Center for Population Dynamics
School of Social and Family Dynamics
Arizona State University
Tempe, Arizona, 85287-3701, USA www.asu.edu/cepod

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Fertility After a Non-Marital First Birth

Sarah R. Hayford[1]

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[1] Center for Population Dynamics, School of Social and Family Dynamics, Arizona State University

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ABSTRACT
Much attention has been devoted to the consequences of non-marital births in terms of women's future achievements and children's well-being. However, less is known about the subsequent fertility behavior of women with non-marital first births -- an important component of population dynamics in a context where an increasing proportion of first births take place to unmarried women. In this article, I analyze second birth hazards for women with marital and non-marital first births. Overall, women with non-marital first births have lower second birth rates than women with marital first births, but this difference is largely explained by differences in marital behavior. Women who marry after a non-marital first birth resemble married women with marital first births, while women who do not marry have lower second birth hazards. Differences between marital and non-marital fertility are consistent over time, suggesting that marriage continues to be a distinctive setting for childbearing.

KEY WORDS
fertility, non-marital fertility, second births

The proportion of American births taking place outside marriage more than doubled during the last quarter of the twentieth century, rising from 14% in 1975 to 33% in 1999 (Ventura and Bachrach 2000). The reasons behind this increase have been intensively studied, if not yet entirely illuminated, and the consequences of non-marital childbearing for the well-being of mothers and children have also been heavily explored. As non-marital fertility becomes more common, more research has been devoted to the place of non-marital fertility within family-building trajectories (e.g. Wu, Bumpass, and Musick 2001; Wu and Li 2004; Wu and Martin 2002). The relationship between non-marital fertility and total fertility is important to understanding future population dynamics for a society in which fertility is no longer limited to marriage. At the individual level, family size and birth intervals have a strong impact on both childhood experience and adult outcomes (Conley 2004; Steelman et al. 2002). Understanding differences in subsequent fertility between women with marital and non-marital first births is therefore necessary to assess the full socio-economic implications of non-marital childbearing.

In this article, I compare second birth hazards and timing for women with marital and non-marital first births, incorporating the effects of changes in marital status after the first birth. I also assess whether differences in fertility trajectories between women with marital and non-marital first births have changed over time.

A large proportion of non-marital births are first births. This proportion has dropped in recent decades, but the majority of non-marital births still take place to women whose first birth was non-marital. Thus, understanding the consequences of a non-marital first birth is a logical first step in understanding how non-marital fertility affects women's childbearing careers. Looking at the influence of marital status at first birth on later fertility is consistent with a life

course perspective on fertility. The life course approach argues that life can be understood as a series of stages, and that what happens in one stage affects the available choices and decisions made in the next stage. In the case of fertility, this framework implies that the context in which a woman begins childbearing has implications for her subsequent family building behavior. This may be especially true for women with non-marital first births: A growing body of research argues that women who begin their family formation with a birth outside of marriage differ in important ways from women who marry and have a child within marriage (Ellwood and Jencks 2004; McLanahan 2004). In this article, I explore whether these differences extend to subsequent fertility behavior.

There are several reasons to believe that women with marital and non-marital first births might have different subsequent fertility trajectories. Women with non-marital first births are disproportionately young, poorly educated, and African American (Morgan 1996; Morgan and Rindfuss 1999; Sullivan 2005; Ventura et al. 1995). These characteristics are also associated with higher than average fertility rates (Morgan and Rindfuss 1999; Evans 1986). Aside from these measurable characteristics, women with non-marital first births may be selected on unobservable characteristics such as high fecundity and ineffective use of contraception. To the extent that these characteristics are stable across the life course, these factors would also lead to higher subsequent fertility for women with a non-marital first birth.

However, fertility differentials by most socio-demographic characteristics have decreased over the past thirty years. The overall effect of these compositional factors might therefore be small, and other factors might offset the positive association of these characteristics with fertility. For example, women who bear a child outside of marriage are less likely than women without a

child to ever marry (Lichter and Roempker Graefe 2001; Upchurch, Lillard, and Panis 2001). Women with non-marital first births might have lower subsequent fertility than women who have first children within marriage due to the same factors that lead to overall lower levels of fertility among unmarried women.

Unmarried women have consistently lower fertility rates than married women (Rindfuss and Parnell 1989). According to the classic proximate-determinants framework, unmarried women are not exposed to the risk of childbearing because they are not sexually active (Bongaarts and Potter 1983). As both extramarital sex and contraception have become more common, however, proximate determinants have become less useful for explaining differences between marital and non-marital fertility.

The costs of childbearing are higher on average for unmarried women than for married women because unmarried women are less likely to be able to rely on a partner to provide financial, emotional, and physical support for raising children. However, differences in the costs of children for married and unmarried women have declined over time. Increases in the proportion of women whose first birth is non-marital can be at least partially attributed to improvements in women's ability to support children on their own (Becker 1981; Cherlin 1992; McLanahan 2004). Both women's labor force participation and women's wages have increased during the period since 1970, and government assistance programs provide additional financial support to unmarried women. At the same time, declines in men's real wages and increasing unemployment among young men, especially African American men, have reduced the financial resources that fathers are able to provide to children (Oppenheimer 1994; Wilson 1987). Rising divorce rates imply that even women who have births while married may not be able to rely on

their husband's support in the future, and the increasing proportion of non-marital births that take place within cohabiting unions means that non-marital births are now more likely to be partnered births. If differences between marital and non-marital fertility are primarily due to the costs of childbearing, these differences should be declining over time. To the extent that the costs of childbearing are similar for first and higher-order births, the fertility trajectories of women with marital and non-marital first births should be converging.

The benefits of having children may also differ for married and unmarried women. Theorizing about possible differences by marital status in the benefits of childbearing is complicated by the difficulty of explaining any benefits to fertility in the current low-fertility context. Early fertility theories were developed to explain the first demographic transition, the fertility decline that accompanied industrialization. They assumed that children had immanent as well as instrumental value, but focused on the increasing costs of childbearing and did not specify what the non-material values of children might be. More recently, theories of contemporary fertility have tried to explain why people want children.

Friedman, Hechter, and Kanazawa (1994) propose that people desire children as a way of reducing uncertainty in life decisions. Having children increases uncertainty in some ways -- there is no way to predict the quality of children, and the presence of children may introduce disorder into organized lives. But Friedman, Hechter, and Kanazawa argue that parenthood increases certainty in the underlying structure of life. Parenthood is a defined role, and an irrevocable one, that "reduce[s] uncertainty by embedding actors in recurrent social relations." (382) The social role of parent may be particularly important to people who have little access to other stabilizing roles such as marriage or a career. Qualitative research among unmarried low-

income mothers provides support for the uncertainty reduction hypothesis, highlighting the meaning and structure that children bring to poor women's lives (Edin and Kefalas 2005). Among married couples, in contrast poor relationship quality and higher reported likelihood of divorce are associated with lower birth rates at all parities, which contradicts the uncertainty reduction hypothesis (Myers 1997). It is not clear which of these two examples is most relevant to the case of fertility after a first non-marital birth.

Schoen et al. (1997), building on anthropological studies of fertility, emphasize the social benefits of children. They suggest that children help people strengthen and maintain social ties and gain access to the material and emotional support provided by those ties. The social benefits of children are the primary motivation for childbearing. To test their theory, the authors create a composite variable based on responses to questions about the importance of children. Their index is composed of answers to questions about the importance of providing grandchildren to parents, of providing the respondent with someone to love, and of family structure (number of siblings, sex composition of the children). In their empirical test, Schoen et al. model fertility intentions separately by marital status, although they do not specify why the motivating effects of social ties would be different for married and unmarried people. They find that the "social resources" index has a significant positive effect on childbearing intentions. The more importance respondents grant to the social values of children, the more likely they are to intend to have children. This relationship is strongest at parity one, and stronger for married women than for unmarried women. I interpret these results to mean that the social meaning of children, and in particular their place in the family, play an important role in fertility decisions. The social

meanings of childbearing seem to be less important for non-marital fertility than for marital fertility, but it is not clear why.

As operationalized by Schoen et al. (1997), the "social resources" theory of fertility is a more structured application of longstanding normative theories of fertility. These theories argue that we have children because it is expected of us, and that family situation determines the nature of expectations. Ryder, for instance, frequently reiterated his belief that American fertility was driven by normative imperatives, namely, that adults should marry and have at least two children as soon as they could afford to (e.g. Ryder 1969, 1973, 1980). Negative stereotypes about only children may contribute to the importance of the second child; two child families are normative partly because parents want a sibling for the first child (Blake 1981; Bulatao 1981). Parents may also be motivated to have more than one child because of desire for children of a particular sex, although sex preferences appear to be decreasing (Pollard and Morgan 2002; Yamaguchi and Ferguson 1995).

Normative theories are explicit about why non-marital fertility is lower than marital fertility. Historically, non-marital childbearing was discouraged by the social stigma attached both to unwed mothers and to children born outside wedlock, while married couples were pushed toward childbearing in order to complete their family. Studies of fertility in step-families have shown that having children is an important part of marriage even in non-traditional married households (Griffith, Koo, and Suchindran 1985; Thomson and Li 2002). However, these normative pressures have weakened, and both non-marital childbearing and voluntary childlessness have become more accepted in the late twentieth century (Pagnini and Rindfuss 1993; Thornton 1989; Thornton and Young-DeMarco 2001). Norms about family formation may

be less important in explaining current differences between marital and non-marital fertility than they have been in the past. In addition, women who have already had one non-marital birth may be less constrained by norms against non-marital fertility than women whose first birth was marital.

Current fertility theory does not provide a clear set of hypotheses about how fertility might differ between women with marital and non-marital first births. Rational choice models of fertility do not explicitly incorporate variations by parity in the value of children. Normative theories of family building suggest reasons for having children after the first, but it is not clear whether or how these reasons might apply to women with one child in different marital contexts. My analysis is largely exploratory and descriptive, and aims to provide material for further development of existing theoretical frameworks. I do not claim to pinpoint the causal effects of non-marital fertility, but observe the associations between a non-marital first birth and subsequent birth rates.

An additional complication in interpreting results stems from the possibility that the observed correlation between marriage and fertility represents causation from fertility to marriage, rather than the reverse. It may be that women only marry if and when they want children. If this were the case, unmarried women would be selected for a low desire for children, and the low fertility of unmarried women would be attributable to the process of selection into marriage. My analysis avoids some of the possible contamination from reverse causation by looking at women who have already had at least one child. Since many non-marital births are unintended, however, selection into marriage based on fertility desires may still confound results.

I do not include cohabitation as a separate marital status in this analysis; births to cohabiting women are counted as non-marital births. Other research has shown that cohabitation in the United States is a short-term arrangement. Unlike in Europe, where many couples in long-term relationships continue to cohabit rather than entering formal marriage, American cohabiters tend to either marry or break up within a few years (Bumpass and Sweet 1989). As cohabitation has become more common and more accepted in the United States, cohabiting relationships have not become more stable; if anything, they have become more likely to end in dissolution rather than in marriage (Bumpass and Lu 2000). Parents who are living together but not married when their child is born -- who accounted for two-fifths of "non-marital" births in the United States between 1990 and 1994 -- are more likely to break up than parents who are married when their children are born (Bumpass and Lu 2000; Ellwood and Jencks 2004). Cohabiting women are therefore more like unpartnered women than like married women in terms of their subsequent relationship with the baby's father. If anything, grouping births to cohabiting mothers with births to unpartnered mothers understates the differences between women whose first births are marital and women whose first births take place while unpartnered.

DATA

I use data from the Fertility and Marital History Supplement to the Current Population Survey of June 1995. The CPS surveyed about 54,500 households with a response rate of 94%, and is representative of the non-institutionalized population. The Marriage and Fertility History supplement was administered to 47410 women age 15 to 65. Information was gathered on the first three marriages and the most recent marriage, and on the first four children and the most recent child. In addition to the data on marriage and fertility, the Current Population Survey also

collects basic socio-demographic data, including race and ethnicity, education level, and country of birth.

The major benefit of using data from the CPS Fertility Supplement is the large sample size, which allows for analysis of relatively rare combinations of characteristics (for example, well-educated women who have non-marital births). Of course, there are also drawbacks to using this survey. First, the CPS contains very limited data on partnership. There is no information on the father of a woman's children, making it impossible to determine whether women eventually marry the father of children born out of wedlock. The CPS also does not record either current cohabitation status or cohabitation histories. Second, the CPS collects only completed education level, rather than education history.

For marriages, the month and year that the marriage began and the date and means by which it ended, if it ended, are collected. For children, the month and year of birth and the sex of the child are collected. I use these data to construct reproductive histories and assign variables for women's marital status at the first birth and at subsequent births. Because exact dates of births and marriages are not available, I count births that took place in the same month that marriages started or ended as marital births. I treat births within marriage that were premaritally conceived as marital births, and births that take place after separation but before divorce as non-marital births. (Where a separation date was not available, I used the date of divorce or widowhood as the end of the marriage.) This classification system relies on a social rather than legal definition of a non-marital birth, and reflects the social experience of mothers and children rather than a formal legal classification of illegitimacy (Jones et al. 1985).

Women who had more than five children were not asked about birth dates for all of their children, but because I only examine timing for the first two births. this gap does not affect my analysis. Women married more than four times were not asked about marriage dates for all marriages, and the exact number of marriages was not recorded. Only 187 women surveyed -- 0.39% of the sample -- had been married four or more times. For most of these women, missing marriage dates did not affect the assignment of marital status for births, since births tended to occur at young ages and the missing (higher order) marriages occurred later in their lifetime. Only one first birth and no second births fell in an interval not covered by the recorded marriage data. (That is, only one birth took place between the end of the third marriage and the beginning of the last marriage of a woman for whom it was not known whether or when another marriage happened between these dates.) This birth was classified as non-marital.

All models include white and African American non-Hispanic women born in the United States; women with multiple births at any parity are excluded. (755 women with at least one multiple birth were excluded from the sample.) I also exclude women with first births before 1955, since the age structure of the CPS sample means that I only have data for women age 25 and younger in that period. The final analysis included 19902 women with marital first births and 5925 women with non-marital first births. There were 19564 second births in the sample being studied.

As independent variables, I concentrate on standard demographic measures -- race, marital status, age at first birth, and education level -- as well as a measure for historical period. In this descriptive demographic analysis, I do not include fine-grained controls that might serve

as more proximate determinants of fertility. Instead, I look at these key variables to understand the broad outlines of fertility determinants.

Table 1 shows the distribution of independent variables in the sample. The primary independent variable is marital status at the first birth. I count any births that took place while the mother was married as marital births, not distinguishing between births conceived inside and outside of marriage. (I included legitimated births as a separate category in exploratory analyses, but they did not differ significantly from marital births.) Thus, I have two categories for marital status at first birth, married and unmarried.

[TABLE 1 ABOUT HERE]

I also control for subsequent marital status. Marital status is allowed to change monthly; I measure whether a woman was married at 8 months prior to the current month in order to approximate marital status at time of conception. Legitimated second births are therefore counted as non-marital conceptions in this analysis.

Including age at first birth controls for the length of time a woman has to have another child and her fecundity during that period. For convenience, I center age around age 25, which shifts the intercept but does not affect the coefficient for age. The intercept should be interpreted as the log-odds of having another birth for women who had their first birth at age 25. I include a term for age squared to allow for non-linearity in the relationship between age and the likelihood of having another child. (I divide the age squared term by 100 in order to scale the coefficients in a readable metric.) However, in testing for interactions between age and other covariates, I only interact the linear age term.

Women are divided into three groups by completed education level: women who never received a high school diploma, women with a high school degree or with some college, and women with a bachelor's degree or higher. I tested models with more precise educational categories and models with different divisions of educational groupings, but these groupings proved to best capture variation in completed fertility by education level.

In order to account for changes in fertility behavior over time, I control for the time in which women had their first birth. Because of the large age range of women sampled in the CPS, births are observed over a period of 51 years, from 1944 to 1995; as noted above, I exclude women with first births before 1955. I divide time into four separate periods: 1955-1964, 1965-1974, 1975-1984, and 1985-1995. The 1955-1964 period corresponds to the Baby Boom, and the 1965-1975 period is roughly equivalent to the following Baby Bust. The mid-60s have been shown to be a turning point in fertility behavior, with distinctive patterns before and after this period (Morgan and Rindfuss 1999). I divided the post-1975 period into two ten-year periods, 1975-1984 and 1985-1995, based on observation of trends in overall fertility rates.

METHODS

For descriptive analysis, I use kernel-smoothing methods to produce approximate hazard functions for second births. In this procedure, the hazard function at individual points of time is estimated based on the slope of the survival function. These individual estimates are then averaged to produce a smoother curve. I use the SAS macro SMOOTH written by Paul Allison (available at http://www.ssc.upenn.edu/~allison/) to graph hazard functions based on cumulative survival curves produced from Cox regressions with no covariates performed separately by marital status at first birth. The graphs shown here use a bandwidth of six months, meaning that

each point on the graph represents the average of the hazards over the six months before and after that time. For the purposes of these graphs, I followed women after the first birth for ten years, until the survey date, or until age 50, whichever came first. I limited observations to a maximum of ten years to produce clearer graphics and to allow presentation of these graphics on a more reasonable scale. At longer periods since first birth, hazards continue to decline.

For multi-variate analysis, I use Cox regression models (Allison 1995; Singer and Willet 2003). Like other methods for analyzing event history data, Cox models use the time to an event to estimate the relationship between observed covariates and the rate of occurrence of the event, taking into account the fact that not all respondents will undergo the event and that some observations will be cut off before the event occurs. Here, the event under study is the second birth; I observe women from the time of the first birth until the survey date or until age 50, whichever comes first. The timing of events is measured to the nearest month.

Specifically, I estimate the equation:

$$h_i(t) = \lambda_0(t) \exp [\beta_1 x_{1i} + \beta_2 x_{2i} + ... + \beta_k x_{ki}], \quad (1)$$

where $h_i(t)$ represents the hazard, or instantaneous rate, of second birth for an individual i at time t. The function $\lambda_0(t)$ is a baseline hazard function, x_{ki} are characteristics of the individual i, and β_k are the estimated coefficients for these characteristics. In this model, the baseline hazard function is non-parametric and can take any form. The ratio of the individual hazard to the baseline hazard, given by the exponentiated function of individual characteristics and estimated coefficients, is fixed for each individual. If, for example, birth hazards for women with non-marital first births are half those of women with marital first births, under this model they are

assumed to be half at all intervals since the first birth. In effect, each individual hazard function is assumed to have the same shape as the baseline hazard.

Preliminary analysis of descriptive data showed that the hazard functions for women with marital and non-marital first births are not proportional: The difference in fertility rates between the two groups of women varies over time. I relax the assumption of proportional hazards by including a set of dummy variables allowing the coefficients for marital status at first birth to vary over time. I divide the first five years after the first birth into eleven intervals. The first interval is twelve months long; subsequent intervals are three months long until two years after the first birth and then six months long after that point. Durations longer than five years after the first birth are treated as a single interval. These interval lengths were chosen based on inspection of the hazard curves and experimentation with alternate partitions of time. In some models, I include a measure of current marital status. Because this measure is time-varying, it also works to relax the assumption of proportional hazards.

RESULTS

Figure 1 shows smoothed hazard curves for women with marital and non-marital first births. These curves are purely descriptive and do not account for any cofactor aside from marital status at first birth. They represent an estimate of the instantaneous birth rate at any given time for women in the two groups who have not yet had a second child. The two curves have similar shapes, with a relatively rapid rise in birth hazards and a peak around three to four years after the first birth, and then a steady decline. Birth hazards for women with non-marital first births are lower than hazards for women with marital first births for about the first five years after the first birth; after that point, the two curves approach each other, and they are essentially

the same starting around 85 months after the first birth. The hazard curve for women with non-marital first births peaks slightly earlier and declines more sharply than the curve for women with marital first births.

Interpreting differences in hazard curves often poses problems due to the possibility of differences being driven by heterogeneity. In this case, for instance, the two hazard curves may be similar at long intervals if the most fertile women in both groups have children soon after the first birth, leaving only subfecund women in the pool of women at risk at later durations. The problem is confounded by the possibility of changing marital status. At longer intervals, women are more likely to have married or divorced (or both) since their first birth. The two groups of women may therefore be more similar to each other as time goes by, which might explain the growing similarity between the two hazard curves.

I turn to multivariate models to further explore fertility after the first birth. The first model shown in table 2 is a base model, including only marital status at first birth, shown here for comparison with later models. As expected, model 1 indicates a strong and significant negative effect of having a non-marital first birth on second birth hazards. Model 2 adds a set of dummy variables allowing the coefficient for having a non-marital first birth to be different in each of 12 time intervals. Allowing variation over time significantly improves model fit, as judged by likelihood statistics. In addition, nearly all of the individual coefficients are statistically significant. The difference in second birth hazards appears to have two local peaks, at 21-23 months after the first birth and 42-47 months after the first birth. At intervals longer than 60 months after the first birth, the coefficient for marital status at first birth is no longer

statistically significant. The results from model 2, which does not control for any covariates besides marital status at first birth, are consistent with the hazard curves presented in figure 1.

[TABLE 2 ABOUT HERE]

In model 3, I add socio-demographic characteristics. Again, model fit is significantly improved by adding these characteristics, and the majority of the traits included here are significantly correlated with second birth hazards. The coefficients for the period of first birth are the largest in magnitude of the socio-demographic characteristics. All of the period coefficients are negative: Second birth hazards are lower for women with first births in each of the three later periods than they were during the Baby Boom years. Judging from this model, second birth rates did not continue to decline after 1965. The coefficient for the period 1975-1984 is very close to that for the period 1965-1974, and the coefficient for the period 1985-1995 is slightly smaller than for the two earlier periods, suggesting that second birth rates may have risen slightly in the late 1980s and early 1990s. Age is negatively associated with second birth hazards, as expected. Both college-educated women and women with less than a high school degree have higher birth hazards than women in the middle education category, but these coefficients are relatively small. African American women have lower second birth hazards than white women, but this relationship is also weak -- birth hazards are only about 10% lower ((1-exp(-0.10))*100 = (1-0.10)*100 = 10) for African American women than for white women.

The relationship between marital status at first birth and subsequent birth hazards is not substantively changed by controlling for race, age at first birth, educational attainment, and historical time. The depressing effect of having a non-marital first birth becomes slightly stronger when other covariates are incorporated. The increase in the magnitude of the

coefficients is approximately equal in all time intervals; accounting for socio-demographic characteristics in the model does not appear to alter the shape of the hazard curve for women with non-marital first births relative to the baseline hazard.

In model 4, I add current marital status to the model. Marital status is treated as a time-varying characteristic; as noted above, I measure marital status at conception, not at birth. As expected, unmarried women have lower second birth hazards than married women. The coefficient for being currently unmarried, -0.83, is the largest coefficient in the model; birth hazards for unmarried women are less than half those of married women. This difference is statistically significant at the 0.001 level. Controlling for marital status also produces a very different relationship between marital status at first birth and subsequent birth hazards than that shown in previous models. For the first 20 months after the first birth, women with non-marital first births have *higher* second birth hazards than women with marital first births. After that point, there is no consistent relationship between marital status at first birth and second birth hazards. At 24-29 months after first birth, and at intervals more than 60 months after the first birth, having a non-marital first birth is positively associated with birth hazards. At 42-47 months after the first birth, on the other hand, women with a non-marital first birth have lower birth hazards than women with marital first births, all other things being equal. At most times, however, there is no statistically significant relationship between marital status at first birth and subsequent birth hazards. Thus, controlling for current marital status accounts for much of the difference in second birth hazards for women with marital and non-marital first births.

Comparing models 3 and 4 makes clear that some of the apparent effects of other variables are actually compositional with respect to marital status. For example, when current

marital status is incorporated into the model, there is no statistically significant difference between birth hazards for white and African American women. The dummy variables for historical period of first birth also decrease in magnitude when current marital status is added to the model: Part of the reason that women with first births in the Baby Boom period were more likely to have a second child was that they spent more time married.

Model 4 assumes that the relationship between current marital status and fertility is the same for all women. However, it is likely that being unmarried has different significance for fertility depending on women's marital status at first birth. Women with a marital first birth are unmarried because they have divorced the father of their first child. Thus, being unmarried represents disruption of an existing partnership. It is more difficult to predict the effects of remaining unmarried for women whose first birth was non-marital. They may still be in a relationship with the father of their first child, or they may be unpartnered or in a new relationship. Having a non-marital first birth may be indicative of having less strong negative feelings about the appropriateness of having children outside of marriage, so women with non-marital first births may have higher non-marital birth rates than women with marital first births. Alternatively, women whose first birth was non-marital may have an increased awareness of the cost of having a child outside of marriage, which would depress their birth rates while currently unmarried compared to women whose first birth was marital.

Being currently married may also have different meanings for women depending on their marital status at first birth. For women whose first birth was non-marital, getting married means entering into a new partnership or changing the legal status of an existing partnership, and may result in increased fertility rates if a child is desired to solidify the new partnership. For women

with marital first births, in contrast, being married is a continuation of their previous status, and is not likely to be linked to a sudden change in fertility rates.

To incorporate these possible differential effects of marital status, I present a final model including interactions between marital status at first birth and current marital status. Because model 4 showed that controlling for current marital status accounted for much of the variation over time in the effect of having a non-marital first birth, I constrain the coefficient for the main effect of non-marital first birth to be constant over time in this model. However, I do allow the relationship between current marital status and fertility to vary over time. Here, I define separate coefficients for current marital status in five one-year intervals and for marital status at times more than five years after the first birth. Exploratory analysis showed that these six coefficients were sufficient to capture variation in this specification of the model, compared to the more detailed time periods used in previous models. I also include interaction terms between having a non-marital first birth and each of the time-specific coefficients for current marital status. Thus, not only the magnitude and direction of the effect of current marital status, but also the shape over time of this effect, is allowed to vary according to marital status at first birth. Results from this model are presented in table 3. The coefficients for socio-demographic characteristics aside from marital status are not substantively different from those in the previous model. I therefore concentrate my discussion of results on the coefficients for the marital status variables.

[TABLE 3 ABOUT HERE]

In this final model, model 5, the main effect of having a non-marital first birth is not statistically significant. This main effect represents the average difference over time between second birth hazards for married women with marital and non-marital first births. Among

married women, then, there does not appear to be a difference in birth hazards depending on marital status at first birth. However, the interaction terms between having a non-marital first birth and being currently unmarried are statistically significant. That is, women whose first birth was non-marital have different second birth hazards than women whose first birth was marital only when they are unmarried. These interaction terms are positive, meaning that, among women who are currently unmarried, women with non-marital first births have higher second birth hazards. This finding is consistent with the hypothesis that women with non-marital first births have less negative attitudes toward having children outside of marriage. It is also consistent with the possibility that women with non-marital first births are less efficient contraceptors and therefore less adept at avoiding non-marital births.

The interactions between marital status at first birth and current marital status also mean that the relationship between current marital status and second birth hazards differs according to marital status at first birth. For ease of interpretation, table 4 shows the coefficients for being currently unmarried separately by marital status at first birth. The first column, for women whose first birth was marital, is made up of the main effect coefficients from model 5. Coefficients in the second column, representing women whose first births were non-marital, were calculated by adding the interactions with marital status at first birth to the main effect coefficients from model 5. Significance levels were obtained by re-running the model with non-marital first births as the omitted category (full results not shown).

[TABLE 4 ABOUT HERE]

For women whose first birth was marital, the numbers in the first column represent the difference in fertility rates between women who stay married and women who divorce. Currently

unmarried women have lower second birth hazards than women who remain married. The difference between married and unmarried women is highest in the second and third years after the first birth -- the years when second births are most likely to occur. In later years, the difference between married and unmarried women decreases, probably due to the declining likelihood of having a second birth among married women, but it remains negative, statistically significant, and relatively large in magnitude (-0.88) even five years after the first birth.

The numbers in the second column quantify the difference in second birth hazards between women with non-marital first births who stay unmarried and women who later marry. Again, women who are unmarried have lower birth hazards than married women, and the coefficients increase in the second and third year after the first birth in the same way as the coefficients for women with marital first births. However, the negative effect of being unmarried is less for women with non-marital first births than it is for women whose first births were marital.

This analysis includes women with first births between 1955 and 1995. This 40-year era was a time of immense changes in fertility rates, marriage timing, the prevalence of marriage and divorce, and social attitudes toward cohabitation and non-marital fertility. In order to assess whether the relationship between marital status and fertility varied over this time period, I ran this model separately by period for the same periods I used in my analysis (1955-1964, 1965-1974, 1975-1995). (I ran the model separately by period, rather than allowing interactions between the time dummy variables and other variables, because including interactions in the already-complex model would have made interpretation too difficult.) Results are shown in table 5.

[TABLE 5 ABOUT HERE]

Surprisingly, there are no large differences across these periods. Although the exact value of coefficients varies across periods, almost all marital status coefficients are in the same direction and are similar in magnitude. There is no monotonic trend of either increasing or decreasing relationships between marital status and second birth hazards over time across all periods, nor any consistent change from one period to the next. In addition, the shape of the relationship between current marital status and subsequent fertility is similar in all models. These results are consistent with findings from decompositions of the non-marital fertility ratio (Smith, Morgan, and Koropeckyj-Cox 1996) and of the proportion of children born in cohabiting unions (Raley 2001) that show that changes in the marital/partnership distribution of births are driven more by changes in the marital/partnership distribution of women than by changes in the relative fertility rates in different types of partnership.

DISCUSSION

Women whose first birth takes place outside of marriage have lower second birth rates than women with marital first births, largely because they are less likely to be married after the first birth. When women whose first birth is non-marital do marry, their fertility is similar to that of women who stay married after a marital first birth. However, differences between women with marital and non-marital first births persist among unmarried women. Women who divorce after a marital first birth have significantly lower second birth hazards than unmarried women whose first birth was non-marital.

These findings have implications for family composition and population dynamics. Women with a non-marital first birth are less likely to have a second child than married mothers;

in previous research, I showed that marital status at first birth had no relationship to the likelihood of having a third child, conditional on second birth (Hayford 2004). Taken together, these results imply that having a non-marital first birth is associated with lower completed fertility, all other things being equal. In addition, lower second birth hazards for unmarried women imply that non-marital second births take place later after the first birth than marital second births. That is, for those women who do have second children, birth spacing differs depending on whether births take place inside or outside of marriage.

Although this analysis does not explicitly analyze birth intervals, several models show larger differences between birth rates to married and unmarried women two to three years after the first birth, when second birth rates to married women are highest. That unmarried women do not share this peak suggests that non-marital fertility may be less driven by preferences and norms about birth spacing than marital fertility.

Women with marital first births have lower non-marital second birth rates than women with non-marital first births. On average, these women are better educated and have better employment prospects than women with non-marital first births, so concerns about the financial costs of non-marital fertility appear not to be the driving force in second birth rates. Instead, attitudes about childbearing outside of marriage appear to be persistent across the life course, and having a marital first birth may reflect an ongoing preference for marriage as a setting for having children.

Due to data constraints, I do not include cohabitation as a marital status in this analysis. First births to cohabiting women are counted as non-marital first births, and women in cohabiting unions are counted as unmarried in my analysis of second birth hazards. Classifying cohabiting

first births as non-marital first births is unlikely to pose a major problem for this analysis. As previously mentioned, cohabiting relationships in the United States tend to be short-term and unstable. Thus, the finding that women with non-marital first births have lower fertility rates on average than women with marital first births is not likely to be an artifact of treating cohabiting first births as non-marital first births, and the results presented here on differences between women with marital and non-marital first births are conservative estimates of the true differences.

However, treating cohabiting mothers as unmarried women at risk of a non-marital second birth may be misleading. If women whose first births are non-marital are more likely to cohabit rather than marry a partner in the years after the birth, while women with marital first births remarry when they form a new partnership, then currently unmarried women with non-marital first births would be more likely to be partnered than currently unmarried women with marital first births. This difference in partnerships might explain the higher fertility rates found among unmarried women with non-marital first births. Further research including data on cohabitation would be necessary to determine whether this is the case. However, the fact that the relationships between marital status and fertility have been stable over time, while cohabitation rates have increased over the period under study, is an indication that these results are not wholly driven by cohabitation.

Taken together, these results suggest that marriage is still a distinct setting for bearing and raising children, possibly because norms about family size and child spacing are less relevant outside of marriage. These relationships have not changed over time: The growing acceptance of

non-marital fertility has not eroded the differences between marital and non-marital childbearing. Instead, more women are having children in a non-institutionalized framework.

REFERENCES

Allison, Paul. 1995. *Survival Analysis Using the SAS System: A Practical Guide*. Cary, NC: SAS Publishing.

Becker, Gary. 1981. *A Treatise on the Family*. Cambridge, MA: Harvard University Press.

Blake, Judith. 1981. "The Only Child in America: Prejudice Versus Performance." *Population and Development Review* 7 (1) : 43-54.

Bongaarts, John and Robert Potter. 1983. *Fertility Biology and Behavior: An Analysis of the Proximate Determinants*. New York: Academic Press.

Bulatao, Rodolfo A. 1981. "Values and Disvalues of Children in Successive Childbearing Decisions." *Demography* 18 (1) : 1-25.

Bumpass, Larry L. and Hsien-Hen Lu. 2000. "Trends in Cohabitation and Implications for Children's Family Contexts in the United States." *Population Studies* 54 (1) : 29-41.

Bumpass, Larry L. and James A. Sweet. 1989. "National Estimates of Cohabitation." *Demography* 26 (4) : 615-25.

Cherlin, Andrew J. 1992. *Marriage, Divorce, Remarriage*. Cambridge, MA: Harvard University Press.

Conley, Dalton. 2004. *The Pecking Order: Which Siblings Succeed and Why*. New York: Pantheon Books.

Edin, Kathryn and Maria Kefalas. 2005. *Promises I Can Keep: Why Poor Women Put Motherhood Before Marriage*. Berkeley, CA: University of California Press.

Ellwood, David T. and Christopher Jencks. 2004. "The Uneven Spread of Single Parent Families: What Do We Know? Where Do We Look for Answers?" In *Social Inequality*, Kathryn M. Neckerman, ed. pp. 3-77. Russell Sage Foundation.

Evans, M. D. R. 1986. "American Fertility Patterns: A Comparison of White and Nonwhite Cohorts Born 1903-56." *Population and Development Review* 12 (2) : 267-93.

Friedman, Debra, Michael Hechter, and Satoshi Kanazawa. 1994. "A Theory of the Value of Children." *Demography* 31 (3) : 375-401.

Griffith, Janet D., Helen P. Koo, and C. M. Suchindran. 1985. "Childbearing and Family in Remarriage." *Demography* 22 (1) : 73-88.

Hayford, Sarah R. 2004. "Variation in Transition to the Next Birth by Parity and Marital Status." Paper presented at the annual meetings of the Population Association of America, April 1-3, Boston, MA.

Jones, Jo Ann, Joan R. Kahn, Allan Parnell, Ronald R. Rindfuss, and C. Gray Swicegood. 1985. "Nonmarital Childbearing: Divergent Legal and Social Concerns." *Population and Development Review* 11 (4) : 677-93.

Lichter, Daniel T. and Deborah Roempke Graefe. 2001. "Finding a Mate? The Marital and Cohabitation Histories of Unwed Mothers." In *Out of Wedlock: Causes and Consequences of Nonmarital Fertility*, Lawrence L. Wu and Barbara Wolfe, eds. pp. 317-343. New York: Russell Sage Foundation.

McLanahan, Sara. 2004. "Diverging Destinies: How Children Are Faring Under the Second Demographic Transition." *Demography* 41 (4) : 607-27.

Morgan, S. Philip. 1996. "Characteristic Features of Modern American Fertility: A Description of Late Twentieth-Century US Fertility Trends and Differentials." *Population and Development Review* 22 (Supplement: Fertility in the United States: New Patterns, New Theories) : 1-45.

Morgan, S. Philip and Ronald R. Rindfuss. 1999. "Reexamining the Link of Early Childbearing to Marriage and to Subsequent Fertility." *Demography* 36 (1) : 59-75.

Myers, Scott M. 1997. "Marital Uncertainty and Childbearing." *Social Forces* 75 (4) : 1271-89.

Oppenheimer, Valerie Kincade. 1994. "Women's Rising Employment and the Future of the Family in Industrial Societies." *Population and Development Review* 20 (2) : 293-342.

Pagnini, Deanna L. and Ronald R. Rindfuss. 1993. "The Divorce of Marriage and Childbearing: Changing Attitudes and Behavior in the United States." *Population and Development Review* 19 (2) : 331-47.

Pollard, Michael S. and S. Philip Morgan. 2002. "Emerging Parental Gender Indifference? Sex Composition of Children and the Third Birth." *American Sociological Review* 67 (4) : 600-13.

Raley, R. Kelly. 2001. "Increasing Fertility in Cohabiting Unions: Evidence for the Second Demographic Transition." *Demography* 37 (1) : 59-66.

Rindfuss, Ronald R. and Allan M. Parnell. 1989. "The Varying Connection Between Marital Status and Childbearing in the United States." *Population and Development Review* 15 (3) : 447-70.

Ryder, Norman B. 1969. "The Emergence of a Modern Fertility Pattern: United States, 1917-1966." In *Fertility and Family Planning: A World View*, S. J. Behrman, Leslie Corsa, Jr., and Ronald Freedman, eds. pp. 99-123. Ann Arbor, MI: University of Michigan Press.

Ryder, Norman B. 1973. "Recent Trends and Group Differences in Fertility." In *Toward the End of Growth: Population in America*, Charles F. Westoff, ed. pp. 57-68. Englewood Cliffs, NJ: Prentice-Hall.

Ryder, Norman B. 1980. "Components of Temporal Variations in American Fertility." In *Demographic Patterns in Developed Societies*, R. W. Hiorns, ed. pp. 15-54. London: Taylor and Francis Ltd.

Schoen, Robert, Young J. Kim, Constance A. Nathanson, Jason Fields, and Nan Marie Astone. 1997. "Why Do Americans Want Children?" *Population and Development Review* 23 (2) : 333-58.

Singer, Judith D. and John B. Willett. 2003. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. Oxford: Oxford University Press.

Smith, Herbert L., S. Philip Morgan, and Tanya Koropeckyj-Cox. 1996. "A Decomposition of Trends in the Nonmarital Fertility Ratios of Blacks and Whites in the United States, 1960-1992." *Demography* 33 (2) : 141-51.

Steelman, Lala Carr, Brian Powell, Regina Werum, and Scott Carter. 2002. "Reconsidering the Effects of Sibling Configuration: Recent Advances and Challenges." *Annual Review of Sociology* 28 : 243-69.

Sullivan, Rachel. 2005. "The Age Pattern of First-Birth Rates Among U.S. Women: The Bimodal 1990s." *Demography* 42 (2) : 259-73.

Thomson, Elizabeth and Li, Jui-Chun Allen. 2002. "Her, His, and Their Children: Childbearing Intentions and Births in Stepfamilies." Center for Demography and Ecology, University of Wisconsin-Madison. NSFH Working Paper No. 89.

Thornton, Arland. 1989. "Changing Attitudes Toward Family Issues in the United States." *Journal of Marriage and the Family* 51 (4) : 873-93.

Thornton, Arland and Linda Young-DeMarco. 2001. "Four Decades of Trends in Attitudes Toward Family Issues in the United States: The 1960s Through the 1990s." *Journal of Marriage and the Family* 63 (4) : 1009-37.

U.S. Bureau of the Census. 1997. *Current Population Survey, June 1995: Fertility and Marital History Supplement*. Washington, DC: U.S. Department of Commerce, Bureau of the Census.

Upchurch, Dawn M., Lee A. Lillard, and Constantijn W. A. Panis. 2001 . "The Impact of Nonmarital Childbearing on Subsequent Marital Formation and Dissolution." In *Out of Wedlock: Causes and Consequences of Nonmarital Fertility*, Lawrence L. Wu and Barbara Wolfe, eds. pp. 344-383. New York: Russell Sage Foundation.

Ventura, Stephanie J. and Bachrach, Christine. 2000. "Nonmarital Childbearing in the United States, 1940-1999." Hyattsville, MD: National Center for Health Statistics. National Vital Statistics Reports: 48 (16).

Ventura, Stephanie J., Christine Bachrach, Laura Hill, Kelleen Kaye, Pamela Holcomb, and Elisa Koff. 1995. "The Demography of Out-of-Wedlock Childbearing." In *Report to the Congress on Out-of-Wedlock Childbearing*, U.S. Department of Health and Human Services, ed. Hyattsville, MD: U.S. Department of Health and Human Services.

Wilson, William J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago, IL: University of Chicago Press.

Wu, Lawrence L., Larry L. Bumpass, and Kelly Musick. 2001. "Historical and Life Course Trajectories of Nonmarital Childbearing." In *Out of Wedlock: Causes and Consequences of Nonmarital Fertility*, Lawrence L. Wu and Barbara Wolfe, eds. pp. 4-48. New York: Russell Sage Foundation.

Wu, Lawrence L. and Li, Jui-Chun Allen. 2004. "Marital and Childbearing Trajectories of American Women: 50 Years of Social Change." In *On the Frontier of Adulthood: Theory, Research, and Public Policy*, Richard Settersen, Jr., Frank F. Furstenberg, Jr., and Ruben G. Rumbaut, eds. Chicago, IL: University of Chicago Press.

Wu, Lawrence L. and Steven P. Martin. 2002. "Is There an Engine of Non-Marital Fertility?" Center for Demography and Ecology, University of Wisconsin-Madison. CDE Working Paper No. 2002-14.

Yamaguchi, Kazuo and Linda R. Ferguson. 1995. "The Stopping and Spacing of Childbirths and Their Birth-History Predictors: Rational-Choice Theory and Event-History Analysis." *American Sociological Review* 60 (2) : 272-98.

Table 1: Distribution of Independent Variables in Sample

	Women in sample	Proportion with observed second birth
Total	24270	0.74
Marital status at first birth		
Married	18593	0.77
Unmarried	5677	0.65
Race		
African American	3194	0.69
White	21076	0.75
Age at first birth		
Under 15	244	0.74
15-17	2516	0.77
18-19	4101	0.79
20-24	9878	0.78
25-29	5285	0.71
30-34	1770	0.55
35-39	421	0.32
40+	55	0.12
Education level		
No high school degree	2795	0.75
High school degree/some college	16717	0.74
Bachelor's degree or higher	4758	0.71
Year of first birth		
1955-64	4601	0.9
1965-74	6140	0.81
1975-95	13529	0.65

Data: 1995 Current Population Survey, Marital and Fertility History Supplement. Table includes white and African American non-Hispanic women born in the United States with first births in or after 1955. Women with multiple births at any parity are excluded. Statistics are weighted using CPS survey weights.

Table 2: Results from Cox Proportional Hazards Models, Measuring Time since First Birth in Months

	MODEL 1			MODEL 2		
	coefficient	s.e.		coefficient	s.e.	
Non-marital first birth:						
Constant effect	-0.3	0.02	***			
Time varying effect						
(time since first birth)						
0-11 months				-0.13	0.14	
12-14 months				-0.17	0.08	*
15-17 months				-0.08	0.07	
18-20 months				-0.18	0.07	*
21-23 months				-0.57	0.08	***
24-29 months				-0.26	0.05	***
30-35 months				-0.42	0.05	***
36-41 months				-0.48	0.06	***
42-47 months				-0.75	0.07	***
48-53 months				-0.43	0.08	***
54-59 months				-0.35	0.09	***
60+ months				0.02	0.04	
-2 log likelihood	176832			176682		
Degrees of freedom	1			12		

* p<0.05, ** p<0.01, ***p<0.001.

Table 2, continued

	MODEL 3			MODEL 4		
	coefficient	s.e.		coefficient	s.e.	
Non-marital first birth:						
Constant effect						
Time varying effect (time since first birth)						
0-11 months	-0.16	0.14		0.55	0.14	***
12-14 months	-0.20	0.08	*	0.47	0.08	***
15-17 months	-0.12	0.07		0.51	0.07	***
18-20 months	-0.22	0.07	**	0.37	0.07	***
21-23 months	-0.61	0.08	***	-0.05	0.08	
24-29 months	-0.3	0.05	***	0.23	0.05	***
30-35 months	-0.46	0.06	***	0.03	0.06	
36-41 months	-0.51	0.06	***	-0.07	0.06	
42-47 months	-0.79	0.07	***	-0.37	0.07	***
48-53 months	-0.47	0.08	***	-0.09	0.08	
54-59 months	-0.39	0.09	***	-0.03	0.09	
60+ months	-0.02	0.04		0.24	0.04	***
Currently not married				-0.83	0.03	***
African American (omitted=white)	-0.1	0.02	***	-0.03	0.02	
Age at first birth in years - 25	-0.04	0.00	***	-0.05	0	***
Age at first birth in years - 25, squared, ÷ 100	-0.02	0	***	-0.02	0	***
Education level (omitted=high school degree, some college)						
No high school degree	0.07	0.02	**	0.07	0.02	**
Bachelor's degree or higher	0.11	0.02	***	0.11	0.02	***
Year of first birth (omitted=1955-1964)						
1965-1974	-0.39	0.02	***	-0.36	0.02	***
1975-1984	-0.40	0.02	***	-0.34	0.02	***
1985-1995	-0.32	0.02	***	-0.25	0.02	***
-2 log likelihood	175550			174468		
Degrees of freedom	20			21		

* p<0.05, ** p<0.01, ***p<0.001. Data: 1995 Current Population Survey, white and African American non-Hispanic native-born women. Women with multiple births at any parity excluded. 18092 events (second birth), 6178 censored observations (censored at survey date or at age 50).

Table 3: Results from Cox Proportional Hazards Models, Measuring Time since First Birth in Months

	MODEL 5		
	coefficient	s.e.	
Non-marital first birth	-0.06	0.03	
Currently unmarried, time varying effect (time since first birth)			
0-11 months	0.3	0.41	
12-23 months	-0.81	0.13	***
24-35 months	-1.42	0.12	***
36-47 months	-1.47	0.11	***
48-59 months	-1.36	0.13	***
60+ months	-0.88	0.07	***
Interactions, non-marital first birth*currently unmarried (time since first birth)			
0-11 months	-0.42	0.43	
12-23 months	0.43	0.13	***
24-35 months	0.89	0.13	***
36-47 months	0.55	0.12	***
48-59 months	0.49	0.15	***
60+ months	0.41	0.09	***
African American (omitted=white)	-0.05	0.02	
Age at first birth in years - 25	-0.05	0.00	***
Age at first birth in years - 25, squared, ÷ 100	-0.02	0	***
Education level (omitted=high school degree, some college)			
No high school degree	0.07	0.02	**
Bachelor's degree or higher	0.11	0.02	***
Year of first birth (omitted=1955-1964)			
1965-1974	-0.36	0.02	***
1975-1984	-0.33	0.02	***
1985-1995	-0.25	0.02	***
-2 log likelihood	174399		
Degrees of freedom	21		

* $p<0.05$, ** $p<0.01$, ***$p<0.001$. Data: 1995 Current Population Survey, white and African American non-Hispanic native-born women. Women with multiple births at any parity excluded. 18092 events (second birth), 6178 censored observations (censored at survey date or at age 50).

Table 4: Net Effects of Current Marital Status

Currently unmarried, time varying effect (time since first birth)	Marital first birth	Non-marital first birth
0-11 months	0.30[a]	-0.13[a]
12-23 months	-0.81	-0.39
24-35 months	-1.42	-0.53
36-47 months	-1.47	-0.92
48-59 months	-1.36	-0.87
60+ months	-0.88	-0.47

Coefficients taken from model 5, shown in full in table 3. All coefficients statistically significant ($p<0.001$) except for [a], not statistically significant. Data: 1995 Current Population Survey, white and African American non-Hispanic native-born women. Women with multiple births at any parity excluded. 18092 events (second birth), 6178 censored observations (censored at survey date or at age 50).

Table 5: Results from Cox Proportional Hazards Models, Measuring Time since First Birth in Months, Run Separately by Period of First Birth

	FIRST BIRTH 1955-1964			FIRST BIRTH 1965-1974		
	coefficient	s.e.		coefficient	s.e.	
Non-marital first birth	-0.08	0.07		-0.03	0.06	
Currently unmarried, time varying effect (time since first birth)						
0-11 months	-0.25	1.00		-9.06	83.52	
12-23 months	-0.74	0.27	**	-1.11	0.30	***
24-35 months	-1.50	0.36	***	-1.78	0.28	***
36-47 months	-1.04	0.26	***	-1.40	0.18	***
48-59 months	-1.20	0.36	***	-1.50	0.25	***
60+ months	-0.82	0.20	***	-0.93	0.12	***
Interactions, non-marital first birth * currently unmarried (time since first birth)						
0-11 months	-0.04	1.04		9.15	83.52	
12-23 months	0.38	0.29		0.58	0.32	
24-35 months	1.05	0.38	**	1.36	0.29	***
36-47 months	0.39	0.31		0.47	0.21	*
48-59 months	0.29	0.44		0.71	0.29	*
60+ months	0.08	0.28		0.57	0.15	***
African American (omitted=white)	-0.16	0.05	**	-0.05	0.05	
Age at first birth in years - 25	-0.07	0.01	***	-0.05	0.00	***
Age at first birth in years - 25, squared, ÷ 100	-0.01	0.01		-0.02	0	***
Education level (omitted=high school degree, some college)						
No high school degree	-0.03	0.04		0.14	0.05	**
Bachelor's degree or higher	0.09	0.05		0.00	0.04	
-2 log likelihood	36181			48433		
Degrees of freedom	18			18		
Events	4148			5014		
Censored observations	453			1126		

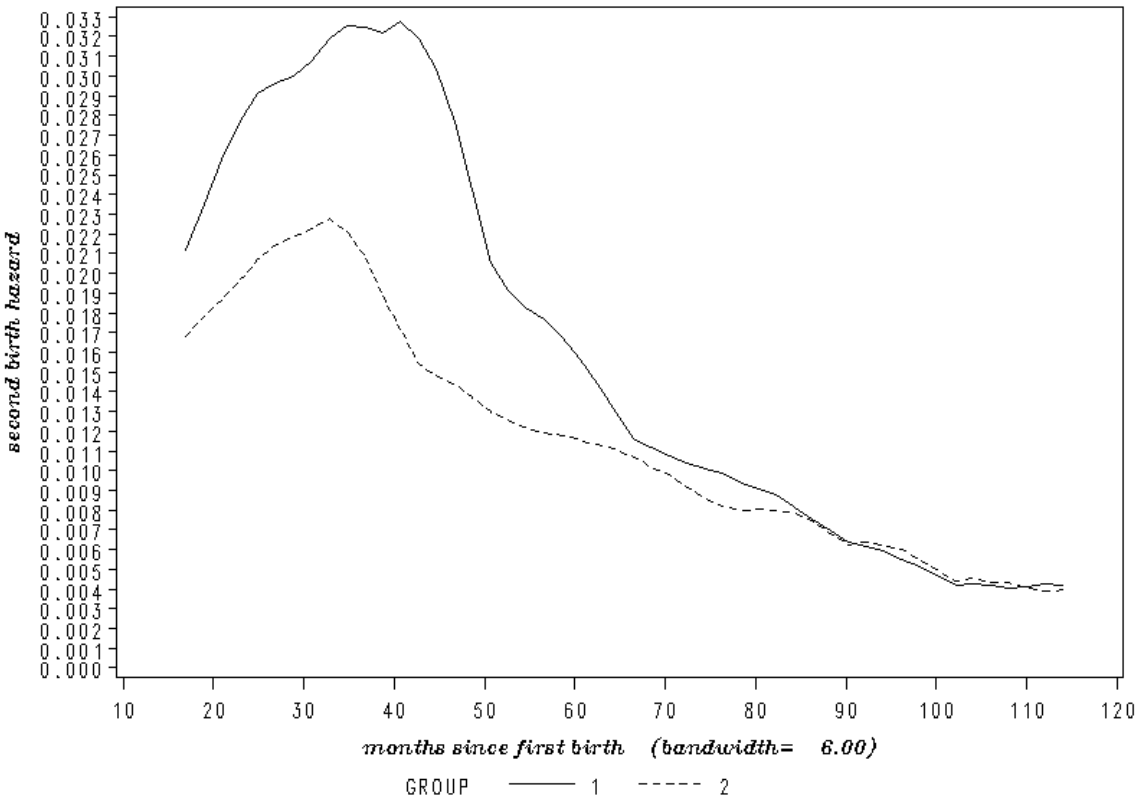
* p<0.05, ** p<0.01, ***p<0.001.

Table 5, continued.

	FIRST BIRTH 1975-1984			FIRST BIRTH 1985-1995		
	coefficient	s.e.		coefficient	s.e.	
Non-marital first birth	-0.1	0.05		0.01	0.07	
Currently unmarried, time varying effect (time since first birth)						
0-11 months	1.93	0.54	***	0.38	1.02	
12-23 months	-0.49	0.20	*	-0.94	0.29	**
24-35 months	-1.51	0.19	***	-1.10	0.20	***
36-47 months	-1.60	0.18	***	-1.68	0.26	***
48-59 months	-1.34	0.20	***	-1.39	0.28	***
60+ months	-0.84	0.10	***	-1.29	0.24	***
Interactions, non-marital first birth * currently unmarried (time since first birth)						
0-11 months	-1.47	0.57	*	-0.21	1.03	
12-23 months	0.20	0.21		0.75	0.30	*
24-35 months	1.00	0.21	***	0.36	0.22	
36-47 months	0.72	0.21	***	0.63	0.29	*
48-59 months	0.62	0.23	**	0.08	0.33	
60+ months	0.39	0.13	**	0.47	0.28	
African American (omitted=white)	-0.03	0.04		0.07	0.06	
Age at first birth in years - 25	-0.05	0.00	***	-0.04	0.00	***
Age at first birth in years - 25, squared, ÷ 10	-0.03	0	***	-0.03	0	***
Education level (omitted=high school degree, some college)						
No high school degree	0.01	0.05		0.30	0.06	***
Bachelor's degree or higher	0.10	0.04	**	0.26	0.04	***
-2 log likelihood	52902			33687		
Degrees of freedom	18			18		
Events	5392			3538		
Censored observations	1472			3127		

* p<0.05, ** p<0.01, ***p<0.001. Data: 1995 Current Population Survey, white and African American non-Hispanic native-born women. Women with multiple births at any parity excluded.

Figure 1: Smoothed Second Birth Hazards for Women with Marital and Non-marital First Births



Group 1 = women with marital first births; Group 2 = women with non-marital first births. Data: 1995 Current Population Survey, white and African American non-Hispanic native-born women. Women with multiple births at any parity excluded from analysis. Observations censored at survey date, at age 50, or 10 years after first birth.