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Parenthood? Trends in the Timing
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ABSTRACT

The twentieth century saw dramatic increases in childbearing outside of marriage. Although this change in family formation behavior may also have implications for fertility *within* marriage, marital childbearing has less frequently been studied. This paper uses data from ten fertility surveys to describe changes in the timing of marital childbearing from the 1940s through the beginning of the 21st century for non-Hispanic white and non-Hispanic black women. Using harmonized data from the new Integrated Fertility Survey Series, we explore trends in first marital births. Our results suggest increasing bifurcation in patterns of fertility timing for white women. We find that a growing proportion of marriages begin with a premarital conception; at the same time, an increasing proportion of couples are postponing fertility within marriage. For black women, marital fertility is increasingly postponed beyond the early years of marriage. Changes in the timing of childbearing within marriage are not explained by shifts in the educational or age composition of women who marry.

INTRODUCTION

Dramatic changes in family formation behavior occurred over the second half of twentieth century. These shifts, and their implications for child and adult well-being, are well documented (e.g., Cherlin 2010; Ellwood and Jencks 2004; McLanahan 2004; Smock and Greenland 2010). Americans are marrying later, and more are remaining unmarried; divorce rates have increased; nonmarital cohabitation has become more common; and the proportion of births taking place to unmarried women continues to rise. Some of these trends appear to have run their course – for example, divorce rates have plateaued since the 1980s (Raley and Bumpass 2003) – but the upward climb in cohabitation and nonmarital childbearing continues. These trends have been particularly pronounced among women with lower levels of education (Ellwood and Jencks 2004; Martin 2004; Smock and Greenland 2010).

The upshot of these changes is that marriage and parenthood have been increasingly decoupled, both behaviorally and normatively. This decoupling has primarily been studied in terms of childbearing outside of marriage, but the separation between marriage and childbearing may also have ramifications for fertility behavior *within* marriage. While the focus on nonmarital childbearing is understandable, attention to marital fertility has waned (Smock and Greenland 2010). It is still the case that the majority of births – 59.0% of all births in 2009 – occur among married women (Hamilton et al. 2010). Thus, the failure to examine and understand trends in marital fertility as well as nonmarital fertility represents a key gap in current knowledge. While childbearing continues to be an important goal for most Americans, pronatalist beliefs and the normative link between childbearing and marriage have weakened. This shift may have led to delays in marital fertility or increased childlessness in marriage. Alternatively, because marriage is increasingly optional rather than perceived as a required step toward adulthood, there may be more couples who do not marry unless and until they decide to become parents. This latter phenomenon would lead to more and earlier marital births. Either or both of these changes may be taking place; given educational and racial-ethnic stratification in U.S. family behavior, they are likely also differentially distributed in the population.

To understand how the decoupling of marriage and parenthood has influenced childbearing in marriage, we use data from six decades of fertility surveys to describe changes in the timing of marital fertility over the second half of the twentieth century. We analyze harmonized data from a newly available data resource, the Integrated Fertility Survey Series

(IFSS), to explore trends in the interval between marriage and the first marital birth, with particular attention to births in the first months of marriage (i.e., births resulting from premarital conceptions). We assess the role of changes in education and age at marriage in accounting for changes over the time period studied and test for differential changes according to educational attainment. Analyses are conducted separately for non-Hispanic white and non-Hispanic black women. Results show a decline in birth rates in the first three years of marriage for all women. For white women, birth rates in the first seven months of marriage declined less slowly, or even increased slightly during some periods. That is, a growing delay in marital fertility was accompanied for white women by an increase in the proportion of marriages begun after a premarital conception.

THE CHANGING INSTITUTION OF MARRIAGE

Cherlin (2004) described changes in family formation behavior over the late twentieth century as representing the “deinstitutionalization of marriage.” That is, marriage is increasingly understood as a relationship defined by, and for, individual needs, rather than a social contract entered for economic or normative reasons. Although most never-married Americans want to marry (Manning, Longmore, and Giordano 2007; Thornton and Young-DeMarco 2001), more recent cohorts are more likely to view marriage as “becoming obsolete” and less likely to view a successful marriage as one of the most important things in life (Wang and Taylor 2011; Pew Research Center 2010). At the same time, nonmarital cohabitation – a coresidential relationship without formal legal, religious, or social supports – has become an increasingly accepted and even expected family form. As such, marriage has evolved from a necessary step toward adulthood into an optional lifestyle choice, one that persists only as long as both spouses are individually fulfilled.

This transformation of marriage from a public social contract to a private individualistic union occurred gradually over the latter half of the 20th century (Amato et al. 2007) and is part of the broader set of changes in family and demographic behavior known as the Second Demographic Transition (SDT; see Lesthaeghe 2010, van de Kaa 2004 for reviews of the theory and its development). The original SDT theoretical framework links these changes to economic development, particularly the growing financial independence of women, but also to ideational changes leading to an increased value placed on individual satisfaction and fulfillment, personal freedom and choice, and “expressive individualism” at the expense of adherence to traditional

religious and social norms connecting marriage and childbearing (Amato 2009; Surkyn and Lesthaeghe 2004).

Although most Americans agree that marriage is the *most* appropriate setting for raising children, nonmarital parenthood is widely considered an acceptable alternative (Kefalas et al. 2011; Thornton and Young-DeMarco 2001). The growing proportion of births that take place outside of marriage, and the declining likelihood that a nonmarital conception will be “legitimated” by marriage before the birth (Hoelter, LeClere, and Smock 2008), demonstrate that fewer couples believe it necessary to be married in order to become parents. To some extent, cohabitation has replaced marriage as a context for childbearing. Cohabiting births are responsible for a substantial proportion of recent increases in nonmarital fertility in the United States, and there is some evidence that cohabitation functions as a replacement for marriage in some subgroups (Guzzo and Hayford forthcoming; Manning 1993; Mincieli et al. 2007). The extent to which cohabitation is accepted as a setting for childbearing varies across subgroups, but patterns of nonmarital and cohabiting fertility clearly demonstrate that marriage is no longer necessary for childbearing. It remains to be seen whether the reverse also holds – whether childbearing is still necessary for marriage. If personal fulfillment has become the primary consideration in getting (and staying) married, we might see more childless marriages and longer periods between marriage and first birth.

The separation of marriage and childbearing also has implications for nonmarital conceptions and legitimation. As noted by Smock and Greenland (2010), so-called “shotgun marriages” have become decreasingly likely to follow a nonmarital conception. In fact, marrying simply because of a pregnancy is often viewed as a mistake or somehow irresponsible and immature due to rising social prerequisites for marriage (such as financial and residential independence), increased difficulties in securing stable employment (Kefalas, Furstenberg, Carr, and Napolitano 2011), and individual expectations (love, trust, and fulfillment) of marriage (Edin and Kefalas 2005; Hertog and Iwasawa 2011). It is important to note, however, that the declining rate of legitimation of premarital conceptions does not necessarily imply a decline in marriages begun by legitimation. Rising ages at marriage and higher rates of cohabitation mean that couples spend a longer period of time “at risk” of a nonmarital conception. If lower rates of legitimation are accompanied by larger numbers of conceptions, the number of marriages that result from legitimation may remain stable or even increase.

As noted above, most Americans still want to marry, even though marriage is decreasingly necessary as a component of adulthood or as a prerequisite for childbearing. To explain the continued significance of marriage, some scholars argue that marriage serves as a “capstone” relationship symbolizing the achievement of adult goals. Marriage is understood as appropriate only after financial and residential independence have been securely established (Gibson-Davis, Edin, and McLanahan 2003; Smock, Manning, and Porter 2005). These social prerequisites represent a “high bar” for marriage, and it is increasingly difficult to meet this bar for many young adults (Edin and Kefalas 2004; Kefalas et al. 2011). As a result, marriage has become increasingly concentrated among socially advantaged men and women.

EDUCATIONAL DIFFERENTIALS IN FAMILY CHANGE

During the period of rapid family change in the late twentieth century, educational differentials in marriage and family formation widened (Ellwood and Jencks 2004; McLanahan 2004). This growing gap is largely attributable to larger changes in behavior among less educated women relative to their more educated counterparts. Nonmarriage, divorce, and nonmarital childbearing are all negatively associated with educational attainment (Isen and Stephenson 2010; Martin 2004). Highly educated women are more likely to postpone or forego motherhood than their less educated counterparts (England, McClintock, and Shafter 2011; Heaton, Jacobsen, and Holland 1999; Abma and Martinez 2006; Kelly 2009). However, these patterns are largely explained by delayed marriage and low non-marital fertility among highly educated women, and may not apply to educational differentials in fertility within marriage. It is not clear what the growing educational divide in family formation behavior implies for educational gradients in childbearing within marriage.

If more educated women (and their spouses) have been more likely to adopt individualistic attitudes toward marriage, then delayed childbearing and childlessness in marriage should have grown more rapidly for more educated than for less educated women. In particular, since better-educated women are less likely to have a premarital conception (England, McClintock, and Shafer 2011), fewer marriages would be followed by a birth in the first few months among those with higher education relative to lower education. This gap may have grown over time as cohabitation and premarital sexual activity have become more common.

But it is also possible that trends in marital fertility are similar across education levels. As marriage has become more optional, it may have become increasingly selective of those who want to have children. Combined with sociobiological pressures to have children within a normative age range, the result may be that most people still have children once married, and tend to do so relatively soon after marriage.

CURRENT INVESTIGATION

This article uses data from ten fertility and family surveys to analyze the timing of the first marital birth in the marriage cohorts of the 1940s to the 1990s, describing non-Hispanic white and non-Hispanic black women separately. We include educational attainment as a control, to assess the possibility that changes in marriage timing are the result of the changing education distribution of married women rather than education-specific changes in behavior, and we also test for changes in the association between education and the timing of marital childbearing. Models control for age at marriage.

Our analysis begins with descriptive statistics showing the proportion of married women who have a first birth within seven months, two years, and five years of the first marriage. These statistics show the relative prevalence of marriages that begin with a premarital conception and marriages in which childbearing is delayed. We also present trends in first birth hazards over the first fifteen years of marriage and the educational and age distribution of married women in each of 11 marriage cohorts. We then proceed to multivariate analysis to formally test for the statistical significance of change over time and the contribution of compositional changes to explaining time trends; interactions test for the possibility of differential change by educational attainment.

Overall, we expect that marital fertility will exhibit marked changes during the latter half of the 20th century, as rising individualism has shifted expectations of marriage and decreased pressures to have children. Fewer marriages will involve children, and married women will wait longer between getting married and becoming a parent. We also tentatively hypothesize that fewer marriages will be begun by a premaritally conceived pregnancy.

DATA AND METHODS

Data, measures, and sample

Data come from the Integrated Fertility Survey Series (IFSS), a harmonized dataset combining data from ten surveys of fertility and family behavior conducted in the United States between 1955 and 2002. The component surveys are the Growth of American Families (GAF) surveys of 1955 and 1960; the National Fertility Surveys (NFS) of 1965 and 1970; and the National Surveys of Family Growth (NSFG) of 1973, 1976, 1982, 1988, 1995, and 2002. All are nationally representative, but the populations represented vary; Table 1 presents the sampling frames and sample sizes of each survey. The IFSS compiles data from all surveys and harmonizes the original data, including weights and survey design variables, into comparable formats. Harmonized IFSS data are available at: <http://www.icpsr.umich.edu/icpsrweb/IFSS/>.

Table 1. IFSS surveys, sampling frames, and sample sizes

Survey	Sample frame	N (women)
GAF: 1955	Married white women, age 18-39	2713
GAF: 1960	Married white women, age 18-39; previously married white women (married in 1955), age 23-44; married non-white women, age 18-39	3256
NFS: 1965	Currently married women, age 55 and under; black women oversampled	5617
NFS: 1970	Ever-married women, age 45 and under; black women oversampled	6752
NSFG: 1973	Ever-married women and single women with children in household, age 15-44; black women oversampled	9797
NSFG: 1976	Ever-married women and single women with children in household, age 15-44; black women oversampled	8611
NSFG: 1982	Women, age 15-44; black and teenage women oversampled	7969
NSFG: 1988	Women, age 15-44; black women oversampled	8450
NSFG: 1995	Women, age 15-44; black and Hispanic women oversampled	10847
NSFG: 2002	Women, age 15-44; black, Hispanic, and teenage women oversampled	7643

The primary measures used in this analysis, timing of first marriage and first marital birth, are fully comparable across surveys. Although the completeness of marital histories collected in the IFSS component surveys varies, all collect start and end dates of first marriages. The only challenge to comparability of these measures is the limited sampling frames of the early surveys. The 1955 and 1960 GAF, the 1965 and 1970 NFS, and the 1973 NSFG interviewed only married women, and the 1976 NSFG is restricted to ever-married women and

women with children in the household. In addition, the 1955 GAF includes only white women, and Hispanic ethnicity is not measured in the GAF or NFS surveys. These restrictions limit analytic possibilities. For example, because unmarried women are not interviewed in the early surveys, it is not possible to consider change over time in selection into marriage or the proportion of nonmarital conceptions that are legitimated. In addition, the time period analyzed is shorter for African American women than for white women.

However, given the scarcity of survey data on marriage and families over the course of a half century, the benefits of using the IFSS data outweigh the limitations. In all, the pooled surveys include 56,492 ever married women; 737 first marriages with missing start or end dates were dropped from the analytic sample. To minimize bias related to retrospective reporting and age truncation, we limit analyses to marriages that took place within the fifteen years prior to the survey in which they were reported.¹ We also exclude marriages to women with missing data on education or age at marriage. After these restrictions, our analytic sample consists of 33,111 marriages to 25,159 white women and 7,952 African American women. Because of changing race-ethnic categorizations over the different surveys, we exclude 616 marriages to women of other racial and ethnic groups. We also exclude marriages to Hispanic women because sample sizes in the early years were too small for robust analysis. The GAF and NFS surveys do not measure Hispanic ethnicity, although they include both Hispanic and non-Hispanic respondents. For these surveys, we analyze Hispanic and non-Hispanic respondents together. In the 1973 NSFG, the first survey that measured Hispanic ethnicity, less than 3% of the sample identified as Hispanic, and the Hispanic population was likely smaller in the earlier surveys. Thus, combining Hispanic and non-Hispanic respondents is unlikely to distort results.

We analyze trends in the timing of marital fertility across 11 marriage cohorts spanning the twentieth century from the Baby Boom onwards: before 1950; 1950-54; 1955-59; 1960-64; 1965-69; 1970-74; 1975-79; 1980-84; 1985-89; 1990-95; and 1995-2002. Timing of marital fertility is defined as the duration elapsed between the first marriage and the first birth within the marriage (regardless of the parity of the birth with respect to the woman's reproductive career).

¹ Even with this restriction, marriages to women age 30 and over are underrepresented in our sample relative to population levels because of the age restrictions of the surveys and truncation of observations in years before the survey. In descriptive statistics we distinguish between marriages at ages 25-29 and marriages to women age 30 and over, but our multivariate models combine these two groups.

All of the IFSS component surveys collect complete fertility histories, and less than one percent of births reported have missing dates. Following most literature on premarital conceptions, we identify births that took place within seven months of the marriage start date as premaritally conceived.

The primary stratifying variables in our analysis are race-ethnicity and education. All analyses are conducted separately for white and African American women. Educational attainment is measured at the time of the survey; note that for women who are enrolled in school after they marry, education at the time of the survey may not accurately represent attainment at the time of marriage. However, because of strong norms about role conflict and the sequencing of marriage and education in the United States, we expect that the error introduced by measuring education at the time of survey is minimal. The IFSS harmonized variable reports educational attainment as years of schooling. Based on this measure, we created four education categories: no high school degree (less than 12 years), high school degree only (12 years), some college education (more than 12 but less than 16 years), and bachelor's degree or higher (16 or more years)². It is important to underscore that while our categorization of education is the same in all surveys, these categories do not have the same meaning over the period of study. Most notably, the proportion of women attending and graduating from college increased substantially over the second half of the twentieth century. Thus, the selectivity and social meaning of college education for women changed over time. We discuss the possible implications of these changes in the discussion sections.

We also control for age at marriage. The average age at marriage increased substantially over the second half of the twentieth century; because age is associated with fecundity, this changing distribution could affect marital fertility even absent any change in fertility intentions or behavior. Age at marriage is taken directly from the IFSS harmonized variable and categorized as follows: under 18, 18-19, 20-24, 25-29, and 30 or over.

² Unfortunately, degree attainment is not consistently available across surveys. Thus, it is not possible to create an accurate measure of degrees received. We also considered using reported years of schooling to create relative measures of education (e.g., education terciles or quartiles). However, some surveys report education in ranges rather than exact years. The approach used here is the most straightforward way of creating a meaningful education measure that is reasonably consistent over time.

Methods and analytic approach

We begin with descriptive analyses presenting the distribution of early and late childbearing in first marriages for white and African American women. We use life table methods to estimate the proportion of marriages in which a child is born (1) in the first seven months (i.e., the proportion of marriages that begin with a premarital conception); (2) in the first two years; and (3) in the first five years, accounting for censoring of observations (by marital dissolution or by the interview date) before the first marital birth. Life tables are constructed using PROC LIFETEST in SAS; based on initial exploratory analysis we defined intervals as 0-7 months, 8-12 months, 13-24 months, 25-36 months, and 37 months or more. We also briefly describe changes in the distribution of education and age at marriage in marriage cohorts over the second half of the twentieth century.

We next estimate continuous time event history models (Cox models) predicting the timing of the first birth within marriage. Analyses are conducted separately for white and African American women. These models account for censoring of marriages by marital dissolution or the survey date and allow for formal significance tests of differences across cohorts. We first estimate baseline models that include measures for marriage cohort only. Cox models assume proportional hazards; that is, they assume that cohort differences in the hazards of first birth are constant at all marriage durations. To relax the proportionality assumption, we then estimate models allowing for interactions between marriage cohort and time since marriage (specified as set of intervals: 0-7 months, 8-12, 13-24 months, 25-26 months, and 37 or more months). These interactions assess whether time trends in fertility early and late in marriage are different. Subsequent models incorporate education and age at marriage to examine whether changes in the composition of marriage cohorts explain change in the timing of marital fertility.

RESULTS

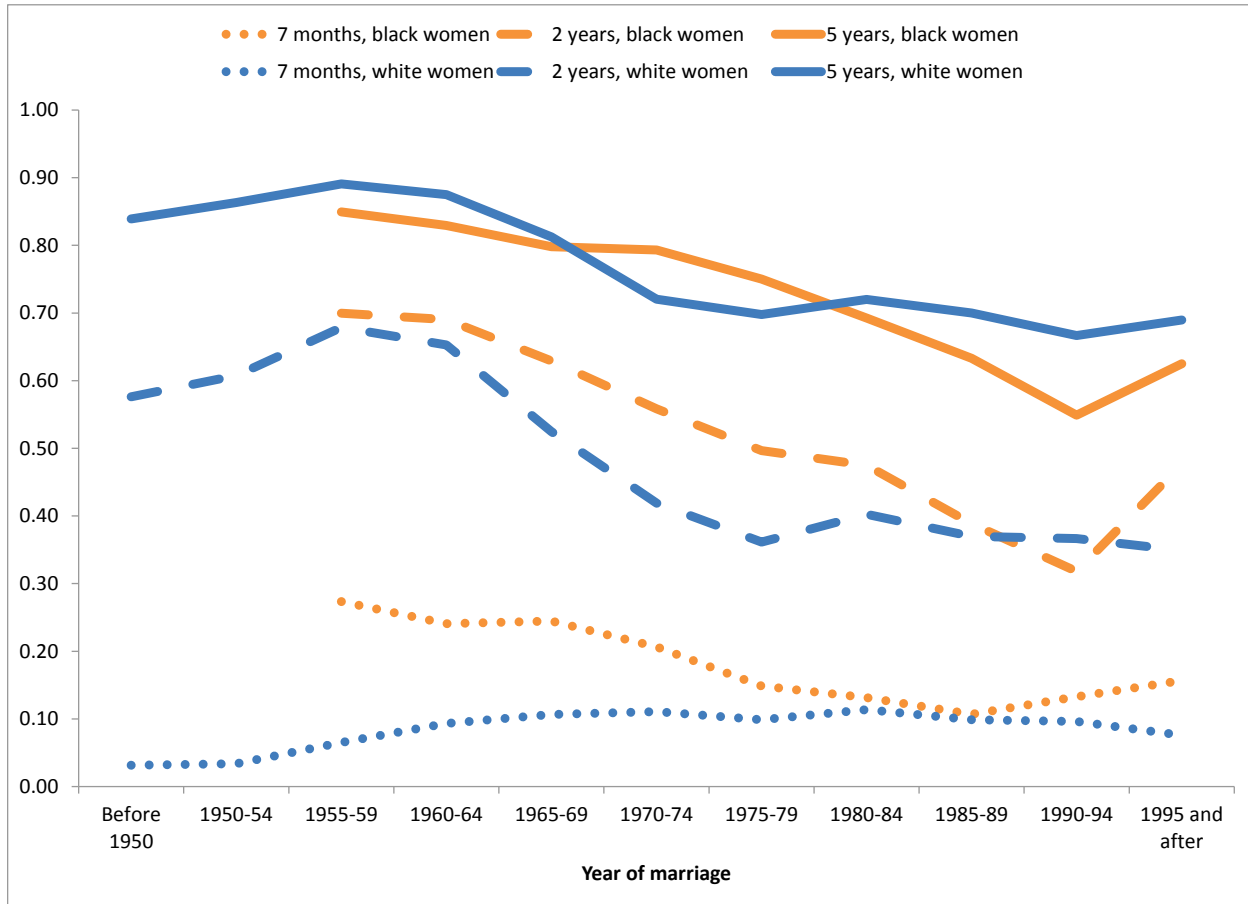
Table 2 shows the proportion of marriages in which women report a birth within 7 months (a birth resulting from a premarital conception), 2 years, and 5 years. These proportions are generated from life table estimates and represent cumulative proportions. The same information is presented graphically in Figure 1. Several overall patterns are apparent. First, marital fertility rates overall appear to be falling. Cumulative proportions reporting a birth after two and five years of marriage declined over the second half of the twentieth century for both white and African American women. The decline is substantial: in the 1955-59 marriage cohort, the cohort with the highest fertility, an estimated 89% of white women and 85% of black women would give birth within five years of their first marriage if exposed to the observed rates for that period of time.

Table 2. Changing timing of first marital birth for U.S. marriage cohorts

Cohort	N	Percent of marriages with first birth within:		
		7 months	2 years	5 years
<i>Marriages to white women</i>				
Before 1950	2241	0.03	0.58	0.84
1950-54	1983	0.03	0.61	0.86
1955-59	2474	0.07	0.68	0.89
1960-64	3613	0.09	0.65	0.88
1965-69	4084	0.11	0.52	0.81
1970-74	3374	0.11	0.42	0.72
1975-79	1604	0.10	0.36	0.70
1980-84	2002	0.11	0.40	0.72
1985-89	1498	0.10	0.37	0.70
1990-94	1353	0.10	0.37	0.67
1995 and after	933	0.08	0.35	0.69
<i>Marriages to black women</i>				
Before 1950		not observed		
1950-54		not observed		
1955-59	595	0.27	0.70	0.85
1960-64	1371	0.24	0.69	0.83
1965-69	1718	0.24	0.63	0.80
1970-74	1742	0.21	0.56	0.79
1975-79	724	0.15	0.50	0.75
1980-84	733	0.13	0.47	0.69
1985-89	464	0.11	0.39	0.63
1990-94	367	0.13	0.32	0.55
1995 and after	238	0.16	0.48	0.62

Data: Fertility surveys from 1955-2002 harmonized by the IFSS project; see text for details. Marriages with non-missing dates of marriage and first birth in the 15 years prior to each survey. Surveys before 1973 combine Hispanic and non-Hispanic respondents; in surveys after 1973, Hispanic respondents are excluded from analysis. Life table estimates accounting for censoring of observations.

By the late 1990s marriage cohorts, this figure had declined 22% for white women and 27% for black women, to 69% and 62%, respectively. For black women, birth rates fell in the very early stages of marriage as well: The proportion of marriages with births in the first seven months declined for much of the period of observation, although there appears to have been a slight uptick in the 1990s. In contrast, the proportion of white women's marriages that began with a premarital conception increased over most of the second half of the twentieth century.

Figure 1: Proportion of marriages with first birth within specified interval, U.S. marriage cohorts

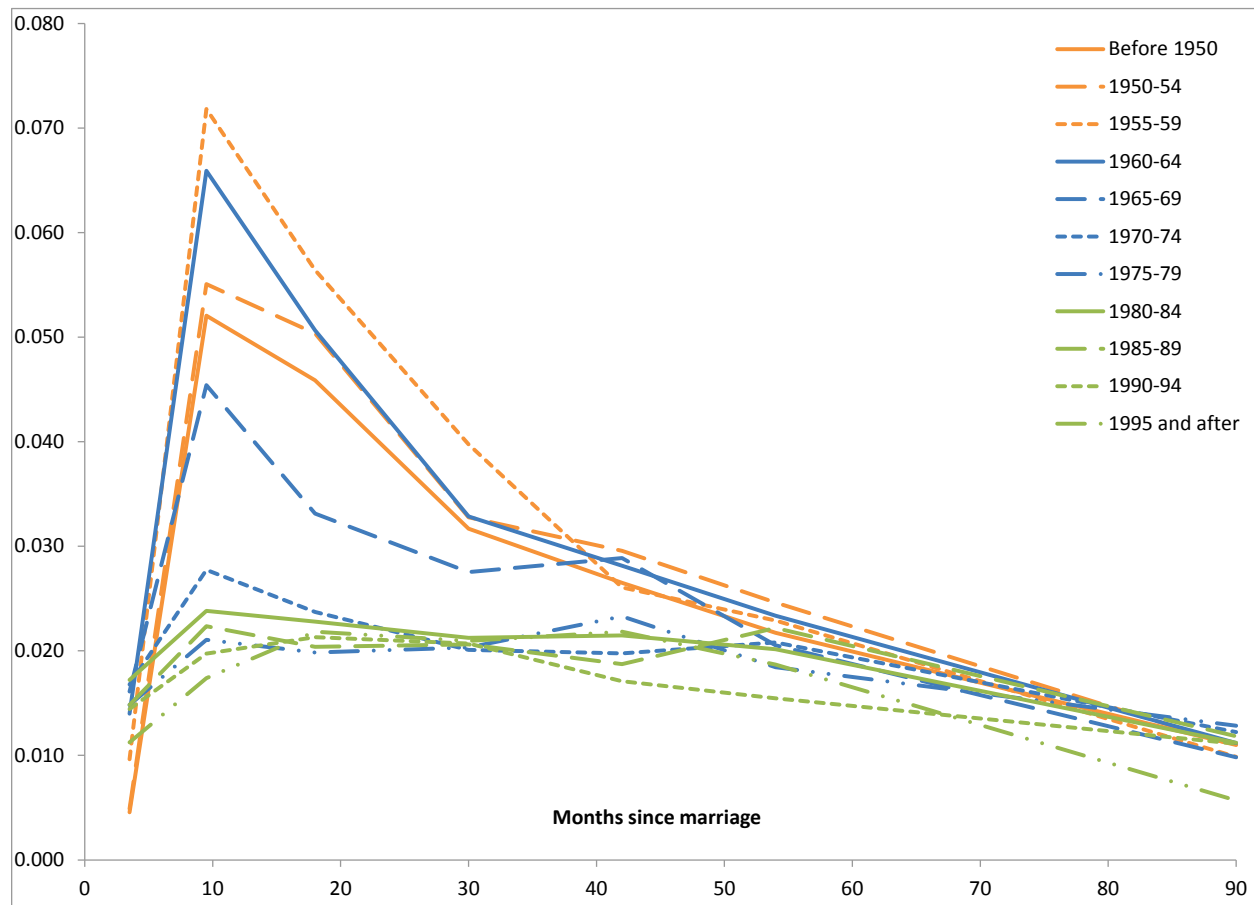
Data: Fertility surveys from 1955-2002 harmonized by the IFSS project; see text for details. Marriages with non-missing dates of marriage and first birth in the 15 years prior to each survey. Life table estimates accounting for censoring of observations. Surveys before 1973 combine Hispanic and non-Hispanic respondents; Hispanic respondents excluded after 1973.

Second, trends are largely similar for white and black women. The cumulative proportion of women reporting a birth after two years of marriage is slightly higher for black women than for white women for much of the century, but a decline in birth rates is apparent in all marriages. Both levels and trends in the proportion of women experiencing a birth within the first five years of marriage are very similar for the two race-ethnic groups. Again, fertility in the first seven months of marriage is an exception to this pattern. The proportion of marriages that began with a premarital conception is substantially higher for black women than for white women in the 1950s and 1960s marriage cohorts. For example, 27% of marriages to black women in the period 1955-59 began with a premarital conception, compared to only 7% of marriages to white women. This

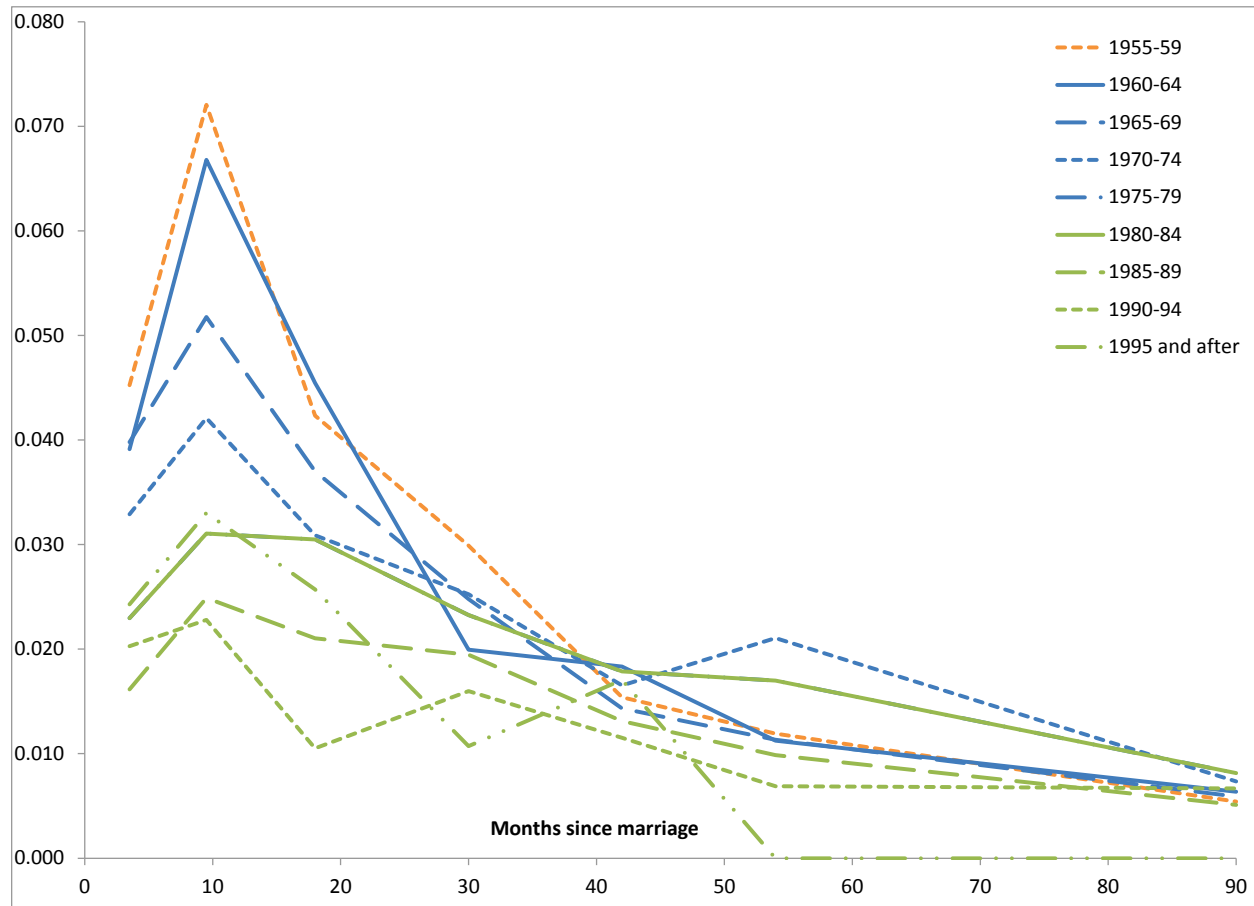
proportion declined for black women and increased for white women; by the late 1980s, there was little black-white difference in early marital fertility.

Figures 2 and 3 present hazard rates for marital fertility for white and black women, respectively, by marriage cohort over the second half of the twentieth century. Hazard rates are generated from life tables as described above. In both figures, the orange lines represent marriage cohorts from the 1950s and earlier; the blue lines represent marriage cohorts from the 1960s and 1970s, and the green lines represent marriages cohorts from the 1980s and 1990s; the solid lines are the earliest cohort in each of these grouping.

Figure 2: Hazard rates of first birth within first marriage, white women in U.S. marriage cohorts



Data: Fertility surveys from 1955-2002 harmonized by the IFSS project; see text for details. Marriages with non-missing dates of marriage and first birth in the 15 years prior to each survey. Life table estimates accounting for censoring of observations. Surveys before 1973 combine Hispanic and non-Hispanic respondents; Hispanic respondents excluded after 1973.

Figure 3: Hazard rates of first birth within first marriage, black women in U.S. marriage cohorts

Data: Fertility surveys from 1955-2002 harmonized by the IFSS project; see text for details. Marriages with non-missing dates of marriage and first birth in the 15 years prior to each survey. Life table estimates accounting for censoring of observations. Surveys before 1973 combine Hispanic and non-Hispanic respondents; Hispanic respondents excluded after 1973.

These figures are largely consistent with the cumulative proportions experiencing a birth shown in Table 2 and Figure 1. For white women, Figure 2 shows a crossover in birth hazards. Hazards in the first seven months of marriage increase between the 1950s and the 1960s/1970s, then decline again in the 1980s/1990s, while hazards at later marriage durations decline fairly steadily starting in the late 1950s. Early cohorts show a sharp peak in hazards in the first and second year of marriage, i.e., a strong pattern of birth timing shortly after marriage. This peak flattens out by the 1970s marriage cohorts; birth hazards for the later cohorts are essentially stable after the first seven months of marriage, pointing to a weakening of the link between marriage and fertility timing.

Hazard curves for black women show no crossover, with hazards declining at all marital durations. There is some evidence of a flattening of the hazard curves for black women as well, but the pattern is less clear. Because sample sizes are smaller for marriages reported by black women than for marriages reported by white women, there is more fluctuation in hazard rates both across marriage cohorts and over the duration of marriage, making it more difficult to discern patterns. In the early cohorts (1955-59, 1960-64), when the sharp peak in birth hazards is most apparent, the decline in hazards after the peak in the first year of marriage is larger and more rapid for black women than for white women. Combined with the higher fertility of black women than white women in the first seven months of marriage in these cohorts, this pattern suggests that the timing of marriage was even more closely linked to childbearing among African American women than among white women.

Changes in the timing of marital births may be the result of the changing characteristics of women who marry. Table 3 shows changes in the education and age at marriage composition of white and African American marriage cohorts over the second half of the twentieth century. The education composition of marriage cohorts changed dramatically over the period of observation. Of white women in the earliest marriage cohort (marriages before 1950), 37.3% did not have a high school degree, and 45.5% had only a high school degree. Only 17.3% had any post-high school education (12.0% had some college education and 5.3% had a bachelor's degree or higher). By the latest cohort, almost three quarters of white women marrying had post-high school education: 31.9% had some college education, and 41.9% had a bachelor's degree. A similar pattern is apparent for black women who married, although the overall education levels for black married women are slightly lower than for white women in all cohorts. This shift in the educational attainment of married women is driven both by the substantial increase in education for all women and by the increasing education gradient in marriage rates. That is, there are more educated women, and more educated women are increasingly more likely to get married than less educated women, producing a large increase in the educational attainment of married women.

The age distribution also shifted substantially upwards. In almost all marriage cohorts, the modal marriage age for both white and black women was age 20-24. (The one exception is the most recent marriage cohort for black women, in which the largest proportion of women were age 25-29 at marriage.) However, over time there has been a shift from the lower age groups (under 18, 18-19) into the older age groups (25-29, 30 and older).

Table 3: Changing age and educational composition of U.S. marriage cohorts

Marriages taking place:	N	Percent of marriages to women age:					Percent of marriages to women with:			
		Under 18	18-19	20-24	25-29	30 and up	No h.s. degree	H.s. degree	Some college	B.A.
<i>Marriages to white women</i>										
Before 1950	2241	16.3	24.8	45.4	12.3	1.4	37.3	45.5	12.0	5.3
1950-54	1983	18.3	26.5	41.4	9.6	4.3	30.0	50.6	11.5	7.9
1955-59	2474	19.8	30.5	38.2	8.0	3.4	25.8	50.2	14.1	10.0
1960-64	3613	18.6	32.8	40.1	6.6	2.0	22.1	50.6	15.7	11.7
1965-69	4084	13.1	30.8	47.8	7.5	0.8	12.6	43.3	25.1	19.0
1970-74	3374	14.7	32.8	43.4	8.1	1.1	9.4	39.3	28.2	23.1
1975-79	1604	9.5	28.7	45.3	14.2	2.3	8.1	38.8	29.4	23.7
1980-84	2002	7.6	21.3	49.0	17.4	4.8	10.2	33.4	30.6	25.9
1985-89	1498	4.2	14.4	49.9	21.1	10.5	9.1	32.6	29.0	29.3
1990-94	1353	3.4	12.7	43.0	29.3	11.7	9.9	23.3	30.8	36.0
1995 and after	933	1.9	10.5	41.4	30.4	15.9	9.0	17.2	31.9	41.9
<i>Marriages to black women</i>										
Before 1950		not observed								
1950-54		not observed								
1955-59	595	23.8	24.2	37.8	10.9	3.3	50.4	32.5	11.1	6.0
1960-64	1371	21.8	29.9	36.7	8.3	3.3	36.5	43.7	12.9	7.0
1965-69	1718	16.9	28.5	41.0	11.5	2.1	22.5	46.1	21.8	9.6
1970-74	1742	20.8	28.6	37.3	12.5	0.8	21.1	41.2	26.8	10.9
1975-79	724	6.4	26.0	39.3	20.1	8.2	10.6	46.3	30.9	12.3
1980-84	733	4.5	18.1	44.6	25.1	7.8	15.8	33.4	32.1	18.7
1985-89	464	0.7	12.4	41.4	25.1	20.4	11.7	32.4	43.2	12.8
1990-94	367	1.4	9.3	37.9	28.2	23.3	11.6	30.1	33.6	24.7
1995 and after	238	0.8	6.7	33.5	34.3	24.6	11.8	29.7	34.9	23.7

Data: Fertility surveys from 1955-2002 harmonized by the IFSS project; see text for details. Marriages with non-missing dates of marriage and first birth in the 15 years prior to each survey. Surveys before 1973 combine Hispanic and non-Hispanic respondents; after 1973, Hispanic respondents are excluded from analysis. Percents weighted.

Results from continuous time models predicting the hazard of first birth are shown in Tables 4a (for white women) and 4b (for black women). Tables 4a and 4b present results from three models: a baseline model estimating differences between marriage cohorts (Model 1); a model that relaxes the proportional hazards assumption by specifying interactions between marriage cohort and duration of marriage (Model 2); and a model that includes both duration-cohort interactions and controls for changes in the sociodemographic characteristics of women marrying in each cohort (Model 3).

For white women, results from Model 1 indicate that the hazards of first marital birth were highest for women married during the Baby Boom (the marriage cohorts of 1955-59 and 1960-64 [the reference category]). Birth hazards for all other marriage cohorts are significantly lower than for the 1960-64 cohort. The magnitude of the coefficients suggests a relatively continuous decline in birth hazards starting in the late 1960s and continuing through the end of the twentieth century. Results for black women show a similar pattern of change (Model 1, Table 4b). The coefficients are smaller in magnitude for black women than for white women in the 1960s and 1970s and larger in the 1980s and 1990s, implying a later and faster decline in marital fertility rates.

To fully analyze the changing timing of marital births, Model 2 tests for the possibility that trends over time in marital fertility are different at different marriage durations. Overall, this possibility is strongly supported; model fit is significantly improved relative to Model 1 (Tables 4a, 4b). Interactions are included for the first 7 months of marriage; months 8-12; months 13-24; and months 25-36. The main effect for marriage cohort in these models therefore measures time trends in the omitted interval, marriage durations longer than 36 months. For both white and African American women, the main effects are reduced in magnitude relative to their size in Model 1, indicating that changes over time in birth hazards were smaller at long durations of marriage than in the first three years of marriage. That is, changes in marital fertility were largest in the early years following the marriage.

For white women, interactions for the first 7 months of marriage are statistically significant and negative before 1960: during this period, hazards of birth in marriage were lower overall than in the 1960-64 marriage cohort, the reference category (Model 1), but these differences appear to be concentrated in the early period, i.e., driven by lower proportions of marriages beginning with a premarital conception.

Table 4a: Continuous time hazard models predicting first birth in first marriage, white women

	Model 1			Model 2			Model 3		
	b	se		b	se		b	se	
Year of marriage									
Before 1950	-0.20	0.03	***	-0.13	0.06	*	-0.16	0.06	**
1950-54	-0.13	0.03	***	-0.11	0.07		-0.12	0.07	+
1955-59	0.05	0.03	+	-0.07	0.07		-0.06	0.07	
1960-64 (omitted)									
1965-69	-0.25	0.03	***	-0.03	0.06		0.04	0.06	
1970-74	-0.52	0.03	***	-0.23	0.06	***	-0.14	0.06	*
1975-79	-0.59	0.04	***	-0.23	0.07	**	-0.11	0.07	
1980-84	-0.53	0.03	***	-0.24	0.07	***	-0.05	0.07	
1985-89	-0.61	0.04	***	-0.24	0.07	***	0.00	0.07	
1990-94	-0.68	0.04	***	-0.45	0.08	***	-0.16	0.08	+
1995 and after	-0.71	0.05	***	-0.38	0.11	***	-0.08	0.11	
Interactions: marriage duration x year of marriage									
0-7 months x:									
Before 1950				-0.82	0.12	***	-0.80	0.12	***
1950-54				-0.85	0.13	***	-0.85	0.13	***
1955-59				-0.26	0.10	*	-0.27	0.10	**
1960-64 (omitted)									
1965-69				0.08	0.08		0.06	0.08	
1970-74				0.26	0.09	**	0.24	0.09	**
1975-79				0.13	0.11		0.13	0.11	
1980-84				0.22	0.10	*	0.21	0.10	*
1985-89				0.07	0.11		0.09	0.11	
1990-94				0.29	0.12	*	0.30	0.12	*
1995 and after				-0.07	0.16		-0.03	0.16	
8-12 months x:									
Before 1950				0.00	0.09		0.02	0.09	
1950-54				0.10	0.09		0.09	0.09	
1955-59				0.19	0.09	*	0.18	0.09	*
1960-64 (omitted)									
1965-69				-0.48	0.08	***	-0.49	0.08	***
1970-74				-0.85	0.10	***	-0.87	0.10	***
1975-79				-1.12	0.13	***	-1.11	0.13	***
1980-84				-0.88	0.11	***	-0.89	0.11	***
1985-89				-0.95	0.13	***	-0.92	0.13	***
1990-94				-1.03	0.15	***	-1.02	0.15	***
1995 and after				-0.96	0.18	***	-0.93	0.18	***

13-24 months x:						
Before 1950	0.05	0.08		0.05	0.08	
1950-54	0.10	0.09		0.09	0.09	
1955-59	0.24	0.08	**	0.22	0.08	**
1960-64 (omitted)						
1965-69	-0.40	0.07	***	-0.41	0.07	***
1970-74	-0.53	0.09	***	-0.55	0.09	***
1975-79	-0.63	0.10	***	-0.63	0.10	***
1980-84	-0.57	0.09	***	-0.57	0.09	***
1985-89	-0.66	0.10	***	-0.64	0.10	***
1990-94	-0.41	0.11	***	-0.40	0.11	***
1995 and after	-0.47	0.14	**	-0.44	0.14	**
25-36 months x:						
Before 1950	0.04	0.10		0.04	0.10	
1950-54	0.14	0.11		0.12	0.11	
1955-59	0.25	0.11	*	0.24	0.11	*
1960-64 (omitted)						
1965-69	-0.17	0.09	+	-0.18	0.09	*
1970-74	-0.28	0.11	**	-0.30	0.11	**
1975-79	-0.26	0.12	*	-0.26	0.12	*
1980-84	-0.20	0.11	+	-0.20	0.11	+
1985-89	-0.29	0.12	*	-0.27	0.12	*
1990-94	0.01	0.13		0.01	0.13	
1995 and after	-0.08	0.16		-0.07	0.16	
Sociodemographic controls						
Age at marriage						
Under 18				0.41	0.02	***
18-19				0.24	0.02	***
20-24 (omitted)						
25 or over				-0.21	0.02	***
Education						
No h.s. degree				0.14	0.02	***
H.s. degree (omitted)						
Some college				-0.11	0.02	***
B.A. or higher				-0.37	0.02	***
-2 log likelihood	336019	334945		333579		

Data: Fertility surveys from 1955-2002 harmonized by the IFSS project; see text for details. N=25159 marriages with non-missing dates of marriage and first birth in the 15 years prior to each survey. Surveys before 1973 combine Hispanic and non-Hispanic respondents; in surveys after 1973, Hispanic respondents are excluded from analysis.

Table 4b: Continuous time hazard models predicting first birth in first marriage, black women

	Model 1		Model 2		Model 3		
	b	se	b	se	b	se	
Year of marriage							
Before 1950	not observed						
1950-54	not observed						
1955-59	0.08	0.05	-0.02	0.15	0.07	0.15	
1960-64 (omitted)							
1965-69	-0.11	0.04	**	-0.10	0.11	-0.09	0.11
1970-74	-0.23	0.04	***	0.09	0.12	0.10	0.12
1975-79	-0.38	0.06	***	0.14	0.13	0.23	0.13 +
1980-84	-0.52	0.06	***	-0.12	0.14	0.11	0.14
1985-89	-0.70	0.07	***	-0.44	0.18	*	-0.16 0.18
1990-94	-0.84	0.08	***	-0.32	0.19	+	0.07 0.19
1995 and after	-0.58	0.10	***	-0.37	0.28		0.04 0.28
Interactions: marriage duration x year of marriage							
0-7 months x:							
Before 1950	not observed						
1950-54	not observed						
1955-59				0.18	0.18	0.11	0.18
1960-64 (omitted)							
1965-69				0.09	0.13	0.10	0.13
1970-74				-0.34	0.14	*	-0.31 0.14 *
1975-79				-0.76	0.17	***	-0.71 0.17 ***
1980-84				-0.61	0.18	***	-0.60 0.18 ***
1985-89				-0.45	0.23	*	-0.40 0.23 +
1990-94				-0.42	0.24	+	-0.38 0.24
1995 and after				-0.21	0.33		-0.16 0.33
8-12 months x:							
Before 1950	not observed						
1950-54	not observed						
1955-59				-0.06	0.20		-0.10 0.20
1960-64 (omitted)							
1965-69				-0.28	0.15	+	-0.26 0.15 +
1970-74				-0.55	0.15	***	-0.52 0.15 ***
1975-79				-0.78	0.19	***	-0.73 0.19 ***
1980-84				-0.67	0.20	***	-0.66 0.20 ***
1985-89				-0.55	0.25	*	-0.52 0.25 *
1990-94				-0.91	0.29	**	-0.88 0.29 **
1995 and after				-0.31	0.36		-0.27 0.36

13-24 months x:						
Before 1950	not observed					
1950-54	not observed					
1955-59	0.03	0.19		-0.01	0.19	
1960-64 (omitted)						
1965-69	-0.06	0.14		-0.04	0.14	
1970-74	-0.47	0.15	**	-0.44	0.15	**
1975-79	-0.60	0.17	***	-0.55	0.17	**
1980-84	-0.34	0.18	+	-0.33	0.18	+
1985-89	-0.36	0.23		-0.34	0.23	
1990-94	-1.12	0.28	***	-1.09	0.28	***
1995 and after	-0.18	0.34		-0.15	0.34	
25-36 months x:						
Before 1950	not observed					
1950-54	not observed					
1955-59	0.41	0.24	+	0.40	0.24	+
1960-64 (omitted)						
1965-69	0.30	0.18		0.31	0.18	+
1970-74	0.18	0.19		0.19	0.19	
1975-79	-0.05	0.22		-0.02	0.22	
1980-84	-0.07	0.24		-0.06	0.24	
1985-89	0.50	0.26	+	0.50	0.26	+
1990-94	0.11	0.29		0.13	0.29	
1995 and after	-0.44	0.48		-0.42	0.48	
Sociodemographic controls						
Age at marriage						
Under 18				0.51	0.04	***
18-19				0.34	0.03	***
20-24 (omitted)						
25 or over				-0.58	0.04	***
Education						
No h.s. degree				-0.08	0.04	*
H.s. degree (omitted)						
Some college				-0.05	0.04	
B.A. or higher				-0.05	0.05	
<hr/>						
-2 log likelihood						

Data: Fertility surveys from 1955-2002 harmonized by the IFSS project; see text for details. N=7952 marriages with non-missing dates of marriage and first birth in the 15 years prior to each survey. Surveys before 1973 combine Hispanic and non-Hispanic respondents; in surveys after 1973, Hispanic respondents are excluded from analysis.

For other intervals, interactions for the years before 1960 are generally not statistically different from zero. For years after 1965, the interaction terms in the first interval (0-7 months) are not all statistically different from zero but are generally positive in direction. Adding the interactions to the negative main effects coefficients for these cohorts shows that hazards of a premaritally conceived birth changed relatively little in the post-1960 period. Cohort-marriage duration interactions for the 8-12 and 13-24 month intervals are predominantly negative in sign, large in magnitude, and statistically significant. Interactions in the 25-36 month interval are smaller, but also negative and statistically significant. Taken all together, Model 2 shows that hazards of marital births declined after the 1960-64 marriage cohort; these declines were weaker in the first seven months of marriage, but stronger in the rest of the first three years of marriage, than at longer marriage durations. These results demonstrate the increasing postponement of the first marital births beyond the third year of marriage.

For black women, interactions for the first three intervals (0-7 months, 8-12 months, 13-24 months) are negative in sign and are statistically significant for most cohorts (Model 2, Table 4b). Combined with the negative main effects, these interactions show that declines in marital fertility were larger in the first two years of marriage than at long durations. For the interval 25-36 months, there is no consistent trend in the sign of the interactions, and most interactions are not statistically different from zero, suggesting little difference in trends in marital fertility in the third year of marriage vs. longer durations. As for white women, these models show reduced marital fertility early in the marriage combined with smaller changes over time in the later years.

Model 3 adds controls for basic sociodemographic characteristics (age at marriage, education) to assess the extent to which compositional changes in the population of women marrying mediate changes in timing of marital fertility. For both white women (Table 4a) and black women (Table 4b), the coefficients for the main effects of marriage cohort are substantially attenuated relative to Model 2, and most of the coefficients are not statistically different from zero. That is, at longer durations (after 36 months of marriage), change over time in the hazards of the first marital birth can be largely explained by changes in the age and educational attainment of women who marry. However, the cohort-duration interaction coefficients are virtually unchanged by adding sociodemographic controls. Compositional changes thus cannot explain the changing timing of births in the first three years of marriage.

For white women, education is negatively associated with marital fertility rates. For black women, women without a high school degree have *lower* hazards of a first marital birth than

women with a high school degree, and fertility rates do not vary by educational attainment among women with a high school degree, women with some college, and women with a bachelor's degree or higher. These findings are unexpected and may be related to variation in educational selection into marriage. In additional models (not shown), we tested interactions between education and marriage duration and found a strong education gradient for both African American women and white women in the first seven months of marriage. That is, married women with at least some college education are significantly less likely to have a premaritally conceived marital birth than women with only a high school degree. Education differences in birth hazards after the first seven months of marriage are smaller and not statistically different from zero. Age at marriage is associated with marital fertility as would be expected: Younger wives have higher birth hazards and older wives have lower birth hazards than women who marry in their early 20s. These associations are stronger for African American women than for white women.

In additional models, we estimated three-way education x marriage duration x marriage cohort interactions as well (not shown). These models did not show a consistent pattern of variation by education in time trends in marital fertility. For all education levels, the hazards of a first marital birth fell over the first three years of marriage, leading to a flattening of hazard curves. Essentially, the timing of the first birth appears to be less closely linked to the timing of marriage in the later marriage cohorts. Given the lower fertility of more educated women in the earlier cohorts, this flattening effect is more apparent for women with post-secondary education, but does not appear to be proportionally greater.

DISCUSSION AND CONCLUSIONS

In the second half of the twentieth century, the U.S. family system was marked by a weakening of normative, legal, and behavioral links between marriage and childbearing. The impact of this weakening on childbearing outside of formal marriage has been extensively studied. But much research on family change implicitly assumes stasis in patterns of childbearing within marriage. This paper turns empirical attention to the question of changing rates and timing of marital fertility. We find that marital fertility rates fell during the later decades of the twentieth century after peaking in the Baby Boom marriage cohorts of the early 1960s. These declines were especially marked during the first two years of marriage. For women who married during the 1960s, there was a sharp peak in fertility early during the married years, suggesting

strong expectations that marriage would be followed shortly by children. The marriage cohorts of the 1980s and 1990s, in contrast, did not experience this early rise in marital fertility.

For white women, overall declines in marital fertility rates were accompanied by increases in fertility during the first seven months of marriage – that is, an increasing proportion of marriages followed a premarital conception. Taken in conjunction with other research showing declining rates of legitimation for premarital conceptions (Hoelter, Leclere, and Smock 2008), these findings suggest a bifurcation. Fewer couples see marriage as the only possible response to a nonmarital conception. Yet fewer couples see marriage as necessary for social adulthood or a stable relationship – that is, there are fewer reasons to marry other than a nonmarital conception. These conditions, in conjunction with a rising number of conceptions outside marriage, appear to produce a pattern of more marriages beginning with a conception even as fewer conceptions lead to marriage.

For African American women, declines in marital fertility were experienced across all durations, including the first seven months, and the proportion of marriages begun with a premarital conception did not increase. This difference in trends between white and African American marriages is largely driven by different starting points: relative to white women, African American women had much higher birth rates in the first seven months of marriage during the 1960s birth cohorts. Current rates and timing of marital fertility are strikingly similar for white and African American women. Race-ethnic differences in nonmarital fertility and in marriage rates continue to be substantial, but there is some evidence of convergence. Our findings lend additional support to the possibility of growing similarity in a broader range of family formation behavior across different race-ethnic groups.

Controlling for the changing age and education composition of marriage cohorts does little to account for change over time in the timing of marital fertility. Although the timing of the first birth within marriage, and especially the likelihood that a first birth occurs in the first seven months of marriage, varies by education level, this variation does not appear to be driving change over time. This finding is somewhat surprising, given the extensive evidence of differential change in family formation behavior across education strata. It is perhaps to be expected, however, given our focus on behavior within marriage. Our analyses take marriage as a starting point, overlooking the complicated mechanisms of selection and causation that drive partnership formation and the decision to formalize a relationship by marrying. Our results

suggest that changing educational gradients in family formation are concentrated in these early selection processes, rather than fertility once marriage has taken place.

Furthermore, because we use constant education measures, our results conflate change in behavior by educational attainment with changing meaning of educational attainment. For example, the behavior of the most highly educated women may in fact be more different in the 1990s marriage cohorts than in the 1960s marriage cohorts, but the category “bachelor’s degree or more” may less effectively capture the most educated women in the later cohorts. If this is the case, our categorization would obscure true variation over time in the education gradient of marital fertility. In future research, we will explore alternative approaches to measuring education in order to better understand the dynamic relationship between educational attainment and the timing of marital fertility.

Patterns of family formation behavior in the United States have become increasingly polarized. Nonmarital childbearing, early childbearing, and social disadvantage have been more strongly clustered, while delayed childbearing has become more highly linked with marital childbearing and economic resources (Ellwood and Jencks 2004; McLanahan 2004). Our findings point to a possible divergence in childbearing within marriage as well as between marital and nonmarital childbearing. While some women have children shortly after marriage (including a small minority who are pregnant when they marry), an increasing minority remain childless even after several years of marriage. Like other dichotomies in family formation behavior, this divergence has implications for children’s well-being, to the extent that duration of marriage at first birth is associated with the odds of divorce (Wineberg 1988). And like other family formation behaviors, the timing of marital fertility is related to educational attainment, such that the most educated women are more likely to experience patterns that are beneficial to children’s well-being.

The delinking of marriage and childbearing has long been demonstrated by the increasing rates of childbearing outside of formal, legal marriage. The emergence of a substantial subgroup of couples who remain childless for several years after marrying provides another piece of evidence for this delinking and illustrates the erosion of another feature distinguishing legal marriage from other types of relationship. Just as the presence of children in cohabiting relationships brings cohabitation closer to marriage, so the absence of children in a marriage may bring marriage closer to cohabitation. Marriage is increasingly distinctive for its symbolic value rather than for its structural features.

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