33	35
Never married and not cohabiting	1265	1029	78	81	57	56	13	10	45	46
Formerly married and not cohabiting	388	264	59	68	74	78	30	25	44	53
Cohabiting	1601	981	65	61	194	248	68	96	126	152
Parity										
No previous births	2670	1260	u	47	u	100	u	53	u	47
1	2030	933	u	46	u	193	u	105	u	88
≥2	1959	1048	u	53	u	79	u	37	u	42
Religious affiliation										
Protestant	3022	1456	u	48	u	101	u	52	u	48
Mainstream	1546	774	u	50	u	110	u	55	u	55
Evangelical	1476	682	u	46	u	92	u	50	u	42
Catholic	1901	862	u	45	u	120	u	66	u	54
Other	578	207	u	36	u	96	u	62	u	34
None	1158	717	u	62	u	116	u	44	u	71

Note: Numbers may not sum to group totals due to rounding. u denotes unavailable; HS, high school.

[a] Rates are per 1000 women aged 15–44 years.

[b] The population denominator for the rates for women aged <15 years is women aged 10–14 years; the denominator for the rates for women aged ≥40 years is women aged 40–44 years.

[c] Among women aged ≥20 years.

[d] Excludes women who self-identify as other non-Hispanic race/ethnic groups.

unintended pregnancy, and had an unintended birth rate that was almost twice the national rate and nearly four times the rate for college graduates.

3.2.3. Race and ethnicity

The proportion of unintended pregnancies ending in abortion decreased across all racial and ethnic subgroups, with black women most likely to end an unintended pregnancy by abortion. Hispanic women had the highest unintended birth rate, and minority women had rates that were more than twice that of white women.

3.2.4. Income

Compared with higher-income women, poor and low-income women were less likely to end an unintended pregnancy by abortion. Consequently, poor women had a relatively high unintended birth rate. While lower-income women experienced an increase in the unintended birth rate,

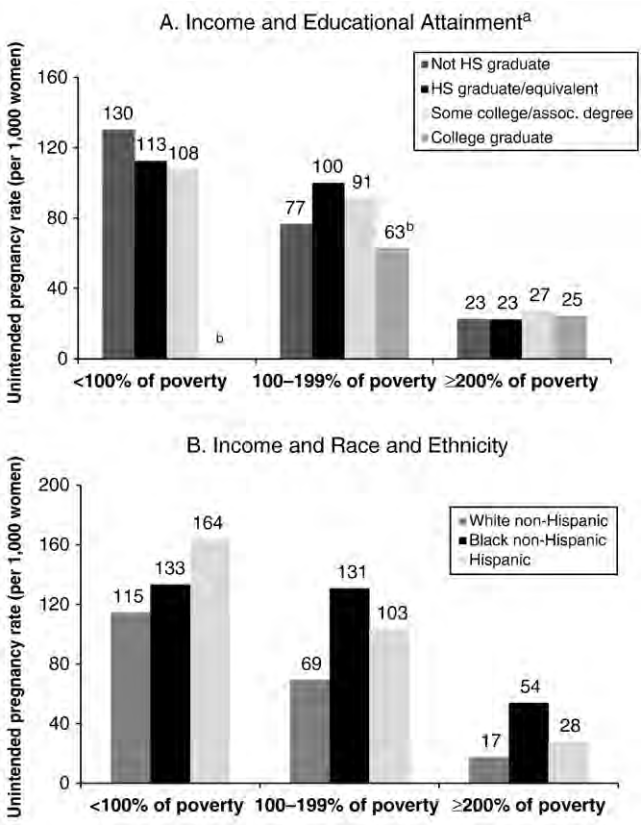

Fig. 1. (A) Unintended pregnancy rates for poor women were inversely related to educational attainment, but rates among women in the highest income bracket varied little across education levels. (a) Rates for educational attainment are among women aged 20–44 years. (b) Rates for college graduates at <100% and 100%–199% of poverty are combined to account for small sample sizes. (B) Among poor women, Hispanics had the highest unintended pregnancy rate, and among the low- and higher-income groups, black women had the highest rate. Note: This figure excludes women who self-identify as other non-Hispanic race/ethnic groups.

this rate remained relatively stable for women in the highest income category.

3.2.5. Relationship status

Married and cohabiting women were much less likely than other women to end an unintended pregnancy by abortion. The rate of unintended births among cohabiting women increased sharply and was more than three times the rate for other women.

3.2.6. Parity

Women with exactly one previous birth were least likely to end an unintended pregnancy by abortion, and their unintended birth rate was more than twice that of the other groups.

3.2.7. Religious affiliation

Women with no religious affiliation were most likely to end an unintended pregnancy by abortion; they also had the highest unintended birth rate, followed closely by Catholics and Protestants. Evangelicals were least likely to terminate an unintended pregnancy.

4. Discussion

The US unintended pregnancy rate increased slightly between 2001 and 2006, a worrisome trend, and remains significantly higher than the rate in many other developed countries [24]. Population shifts — for example, increases in groups with high rates, such as poor and minority women — may have contributed to the overall increase. In addition, the overall increase could have occurred if the trend toward later childbearing [25] has led to a longer period before childbearing when relatively less-effective methods are used [26] and a shorter period post-childbearing when use of highly effective long-term methods is more common.

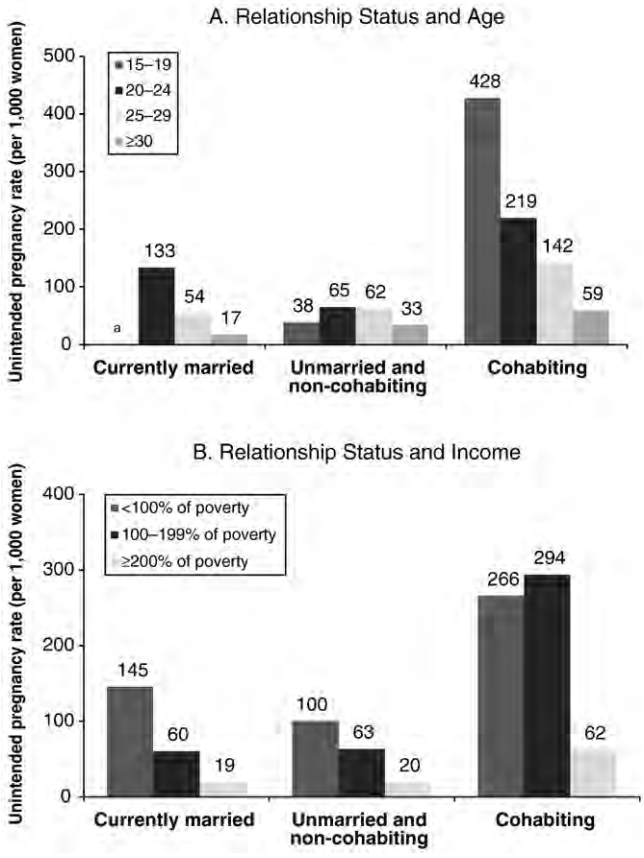

Fig. 2. (A) Teens had relatively high unintended pregnancy rates among married and cohabiting women, but noncohabiting teens had a low unintended pregnancy rate. (a) The rate for married women aged 15–19 years is not available. (B) Women in lower-income groups had relatively high unintended pregnancy rates regardless of relationship status. Cohabiting women had the highest rates across all income levels, and among them, poor or low-income women had very high rates. Notes: Unmarried women include never-married and formerly married women. Cohabiting women were not married.

Table 2
Percentage of unintended pregnancies ending in abortion and unintended birth rate for all women and by demographic characteristics

Characteristics	Percentage of unintended pregnancies ending in abortion[a]		Unintended birth rate[b]	
	2001	2006	2001	2006
All women	47	43	23	25
Age (years)[c]				
<15	50	49	1	1
15–19	39	37	35	32
15–17	37	41	21	16
18–19	40	35	54	57
20–24	47	41	47	56
25–29	49	46	31	33
30–34	47	45	20	22
35–39	56	56	7	7
≥40	47	46	3	4
Educational attainment[d]				
Not HS graduate	34	32	41	46
HS graduate/equivalent	43	40	26	30
Some college/associate degree	59	56	17	19
College graduate	54	49	10	12
Race and ethnicity[e]				
White non-Hispanic	42	39	17	18
Black non-Hispanic	57	52	35	37
Hispanic	40	38	42	45
Income as a percentage of poverty				
<100%	40	43	63	66
100%–199%	48	38	36	46
≥200%	51	49	11	10
Relationship status				
Currently married	24	22	21	23
Never married and not cohabiting	59	61	16	15
Formerly married and not cohabiting	66	60	12	17
Cohabiting	53	39	53	79
Parity				
No previous births	u	44	u	22
1	u	40	u	45
≥2	u	46	u	19
Religious affiliation				
Protestant	u	38	u	25
Mainstream	u	44	u	26
Evangelical	u	32	u	24
Catholic	u	44	u	26
Other	u	47	u	15
None	u	51	u	30

Note: u denotes unavailable; HS, high school.
[a] Pregnancies exclude spontaneous fetal losses and stillbirths.
[b] Rates are per 1000 women aged 15–44 years.
[c] The population denominator for the rates for women aged <15 years is women aged 10–14 years; the denominator for the rates for women aged ≥40 years is women aged 40–44 years.
[d] Among women aged ≥20 years.
[e] Excludes women who self-identify as other non-Hispanic race/ethnic groups.

During the same period, the overall proportion of women ending an unintended pregnancy by abortion decreased. These changes may have been due to decreased access to abortion in some areas, increased stigmatization of abortion or both.

Among all the subgroups for which we present data, only women aged 15–17 years saw notable improvements since 2001; both their unintended pregnancy rate and unintended birth rate declined by roughly one quarter.

Many disparities among subgroups, already large, grew. In particular, cohabiting women exhibited very high and increasing unintended pregnancy and unintended birth rates. Like married women, cohabiting women are regularly sexually active but are less likely than married women to desire pregnancy and, thus, are at a very high risk for unintended pregnancy. They are, however, more likely to carry a pregnancy — including an unintended pregnancy — to term than unmarried noncohabiting women, perhaps because they have more partner support. In addition, the decline in the proportion of unintended pregnancies ending in abortion may have been related to increased normalization of childbearing among these couples. These findings represent consequences of broad demographic trends — specifically, fewer married women and a greater proportion of childbearing to unmarried women — and also help to explain those trends by showing that cohabiting couples, regardless of marital status, have high pregnancy rates and that a large proportion of those pregnancies are unintended.

Poor and low-income women also experienced some of the greatest increases and highest rates of unintended pregnancy. This finding is consistent with numerous studies that document the association between disadvantage and higher risk for unintended pregnancy [27–29]. While reasons behind this relationship are not fully understood, they are related to the significant life challenges facing many of these women [30,31]. The upward trend in their unintended pregnancy rate has continued for over a decade [10]. During this time, publicly funded family planning clinics—which have been shown to help low income women achieve their childbearing goals [32]—were only able to meet about 40% of the need for publicly subsidized care [33]. This gap in services, along with rising unintended pregnancy rates, underscores the need to expand programs that could enable low income women and couples to be more consistent and effective contraceptive users.

The disparities by parity are probably explained by the desire for families with two children. In other words, the high intended and unintended rates for women with one birth compared with childless women or those with two or more births may be due to the fact that women reporting only one birth may be more likely to have a second birth but are less likely to progress to a third birth [34]. At the same time, their high unintended pregnancy rate suggests that mothers have difficulties timing births, and their high unintended birth rate suggests less concern about continuing an unintended pregnancy compared with other women.

This is an aggregate-level analysis incorporating data from multiple data sets, which makes statistical testing difficult. One test that can be performed is a comparison based on a subset of our data: the proportion of pregnancies ending in birth (i.e., excluding abortions, which are underreported, and miscarriages) that were unintended in 2006 and 2001. The

overall percentage increase, from 35% to 36%, was not significant, although the increase among women aged 20–24 years, from 45% to 53%, was significant at the p<.10 level. Nonetheless, we do see substantively significant changes in unintended pregnancy rates in several subgroups. This argues that the limited tests on a subset of our key statistic do not capture the whole picture, and their results should not be considered conclusive.

In conclusion, the United States did not make progress toward its goal of reducing unintended pregnancy between 2001 and 2006. To better understand what drove these rates up, we are currently conducting a demographic analysis of changes in population composition and reproductive health behaviors that have historically affected them. However, given the nation's increasingly high unintended pregnancy rate and the fact that 11% of the population at risk does not use birth control [26], reducing the unintended pregnancy rate requires that we focus on increasing and improving contraceptive use among women and couples who want to avoid pregnancy. Increased use of long-acting and cost-effective contraceptive methods such as the intrauterine device (IUD) could play an important role in such an effort. In particular, the age at which childbearing begins has increased [25], and the length of time from first intercourse to first birth is, on average, 8 years; this is a period of potential risk for women and couples and should be seen as an appropriate time to use long-acting methods. The American Congress of Obstetricians and Gynecologists has indicated that such methods should be "first-line" choices for young women, and coupling IUDs with condoms for additional protection may have the potential to reduce unintended pregnancy even further [35,36]. Although these methods are highly cost-effective over time, even women with health insurance may have difficulty paying for these methods because some plans do not cover the high upfront costs or other charges women often incur to use them [37]. Research indicates that when financial barriers are completely removed and comprehensive information is provided on all methods, women choose long-acting, highly effective methods in large numbers [38].

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EXHIBIT 45

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Responsible Fathering: An Overview and Conceptual Framework

This article defines responsible fathering, summarizes the relevant research, and presents a systemic, ecological framework to organize research and programmatic work in this area. A principal finding is that fathering is influenced, even more than mothering, by contextual factors in the family and community.

For more than a century, American society has engaged in a sometimes contentious debate about what it means to be a responsible parent. Whereas most of the cultural debate about mothers has focused on what, if anything, mothers should do outside the family, the debate about fathers has focused on what fathers should do inside the family. What role should fathers play in the everyday lives of their children, beyond the traditional breadwinner role? How much should they emulate the traditional nurturing activities of mothers, and how much should they represent a masculine role model to their children? Is fatherhood in a unique crisis in late twentieth century America (Blankenhorn, 1995; Doherty, 1997; Griswold, 1993; LaRossa, 1997; Popenoe, 1996)?

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Key Words: coparental relationship, fathers, father-child relationship, family relations and dynamics, divorce, parenting.

The recent upsurge of interest in fathering has generated concern among supporters of women's and mothers' rights that the emphasis on the important role of fathers in families may feed longstanding biases against female-headed single-parent families, that services for fathers might be increased at the expense of services for single mothers, and that the profatherhood discourse might be used by the fathers' rights groups who are challenging custody, child support, and visitation arrangements after divorce. On the other hand, feminist psychologists have recently argued for more emphasis on fathering and have suggested that involved, nurturing fathers will benefit women as well as children (Phares, 1996; Silverstein, 1996). Only an ecologically sensitive approach to parenting, which views the welfare of fathers, mothers, and children as intertwined and interdependent, can avoid a zero-sum approach to parenting in which fathers' gains become mothers' losses.

These cultural debates serve as a backdrop to the social science research on fathering because researchers are inevitably influenced by the cultural context within which they work (Doherty, Boss, LaRossa, Schumm, & Steinmetz, 1993). In their recent reanalysis of the historical trends of American ideals of fatherhood, Pleck and Pleck (1997) see the emerging ideal of fatherhood in the late twentieth century as father as equal coparent. (From 1900 to 1970, the dominant cultural ideal was the genial dad and sex role model, and from 1830 to 1900, the distant breadwinner.) Research on fathering, then, has attained prominence in the

social sciences during an era of historically high expectations of men's involvement in the everyday lives of their children. Not surprisingly, a good deal of that research has compared levels of fathers' involvement with mothers' involvement because mothers have become the benchmark for norms for fathering (Day & Mackey, 1989).

This post-1970s interest in fathering has been fueled by the reappraisal of family roles for women and by unprecedented demographic changes in the American family. In other words, scholarly, professional, and public policy interest in fathering has crystallized during the time that the foundation of traditional fathering—the physically present father who serves as the unique family breadwinner—has been eroding rapidly. With more than half of mothers in the work force, with new marriages breaking up at a rate of 50%, and with nearly one third of births to single women, the landscape of fathering has been altered substantially (Bumpass, 1990; U.S. Bureau of the Census, 1994a).

Sociological and historical work on fathering makes it clear that fathering (at least beyond insemination) is fundamentally a social construction. Each generation molds its cultural ideal of fathers according to its own time and conditions, and each deals with the inevitable gap between what LaRossa (1988) terms the "culture" of fatherhood and the "conduct" of fathers in families. Sociological and historical analyses also make it clear that fathering cannot be defined in isolation from mothering, mothers' expectations, and social expectations about childrearing in the society, and that these social expectations have been fairly fluid in the United States in the twentieth century. LaRossa (1997) has demonstrated how the culture of fatherhood and the conduct of fathers change from decade to decade as social and political conditions change.

In addition to this historical and social constructivist perspective, fathering also lends itself to a systemic framework, which views fathering not primarily as a characteristic or behavioral set of individual men or even as a dyadic characteristic of a father-child relationship, but as a multilateral process involving fathers, mothers, children, extended family, and the broader community and its cultures and institutions. Fathering is a product of the meanings, beliefs, motivations, attitudes, and behaviors of all these stakeholders in the lives of children. Indeed, this article will suggest that fathering may be more sensitive than mothering to contextual forces, forces that currently create more obstacles than bridges for fathers but that potentially could be turned in a more supportive direction.

With these historical, social constructionist, and systemic perspectives as a backdrop, we examine the concept of responsible fathering, summarize findings from the major areas of research on responsible fathering, and offer a conceptual framework to guide future research and program development. Because of the vastness of the literature on fathering and the presence of a number of recent reviews, the review of the literature in this report is selective rather than comprehensive. It focuses on major recent work and points out continuing gaps, such as cultural issues in fathering. In some areas, we rely almost entirely on recent reviews by other scholars such as Pleck (1997). Our goal is one of synthesis and theory development rather than comprehensive documentation.

Responsible Fathering

The use of the term "responsible fathering," which was the original language used by the U.S. Department of Health and Human Services in commissioning our work, reflects a recent shift by academics and professionals away from value-free language and toward a more explicit value-advocacy approach. "Responsible" suggests an "ought," a set of desired norms for evaluating fathers' behavior. The term also conveys a moral meaning (right and wrong) because it suggests that some fathering could be judged "irresponsible." The willingness to use explicitly moral terms reflects a change in the social climate among academics, professionals, and policymakers, who until recently embraced the traditional notion that social science, social policy, and social programs could be value free. In the late twentieth century, there is more appreciation of the inevitability of value-laden and moral positions being part of social science and social interventions and a greater willingness to be explicit about values so that they can be debated openly and their influence on social science and policy can be made clear, rather than being covert (Doherty, 1995a; Doherty et al., 1993; Wolfe, 1989). Indeed, there has always been a strong but implicit undercurrent of value advocacy in fathering research, much of it conducted by men and women interested in promoting more committed and nurturing involvement by men in their children's lives. Similarly, there has always been a moral undertone to the focus on fathers'

deficits that has characterized much of the literature on absent, "deadbeat," and emotionally uninvolved fathers (Doherty, 1990). The term "responsible fathering," as we use it, applies to fathers across all social classes and racial groups, not narrowly to men in lower social classes or minority groups. Now that value advocacy has become more explicit in the fathering area (Dollahite, Hawkins, & Brotherson, 1997), responsible fathering needs to be clearly defined. James Levine and Edward Pitt (1995) have made an important start in their delineation of responsible fathering. They write:

> A man who behaves responsibly towards his child does the following:
>
> - He waits to make a baby until he is prepared emotionally and financially to support his child.
> - He establishes his legal paternity if and when he does make a baby.
> - He actively shares with the child's mother in the continuing emotional and physical care of their child, from pregnancy onwards.
> - He shares with the child's mother in the continuing financial support of their child, from pregnancy onwards. (pp. 5–6)

Levine and Pitt's elements of responsible fathering have the advantage of referring to both resident and nonresident fathers, a reflection of the diversity of fathers' situations. The authors also assert that commitment to this ethic of responsible fatherhood extends beyond the father to the mother, to professionals who work with families, and to social institutions entrusted with the support of families. We employ Levine and Pitt's definition in this article, but we narrow our scope to men who are already fathers; we do not address the issue of postponing fatherhood.

The developmental backdrop for the discussion of fathering reflects children's needs for predictability, nurturance, and appropriate limit setting from fathers and mothers, as well as for economic security and a cooperative, preferably loving relationship between their parents (Hetherington & Parke, 1993). Furthermore, the specific needs of children vary by their developmental stage. Parents are required to provide higher levels of physical caregiving when their children are infants and greater levels of conflict management when their children become adolescents. Although we do not review the literature on the effects of active fathering on children, an assumption behind this article—and our value stance—is that children need and deserve active, involved fathers throughout their childhood and adolescence. The prime justification for promoting responsible fathering is the needs of children.

Research on Responsible Fathering

The major areas of research on responsible fathering reflect the domains outlined by Levine and Pitt (1995), with the addition of attention to whether the father resides with the child. These domains can be categorized as (a) establishing legal paternity, (b) nonresidential fathers' presence versus absence, (c) nonresidential fathers' economic support for their children, and (d) residential fathers' level of involvement with their children. There are not many theoretical models or research studies that cross over between residential and nonresidential fathers. Offering such a model is one of the goals of this article. The review of literature, however, will be organized by the four research traditions delineated above. In order to delimit the review, we focus on heterosexual, biological fathers and not gay fathers, stepfathers, adoptive fathers, or father surrogates—groups deserving considerably more research and programmatic attention.

Fathers and Legal Paternity

Declaring legal paternity is the sine qua non of responsible fathering. With legal paternity comes a variety of economic, social, and psychological benefits to the child and some degree of protection of the father's rights. Tangible benefits for the child include health care if the father is employed, social security, mandated child support, and armed forces benefits if the father is in the military. They also include the intangible benefit of knowing one's biological heritage and having a clearer sense of social identity (Wattenberg, 1993).

Unfortunately, only about one third of nonmarital births in the U.S. are followed by paternity adjudication (Adams, Landsbergen, & Hecht, 1994). There is limited research on the reasons, but they appear to involve lack of information about the benefits of legal paternity, the dynamics of the couple relationship, opposition from mothers, cultural issues, social policy barriers, and low priority actions on the part of social institutions (Anderson, 1993; Wattenberg, 1993). In a study of new, unmarried parents, Wattenberg documented the faulty and incomplete information the young couples had. Nor were they informed by health

personnel or social service personnel, who themselves had major gaps in their knowledge about the advantages of paternity determination. What's more, current institutional practices encourage unmarried fathers in welfare families to remain "underground" because the state generally keeps a substantial portion of the child support the father pays. If he does not declare paternity, any informal, under-the-table payments he makes go directly to the mother and child (Achatz & MacAllum, 1994).

Anderson (1993) and Wattenberg (1993) also have explored the ambivalence of the mother and father themselves about establishing paternity. Young fathers sometimes feel tricked and trapped by the mother, and the mother may feel both protective of the father (not wanting him to be harassed by authorities) and reluctant to tie herself to him in the future. Extended family on both sides may have mixed feelings about legal paternity and father involvement. Social service personnel, too, have been found to have the same ambivalence and reluctance to encourage the mother and father to establish paternity. Recently, however, federally mandated reforms have required states to implement programs to promote the acknowledgment of paternity. The results thus far have been mixed: Rates of paternity establishment have increased, but paternity is still unacknowledged in the majority of cases for reasons cited in prior studies (Sorenson & Turner, 1996).

The available research on the process of establishing legal paternity supports an ecological model that emphasizes how contextual forces in the community combine with mother-father relationship factors and individual father factors to create a situation where too many fathers stumble on the first step of responsible fathering.

Father Presence Versus Absence

After the declaration of paternity, the bedrock of fathering is presence in the child's life. The two major structural threats to fathers' presence are nonmarital childbearing and divorce. In 1993, 6.3 million children (9% of all children) were living with a single parent who had never married, up from 243,000 in 1960 (.4% of all children). In terms of percentages of all births, nonmarital births have risen from 4% of births in 1940 to 31% in 1993; the biggest increases occurred in the 1970s and 1980s. The nonmarital birth rate for women over age 20 has increased substantially since the late 1970s. For teenagers, although the overall birth rate has actually remained steady for decades, the decision to not marry has led to a dramatic increase in the nonmarital birth rate (U.S. Department of Health and Human Services, 1995).

In nearly all cases, children born outside of marriage reside with their mothers. If fathers do not live with the mother and child, their presence in the child's life is frequently marginal and, even when active for a while, tends to be fragile over time. Until recently, studies in this area have been hampered by small, nonrepresentative samples. Lerman (1993), using data from a nationally representative group of over 600 unwed fathers, found that about three fourths of young fathers who did not reside with their children at birth never lived in the same household with them. About 50% of these fathers visited their child once a week, but about 20% never visited or visited once a year. The pattern over time was toward less contact as the children got older. There were racial differences in these findings, however. African American unmarried fathers were more likely to live close to their children and see them more frequently than were White and Hispanic fathers. The figures for fathers who rarely or never visited their children were as follows: African American (12%), Hispanic (30%), and White (37%). African American unmarried fathers also had a slightly higher frequency of support payments.

A number of qualitative studies have documented how mothers and grandmothers serve as gatekeepers for the father's presence in the child's life and how institutional practices create barriers, particularly for young fathers (Allen & Doherty, 1996; Wattenberg, 1993). Many of these fathers relinquish involvement, and many who try to stay involved face structural and relationship barriers.

Overall, there appears to be a strong negative effect of nonmarital fathering on the father-child bond. Furstenberg and Harris (1993), reporting on their 20-year follow-up of new unmarried African American parents in Baltimore (a group who were generally representative of African American unmarried parents nationally), found that only 13% of the young adults reported a strong bond with their biological father if he had not lived with them. The figure was 50% for fathers who lived with the child. These investigators also examined bonds with stepfathers and other male figures in the child's life. Here, too, the findings were sobering: "Taking all these father figures into account, just 1% of the children had a strong relationship with two or more fathers, 30% reported a strong tie with at least one, and 69% had no father figure to

whom they were highly attached" (p. 126). Note that this study focused on the quality of father-child bonds among young adult children, not the frequency of contact.

In more than 25% of nonmarital births, the parents are cohabiting (U.S. Department of Health and Human Services, 1995). In these cases, fathers are far more present in their children's lives. However, studies indicate that cohabiting couples have high breakup rates, and those who go on to marry have higher divorce rates (Bumpass, Sweet, & Cherlin, 1991; DeMaris & Rao, 1992). Therefore, even when the father lives with the mother of the child, his ongoing presence in the child's life is often fragile.

Although the number of nonmarital births has been increasing, an even greater number of children (6.6 million) live with a single parent subsequent to divorce (U.S. Bureau of the Census, 1994b). In about 90% of cases, these children reside with their mothers. Research has documented a declining presence of noncustodial fathers over the years after a divorce. One national study of school-aged children found that 2 years after a divorce about half had not seen their father for a year (Furstenberg & Nord, 1985). A more recent study, using 1990 data from the Survey of Income and Program Participation, reported that about one third of divorced fathers did not spend time with their children in the previous year (Nord & Zill, 1996). In general, although father involvement after divorce seems to be increasing and some fathers are quite involved with their children after a divorce, the predominant pattern among noncustodial fathers is one of gradual withdrawal from their children's lives (Amato & Rezac, 1994; Seltzer, 1991).

The sequelae of divorce for the quality of father-child relations is also quite sobering. Zill, Morrison, and Coiro (1993) followed a large national sample of children and parents through the young adulthood of the children. After adjusting for a variety of demographic factors and vocabulary test scores, they found increasing alienation of divorced fathers from their children, measured by the children's descriptions of these relationships. Among 18- to 22-year-olds, 65% of those whose parents had divorced reported a poor relationship with their father, compared with 29% of those whose parents had not divorced. The data also showed poorer relationships with mothers after divorce, but the effect for fathers was stronger. Remarriage of one of the parents made things worse: 70% of children of divorce and remarriage reported a poor relationship with their father.

Much of the research on fathers' involvement with their children after divorce has focused on children's well-being. Although some studies have found that higher levels of father involvement were associated with greater psychological adjustment among children, other studies, especially those with nationally representative samples, have failed to support that conclusion (Furstenberg, Morgan, & Allison, 1987; Hetherington, Cox, & Cox, 1982; Guidubaldi, Cleminshaw, Perry, Nastasi, & Lightel, 1986; Kalter, Kloner, Schreier, & Okla, 1989). A number of scholars who reported no effects for father involvement suggested that, although contact with both parents is desirable in principle, the benefits of father involvement for the child may be neutralized when there is significant conflict between parents. That is, when there is a good deal of interparental conflict, higher contact with the father might create additional strains on the child, strains that offset the advantages of seeing the father more frequently (Hetherington et al., 1982).

Amato and Rezac (1994) tested this hypothesis directly with data from the National Survey of Families and Households. They found that higher levels of involvement by the nonresidential parent (mostly fathers), measured by frequency of contacts, were associated with less problem behavior in children only in the presence of low interparental conflict. In other words, when the parents got along well, frequent contact of fathers with their children had positive behavioral outcomes for the children. When the parents had more serious conflict, however, high contact between father and child was associated with worse behavioral outcomes. This finding, which was statistically significant for boys but fell short of significance for girls, supports the importance of a systemic and ecological model for fathering, rather than a dyadic model that focuses only on the father-child relationship. Recent analyses of national data by Nord and Zill (1996) also shed light on the complexities of involvement of nonresidential fathers. They found that joint custody and voluntary visitation agreements were associated with better health among adolescents than were sole custody and court-ordered agreements. Generally, although more contact with the nonresident father was associated with better reports of health, the status of the parents' divorce agreements was an important moderating factor.

Overall, it appears that there are many barriers to the father's presence in a child's life outside of a marital context. Residential status alone, of

course, cannot account for this situation. Although there is a dearth of studies in this area, noncustodial mothers appear to do a better job of maintaining presence in their children's lives. For instance, more noncustodial mothers than fathers live in the same state as their children (U.S. Bureau of the Census, 1995) and have more contact with their children than noncustodial fathers do (Amato & Rezac, 1994). It appears that there are personal, relational, cultural, and institutional barriers specific to fathering that inhibit fathers' presence in the lives of children with whom they do not live.

Fathers' Payment of Child Support

For many policy specialists, the principal concern with fathering outside of marriage lies with the payment of child support. The term "deadbeat dad" was coined to communicate moral indignation at the number of fathers who do not contribute to their children's economic well-being after a divorce. The research data are clear and consistent on the subject. According to a report on child support by the U.S. Bureau of the Census (1995), only 48% of the mothers who are awarded child support by the courts receive the full amount due. The remainder are divided more or less equally between those who receive partial payment and those who received nothing. Furthermore, other research has found that the amounts awarded and paid are not adequate to support a child, given mothers' often low incomes, even if the full amounts are forthcoming (Rettig, Christensen, & Dahl, 1991).

This economic struggle is even more common for nonmarital childbearing than for postdivorce situations, especially when fathers have lost contact with their children (Lerman, 1993). In 1993, 38% of children living with divorced mothers, but 66% of those living with never-married mothers, were living below the poverty line, compared with 11% of children living in two-parent families (U.S. Bureau of the Census, 1994b). Only 27% of never-married custodial mothers have a child support award (U.S. Bureau of the Census, 1995). Because many children born to never-married parents have not had legal paternity established, the prospects of establishing awards for these children are limited.

Researchers have examined factors in the nonpayment of child support by fathers. One important predictor is having joint custody or visitation privileges or both. Fathers with these arrangements pay all or part of child support more often than those who do not (79% vs. 56%; U.S. Bureau of the Census, 1995). When asked about their lack of economic support, many fathers point to resentment toward mothers for misusing the funds and for withholding the children from the father (Furstenberg, Sherwood, & Sullivan, 1992; Kurdek, 1986). Indeed, studies have documented that more frequent contact is associated with more child support (Seltzer, 1991). Similarly, a tug-of-war over visitation and other contacts with children is associated with lower child support payments (Dudley, 1991; Seltzer, Schaeffer, & Charng, 1989).

Researchers and policymakers have tended to assume that the failure of noncustodial parents to provide economic support is primarily a problem specific to fathers. Without studies of noncustodial mothers' child support, many assumed that noncustodial mothers would be better payers of child support in the same way that they maintain more contact with their nonresidential children. This appears not to be the case. The most recent U.S. Bureau of the Census (1995) report on child support offered the first national data on child support payments by noncustodial mothers, as well as fathers. The findings showed that noncustodial mothers, like noncustodial fathers, do not pay all the child support that is owed. Custodial fathers receive about 53% of the child support owed, and custodial mothers receive about 68%. Slightly more than half of the noncustodial fathers (52%) and less than half of the noncustodial mothers (43%) pay all of what they owe. Mothers' nonpayment cannot be dismissed as stemming from their incomes being lower than the incomes of fathers because child support awards by the court are calibrated partly according to income.

These findings of nonsupport by noncustodial mothers suggest that there is something in the structure of nonresidential parenting, rather than in the culture of fatherhood, that is the principal inhibitor of economic support for children outside of marriage. Structural aspects of nonresidential parenting that may inhibit economic support might include having to send funds to an ex-spouse or to an ex-partner, having to provide economic support in the absence of day-to-day contact with one's children, and having no influence over how child support funds are spent. Because there are far more noncustodial fathers than noncustodial mothers, the greater social and policy problem is the lack of paternal support. But the solutions should reflect the possibility that there are inherent difficulties in paying money to an ex-spouse

or to an ex-partner when a parent does not live with, and thus does not have daily contact with, his or her children.

Residential Father Involvement with Children

A striking aspect of research on father involvement with the residential children is its emphasis not on the traditional responsibility of the father for economic support, but on the father's face-to-face interaction with his child in the family setting. However, it is clear that the quality of fathers' interactions with their children is tied to the father's success, real or perceived, as a breadwinner. The classic studies documenting this phenomenon are reports by Glen Elder and colleagues on how unemployment during the Great Depression affected the quality of father-child relations for men who became unemployed or who perceived themselves as less than adequate providers. These men increased the quantity of time with their children but showed decreased parenting quality through more arbitrariness and rejecting behaviors. Elder and colleagues found that the impact of unemployment on fathering was greater than on mothering, a finding replicated by other studies as well (Elder, Liker, & Cross, 1984; Elder, Van Nguyen, & Caspi, 1985; McLoyd, 1989). Studies with more recent cohorts of fathers have shown the same results and have emphasized that the father's perception of his financial situation, even more than his actual situation, influenced his fathering behavior (Harold-Goldsmith, Radin, & Eccles, 1988; LaRossa & Reitzes, 1993).

It appears that feeling like a failure in the breadwinning role is associated with demoralization for fathers, which causes their relationships with their children to deteriorate (McLoyd, 1989). This phenomenon has particular relevance for African American fathers and other fathers of color, who often face serious barriers to success in the provider role, with deleterious consequences for the ability to father (McLoyd, 1990; Taylor, Leashore, & Toliver, 1988). At a conceptual level, this connection between fathering and breadwinning demonstrates the importance of taking an ecological approach to fathering (Allen & Connor, 1997).

As for research on the kinds of father involvement inside the home, early studies on father-child interactions were dispersed into a variety of content categories such as warmth, control, sex role modeling, playfulness, and independence training. Lamb, Pleck, Charnov, and Levine (1985) then introduced the content-free dimensions of paternal engagement (direct caregiving, leisure, or play), paternal accessibility (availability to the child), and paternal responsibility (knowing what the child needs and making decisions about how to respond). Subsequently, research began to focus on the extent of paternal involvement in these three domains (especially the first two, because responsibility proved hard to operationalize). In addition to examining fathers' absolute levels of involvement with their children, researchers also concerned themselves with measuring the proportion of the father's involvement to the mother's involvement and assessing the predictors and child outcomes of different levels of paternal involvement with children of different ages.

Lamb and Pleck also introduced an often used model of the determinants of father involvement: motivation, skills, social support, and institutional practices (Lamb, 1987a; Lamb et al., 1985). They proposed that optimal father involvement will be forthcoming when these four factors are present—that is, when a father is highly motivated, has adequate parenting skills, receives social support for his parenting, and is not undermined by work and other institutional settings.

Recently, the literature on residential father involvement has been comprehensively reviewed and analyzed by Pleck (1997) for the third edition of Lamb's classic book, *The Role of the Father in Child Development.* The following summary relies heavily on Pleck's review.

Pleck's (1997) summary of studies during the 1980s and 1990s indicates that fathers' engagement (in proportion to mothers) is currently somewhat over 40%, and their accessibility is nearly two thirds that of mothers. (This indicates a level of engagement that is less than half of mothers' level; 100% means a level of involvement equal to mothers.) These figures are higher than those found in studies during the 1970s and early 1980s—by about one third for engagement and one half for accessibility.

As for absolute levels of engagement and accessibility (distinguished from the proportion of mother's involvement), Pleck (1997) reports that the age of the child and the day of the week were important factors in the available studies. For example, McBride and Mills (1993), using a guided interview to determine time of activities, found that paternal engagement with young children was from 2.0 to 2.8 hours per day, with 1.9 hours on weekdays and 6.5 hours on weekends. According

to Pleck's review, hours with adolescents tend to be lower. U.S. studies show a range from .5 to 1.0 hour on weekdays and from 1.4 to 2.0 hours on Sundays. Fathers spent more time with sons than with daughters. Accessibility estimates are higher across a number of studies, ranging from 2.8 to 4.9 hours per day with younger children and 2.8 hours per day with adolescents (Pleck, 1997). Pleck notes that these well-documented amounts of time are markedly different than the figure of 12 minutes per day that is often cited in the media.

The best data on paternal accessibility are derived from federal surveys of child-care arrangements of employed mothers. These studies indicate that fathers are a significant source of primary child care when mothers are working outside the home. Fathers are as common a source as child-care centers and family day care homes. Twenty-three percent of families with a working mother have a father who serves as the primary parent while the mother works. These figures are up substantially from the 1970s, although recent findings indicate that fathers' involvement as primary caregivers changes in response to the larger U.S. economy and the availability of jobs (U.S. Bureau of the Census, 1996).

Overall, Pleck (1997) concludes that, in keeping with the shift toward a cultural ideal of the highly involved, coequal parent, there is evidence of the increasing engagement, accessibility, and responsibility of fathers in the lives of their children over the past 20 years. However, there remains a large gap between fathers' levels of involvement and mothers' levels. Research on child and sociodemographic predictors of residential fathers' involvement may be summarized from Pleck's review as follows: Fathers tend to be more involved with their sons than their daughters, particularly with older children. Fathers are less involved with older children than younger children, although the decline of fathers' involvement as children get older is proportionately less than the decline in mothers' involvement. Fathers with larger numbers of children are more involved, although the research in this area is somewhat mixed. Fathers are more involved with firstborn than later-born children and with infants born prematurely and who have difficult temperaments; these trends are true for mothers as well. Fathers' socioeconomic characteristics and race and ethnicity have not been found consistently related to their involvement with their children.

Theory and research on residential fathers' involvement with their children have not explicitly used the framework of responsible fathering, although this value-advocacy position comes through in the literature. Indeed, engagement, accessibility, and responsibility are ways to operationalize Levine and Pitt's (1995) notion of responsible fathering as involving "continuing emotional and physical care of their child" (p. 5). Unresolved is the issue of the utility of comparisons between mothers' and fathers' levels of involvement with children. In much of the literature on fathers, the behavior of mothers is the benchmark for evaluation (Levine, 1993). This leads to what feminist psychologist Vicky Phares (1996) termed a "matricentric" approach to parenting research, family therapy, and parent education, in which mothers are considered the standard parent and fathers are either ignored or studied for how they differ from mothers or how they neglect or abandon children. What is needed is a systemic, ecological approach to parenting in which the behaviors and beliefs of children, fathers, and mothers are viewed within an interdependent web of personal, relational, and community influences (Bateson, 1972; Bronfenbrenner, 1979; Park, 1996).

Influences on Fathering: A Conceptual Model

The fathering literature has been long on empirical studies and short on theory. Researchers mostly have adapted concepts from social sciences to fit their particular area, but work is beginning on overarching conceptual frameworks to guide research and program development. In his review of theory in fathering research, Marsiglio (1995) mentions life course theory (which emphasizes how men's experience of fatherhood changes with life transitions), social scripting theory (which emphasizes the cultural messages that fathers internalize about their role), and social identity theory (which focuses on how men take on the identity of a father in relation to their other social roles). Hawkins, Christiansen, Sargent, and Hill (1995), Hawkins and Dollahite (1997), and Snarey (1993) have used Erik Erikson's developmental theory in their work on how fathering can promote generativity among adult men. Other scholars have explored the utility of economic theories to understand fathers' decisions to invest in, or withdraw from, their children (Becker, 1991).

The most specific conceptual model frequently used in the fatherhood literature is Lamb's and Pleck's four-factor model of father involvement,

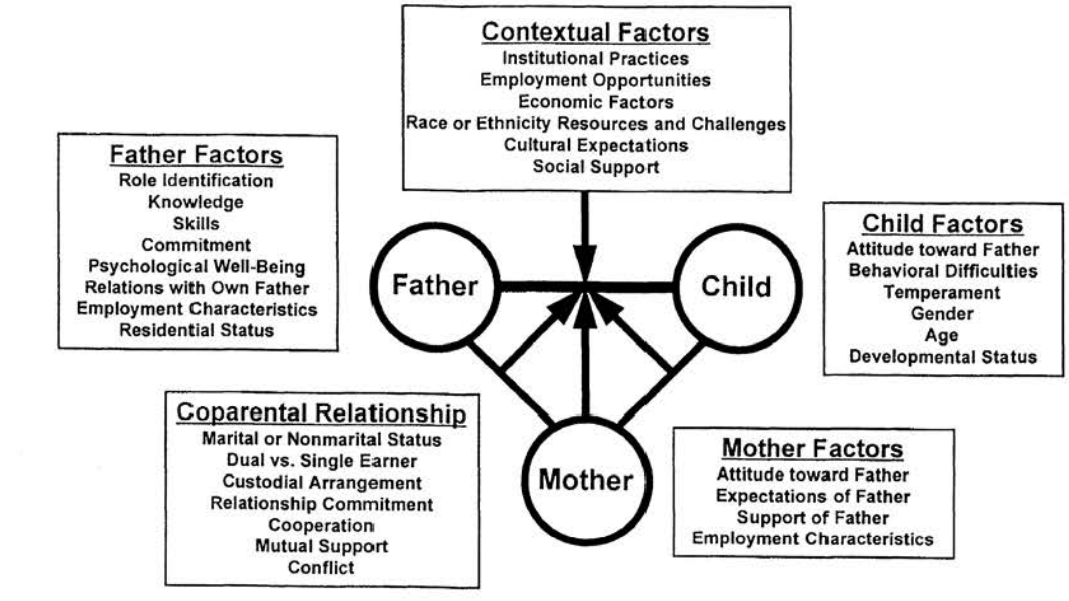
which is not explicitly grounded in a broader theory such as Erikson's theory or social identity theory. (See Lamb et al., 1985.) Lamb and Pleck proposed that father involvement is determined by motivation, skills and self-confidence, social support, and institutional practices. These factors may be viewed as additive, building on one another, and as interactive, with some factors being necessary prior to others. For example, motivation may be necessary for the development of skills. Ihinger-Tallman, Pasley, and Buehler (1995) proposed an eight-factor model of mediators between father identity and actual involvement after divorce: mother's preferences and beliefs, father's perception of mother's parenting, father's emotional stability, mother's emotional stability, sex of child, coparental relationship, father's economic well-being, father's economic security, and encouragement from others. Recently, Park (1996) articulated a systems model of residential father involvement that includes individual, family, extrafamilial, and cultural influences.

Based on the research literature, prior theoretical work on fathering, and the systemic ecological orientation described earlier, we present a conceptual model of influences on responsible fathering. (See Figure 1.) Unlike prior work, the model is intended to include fathering inside or outside marriage and regardless of coresidence with the child. The focus is on the factors that help create and maintain a father-child bond. The model attempts to transcend the dyadic focus of much traditional child development theory by emphasizing first the child-father-mother triad and then larger systems' influences.

The model highlights individual factors of the father, mother, and child; mother-father relationship factors; and larger contextual factors in the environment. Within each of these domains, the model outlines a number of specific factors that can be supported by the research literature. The center of the model is the interacting unit of child, father, and mother, each formulating meanings and enacting behaviors that influence the others. The three are embedded in a broader social context that affects them as individuals and affects the quality of their relationships.

We are particularly interested in highlighting factors that pertain to fathers because one of the goals of this article is to guide father-specific research, program development, and public policy. All of the factors in the model affect the mother-child relationship, as well, because they are generic to parenting (see Belsky, 1984), but many of them have particular twists for fathers. Because theory and research on parenting so often have been derived from work on mothers, it seems particularly important to illuminate the distinctive influences on fathering. The arrows point to the father-child relationship, in particular to the four domains of responsible fathering covered in this review—paternity, presence, economic support, and involvement.

FIGURE 1. INFLUENCES ON RESPONSIBLE FATHERING: A CONCEPTUAL MODEL



Although the model can depict fathers' indirect influence on their children through their support for the mother, the focus here is on direct father-child interaction. And although the influences depicted in the model also can be viewed as influencing the father directly, we prefer to focus on the effects on father-child relations because enhancing those relations and, therefore, the well-being of children is the ultimate goal of programs for fathers.

The research reviewed for this article supports the notion that father-child relations are more strongly influenced than mother-child relations by three of the dimensions of the model: the coparental relationship, factors in the other parent, and larger contextual factors.

Coparental Relationship

A number of studies have shown that the quality of father-child relations both inside and outside marriage is more highly correlated with the quality of the coparental relationship than is true for the mother-child relationship (Belsky & Volling, 1987; Cox, Owen, Lewis, & Henderson, 1989; Feldman, Nash, & Aschenbrenner, 1983; Levy-Shiff & Israelashvili, 1988). Fathers appear to withdraw from their child when they are not getting along with the mother, whereas mothers do not show a similar level of withdrawal. This is one way to understand the tendency of fathers to remove themselves from their children's lives after a breakup with the mother, especially if they have a negative relationship with the mother (Ahrons & Miller, 1993). As Furstenberg and Cherlin (1991) have asserted, for many men, marriage and parenthood are a "package deal." Or one might say that in American culture, a woman is a mother all of her life, but a man is a father if he has a wife. Furthermore, if he has a wife but does not get along with her, he may be present as a father, but the quality of his relationship with his children is apt to suffer.

One reason that fathering is particularly sensitive to the marital or coparental relationship is that standards and expectations for fathering appear to be more variable than those for mothering. There is more negotiation in families over what fathers will do than over what mothers will do and hence more dependence among fathers on the quality and outcome of those negotiations (Backett, 1987). As Lewis and O'Brien (1987) state, men have a less clear "job description" as fathers than women do as mothers. Therefore, fathers' behavior is strongly influenced by the meanings and expectations of fathers themselves, as well as mothers, children, extended family, and broader cultural institutions.

One of the most sensitive areas of research on fathering is the importance of fathers being married to the children's mothers. Because many fathers are not married to the mother, it can seem prejudicial to these men and their children—and perhaps to single-parent mothers—to emphasize the importance of marriage. On the other hand, an implication of our review of the research and our conceptual framework is that, for most American heterosexual fathers, the family environment most supportive of fathering is a caring, committed, and collaborative marriage. This kind of marriage means that the father lives with his children and has a good partnership with their mother. These are the two principal intrafamilial determinants of responsible fathering.

Some of the controversy over the role of marriage in responsible fathering can be circumvented by specifying the quality of the marriage, as we have done. It is the quality of the marital process, rather than the legal or coresidential status, that most affects fathering. One might argue, then, that being married is not important because cohabiting couples could have the same qualities of relationship. Although, in principle, this is true, the best national research on cohabitation indicates that cohabitation is a temporary arrangement for most heterosexual couples; they eventually either marry or break up (Bumpass et al., 1991). We conclude that, in practice, the kind of mother-father relationship most conducive to responsible fathering in contemporary U.S. society is a caring, committed, collaborative marriage. Outside of this arrangement, substantial barriers stand in the way of active, involved fathering.

Mother Factors

Among external influences on fathering, the role of the mother has particular salience because mothers serve as partners and sometimes as gatekeepers in the father-child relationship, both inside and outside marriage (De Luccie, 1995). Mother factors in the conceptual model, of course, interact with the coparental relationship because the mother's personal feelings about the father influence the coparental relationship. But there is also evidence that, even within satisfactory marital relationships, a father's involvement with his children, especially young children, is often contingent on the mother's attitudes toward, expectations of,

and support for the father, as well as the extent of her involvement in the labor force (De Luccie, 1995; Simons, Whitbeck, Conger, & Melby, 1990). Marsiglio (1991), using the National Survey of Families and Households data set, found that mothers' characteristics were more strongly correlated with fathers' involvement than fathers' own characteristics were. Indeed, studies have shown that many mothers, both inside and outside marriage, are ambivalent about the fathers' active involvement with their children (Baruch & Barnett, 1986; Cowan & Cowan, 1987). Given the powerful cultural forces that expect absorption by women in their mothering role, it is not surprising that active paternal involvement would threaten some women's identity and sense of control over this central domain of their lives. The evolution of a social consensus on responsible fathering, therefore, will necessarily involve a consensus that responsible mothering means supporting the father-child bond.

Contextual Factors

Research demonstrates the particular vulnerability of fathering to contextual and institutional practices—from the establishment of legal paternity to the greater impact of unemployment on fathering than on mothering. Lack of income and poor occupational opportunities appear to have a particularly negative effect on fathering (Thomson, Hanson, & McLanahan, 1994). The prevalence of the abandonment of economic and psychological responsibilities among poor, unemployed men and among other men who undergo financial and employment crises is partly a function of the unique vulnerability of fathering to perceived success in the external environment (Jones, 1991; McLoyd, 1989). This analysis suggests that fathering is especially sensitive to changes in economic forces in the work force and marketplace and to shifts in public policy. It also suggests that fathering suffers disproportionately from negative social forces, such as racism, that inhibit opportunities in the environment. McLoyd (1990), in a review and conceptual analysis of economic hardship in African American families, describes how poverty and racism combine to create psychological distress, which is, in turn, associated with more negative parenting styles and more difficulty in the coparental relationship.

Our conceptual model also depicts the positive contribution of ethnic and cultural factors to fathering. One aspect of responsible fathering, that of economic support, is nearly universally expected of fathers by their cultures (Lamb, 1987b). LaRossa (1997), in his historical analysis, has demonstrated how changing cultural expectations in the first part of the twentieth century led to more nurturing father involvement in the U.S. Allen and Connor (1997) have examined how role flexibility and concern for children in the African American community create opportunities for men to become involved in surrogate father relationships with children who lack day-to-day contact with their biological fathers. Unfortunately, there has not been much empirical research that examines fathering in its cultural context, using representative samples of fathers to explore how cultural meanings and practices influence fathers' beliefs and behaviors.

The final contextual factor in the model is social support, which Belsky (1984) emphasized in his theoretical model of parenting and which McLoyd (1990) documented as a crucial factor in diminishing the negative effects of poverty on parenting behavior. However, most of the research on social support specifically for fathers has focused on mothers as sources of social support. Pleck (1997) reviewed the limited research on extrafamilial social support for fathering and found the studies skimpy and inconsistent, except for the pattern that highly involved fathers tend to encounter negative attitudes from acquaintances, relatives, and fellow workers. Clearly, there is a need for studies that examine the sources and influences of social support on fathering, particularly the role of other fathers.

From the perspective of both the contextual factors and the mother factors discussed thus far, fathering can be conceptualized as a more contextually sensitive process than mothering is. Not that mothering is not also contextually sensitive, but the cultural norms are stricter on the centrality and endurance of the mother-child dyad, regardless of what is happening outside that relationship. Father-child relations, on the other hand, are culturally defined as less dyadic and more multilateral, requiring a threshold of support from inside the family and from the larger environment. Undermining from the mother or from a social institution or system may induce many fathers to retreat from responsible fathering unless their own individual level of commitment to fathering is quite strong.

This point about the ecological sensitivity of fathering is a principal conclusion of this article. It suggests that fathering programs and policy initiatives that focus only on fathers will benefit

mainly fathers who already have a supportive social and economic environment. Fathers whose context is less supportive—for example, fathers who do not live with their children, who have strained relationships with the mother, or who are experiencing economic stress—will need more extensive and multilateral efforts to support their fathering.

Child Factors

Individual child factors are included in the model for completeness, but the child factors studied in the research literature do not appear to be as important as the other dimensions in influencing fathering. Fathers do appear to find it easier to be more involved with their sons, especially older sons, presumably because they identify with them and are more comfortable communicating with them (Marsiglio, 1991). Most of the other child factors, such as age, appear to influence mothers as much as fathers, although Larson (1993) and Larson and Richards (1994) have documented how fathers withdraw more from parent-adolescent conflict than mothers do. More research is needed on the influence of the child's temperament and developmental status on relations with nonresidential fathers. Similarly, research is needed on how the child's beliefs about father involvement influence fathers' and mothers' expectations and behavior.

Mother-Child Relationship Factors

We include this domain for theoretical completeness, but we could find no research directly examining how the father-child relationship is affected by the mother-child relationship. Such effects may be tapped indirectly through other dimensions in the model, such as the mother's attitudes toward the father's involvement with the child. For example, a close mother-child bond, combined with an ambivalent maternal attitude toward paternal involvement, might lead to less closeness of the father than a situation in which a mother had the same attitude but, herself, was less close to the child.

Father Factors

Fathers' role identification, skills, and commitment are important influences on fathering (Baruch & Barnett, 1986; Ihinger-Tallman et al., 1995; Pleck, 1997). These three appear to fluctuate from low to high levels along with a number of interpersonal and contextual factors, such as the mother's expectations and the father's residential status with his children (Marsiglio, 1995; Ihinger-Tallman et al., 1995). In American culture, fathers are given more latitude for commitment to, identification with, and competence in their parental role. This latitude brings with it the price of confusion for many fathers about how to exercise their roles (Daly, 1995).

The variability of the individual father factors suggests two important implications of our conceptual model: that the positive support from mothers and the larger context can move men in the direction of more responsible parenting even in the face of modest personal investment, and that strong father commitment, knowledge, and skills are likely to be necessary to overcome negative maternal, coparental, and contextual influences. This latter point is similar to Lamb's (1987a) hypothesis that high levels of father motivation can override institutional barriers and the lack of social support.

As for the father's experience in his own family of origin, some research suggests that the father's relationship with his own father may be a factor—either through identifying with his father or compensating for his father's lapses—in contributing to his own role identification, sense of commitment, and self-efficacy (Cowan & Cowan, 1987; Daly, 1995). Snarey (1993), in a longitudinal study, documented the role of multigenerational connections between fathers.

The final father factors, psychological well-being and employment characteristics, have been studied extensively. Research examining psychological adjustment and parenting quality consistently shows a positive relationship between fathers' (and mothers') psychological well-being and their parenting attitudes and skills (Cox et al., 1989; Levy-Shiff & Israelashvili, 1988; Pleck, 1997). The research on job loss and economic distress generally has examined declines in psychological well-being as mediating factors leading to poorer fathering (Elder et al., 1984; Elder et al., 1985; Jones, 1991). And fathers' work situations have been shown to have mixed relationships with involvement with children. Specific work schedules are not strongly related to involvement, but greater flex time and other profamily practices are associated with more father involvement (Pleck, 1997). Indeed, consistent with other research on fathering, mothers' employment characteristics are more strongly associated with fathers' in-

volvement than fathers' employment characteristics. When mothers are employed, fathers' proportionate share of parenting is greater, although studies are inconsistent about the absolute level of father involvement (Pleck, 1997).

Conceptual Overview

The conceptual model outlines multiple factors that influence fathering, from individual and relational to contextual. The factors can be viewed as additive. For example, low identification with the parental role, combined with low expectations from the mother, would be strongly associated with low involvement of the father in both residential and nonresidential contexts. High identification with the parental role, combined with high expectations from the mother, would lead to greater father involvement in any residential context.

The factors in the model also can be viewed as interactive. For example, high role identification and good employment and income might be sufficient to offset low expectations from the mother. Similarly, not living with the child could be offset by the father's strong commitment to his children and the support of the mother. And strong institutional support through public policies could mitigate unmarried fathers' and mothers' reluctance to declare paternity.

Although the conceptual framework is intended to apply to the four domains of responsible fathering (paternity, presence, economic support, and involvement), most of the research has focused on one or another of these areas. Indeed, the bulk of the empirical research has been on father involvement. Researchers have tended to assume that economic factors uniquely influence economic support and that father factors uniquely influence father involvement. Putting a range of factors into one model challenges researchers to examine how all the factors might influence all the domains of responsible fathering. We acknowledge that some components of the model are likely to influence some aspects of fathering more than others.

Finally, the model should be seen as depicting a dynamic set of processes, rather than a set of linear, deterministic influences. Systemic, ecological models run the risk of reducing the target behavior—in this case, responsible fathering—to a contextually determined phenomenon stripped of individual initiative and self-determination. We want to emphasize the pivotal role of fathers, themselves, in appropriating or discarding cultural and contextual messages, in formulating a fathering identity and developing fathering skills with their own children, in working out their feelings about their own fathers, and in dealing collaboratively with their children's mother. The social construction of fatherhood is an evolving creation of all stakeholders in the lives of children, and contemporary fathers have a central role in this creation. The active construction of fathering by fathers, themselves, is not a prominent theme in the research literature, although it is crucial to programs that work with fathers. More qualitative research is needed to explore the kinds of identity development and social negotiation that constitute the experience of fathering.

Conclusion

This article delineates a conceptual model of influences on fathering that can serve as a stimulus for future research, programming, and policy development. The main premise, supported by a variety of studies, is that fathering is uniquely sensitive to contextual influences, both interpersonal and environmental. Fathering is a multilateral relationship, in addition to a one-to-one relationship. A range of influences—including mothers' expectations and behaviors, the quality of the coparental relationship, economic factors, institutional practices, and employment opportunities—all have potentially powerful effects on fathering. These contextual factors shape the major domains of responsible fathering discussed here: acknowledgment of paternity, willingness to be present and provide economic support, and level of involvement with one's children. When these influences are not supportive of the father-child bond, a man may need a high level identification with the father role, strong commitment, and good parenting skills to remain a responsible father to his children, especially if he does not live with them.

This review and conceptual model deal with factors that promote active, involved fathering, not with the effects of that kind of fathering on children. (See review by Pleck, 1997.) Nor do we take a position on whether there are essential characteristics of fathering versus mothering or whether having parents of two genders is necessary for the well-being of children. The growing literature on gay and lesbian parenting suggests that these kinds of questions are more complex than many scholars assumed in the past (Patterson, 1992; Patterson & Chan, 1997). However, it is not necessary to resolve these issues in order to address the factors that enhance and inhibit the

parenting of men in the role of father in the late twentieth century.

A potentially controversial conclusion of this article is that a high quality marriage is the optimal context for promoting responsible fatherhood. This position moves opposite the trend in contemporary family studies to disaggregate marriage and parenting. We do not suggest that men cannot parent adequately outside this context or that children must be raised in a married household in order to grow up well adjusted. However, we believe that the research strongly indicates that substantial barriers exist for most men's fathering outside a caring, committed, collaborative marriage and that the promotion of these kinds of enduring marital partnerships may be the most important contribution to responsible fathering in our society.

An encouraging implication of this systemic, ecological analysis is that there are many pathways to enhancing the quality of father-child relationships. Fathering can be enhanced through programs and policies that help fathers relate to their coparent, that foster employment and economic opportunities if needed, that change institutional expectations and practices to better support fathers, and that encourage fathers' personal commitment to their children.

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