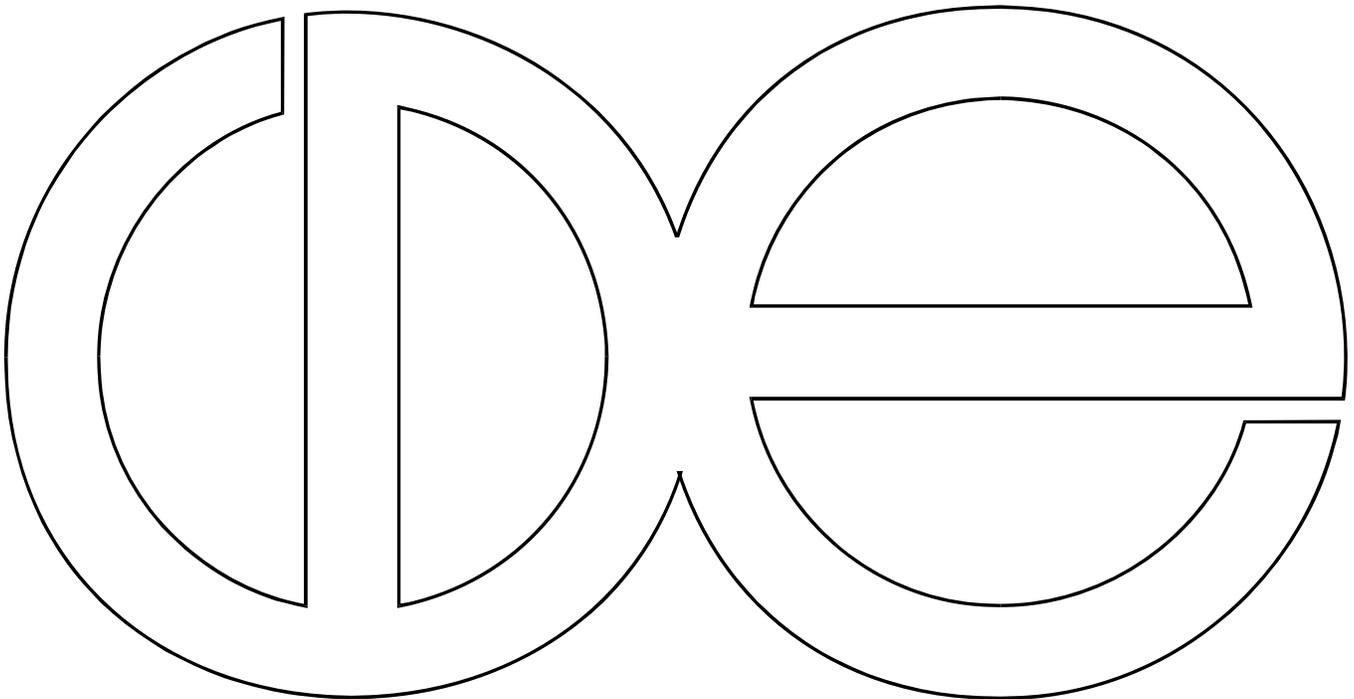


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of Nonmarital Fertility**

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## ABSTRACT

We use data from the 2002 National Survey of Family Growth ( $N=11,182$ ) to examine the intergenerational transmission of nonmarital fertility for both men and women. We find that being born to unmarried parents increases the risk of both (adult) sons and daughters having a nonmarital first birth. Family instability appears to be a key mechanism by which parents' nonmarital birth is linked to offspring fertility, although net of all mechanisms and covariates, being born to unmarried parents remains a significant predictor of daughters'—but not sons'—having a nonmarital birth. We find that gender, race/ethnicity, and SES all moderate the intergenerational transmission of nonmarital fertility.

Keywords: Nonmarital fertility; intergenerational transmission

Running head: Intergenerational Transmission of Nonmarital Fertility

## INTRODUCTION

An extensive literature has shown that family structure is associated with adverse outcomes for children and adolescents: children who spend time living away from their biological fathers are at a greater risk of behavioral problems, having sex or bearing children at an early age, dropping out of high school, and a host of other negative outcomes—compared to those who grow up living with both biological parents (McLanahan & Sandefur, 1994; Sigle-Rushton & McLanahan, 2004). The steep increase in divorce beginning in the late 1960s and early 1970s (DaVanzo & Rahman, 1993) meant that an increasing number of children spent time in a single-parent home, and a large literature from the 1980s and beyond has examined the associations between single motherhood and outcomes for children following biological parents' divorce. Some of this research has focused on adult children, emphasizing the link between childhood family structure and subsequent premarital fertility (Wu & Martinson, 1993; Wu, 1996; McLanahan & Bumpass, 1988), although this work has focused primarily on women.

While overall divorce rates rose considerably up until the 1970s, they have declined in the two subsequent decades (particularly among those with some college education while remaining high for those with a high school degree or less) (Martin, 2006). By contrast, nonmarital childbearing has increased steadily from the early 1960s until the present time, rising from 6% of births outside of marriage in 1960 to fully 41% of births in 2008 (Hamilton et al., 2010). Despite this notable increase, there has been little attention to how being born to unmarried parents may influence offspring fertility and family formation behaviors, including the extent to which nonmarital childbearing may be transmitted across generations.

In this paper, we examine how being born to unmarried parents is linked to the risk of offspring themselves having a nonmarital birth. We examine three research questions. First, how

is being born outside of marriage linked to one's own subsequent nonmarital fertility for both men and women? Second, what are the mechanisms by which the intergenerational transmission of nonmarital fertility appears to operate? And third, is the association between nonmarital birth and having a nonmarital first birth moderated by gender, race/ethnicity, and socioeconomic status (SES)? In the following sections, we review the conceptual and empirical literature related to our three research questions. Then, we describe our data and analytic approach. Finally, we summarize our results and discuss the implications of our findings.

## THEORETICAL BACKGROUND

### *The Intergenerational Transmission of Nonmarital Fertility*

A number of studies, particularly within the U.S., have documented the intergenerational transmission of family-related behaviors. One robust U.S. finding is that children whose parents divorced during their childhood are themselves more likely to dissolve their marriages (Wolfinger, 2000; Amato, 1996; Li & Wu, 2008; McLanahan & Bumpass, 1988; Bumpass et al., 1991), and this holds true across a number of European countries as well (Diekmann & Schmidheiny, 2008). By contrast, individuals raised by stably married parents are more likely to themselves have stable marriages (Wolfinger, 2005; Amato & DeBoer, 2001). Research has also shown that fertility behaviors are transmitted across generations, in part via behavioral socialization (Anderton et al., 1987). Parents' timing of first births, for example, transmits across generations for both sons and daughters; offspring whose fathers and mothers have an early first birth are significantly more likely themselves to have an early first birth (Thornberry et al., 1997; Barber, 2001; Pears et al., 2005).

At the intersection of union formation and fertility behaviors is nonmarital fertility, which as noted earlier, has seen a steady rise in the U.S. (and many Western nations) since the early

1960s. Yet, to our knowledge, whether nonmarital fertility is transmitted across generations has not been directly examined in the extant research. We aim to extend the literature by examining whether (adult) children born to unmarried parents are themselves more likely to experience a nonmarital first birth than their counterparts born to married parents.

### *Mechanisms for the Intergenerational Transmission*

Beyond evaluating the association between parents' and (adult) children's nonmarital fertility, an obvious next step is to understand *how* nonmarital fertility might be transmitted across generations. In other words, what are the mechanisms by which the intergenerational transmission occurs? We draw on the extensive literature about family structure and the mechanisms by which parents' divorce is expected to affect offspring outcomes, particularly related to union formation and fertility, to explore this question. These include: parents' economic resources, childhood socialization, parental social control during adolescence, and family instability and change (Wu & Martinson, 1993; Sigle-Rushton & McLanahan, 2004; Wu, 1996; Barber, 2001). We expect that nonmarital childbearing may operate similarly to divorce in affecting family formation and fertility outcomes, since nonmarital childbearing typically is followed by single parenthood and family instability (with the related implications for parenting and socialization) and occurs to economically-disadvantaged parents. We summarize each of these four key mechanisms below.

*Economic Resources.* Parents' economic resources are central to children's development and life chances, as they enable parents to purchase the necessary material goods and services, such as medical care, higher quality child care and schools, as well as books, toys and experiences that improve developmental processes; it is well-known that low income is detrimental to children's home environment and well-being (Duncan & Brooks-Gunn, 1997;

Berger et al., 2009). Two (working) parents are better able to provide financially for their children than a single parent simply because there are two incomes in the home. In turn, economic resources have been shown to account for about half of the gap in well-being between children living in two-parent versus single-parent families after divorce (McLanahan & Sandefur, 1994). Prior research suggests that parents who have children before marriage are typically economically disadvantaged with respect to education, earnings and income (Nock, 1998; Beck et al., 2010). Therefore, we expect that low economic resources are one pathway by which being born to unmarried parents may increase the likelihood of offspring nonmarital fertility.

Second, the childhood socialization perspective argues that parents play an important role in shaping the next generation via the care and nurturing provided to children and the opportunities for children to observe and learn about appropriate roles, norms and behaviors (Bengtson, 1975; Barber, 2001). While unmarried parents do not necessarily become single parents, we know that at least for contemporary unmarried parents, the majority are likely to break up within only a few years of a child's birth (Högnäs & Carlson, Forthcoming). The socialization perspective suggests that parents' behavior impacts children even as they become adults, particularly via the modeling of family roles and relationships they experienced during childhood. Fathers' absence may contribute to children's development of expectations about adult relationships and the contexts that are best for having and rearing children (McLanahan & Sandefur, 1994). We know that children who experience their parents' divorce will be more likely to later experience divorce themselves (McLanahan & Bumpass, 1988) in part because they are socialized to have a lower commitment to the institution of marriage (Amato & DeBoer, 2001). More generally, those reared by single or unmarried parents may develop normative

attitudes and beliefs that may subsequently contribute to their likelihood of having a nonmarital birth.

*Social Control during Adolescence.* Third—and related to the socialization perspective, the social control perspective argues that two co-residential parents are better able to care for their children than one parent, largely because there are two adults to provide the monitoring and appropriate social control that are intrinsic to positive parenting (Amato, 1987; Sigle-Rushton & McLanahan, 2004). Single mothers often work outside the home (Edin & Lein, 1997; Newman, 1999), which limits their capacity to monitor their children's behavior—they simply have less time and access to do so. In the absence of a second parent to assist with monitoring adolescents' behavior, single mothers may find it difficult to identify, address, and thwart delinquent behavior. The presence of two parents may curb such behaviors as early sexual debut (Wu & Thomson, 2001), which is linked to a higher risk of nonmarital childbearing.

*Family Instability.* Finally, scholars argue that family instability, particularly parents' union transitions, causes a great deal of stress for children, which may affect their behavior (Fomby & Cherlin, 2007; Osborne & McLanahan, 2007). Family instability increases mother's stress and psychological well-being and this has negative consequences for children's outcomes (Osborne & McLanahan, 2007; Cooper et al., 2009). When parents have unstable relationships or break up, children are forced to go through many changes that affect their lives, including the onset of (or ongoing) conflict between parents, new schools, distance from relatives, parents' re-partnering, etc. (Amato & Keith, 1991). As a result, children may feel that they are less able to count on one or both of their parents and may seek attention elsewhere, including in sexual or romantic relationships, which may result in early sexual debut and parenthood (McLanahan, 1985).

In sum, we expect that economic resources, socialization, social control, and family instability are key mechanisms by which nonmarital fertility may be transmitted across generations. We evaluate each of these in our analyses to the extent that our data allow; unfortunately, we are not able to evaluate the childhood socialization mechanism due to data limitations.

#### *Variation by Gender, Race/Ethnicity and SES*

*Gender.* Compared to the large body of research examining the link between family structure and daughters' fertility and family formation behaviors (Wu & Martinson, 1993; Wu, 1996; Powers, 1993; Hogan & Kitagawa, 1985; McLanahan & Sandefur, 1994; Albrecht & Teachman, 2003; McLanahan & Bumpass, 1988; Driscoll et al., 1999), we know significantly less about sons. Several studies have focused on the influence of family background on sons' fertility behaviors, particularly early or adolescent fathering. Sons whose fathers were absent from the home during childhood were significantly more likely to have their first child in their teen years (Forste & Jarvis, 2007; Furstenberg & Weiss, 2000), although this appears to be less true for more recent cohorts (Goldscheider et al., 2009). Sons who experienced multiple family transitions were also more likely to transition into parenthood early (Hofferth & Goldscheider, 2010). Sons raised by one parent were also more likely to have a child with more than one partner (Carlson & Furstenberg, 2006; Guzzo & Furstenberg, 2007) and less likely to co-reside with their children (Guzzo & Furstenberg, 2007). Also, mothers' early first births significantly increased sons' likelihood of entering fatherhood early (Sipsma et al., 2010; Pears et al., 2005; Thornberry et al., 1997).

Given the relative dearth of studies examining the effects of childhood family structure on nonmarital fertility for sons—particularly beyond teen/early fatherhood, we extend the

literature to examine how nonmarital fertility is reproduced across generations for men. Also, we examine whether gender moderates the intergenerational association between parents' and children's nonmarital fertility.

*Race/ethnicity.* The fraction of births that occur outside of marriage has long been higher among racial and ethnic minorities. As of 2008, fully 72% of African American births and 53% of Hispanic births occurred outside of marriage compared to about 29% of white births (Hamilton et al., 2010). A long literature suggests that nonmarital births have been more prevalent within Black communities, and to some extent this racial difference has been attributed to neighborhood differences in concentrations of poverty (Wilson, 1987; South & Baumer, 2000). Others have argued that early sexual intercourse, less consistent contraception, and childbearing outside of marriage are more normative in African American communities (see Furstenberg, 1987 for a review), explaining the higher prevalence of nonmarital births (particularly among adolescents). Whether norms or concentrated neighborhood poverty explain the higher prevalence, these circumstances suggest that we would expect that within African American families, parents' nonmarital childbearing might be more predictive of sons' and daughters' nonmarital childbearing than in other race/ethnic groups.

*Socioeconomic status.* Similarly, it is well-known that nonmarital childbearing is more common among individuals of low socioeconomic status (SES) (Hoffman & Foster, 1997; Trent, 1994; Aassve, 2003). Although not all nonmarital births are unintended (Edin & Kefalas, 2005), and many occur within cohabiting unions (Högnäs & Carlson, Forthcoming), data from the National Maternal and Infant Health Survey show that most unintended births occur to unmarried parents, 64% of these births are to mothers whose income falls below the poverty line, and 58% have less than a high school degree (Kost & Forrest, 1995). Additionally, if children

born to low-income parents are more likely to be low-income themselves (Gottschalk, 1992), we would also expect being born outside of marriage to be more strongly linked to offspring nonmarital fertility in the context of low parental education—our measure of SES.

## METHOD

### *Data*

We use data from the National Survey of Family Growth (NSFG) to examine the link between parents having a nonmarital birth and the subsequent risk of sons and daughters having a nonmarital birth. The NSFG was historically a study of women ages 15-44 with six repeated cross-sections interviewed between 1973 and 2002; the surveys included detailed questions about women's sexual activity, contraception, pregnancy and birth, marriage, cohabitation, and divorce. In Cycle 6 in 2002, 7,643 women ages 15-44 were interviewed. Fifty-eight percent ( $n=4,413$ ) of these women reported having at least one biological child, 45% ( $n=1,971$ ) of which were nonmarital.

For the first time in 2002, the NSFG included in-person interviews with 4,928 men ages 15-44. Thirty-five percent ( $n=1,731$ ) of these men reported having at least one biological child, 47% ( $n=808$ ) of which were nonmarital. Even though these data are cross-sectional, they can be used to construct retrospective longitudinal histories, so we can examine the link between marital statuses at birth across two generations. It is important to note that previous research has documented that men tend to underreport births in surveys (Rendall et al., 1999; Joyner et al., 2010); however, comparisons drawn between the NSFG and vital statistics data suggest only minor under-reporting in later cohorts (Martinez et al., 2006). We plotted the birth status of sons in the NSFG (i.e., whether their parents were married at the respondent's birth) as compared with national figures reported by the National Center for Health Statistics (figure not shown) over

years 1960 to 1988; this comparison suggested that the NSFG data follow the same trend line as the national data, although nonmarital births before 1978 may have been slightly over-reported and after 1978 slightly under-reported, compared to the national figures.

Missing data on our independent and dependent variables as well as our covariates were always less than 10%. Given the small percentage missing on any given variable, we do not suspect that missing values introduce substantial bias in our results. After accounting for combined missing in each sample we have sample sizes of  $N=4,416$  for men,  $N=6,766$  for women, and  $N=11,182$  for our pooled sample.

### *Variables*

Our dependent variable is the timing of sons' and daughters' first birth transition and whether this occurred outside of marriage. In the 2002 cycle of the NSFG, both men and women were asked about their marital status at the time their first child was born. Respondents were coded as 1 if they reported being unmarried at the time of their first birth. The reference category (equal to 0), included both those who had a marital birth and those who had not had a birth by the time of the interview. (Our substantive conclusions are the same if we separate out those with no birth and those with a marital birth and run a multinomial logit model.) We set our risk period to begin at age 15. Therefore, for our time measure we subtracted the date at which the respondents were 15 years old from their first child's date of the birth. Those who had not had a child and those who were married by the date of the interview were censored. We also ran models (not shown) starting the risk period at age at first sex, and the substantive results were very similar. Given the potential for recall problems, particularly for older cohorts who had sex long prior to the interview, and because we wanted to retain those who had not yet had sex in our sample, we set the risk period starting at age 15 for our main analyses.

Our main independent variable was whether or not the respondents' parents were married at the time of their birth. For both sons and daughters, those whose parents were married at their birth were coded as a 0 (reference category). Respondents whose parents were not married at their birth were coded as a 1.

To select our control variables, we relied on prior research, particularly literature related to factors associated with fertility behaviors for women (e.g., Barber, 2001; McLanahan & Sandefur, 1994; Wu & Thompson, 2001). We used four dummy variables for respondents' race/ethnicity: non-Hispanic White (reference), Hispanic, non-Hispanic African American, and non-Hispanic Other. To account for the secular change in nonmarital childbearing, we measured respondent's birth cohort using seven dummy variables for five-year birth cohorts of 1960-64 (reference), 1965-69, 1970-74, 1975-79, 1980-84, 1985-89, and 1990-94. We used a dummy variable to indicate whether respondents' mothers were younger than age 20 when their first child was born. The number of siblings the respondent grew up with was measured continuously. Religious affiliation was measured using five dummy variables: no religion (reference), Catholic, conservative Protestant, Protestant, and Other. We controlled for the level of education of the respondent using four dummy variables: less than a high school degree (reference), high school degree, some college, and a college degree or more.

Drawing on prior research, we examined whether economic resources, social control during adolescence, and family instability mediate the relationship between parents' marital status at sons' and daughters' birth and their subsequent marital status at their first birth. To examine economic resources, we used a proxy of socioeconomic status—parents' educational attainment, which is strongly related to parental earnings and household income; fathers' education was measured using four dummy variables: less than high school (reference), high

school degree, some college, and a college degree or more. For parsimony and because mothers' and fathers' education tend to be highly correlated, we included a dummy variable indicating whether the mother had more education than the father. Social control during adolescence was measured using a dummy variable indicating whether the mother worked during the respondents' childhood and using a dummy variable for whether the respondents' age at first sex was less than or equal to 15. Finally, family instability was measured using a dummy variable indicating whether or not respondents' parents had broken up by the time they were age 14. As noted earlier, unfortunately, a measure of childhood socialization was not available in the NSFG data.

### *Analytic Approach*

Our goal was to estimate how parents' marital status at sons' and daughters' birth influenced respondents' subsequent risk of having a nonmarital first birth, net of covariates. We censored at marriage (or at the survey if no birth occurred) because we are interested in individuals bearing children before ever marrying. (Our substantive results are not altered if we include post-marital unmarried births in our sub-group of interest.) Consistent with prior research on fertility behaviors (Bumpass & McLanahan, 1989; Wu & Thomson, 2001; Guzzo & Hayford, 2009), we estimated Cox Proportional Hazard regression models. These event-history models do not require that researchers make assumptions about the timing of nonmarital births (Allison, 1995). Although intuitively, one would expect these births to occur more frequently in the early twenties and less frequently in the mid- to late thirties and early forties, this commonly-used approach allows nonmarital births to occur at any point during the risk period—which in this case is between ages 15 and 44.

We estimated five models for both sons and daughters. The first model included background controls for race/ethnicity, birth cohort, and whether the respondent's mother had

her first birth under age 20. Our second model added parental economic resources, measured by fathers' educational attainment and whether the mothers' education was greater than the fathers'. The third model added two measures of parenting and social control—whether the mother worked during the respondent's childhood and whether the respondent had sex before age 15. The fourth model added the measure of family instability—whether the respondent's parents had split up by the respondent's age 14. Finally, our fifth model added all of our remaining covariates that reflect aspects of the respondent's experiences during childhood into early adulthood.

## RESULTS

### *Descriptive Statistics*

We begin by describing the characteristics of our sample. Table 1 shows the weighted means and percentages for our covariates; we show figures separately for sons and daughters by their parents' marital status at the time of their birth because we are particularly interested in differences by whether respondents were born to married versus unmarried parents. Beginning with background characteristics, sons whose parents were married when they were born were much more likely to be White (70%) than either Hispanic (15%) or African American (9%), while among sons born to unmarried parents, there was a more even distribution by race/ethnicity (38% were White, 25% were Hispanic, and 33% were African American). The difference in race/ethnicity by parents' marital status was in the same direction but larger for daughters. A higher percentage of sons whose parents were unmarried at the time of their birth were born in later cohorts compared to earlier cohorts (except in the 1990-94 cohort, since many were too young to have had a birth). Sons and daughters born to unmarried parents were more likely to have mothers who were teenagers at their first birth. Parents who were not married at

the time of respondents' birth were less likely to have completed college than parents who were married at the time of their birth.

With respect to parenting and social control factors, not surprisingly, sons and daughters of unmarried parents were slightly more likely to have mothers who worked during their childhood compared to those whose parents were married at the time of their birth. Few sons or daughters had a sexual debut at age 15 or younger (less than 2% of all groups). In terms of family instability, for both sons and daughters, more than 50% of those whose parents were not married at their birth had broken up by the time they were age 14 compared to less than 20% of those whose parents were married at the time of their birth.

There were no differences between those whose parents were married or unmarried at the time of their birth with respect to their average number of siblings, which is relatively high for all groups (around 3.4-3.5). There were few differences in the religion in which respondents were raised by whether or not their parents were married. Thirty-five percent and 37%, respectively, of the sons and daughters of unmarried parents had less than a high school degree, compared to 21% of sons and 18% of daughters whose parents were married at their births. Moreover, a higher percentage of both sons and daughters of married parents had at least some college.

<Table 1 about here>

Given our focus on the intergenerational transmission of nonmarital fertility, next we describe sons' and daughters' fertility status by parents' marital status at their birth (Table 2). We found that fewer sons and daughters had a nonmarital first birth if their parents were married at the time of their own birth: 26% of sons born to unmarried parents subsequently had a nonmarital birth compared to 15% of those whose parents were married at their birth. The difference is even greater for daughters, with 39% of daughters of unmarried parents having a

nonmarital birth compared to 18% of daughters whose parents were married. Based on chi-square tests (not shown), each of these differences was statistically significant.

<Table 2 about here>

### *Multivariate Analyses*

Turning now to our multivariate analyses, Table 3 shows results from our Cox models predicting the risk of sons' nonmarital birth as a function of their parents' marital status at birth and other covariates. We report hazard ratios, which indicate the risk of having a nonmarital first birth (versus having a marital first birth or no birth) by the date of the interview. Results in Model 1 show that parents' nonmarital status at sons' birth significantly increased the risk of sons having a nonmarital birth themselves, controlling for race/ethnicity, cohort, and whether mother had her first birth as a teenager. Those born outside of marriage were 30% more likely to have a nonmarital birth than those born within marriage. When we added parental economic resources in Model 2, there was a slight decrease in the size of the hazard ratio for parents' nonmarital birth status (from 1.30 to 1.27), suggesting that a very small percentage of the explanation for how nonmarital fertility is transmitted from one generation to the next is due to parents' economic resources.

Model 3 shows that once we account for parenting and social control factors, sons remained at a significantly increased risk (1.25) of having a nonmarital birth versus a marital or no birth if their parents were not married when they were born; thus, parenting/social control does not appear to be a primary mechanism by which nonmarital childbearing is transmitted. On the other hand, once we control for family instability in Model 4, parents' marital status at sons' birth no longer significantly increased the risk of his having a nonmarital birth. This suggests that

the influence of parents' marital status on sons' risk of having a nonmarital birth operates in part through the instability of unmarried relationships.

<Table 3 about here>

Table 4 shows results from the same set of models predicting the risk of a nonmarital birth for daughters. Focusing on Model 1, we see that daughters were at a much greater risk of having a nonmarital birth (than a marital or no birth) if their parents were not married at their birth, when we control for race/ethnicity, cohort, and mother age at first birth. Again, as with sons, when we added parental economic resources in Model 2, the hazard ratio for daughters' risk of having a nonmarital birth if their parents had a nonmarital birth decreased from 1.52 to 1.46, suggesting that parental resources plays a very limited role in daughters' risk. Adding the parenting/social control factors (Model 3) did not notably change the magnitude of the nonmarital birth coefficients (1.46 to 1.45), suggesting that as with sons, this does not appear to be a mechanism by which nonmarital childbearing is transmitted. Adding instability (Model 4) reduced the nonmarital birth coefficient to 1.28 (but it remained highly significant), indicating that instability partially accounts for how parents' nonmarital birth is linked to daughters' nonmarital childbearing. Finally, when we included respondent characteristics (Model 5), the magnitude and significance of the estimate declined (1.28 to 1.15), but daughters remained at a significantly increased risk of having a nonmarital birth versus a marital or no birth.

With respect to our covariates, the patterns were similar for both sons and daughters. Focusing on Model 5, we see that for both sons and daughters, African Americans had a much greater risk (and Hispanics had a much lower risk) of having a nonmarital birth compared to Whites. We also see that respondents in more recent cohorts were more likely to have a nonmarital birth. Daughters (but not sons) were at a higher risk of having a nonmarital birth if

they had more siblings, while having sex by age 15 increased the risk that both sons and daughters had a nonmarital birth. The religion in which respondents were raised was not significantly related to the risk of having a nonmarital birth for neither sons nor daughters. On the other hand, respondents' own education is a strong predictor of both sons and daughters having a nonmarital birth—with more education at each level significantly reducing the risk.

<Table 4 about here>

Table 5 reports the results for our analysis of moderators; each set of interactions was estimated in a separate model using the pooled sample of men and women and included all covariates. Beginning with the gender interactions, the results show that sons whose parents were unmarried at their birth were at a significantly lower risk of having a nonmarital birth (versus a marital birth or no birth) compared to daughters whose parents were unmarried at their birth (hazard ratio of .47). In addition, both daughters and sons whose parents were married at their birth were at a significantly lower risk of having a nonmarital birth compared to daughters whose parents were unmarried at their birth. However, the magnitude of the difference for daughters born to married parents was smaller and less statistically significant than it was for sons born to married parents. These results suggest that being born outside of marriage is a stronger predictor of women's future nonmarital childbearing than it is for men's.

With respect to race/ethnicity, the results suggest that regardless of parents' marital status at their birth, African Americans were at a much greater risk of having a nonmarital birth compared to Whites whose parents were unmarried at their birth. Hispanics whose parents were unmarried at their birth were also more likely to have a nonmarital birth than Whites with unmarried parents, but the hazard ratio for Hispanics with married parents was not statistically significant. Whites whose parents were married at their birth were less likely to have a

nonmarital birth than those with unmarried parents; however, this hazard ratio was only marginally statistically significant.

We also examined interactions by socioeconomic status, measured by fathers' education; for simplicity, we coded those whose fathers had a high school degree or less as *low SES* and those whose fathers had at least some college as *high SES*. We found that SES plays an important role in the transmission of nonmarital fertility: respondents from all groups were at a significantly lower risk of having a nonmarital birth compared to those from low-SES backgrounds whose parents were not married at their birth.

<Table 5 about here>

In order to provide a more intuitive presentation of our interaction results, Figure 1 shows survival curves for having a nonmarital birth corresponding to each set of models reported in Table 5. Each set of survival curves shows the cumulative probability of respondents having a nonmarital birth with exposure beginning at age 15. Panel A shows that daughters whose parents were not married when they were born represented the smallest proportion of the sample to have survived the period of exposure without having a nonmarital birth; the greatest proportion was sons whose parents were married at their birth, followed closely by daughters whose parents were married at their birth. The group in Panel B most likely to have survived the period of exposure without having a nonmarital birth was Whites with married parents, and the smallest proportion not having a nonmarital birth was African Americans, regardless of parents' marital status at their birth. Panel C additionally confirms our results that those from lower-SES backgrounds and whose parents were unmarried at their births are the least likely to have survived the period of exposure without having a nonmarital birth, and those from higher-SES

backgrounds whose parents were married at their births had fewer nonmarital births during the period of exposure.

## DISCUSSION

This paper examines how nonmarital childbearing is transmitted across generations. We constructed retrospective histories using data from the NSFG to estimate the risk of a nonmarital first birth as a function of sons' and daughters' being born outside of marriage, a range of covariates, and several potentially mediating factors occurring at different points during the early life course. We extend prior research considering the link between family structure and nonmarital fertility focused primarily on women, and a scant literature on early fatherhood, to include the intergenerational transmission of nonmarital fertility for both men and women. No prior research (of which we are aware) has focused specifically on whether parents' nonmarital fertility influences offspring's subsequent nonmarital fertility.

We find that, for both sons and daughters, whether their parents were married at their births significantly influenced their own risk of later having a nonmarital first birth, suggesting that fertility behaviors are indeed transmitted inter-generationally. We then examined whether economic resources, social control during adolescence, and family instability mediated the relationship between parents' marital status at sons' and daughters' birth and their subsequent marital status at their first birth (we did not have a measure of childhood socialization).

Consistent with prior research focused on *early* fertility (Anderton et al., 1987; Barber, 2001), we found that the risk of sons and daughters having a nonmarital first birth when their parents had a nonmarital birth was transmitted most notably through family instability (parents breaking up by age 14). However, parental economic resources and social control during adolescence played a very limited role in the transmission of nonmarital childbearing, which is inconsistent with

research on early fertility (Barber, 2001). These findings are, however, consistent with prior research on how family structure relates to the premarital fertility of women (Wu & Martinson, 1993; Wu, 1996).

On the other hand, when we look at the direct effect of our social control measures on sons' and daughters' risk of having a nonmarital first birth, daughters' risk of having a nonmarital first birth increased when their mothers worked, but sons' risk did not. This suggests that daughters may be more vulnerable to their mothers' absence from the home than are sons—something noteworthy for future research. Daughters' risk of having a nonmarital first birth decreased when their fathers had a college degree or more, which was also not the case for sons. This suggests that, although parental economic resources may not mediate the transmission of parents' nonmarital fertility to daughters, the direct impact of greater parental resources may buffer daughters from having their first child outside of marriage.

We also examined whether gender, race, and socioeconomic background moderated the relationship between parents' marital status at respondents' birth and their subsequent marital status at their first birth. We found that males were at a significantly decreased risk of having a nonmarital first birth compared to females, regardless of parents' marital status at their births. This was also true for African Americans compared to Whites, which is inconsistent with South and Baumer (2000), who found that premarital childbearing among African Americans is largely linked to the circumstances associated with living in distressed, poor communities. On the other hand, if African Americans are more likely to live in distressed communities than in more affluent communities (regardless of resources); our findings are not necessarily inconsistent with South and Baumer's. As expected, we found that having a higher socioeconomic background generally buffered those whose parents had a nonmarital birth against the risk of later having a

nonmarital first birth. Furthermore, both those from high and low socioeconomic backgrounds whose parents were married at their birth had a reduced risk of having a nonmarital first birth compared to no birth or a marital birth.

It is important to note several limitations of this study. First, the scope of the family background questions limits what we know about parents. Because the NSFG is largely concerned with fertility and health, they ask nothing about the parenting experienced during childhood or parents' attitudes and beliefs regarding childbearing, which would be useful measures of childhood socialization. Our analyses are also restricted to parents' education as our primary measure of socioeconomic background. We do not have measures of parents' income during sons' and daughters' childhood or adolescence, nor do we have information about changes in parental income. Prior research, however, suggests that the effects of changing family structures and family income independently influence daughters' premarital fertility (Wu, 1996). If this holds for men, is not likely that the absence of family income in our models biases our results in a significant way. Finally, men's underreporting of the number of births they have fathered is another potential limitation, although prior research (Martinez et al., 2006) suggests this is less worrisome in the NSFG than in other studies (Rendall et al., 1999). Despite these limitations, this study sheds new light on nonmarital fertility by adding to the literature an empirical investigation of whether parents having a nonmarital birth increases the risk of their children later having a nonmarital birth—a link not previously considered (to our knowledge).

The increasing prevalence of nonmarital fertility and the instability of couple relationships (Beck et al., 2010), the absence of fathers (Tach et al., 2010), and the economic hardship (Nock, 1998) which tend to follow nonmarital births have important implications for the well-being of future generations. To the extent that having a nonmarital first birth is

associated with negative outcomes for children even as they become adults (Haveman et al., 2001), the intergenerational transmission of nonmarital fertility may reinforce other social forces affecting poverty and inequality (e.g., the availability of low-wage work, educational opportunities, neighborhoods, etc), particularly for women. On the other hand, if parents' nonmarital fertility itself results from preexisting disadvantages (selection factors) set in place when children are born, future research should attempt to disentangle these effects in order to better understand the most salient risk factors associated with nonmarital fertility for the next generation and its consequences.

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Table 1: Sample Characteristics For Sons and Daughters by Their Parents' (G1)<sup>a</sup>  
Marital Status at First Birth

	Sons		Daughters	
	G1 Married	G1 Not Married	G1 Married	G1 Not Married
	<i>M</i> or % ( <i>sd</i> )		<i>M</i> or % ( <i>sd</i> )	
<u>Background Characteristics</u>				
Race				
White	69.8	38.0	71.3	32.2
African American	8.8	32.7	9.2	41.8
Hispanic	15.4	24.8	13.7	22.2
Other	6.0	4.5	5.8	3.7
Respondent's Birth Cohort				
1960-64	11.3	6.7	12.2	5.1
1965-69	18.7	11.0	19.3	13.4
1970-74	17.4	13.3	17.1	12.9
1975-79	16.1	18.0	15.8	14.8
1980-84	14.9	17.8	15.4	22.8
1985-89	15.9	24.4	15.5	22.2
1990-94	5.7	8.8	4.9	8.9
Mother's age at first birth < 20	27.9	55.3	31.5	54.9
<u>Economic Resources</u>				
Father's Education				
Less than High School	22.9	35.0	22.8	32.5
High School Degree	30.2	35.6	30.8	36.9
Some College	19.5	14.4	19.1	18.1
College Degree or More	27.3	15.0	27.3	12.6
Mother has higher educ than father	24.8	21.5	21.5	25.3
<u>Parenting/Social Control</u>				
Mother worked during childhood	74.5	66.9	68.4	73.8
Age at First Sex ≤ 15 Years Old	1.3	0.6	0.3	0.5
<u>Family Instability</u>				
Parents Split by Age 14	18.8	51.4	19.6	55.7
<u>Respondent Characteristics</u>				
Number of siblings	3.37 (1.52)	3.48 (1.71)	3.44 (1.56)	3.47 (1.81)
Religion Raised				
No Religion	7.8	8.9	7.0	10.7
Catholic	36.1	33.0	36.3	30.8
Conservative Protestant	22.6	32.8	22.6	37.8
Protestant	26.2	21.1	28.2	17.9
Other	7.3	4.1	5.9	3.0
Education				
Less than High School	20.9	35.2	17.7	37.1
High School Degree	30.7	36.8	27.2	31.2
Some College	27.1	22.0	30.2	22.8
College Degree or More	21.4	6.1	24.9	8.9
<i>N</i>	4,416		6,766	

Note: All figures are weighted by sampling weights. Ns are unweighted.

<sup>a</sup>G1 refers to generation 1, i.e. respondents' parents.

**Table 2: Sons' and Daughters' Fertility Status by Parents' Marital Birth Status at their Birth**

	Sons		Daughters	
	G1 Married	G1 Unmarried	G1 Married	G1 Unmarried
Marital first birth or no birth	84.7	73.7	82.4	61.0
Nonmarital first birth	15.3	26.3	17.6	39.0
Total	100%	100%	100%	100%
<i>N</i>	4,416		6,766	

*Note* : All figures are weighted by sampling weights. *N*s are unweighted.

<sup>a</sup>G1 refers to generation 1, i.e. respondents' parents.

Table 3: Results from Cox Proportional Hazard Models Predicting the Risk of Sons' Nonmarital First Birth by Parents' Marital Birth Status (N=4,416)<sup>a</sup>

	Model 1	Model 2	Model 3	Model 4	Model 5
G1 Nonmarital Birth	1.30 *	1.27 *	1.25 *	1.06	1.08
Race (ref=White)					
Hispanic	.34 ***	.41 ***	.41 ***	.41 ***	.50 ***
African American	3.64 ***	3.36 ***	3.33 ***	3.31 ***	2.90 ***
Other	1.13	1.18	1.16	1.20	1.27
Respondent's Birth Cohort (ref=1960)					
1965	1.06	1.07	1.07	1.05	.99
1970	1.17	1.25	1.23	1.18	1.18
1975	1.31 †	1.43 *	1.41 *	1.40 *	1.38 *
1980	1.36 *	1.50 **	1.48 *	1.45 *	1.37 *
1985	1.62 *	1.79 **	1.76 **	1.75 **	1.37
1990	1.77	2.01	1.98	1.82	1.05
Mother age at first birth < 20	1.61 ***	1.44 ***	1.43 ***	1.40 ***	1.27 **
<u>Economic Resources</u>					
Father's Education (ref=Less than HS)					
High School Degree		.90	.89	.86	1.11
Some College		.72 **	.71 **	.68 **	1.07
College Degree or More		.43 ***	.43 ***	.41 ***	.82
Mother has higher educ than father		.97	.95	.91	1.09
<u>Parenting/Social Control</u>					
Mother worked during childhood			1.10	1.06	1.12
Age at First Sex ≤ 15 Years Old			2.55 **	2.77 **	2.33 *
<u>Family Instability</u>					
Parents Split by Age 14				1.64 ***	1.59 ***
<u>Respondent Characteristics</u>					
Number of siblings					1.05
Religion Raised (ref=No Religion)					
Catholic					1.43 †
Conservative Protestant					1.33
Protestant					1.16
Other					.70
Education (ref=Less than HS)					
High School Degree					.77 **
Some College					.43 ***
College Degree or More					.20 ***

†p<.10 \*p<.05 \*\*p<.01 \*\*\*p<.001

<sup>a</sup>Hazard ratios are reported in each model.

Table 4: Results from Cox Proportional Hazard Models Predicting the Risk of Daughters' Nonmarital First Birth by Parents' Marital Birth Status ( $N=6,766$ )<sup>a</sup>

	Model 1	Model 2	Model 3	Model 4	Model 5
G1 Nonmarital Birth	1.52 ***	1.46 ***	1.45 ***	1.28 ***	1.15 *
Race (ref=White)					
Hispanic	.43 ***	.52 ***	.51 ***	.50 ***	.62 ***
African American	3.30 ***	3.09 ***	3.05 ***	2.97 ***	2.58 ***
Other	1.10	1.16	1.17	1.17	1.32 †
Respondent's Birth Cohort (ref=1960)					
1965	.95	.98	.98	.97	1.09
1970	1.16	1.24 *	1.24 *	1.21 †	1.39 **
1975	1.61 ***	1.75 ***	1.74 ***	1.71 ***	1.85 ***
1980	1.93 ***	2.18 ***	2.16 ***	2.08 ***	2.14 ***
1985	1.84 ***	2.10 ***	2.03 ***	1.96 ***	1.59 ***
1990	1.03	1.20	1.18	1.11	.62
Mother age at first birth < 20	1.73 ***	1.51 ***	1.51 ***	1.47 ***	1.26 ***
<u>Economic Resources</u>					
Father's Education (ref=Less than HS)					
High School Degree		.97	.95	.94	1.12 †
Some College		.68 ***	.67 ***	.67 ***	1.00
College Degree or More		.41 ***	.40 ***	.40 ***	.74 **
Mother has higher educ than father		.73 ***	.72 ***	.71 ***	.89 †
<u>Parenting/Social Control</u>					
Mother worked during childhood			1.13 *	1.09 †	1.14 *
Age at First Sex ≤ 15 Years Old			1.51	1.73	2.19 *
<u>Family Instability</u>					
Parents Split by Age 14				1.51 ***	1.43 ***
<u>Respondent Characteristics</u>					
Number of siblings					
					1.04 *
Religion Raised (ref=No Religion)					
Catholic					1.04
Conservative Protestant					1.12
Protestant					.92
Other					.79
Education (ref=Less than HS)					
High School Degree					.63 ***
Some College					.39 ***
College Degree or More					.14 ***

†p<.10 \*p<.05 \*\*p<.01 \*\*\*p<.001

<sup>a</sup>Hazard ratios are reported in each model.

Table 5: Hazard Ratios for Interactions among Parents' Marital Status at Respondents' Birth, Gender, Race, and SES Background (N=11,182)<sup>a</sup>

<u>Gender Interaction</u>	
G1 NMB * Male (ref=NMB * Female)	.47 ***
G1 MB * Male	.44 ***
G1 MB * Female	.86 *
<u>Race Interaction</u>	
G1 NMB * African American (ref=NMB * White)	2.19 ***
G1 NMB * Hispanic	1.87 ***
G1 NMB * Other	.96
G1 MB * White	.79 †
G1 MB * African American	2.25 ***
G1 MB * Hispanic	1.24
G1 MB * Other	1.05
<u>SES Background Interaction<sup>b</sup></u>	
G1 NMB * High SES (ref=NMB * Low SES)	.81 *
G1 MB * High SES	.73 ***
G1 MB * Low SES	.86 *

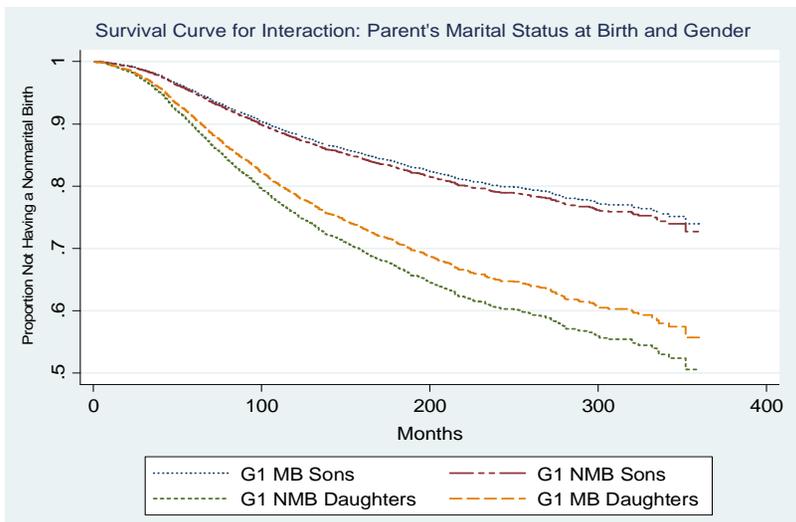
†p<.10 \*p<.05 \*\*p<.01 \*\*\*p<.001

Note: NMB: Nonmarital birth. MB: Marital birth

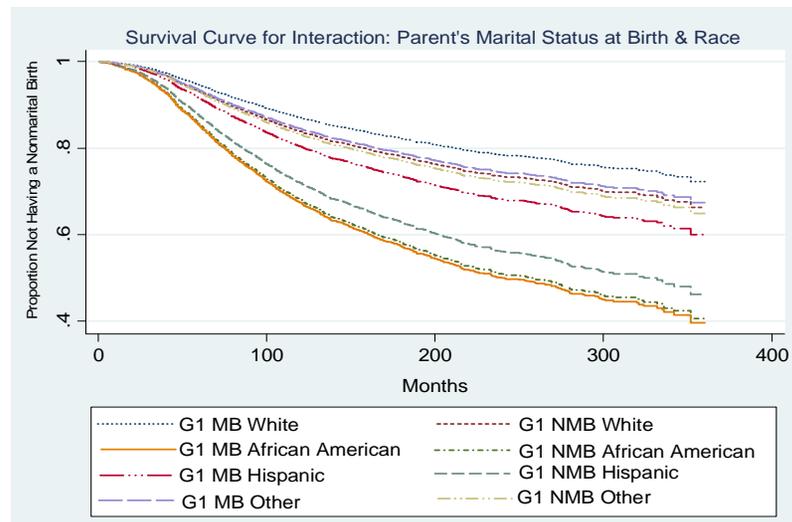
<sup>a</sup>These results are from a pooled sample for sons and daughters and include all covariates. Each interaction model was estimated separately.

<sup>b</sup>For simplicity, we refer to those whose fathers had a high school degree or less as low SES and those whose fathers had some college, a college degree, or more as high SES.

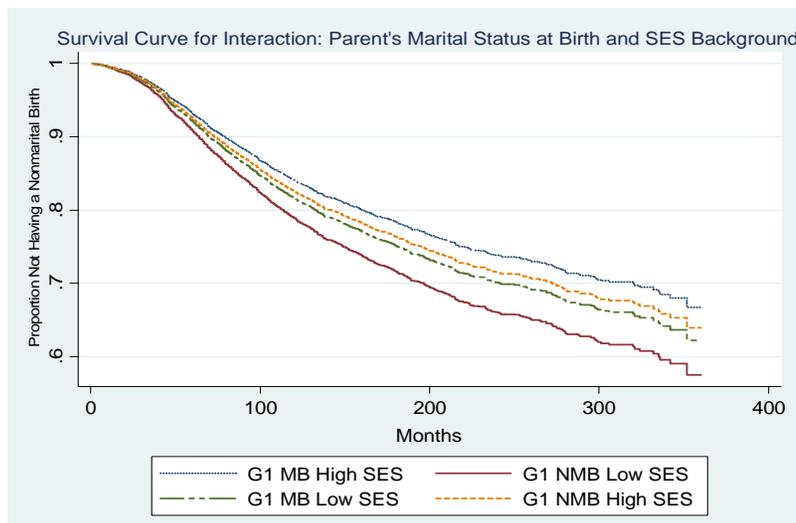
Figure 1: Survival Curves for Interactions with Parents' Marital Status at Respondents' Birth



Panel A



Panel B



Panel C

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