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Chapter 4

Nonmarital First Births and Women's Life Histories

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Overview: This paper draws on evolutionary life history theory to examine nonmarital births in the context of women's ability to secure male parental investment for their offspring. While nonmarital births are usually defined with respect to marital status the day of parturition, we adopt a more nuanced approach that corresponds to men's willingness to commit to family obligations. Our approach distinguishes between marriages preceding pregnancy, marriages occurring between pregnancy and birth, marriages immediately following birth, and births that are not followed by marriage to the child's father. Using retrospective marital and reproductive histories from the Panel Study of Income Dynamics (PSID), we observe a range in women's life history outcomes (fertility and marital measure) corresponding to this range in male commitment around the time of first birth. Self-selection biases are not examined in this analysis, although their implications are discussed.

1. Introduction

Nonmarital childbearing is often considered one of the foremost social problems facing contemporary society. The consequences and causes of both early and nonmarital reproduction have long been of interest to demographers and policy makers, who are often charged both with monitoring the patterns of nonmarital childbearing (and its consequences) and with actively working to change these patterns. Nonmarital births are increasing in the U.S. today, both in absolute numbers and as a percentage of births; they currently account for one third of all births (Ventura, Mosher, Curtin, Abma, and Henshaw, 2001). Many such nonmarital births are first births to women in their teen years, although teen pregnancy rates have recently fallen to record lows (Ventura et al. 2001). Nonetheless, teen pregnancy remains an important political and social issue. The marital patterning of teenage births has changed through the years as well. Teen births in the U.S. were most prevalent in the 1950s, but most of these were births to women who married young. In contrast, births to teens today are far more likely to be to unmarried women (e.g., Luker, 1996; Morgan and Rindfuss, 1999).

There is considerable policy concern over the issue of nonmarital births, both for the impact of such births on women's subsequent lives, and for issues relating to welfare reform. In both historical (e.g., Low, 1991; Low and Clarke, 1991) and contemporary (Lichter and Graefe, 2001) demographic databases, it appears that different socioeconomic groups have distinct levels of nonmarital births, and different social responses. It makes sense that women who have many real options with regard to wealth and career may lose more (and are likely to be more chastised by close relatives) following a nonmarital birth than women with few prospects. Thus it may be unsurprising if nonmarital births were concentrated in families with low socioeconomic status.

In this paper we draw on evolutionary life history theory to examine nonmarital births in the context of women's ability to secure male parental investment for their offspring. The degree and kind of commitment a woman receives from her partner as she approaches her first birth is likely to influence her subsequent life history and reproductive strategy, and to alter the trade-offs she may face between investment in current and future reproductive opportunities. We expect women who do not obtain firm commitment from a partner at the time of first birth to have lower lifetime fertility, greater probability of never marrying, and to marry later than other women. In short, nonmarital first births that involve no commitment from men will be costly for a woman in terms of her lifetime reproductive strategy.

Much of the literature on nonmarital births focuses on the mother's marital status on the day of parturition, but our emphasis on male commitment argues for a more nuanced approach. Women who are married the day they give birth may have been unmarried when they became pregnant; similarly, women who

are unmarried the day of birth may marry their partner soon after. Thus, we divide women's first births into four categories: marital births, narrowly defined (married before pregnancy occurs); "pregnant brides" (married between pregnancy and birth); "legitimizing" births (married immediately after birth); and nonmarital births, narrowly defined (unmarried the day of birth or within 7 months after). These categories reflect a continuum of degrees by which women are able to secure firm and legally binding commitments from men, and should influence the life history outcomes of these women.

We will examine the relationships between type of first birth and life history outcomes in retrospective marital and reproductive histories from the Panel Study of Income Dynamics (PSID), using multivariate analysis to control for background variables where possible. The results are consistent with the predictions of the model: although women who are unmarried at or near the time of their first birth are similar in terms of their background characteristics, their subsequent life paths differ significantly. Relative to women who are married at the time of birth, or marry soon thereafter, women who do not marry soon after the birth of their first child have fewer children, later marriages (if they marry at all), lower likelihood of being married at the end of their reproductive careers, and fewer reproductive years of marriage. Women who are unmarried at conception, but who obtain firm male commitment by or soon after birth, are similar to marital first births in terms of lifetime fertility, but are intermediate between marital and nonmarital first births with respect to other outcomes. We caution that although we have shown a correlation consistent with an evolutionary model, we are aware that we have not demonstrated a causal relationship between type of first birth and life history outcomes.[1]

2. Nonmarital Births in the Context of Life History Trade-offs

Are nonmarital births costly in some way, either for a woman, or for the family or governmental system that supports her? A reasonable answer requires some consistency of definition. Although the argument above assumes some homogeneity in the definition of nonmarital, the term "nonmarital birth" can refer to several different conditions, each of which may have different implications for a woman's future, and the possible costs to her support system. "Marital" and "nonmarital" are the usual categories to describe births. However, the impact for a woman's subsequent life are likely to differ greatly for: a birth to a woman already married for a year or more, a birth to a cohabiting woman who marries the father when she discovers she is pregnant (or immediately after the birth), and a nonmarital birth to a woman when no willing father is present. Even within categories, there may be differences: the impact of a birth within the first few months after marriage may well differ from more delayed marital first births.

First births may be of particular importance. There are good theoretical reasons to predict that a woman's life course may be strongly influenced by the degree and kind of commitment she receives from her partner as she approaches her first birth. Life history theory (Stearns, 1992; Roff, 1992) analyzes the trade-offs of current versus future reproduction, the allocation of resources and effort to oneself versus parental care and reproductive effort, and the timing of major life events such as the cessation of growth, the start of reproduction, etc. We propose to bring life history theory to bear on the issues of nonmarital births.

Human life histories are unusual among primates (e.g., Harvey, Martin, & Clutton-Brock, 1986; Low, 1998; Kaplan, 1997). In most primates, a female and her offspring comprise a relatively independent unit, at least with regard to foraging and primary care of an infant. The complexity of human life, even among traditional societies, and the extraordinary degree of human sociality, results in several unusual infant traits, all of which make two-parent care far more successful than single-parent care. Human infants are carried *in utero* longer than would be predicted for a primate the size of humans, and infants are 38% larger at birth than would be predicted from adult body size. Infants are also helpless, or altricial, far longer than the usual pattern for primates. Thus, women are encumbered by pregnancy/infants longer than other primates, compounded by the fact that humans are furthermore unusual in that they often raise several dependent young simultaneously (Hrdy, 1999; Lancaster, 1991, 1997). In traditional societies, for example, pregnant and nursing women gather food less effectively than other women (e.g., Hurtado, Hill, Kaplan, & Hurtado, 1992). Interestingly, infants are weaned earlier than we would expect; but this appears to be possible because others in addition to the mother contribute to the infant's feeding (Kaplan, Hill, Lancaster, & Hurtado, 2000). All of these conditions mean that women who raise children alone are likely to face higher costs than women with strong support systems; in most societies, the primary support system consists of the child's father (e.g., Hewlett, 1992).

Precisely because humans have evolved to be far more successful with biparental care than without, and because male parental investment is expensive, we expect men to be reluctant, under most conditions, to assume the burden of children they did not father (e.g., Alexander, 1974; Anderson, 2000; Daly and Wilson, 1998; Trivers, 1972). One study of men living in Albuquerque, New Mexico (USA) found that pregnancies were much more likely to be aborted, and relationships to be ended, when men had low confidence of paternity in the pregnancies of their partners (Anderson, Kaplan, & Lancaster, 2002). Men also exhibit strong biases against stepchildren, their partner's children from previous relationships. Stepchildren both receive less direct investment from men (e.g., Amato, 1987; Anderson, Kaplan, and Lancaster, 1999; Anderson, Lam, Kaplan, and Lancaster, 1999; Case, Lin and McLanahan, 1999, 2000; Cooksey and Fondell, 1996; Downey, 1995; Hofferth

and Anderson, 2001; Marsiglio, 1991), and are significantly more likely to be abused or murdered than genetic children (Daly and Wilson, 1988, 1998). While there is considerable variation in the acceptance of stepchildren, both cross-culturally and within the U.S. today, theory predicts that women who already have children will have more difficulty finding a highly desirable mate; that is, their value on the marriage market is decreased (Anderson, 2000; Bergstrom, 1996).

Male contributions can be further understood by modeling parental care as a collective good, with two defining characteristics: indivisibility and non-excludability (Ostrom, 1990; Hawkes, 1992; Taylor and Ward, 1982). Parental care is an indivisible good, since the amount of care provided by one parent does not reduce the amount of care the other parent could provide (although, as we note below, this does not mean there is no effect on what the other parent actually *does* provide). Parental care is also a non-excludable good. The parent who provides care to an offspring (thus raising its fitness, and because of relatedness, the fitness of the other parent) cannot prevent the other parent's fitness from increasing, whether or not the other parent provides any care (Borgerhoff Mulder, 1992; Chase, 1980).

An important problem associated with collective goods is that they attract "free-riders," who, because someone else has paid to provide the good, can enjoy it without paying. In the context of parental care, this has real meaning. In most human societies, biparental care significantly increases the child's fitness, compared to single-parent care; thus a male should be expected to invest. Nonetheless, because parental care is a collective good, if a woman (whether alone or with other support such as welfare or family) can raise a child without an investing male, a man faces significant incentive to become a free rider and defect in his support (e.g., Anderson et al., 1999; Borgerhoff Mulder, 1992; Hawkes, Rogers, & Charnov, 1995; Maynard Smith, 1977, 1982). A relatively well-studied example of this problem is men's provision of child support. In 1991 in the United States, 44% of the 9.9 million custodial mothers whose children were eligible for child support did not have child support awards, and thus received no child support from the children's non-custodial fathers (U.S. Bureau of the Census, 1995). Of the mothers who were due child support, 24% received no payments, 24% received partial payments, and only 52% received full child support payments (U.S. Bureau of the Census, 1995). Many men are thus able to defect on their parental care obligations, and free-ride off of the support provided to the children by maternal family and government support networks.

The Importance of the Type of First Birth

All of these patterns mean that, today as well as in our evolutionary past, a woman who must raise a child alone faces considerable obstacles, compared to

a woman with a strong support system of other adults, particularly the child's father. Women who fail to get a commitment from their partners will experience trade-offs for their own future life course, influencing such outcomes as subsequent reproduction, completed education, and the ability to marry well. We expect a woman whose first birth does not result in commitment by her partner to have some probability of never marrying, and to marry later than other women. In short, nonmarital first births that involve no male parental commitment even after birth seem likely to be costliest for a woman in terms of her lifetime reproduction.

Here we consider first births, and identify four types:

(1) marital births (narrowly defined), in which marriage preceded both pregnancy and first birth;

(2) "pregnant bride" births, in which pregnancy occurs before marriage and marriage occurs before birth;

(3) "legitimizing marriage" births, in which the woman marries the child's father immediately after an out-of-wedlock birth; and

(4) nonmarital births (narrowly defined), in which the woman does not marry the child's father, either before or after her first birth.

We recognize that there are important issues of self-selection surrounding these definitions. Furthermore, like any model, this framework simplifies reality, ignoring for example that some couples who marry upon discovering they are pregnant would have eventually married anyway if the pregnancy had not occurred; under different circumstances they would have qualified as marital births, not pregnant brides. However, the standard definition—based solely on the woman's marital status on the day she gives birth—simplifies reality to an even further degree, collapsing pregnant brides with marital births, and legitimizing births with nonmarital births. The more commonly used definitions obscure to some extent variation in women's ability to obtain male parental investment for their children; the definitions used in this paper are designed to highlight this variation.

We examine these four groups separately, because they represent different levels of willingness of a father/male partner to invest in the woman, the child, or both. These four types of women have, respectively, managed to obtain firm commitment from the fathers of their children before pregnancy, during pregnancy, immediately after the birth, or not at all. Life history theory suggests that these four types of births represent very different trade-offs regarding the costs of reproduction, and are likely to have quite different impacts on a woman's subsequent life course.

3. Sample and Methods

To explore these questions about the types of births defined above, we analyze the retrospective birth and marital histories from the Panel Study of

Income Dynamics (PSID). The PSID is a longitudinal survey that began in 1968 with a nationally representative sample of 5,000 U.S. households. Individuals from the original sample of households have been re-interviewed annually (biannually since 1997); people who leave core households to form new households are also followed, including spouses who divorced as well as children and grandchildren who have grown up. In 1990 the sample was refreshed with a representative national sample of 2,000 Latino households. Each annual wave of the PSID collects core data on income sources and amounts, employment, family composition changes, and demographic events. In addition, in 1985 the PSID began collecting comprehensive retrospective fertility and marriage histories of individuals in the sample households. These retrospective histories form the basis of the data used in the analyses presented here.

Because we are interested in women who have completed their reproductive careers, we will constrain the sample to women age 45 or older at the time of their most recent retrospective interview (1985-1993). We use their reproductive and marital histories to examine the relationships between their type of first birth (marital, pregnant bride, legitimizing, or nonmarital) and several life course outcomes. These outcomes include age at first birth, total fertility, age at first marriage, number of years married between the ages of 15 and 44, and whether or not the woman was married at age 45. To control for background factors that are likely to influence women's early reproductive decisions, analyses will include such variables as a woman's birth cohort, her race and ethnicity, and her highest educational attainment.

The PSID retrospective fertility and marital histories provide data on 3,543 women who were age 45 or older at the time of their most recent interview. Of these, 465 were dropped from the sample because they never had biological children. An additional 39 women were omitted because their educational attainment was unknown; 354 more women were dropped because their ethnic background was unknown or could not be categorized as non-Hispanic white, Hispanic, or African-American. Finally, one woman whose age at first birth was coded as age 67 was also dropped. The resulting sample used for analysis consists of 2,684 parous women who have completed their reproductive careers (Table 1). Not all of these women married; analyses of age at first marriage use a sub-sample of 2,619 women.

The four types of nonmarital births in our model were coded as a set of dichotomous indicator variables, with marital birth (narrowly defined) being the baseline category for statistical analysis. Types of first birth were defined using a seven-month rule. Marital births (narrowly defined) were births that occurred seven months or more after a marriage; pregnant bride births occurred less seven months after a marriage; legitimizing marriage births were so defined if the mother was unmarried the day of birth, but married within seven

months; and nonmarital births (narrowly defined) were those in which the woman did not get married within seven months following her first birth.

We added control variables to the models, allowing us to distinguish the effects of the type of a woman's first birth on her subsequent life history patterns from the effects of background characteristics that are likely to be confounded with her type of first birth. Because we are using retrospective histories for women over 45, we cannot make use of many of the longitudinal variables collected in the PSID waves from 1968 onward; of the 2,705 first births to women in our sample, 2,304 (85.2%) occurred before 1968. Thus, we do not have information on such important variables as household composition, income or location at the time of first birth. Additionally, we have no data on nonmarital cohabitation with partners; nor can we observe pregnancies that do not result in live births (e.g., which are terminated voluntarily, perhaps because secure male commitment was unavailable; see Anderson et al., 2002; Hill & Low, 1992). We also acknowledge that self-selection (into motherhood, marriage, etc.) plays an important role in generating the patterns we observe, although we cannot fully address this issue with the current dataset.

Control variables were coded as dichotomous indicator variables. Race and ethnicity are categorized into three groups: non-Hispanic whites, Hispanics, and African-Americans. Highest educational level was coded as: elementary, some high school, high school graduation, some college, and college degree or more. (Education was coded as a set of indicators because the definition of schooling attainment changes across waves of the PSID, making the construction of a simple continuous education variable unfeasible.) Because detailed educational histories are not available, we cannot ascertain the woman's level of education at the time of her first birth; we therefore use the highest level of education she achieved, and note that this was not necessarily her educational level when she first gave birth. Women's birth cohorts were arranged into seven five-year categories, with women born before 1920 being the first group, and women born between 1945 and 1949 the last.

The PSID oversamples blacks and Hispanics, as well as low-income households. For the years during which the data were collected (1968-1993), the PSID is representative of U.S. households when appropriate weights are

Table 1. Summary statistics for all variables used in analysis, by mother's race/ethnicity

	All Women	White non-Hispanic	Hispanic	African-American	F	[p]
Born before 1920	0.19 (0.39)	0.23 (0.42)	0.09 (0.28)	0.14 (0.35)	29.09	[0.00]
Born 1920-24	0.11 (0.31)	0.10 (0.30)	0.10 (0.30)	0.12 (0.33)	1.47	[0.23]
Born 1925-29	0.13 (0.33)	0.13 (0.33)	0.09 (0.29)	0.14 (0.35)	2.56	[0.08]
Born 1930-34	0.13 (0.34)	0.13 (0.33)	0.13 (0.33)	0.14 (0.35)	0.66	[0.52]
Born 1935-39	0.12 (0.33)	0.10 (0.30)	0.15 (0.36)	0.16 (0.36)	8.76	[0.00]
Born 1940-44	0.15 (0.36)	0.14 (0.34)	0.23 (0.42)	0.15 (0.36)	10.64	[0.00]
Born 1945-49	0.17 (0.38)	0.18 (0.38)	0.21 (0.41)	0.15 (0.36)	3.11	[0.05]
Elementary-school education	0.16 (0.36)	0.09 (0.29)	0.39 (0.49)	0.18 (0.39)	108.98	[0.00]
Attended some high school	0.17 (0.38)	0.13 (0.33)	0.14 (0.35)	0.29 (0.46)	50.84	[0.00]
High school graduate	0.40 (0.49)	0.44 (0.50)	0.31 (0.46)	0.35 (0.48)	16.62	[0.00]
Attended some college	0.15 (0.36)	0.18 (0.38)	0.10 (0.30)	0.12 (0.32)	12.18	[0.00]
Graduated from college	0.12 (0.32)	0.16 (0.37)	0.06 (0.24)	0.06 (0.24)	30.39	[0.00]
First birth was marital	0.73 (0.44)	0.86 (0.35)	0.82 (0.39)	0.41 (0.49)	320.43	[0.00]
"Pregnant bride"	0.11 (0.31)	0.10 (0.30)	0.07 (0.25)	0.17 (0.37)	15.41	[0.00]
Legitimized soon after birth	0.02 (0.15)	0.01 (0.11)	0.02 (0.13)	0.05 (0.21)	14.91	[0.00]
Nonmarital birth (narrowly defined)	0.13 (0.34)	0.03 (0.18)	0.10 (0.30)	0.38 (0.49)	313.10	[0.00]
Age at first birth	22.78 (4.87)	23.47 (4.73)	23.75 (4.88)	20.66 (4.56)	96.37	[0.00]
Age at first marriage[1]	22.02 (5.59)	21.60 (4.61)	23.50 (7.00)	22.20 (6.63)	18.38	[0.00]
Number of years Married ages 15 – 44	21.10 (6.69)	22.13 (5.34)	20.95 (6.25)	18.81 (8.80)	63.08	[0.00]
Married at age 45[1]	0.82 (0.38)	0.84 (0.37)	0.91 (0.29)	0.73 (0.44)	28.67	[0.00]
Total number of children born	3.41 (2.17)	3.03 (1.69)	3.28 (2.17)	4.37 (2.79)	99.35	[0.00]
N	2684	1604	381	699		

Standard deviations presented in parentheses.

1. Sample restricted to ever-married women. N for each column: 2619, 1597, 379, 643.

used (Fitzgerald, Gottschalk, and Moffitt, 1998). However, because events such as first births for woman currently over age 45 obtained from the PSID retrospective histories often occur before the first wave of data collection, weights are not used in the analyses. All statistical analyses were performed using STATA and SPSS.

4. Results

Of the 2,684 parous women over age 45 in the sample, approximately 60% (1604) were non-Hispanic white, 14% (381) were Hispanic, and 26% (699) were African-American (Table 1). These racial/ethnic groups showed consistent and highly significant differences, both in the control variables of education and birth cohort, and in outcome variables of number of years married, total fertility, age at first birth, age at first marriage, and the proportion experiencing each type of first birth (Table 1). For example, a woman's likelihood of graduating from high school differed with race and ethnicity: 45% of non-Hispanic white women in the sample completed high school but had no further schooling, compared to 31% of Hispanic women and 35% of African-American women. African-American women were more likely to be a pregnant bride or to experience a birth that was quickly legitimized than Hispanics or non-Hispanic whites. African-American and Hispanic women were respectively eleven and three times more likely than non-Hispanic whites to have a first birth that was nonmarital (narrowly defined).

Table 2 presents summary statistics for all variables, organized by the type of first birth. Of the 2,684 first births in the sample, 73.3% occurred to women who were married well before their first birth. In addition, 11.0% were to women who gave birth within 7 months of marrying ("pregnant brides"), 2.2% were to women who married within 7 months after the birth ("quick marriages" or legitimized births), and 15.3% were nonmarital first births to never-married women who did not marry shortly after the birth.

The age of first birth for women whose first birth was marital was later than for women whose first birth was of any other type (Table 2). Most marital births occurred to women ages 20-24 (33.8%) and 25-29 (30.5%). Nonmarital births, and those to pregnant brides or women who married to legitimate their children, were concentrated among women ages 15-19 (43.9% - 47.5%) and 20-24 (38.8% - 44.3%) (not shown in table).

Women whose first birth was nonmarital spent fewer of their reproductive years (ages 15-44) married than women whose first births were marital; no other first birth types differed from marital first births in this regard (Table 2). Women's total lifetime fertility varied with the kind of first birth: women whose first birth was marital had the fewest children in their lifetimes (3.20);

Table 2. Summary statistics for all variables used in analysis, by type of first birth

	Marital birth		Pregnant bride		Legitimized birth		Nonmarital birth		F	[p]
Born before 1920	0.20	(0.40)	0.16	(0.37)	0.28	(0.45)	0.11	(0.31)	7.89	[0.00]
Born 1920-24	0.11	(0.31)	0.07	(0.26)	0.05	(0.22)	0.11	(0.31)	1.80	[0.15]
Born 1925-29	0.13	(0.34)	0.11	(0.32)	0.16	(0.37)	0.09	(0.29)	2.04	[0.11]
Born 1930-34	0.13	(0.34)	0.13	(0.34)	0.10	(0.31)	0.14	(0.34)	0.17	[0.91]
Born 1935-39	0.11	(0.31)	0.15	(0.36)	0.16	(0.37)	0.18	(0.38)	5.42	[0.00]
Born 1940-44	0.15	(0.35)	0.15	(0.36)	0.17	(0.38)	0.19	(0.39)	1.30	[0.27]
Born 1945-49	0.17	(0.37)	0.22	(0.42)	0.09	(0.28)	0.205	(0.40)	3.39	[0.02]
White non-Hispanic	0.70	(0.46)	0.54	(0.50)	0.33	(0.47)	0.15	(0.36)	156.72	[0.00]
Hispanic	0.16	(0.37)	0.09	(0.28)	0.10	(0.31)	0.11	(0.31)	5.31	[0.00]
African-American	0.15	(0.35)	0.39	(0.49)	0.57	(0.50)	0.74	(0.44)	268.84	[0.00]
Elementary-school education	0.14	(0.35)	0.14	(0.35)	0.33	(0.47)	0.23	(0.42)	9.79	[0.00]
Attended some high school	0.14	(0.35)	0.23	(0.42)	0.17	(0.38)	0.28	(0.45)	15.86	[0.00]
High school graduate	0.41	(0.49)	0.42	(0.49)	0.36	(0.49)	0.35	(0.48)	1.53	[0.21]
Attended some college	0.16	(0.37)	0.15	(0.36)	0.10	(0.31)	0.11	(0.31)	2.76	[0.04]
Graduated from college	0.14	(0.35)	0.07	(0.26)	0.03	(0.18)	0.03	(0.18)	15.76	[0.00]
Age at first birth	23.79	(4.72)	20.19	(3.58)	20.14	(4.56)	19.83	(4.54)	119.22	[0.00]
Age at first marriage[1]	21.56	(4.55)	20.36	(4.19)	20.50	(4.83)	27.08	(9.30)	107.23	[0.00]
Number of years married, ages 15 – 44	22.25	(5.16)	22.21	(5.99)	21.86	(6.23)	13.78	(9.52)	203.31	[0.00]
Married at age 45[1]	0.85	(0.35)	0.76	(0.43)	0.78	(0.42)	0.71	(0.46)	16.92	[0.00]
Total number of children born	3.20	(1.98)	3.90	(2.36)	4.43	(3.16)	4.04	(2.60)	25.93	[0.00]
N	1970		297		58		359			

Standard deviations in parentheses.

1. Sample restricted to ever-married women only. N for each column: 1970, 297, 58, 297

women who legitimized their first birth by marrying immediately after birth had the most children (4.43); and women whose first birth were nonmarital (narrowly defined) and pregnant brides had intermediate levels of lifetime fertility (4.03 and 3.90, respectively).

The relative frequency of different types of first births, and the relationship of birth type to other variables, vary across racial groups, as do the absolute values of most outcomes (Table 3). Regarding age at first birth, all types of birth other than marital first births occurred earlier than marital first births (with the exception of legitimizing births among Hispanics). Marriage patterns also differ across ethnic sub-groups. For all three groups, women whose first births were nonmarital had the latest age of first marriage, were married the least number of years, and were the most likely to be unmarried at age 45. For whites and Hispanics, legitimized births were intermediate between nonmarital births and both marital births and pregnant bride births; for African-Americans, however, women whose first births were legitimized births had the earliest age of first marriage, were married the greatest number of years, and were the most likely to be married at age 45. With respect to fertility, whites and Hispanics are again similar in that women whose first births were marital had the lowest lifetime fertility, while for African-Americans fertility was lowest among women whose first birth was nonmarital.

In multivariate analysis, other factors contributed to patterns in age at first birth, although the type of first birth remains an important correlate (Table 4). Women born in 1925 or later had significantly earlier ages of first birth; Hispanic women tended to experience their first births later, and African-American women earlier, than non-Hispanic whites; and women with less than a high school education tended to give birth earlier, and those with more than high school later, than women with only a high school degree. Education is associated with a greater than four year delay in age at first birth (see Low et al. 2002 for further discussion). With these other factors held constant, the type of first birth was a significant predictor of age at first birth; all nonmarital births (broadly defined) had earlier ages of first birth than women who were married more than seven months before their first birth. The simple pattern (Table 2) suggests a four year delay in age at first birth for women who marry before they conceive; partialling out the effects of background variables, the delay is still 2.5 – 2.8 years.

Table 3. Means (standard deviations) of outcome variables for parous women age 45+, by ethnicity and type of first birth

A. Non-Hispanics Whites

	Marital birth	Pregnant bride		Legitimized birth		Nonmarital birth		F [p]
N	1,374	156		19		55		
Age at first birth	23.92 (4.62)	20.61 (3.78)	***	20.11 (3.20)	**	21.69 (6.57)	**	30.45 [0.00]
Age at first marriage[1]	21.51 (4.21)	20.76 (4.35)		20.26 (3.12)		27.08 (9.92)	***	27.32 [0.00]
Number of married years, ages 15 – 44	22.38 (4.95)	22.21 (5.63)		20.47 (7.06)		16.25 (8.86)	***	24.88 [0.00]
Married at age 45[1]	0.86 (0.35)	0.77 (0.42)	*	0.68 (0.48)		0.68 (0.47)	**	7.37 [0.00]
Number of kids	2.97 (1.63)	3.48 (2.05)	**	3.37 (1.77)		3.33 (1.85)		5.17 [0.00]

1. Ever-married women only. N = 1374, 156, 19, 50

B. Hispanics

	Marital birth	Pregnant bride		Legitimized birth		Nonmarital birth		F [p]
N	311	26		6		38		
Age at first birth	24.22 (4.77)	21.61 (4.07)	*	26.83 (7.33)		20.92 (4.45)	***	8.12 [0.00]
Age at first marriage[2]	22.50 (5.19)	21.58 (4.38)		26.83 (7.33)		33.00 (12.70)	***	31.58 [0.00]
Number of married years, ages 15 – 44	21.94 (4.87)	21.46 (5.67)		17.67 (6.95)		13.03 (10.00)	***	28.69 [0.00]
Married at age 45[2]	0.92 (0.27)	0.88 (0.33)		0.83 (0.41)		0.78 (0.42)	*	2.84 [0.38]
Number of kids	3.16 (2.03)	3.27 (1.76)		3.83 (3.19)		4.16 (3.02)	*	2.56 [0.06]

2. Ever-married women only. N = 311, 26, 6, 36

C. African-Americans

	Marital birth	Pregnant bride		Legitimized birth		Nonmarital birth		F [p]
N	285	115		33		266		
Age at first birth	22.68 (5.01)	19.30 (2.94)	***	18.94 (3.60)	***	19.29 (3.89)	***	36.41 [0.00]
Age at first marriage[3]	20.75 (5.18)	19.54 (3.79)		19.48 (4.36)		26.06 (8.05)	***	43.56 [0.00]
Number of married years, ages 15 – 44	21.91 (6.30)	22.39 (6.55)		23.42 (5.17)		13.37 (9.54)	***	71.94 [0.00]
Married at age 45[3]	0.76 (0.43)	0.71 (0.45)		0.82 (0.39)		0.70 (0.46)		1.18 [0.32]
Number of kids	4.37 (2.83)	4.60 (2.69)		5.15 (3.62)		4.17 (2.65)		1.61 [0.19]

3. Ever-married women only. N = 285, 115, 33, 210

From Bonferroni multiple-comparison tests, relative to marital births:
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. Age at first birth

	Coeff.	Std. Error	
Intercept	25.02	0.23	***
Born before 1920 (omitted)	—	—	
Born 1920-24	-0.55	0.33	+
Born 1925-29	-1.47	0.31	***
Born 1930-34	-2.35	0.31	***
Born 1935-39	-2.57	0.31	***
Born 1940-44	-2.38	0.30	***
Born 1945-49	-1.78	0.29	***
White non-Hispanic (reference)	—	—	
Hispanic	1.54	0.26	***
African-American	-0.80	0.23	***
Elementary-school education	-1.52	0.27	***
Attended some high school	-1.37	0.25	***
High school graduate (reference)	—	—	
Attended some college	0.84	0.25	**
Graduated from college	2.87	0.28	***
First birth was marital (reference)	—	—	
Pregnant bride	-2.81	0.28	***
Legitimized soon after birth	-2.57	0.58	***
Nonmarital birth (narrowly defined)	-2.45	0.28	***
N	2,684		
F	50.03		
p	0.0001		
R^2	0.220		

\+ $p < 0.10$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Effects of Nonmarital Births on Women's Marriage Patterns

Approximately 17% of women who experienced a nonmarital birth (narrowly defined) failed to marry at all by age 45 (results not shown). Those nonmarital first birth women who eventually married did so significantly later (at age 27.1) than women whose marriage preceded conception (21.6) (Table 2). Pregnant brides and women who married to legitimate the birth married earliest, in their twentieth year (Table 2). The delaying effect of having a nonmarital first birth on age at first marriage holds up within each ethnic group (Table 3A-C), although the particulars differed.

Table 5 presents multivariate models of women's age at first marriage, controlling for background characteristics (see also Weiss and Willis, 1993). In Model 1, there are significant cohort effects, with women born in the 1930s marrying the earliest. Hispanic women married later, and African-American women earlier, than non-Hispanic white women, while women with fewer years of education married earlier than women with more education. When age at first birth is added (Model 2), the model fit improves greatly (44% of the variance explained, compared to 16% in Model 1). Because age at first birth and age at first marriage are correlated, Model 2 partials out the effect of age at first birth to gain a clearer understanding of the relationship between the type of first birth and the age at first marriage. Birth cohort and education level lose significance when age at first birth is in the model, but the type of first birth remains significant. In fact, the size of the effect and the strength of the significance increases for type of first birth, so that, even controlling for age at first birth, all women whose first birth is nonmarital or peri-marital marry at significantly *older* ages than women whose first birth is marital. Pregnant brides and women who marry soon after birth marry about a year and a half later than women who do not conceive until they are married, while women with nonmarital births (narrowly defined) marry 8.7 years later.

Another way to measure a woman's lifetime marital outcomes is to examine the number of her reproductive years (ages 15-44) that she was in a legal marriage. On average, women who experienced a nonmarital first birth (narrowly defined) were married of just under 14 years during their fertile years, compared to approximately 22 years for women whose first birth was within marriage, pregnant brides, and women with legitimizing marriages (Table 2). Within ethnic groups, the pattern persisted: for non-Hispanic whites, Hispanics and African-Americans, nonmarital birth women were married significantly fewer of their fertile years than others; no other differences were significant (Table 3).

Table 5. Age at first marriage, for ever-married women only

	Model 1			Model 2		
	Coeff.	Std. Error		Coeff.	Std. Error	
Intercept	22.00	0.28	***	4.72	0.53	***
Born before 1920 (reference)	—	—		—	—	
Born 1920-24	-0.48	0.39		-0.19	0.32	
Born 1925-29	-0.97	0.37	**	-0.02	0.30	
Born 1930-34	-1.62	0.37	***	-0.09	0.30	
Born 1935-39	-1.77	0.38	***	-0.08	0.31	
Born 1940-44	-1.25	0.36	***	0.32	0.30	
Born 1945-49	-1.49	0.35	***	-0.33	0.29	
White non-Hispanic (reference)	—	—		—	—	
Hispanic	2.20	0.31	***	1.12	0.26	***
African-American	-0.71	0.27	*	-0.15	0.22	
Elementary-school education	-0.60	0.32		0.39	0.26	
Attended some high school	-0.81	0.30	**	0.13	0.24	
High school graduate (reference)	—	—		—	—	
Attended some college	1.10	0.30	***	0.48	0.25	
Graduated from college	2.47	0.33	***	0.43	0.28	+
First birth was marital (reference)	—	—		—	—	
Pregnant bride	-0.50	0.33		1.45	0.27	***
Legitimized soon after birth	-0.23	0.69		1.56	0.57	**
Nonmarital birth (narrowly defined)	6.65	0.36	***	8.69	0.30	***
Age at first birth	—	—		0.69	0.02	***
N	2,619			2,619		
F	32.24			130.04		
p	0.0001			0.0001		
R^2	0.164			0.444		

\+ $p < 0.10$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

These patterns persist in multivariate analysis as well, although other factors are important (Table 6, Model 1). Women born in the early 1920s or in the 1930s spent more fertile years married than those born before 1920; Hispanic and African-American women were married fewer fertile years than non-Hispanic whites; women with high-school education spent more of their fertile years married than did women with more, or less, education. Controlling for all of these factors, women whose first birth was nonmarital still spend 8.5 fewer fertile years married. Adding the woman's age at first birth improves the model fit, and alters the significance of some of the other variables (Table 6, Model 2). With age at first birth in the model, women who married just before or just after their first birth spend about two fewer years married, while women whose first birth was nonmarital (narrowly defined) spend over 10 fewer fertile years married.

A woman's likelihood of being married at age 45 (to any man, not necessarily her first spouse) is also correlated with the status of her first birth. Among ever-married women, those whose first births were marital were likeliest to be married at 45 (85%), and women whose first births were nonmarital were least likely to be married at 45 (71%) (Table 2). In multivariate analysis, other factors contributed to a woman's marital status at age 45 (Table 7, Model 1). Women in some cohorts were more likely to remain married. Hispanic women were most likely to be married at 45, black women least (see also Brien 1997). Women who attended some college but did not graduate were only 64% as likely as high school graduates to be married at age 45, although other levels of education were not significant predictors. Women with nonmarital first births were 55% as likely, and pregnant brides were 64% as likely, to be married at age 45 than women whose first births were marital; women who married immediately after birth were as likely as marital first births to be married at age 45. Age at first birth, when added to the model (Table 7, Model 2), has only a marginally significant effect on being married at age 45; the effects of other variables on the outcomes is largely unchanged.

Nonmarital Births and Women's Total Lifetime Fertility

Most births occur within marriage; thus, lifetime fertility is strongly correlated with lifetime years of marriage. However, nonmarital first births are typically early births, and thus have two conflicting effects: biologically, age at first birth is a strong predictor of lifetime fertility (e.g., Stearns 1992, Roff 1992) – but a nonmarital birth delays marriage, and thus results in fewer years of marriage over the life course (Table 2). Although they are correlated, the type of first birth and the age at first birth have independent effects on lifetime marital outcomes (see Tables 5, 6 and 7).

Table 6. Total number of years married between ages 15 through 44

	Model 1			Model 2		
	Coeff.	Std. Error		Coeff.	Std. Error	
Intercept	22.35	0.32	***	38.76	0.65	***
Born before 1920 (reference)	—	—		—	—	
Born 1920-24	0.91	0.45	*	0.54	0.40	
Born 1925-29	0.35	0.42		-0.61	0.37	
Born 1930-34	1.48	0.42	***	-0.06	0.38	
Born 1935-39	1.35	0.43	**	-0.33	0.39	
Born 1940-44	0.65	0.41		-0.92	0.37	*
Born 1945-49	0.07	0.40		-1.09	0.36	**
White non-Hispanic (reference)	—	—		—	—	
Hispanic	-1.25	0.36	**	-0.23	0.32	
African-American	-0.90	0.31	**	-1.42	0.28	***
Elementary-school education	0.59	0.37		-0.41	0.33	
Attended some high school	0.47	0.34		-0.43	0.30	
High school graduate (reference)	—	—		—	—	
Attended some college	-1.42	0.35	***	-0.87	0.31	**
Graduated from college	-2.10	0.39	***	-0.22	0.35	
First birth was marital (reference)	—	—		—	—	
Pregnant bride	-0.12	0.38		-1.97	0.34	***
Legitimized soon after birth	-0.48	0.81		-2.17	0.71	**
Nonmarital birth (narrowly defined)	-8.53	0.39	***	-10.14	0.35	***
Age at first birth	—	—		-0.66	0.02	***
N	2,684			2,684		
F	47.67			106.44		
p	0.0001			0.0001		
R^2	0.211			0.390		

\+ $p < 0.10$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Table 7. Logistic model of whether married at age 45, for ever-married women

	Model 1				Model 2			
	Coeff.	Odds ratio	Std. error		Coeff.	Odds ratio	Std. error	
Intercept	2.20	9.03	0.16	***	1.63	5.10	0.36	***
Born before 1920 (reference)	—		—		—		—	
Born 1920-24	-0.09	0.91	0.22		-0.08	0.92	0.22	
Born 1925-29	-0.40	0.67	0.20	*	-0.37	0.69	0.20	+
Born 1930-34	-0.28	0.76	0.20		-0.24	0.79	0.20	
Born 1935-39	-0.49	0.61	0.20	*	-0.43	0.65	0.20	*
Born 1940-44	-0.41	0.66	0.20	*	-0.36	0.70	0.20	+
Born 1945-49	-0.56	0.57	0.19	**	-0.52	0.59	0.19	**
White non-Hispanic (reference)	—		—		—		—	
Hispanic	0.71	2.03	0.20	***	0.67	1.95	0.20	**
African-American	-0.39	0.68	0.13	**	-0.37	0.69	0.13	**
Elementary-school education	-0.23	0.79	0.17		-0.19	0.83	0.18	
Attended some high school	-0.16	0.85	0.15		-0.13	0.88	0.15	
High school graduate (reference)	—		—		—		—	
Attended some college	-0.45	0.64	0.15	**	-0.47	0.63	0.15	**
Graduated from college	-0.07	0.93	0.18		-0.14	0.87	0.19	
First birth was marital (reference)	—		—		—		—	
Pregnant bride	-0.45	0.64	0.16	**	-0.38	0.68	0.16	*
Legitimized soon after birth	-0.33	0.72	0.33		-0.27	0.76	0.33	
Nonmarital birth (narrowly defined)	-0.59	0.55	0.16	***	-0.53	0.59	0.17	**
Age at first birth	—		—		0.02	1.02	0.01	+
N	2,619				2,619			
Chi-squared	97.59				100.67			
p	0.0001				0.0001			

\+ $p < 0.10$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Age at first birth is influenced by several factors (Table 4). These include: ethnicity (African-American women's first births were earlier, and Hispanic women's later, than non-Hispanic whites); education (more education is correlated with later first birth); cohort (women born in the 1930s and 1940s had earlier first births than women born before 1930); and, of course, whether marriage preceded the conception leading to first birth.

Overall, women whose first births were nonmarital (broadly speaking) had significantly more children than women whose first births were preceded by marriage (Table 2); in part this arises because nonmarital first births are earlier than first births within marriage. These effects differ for women of different ethnicities (Table 3). Among non-Hispanic white women, pregnant brides had significantly more children than women whose first birth was marital; women who married to legitimize, and women who had nonmarital births did not differ significantly (Table 3A) (although lack of significance may simply be a result of small sample size). Among Hispanic women, women whose first birth was nonmarital had significantly more children in their reproductive lifetimes than women whose first birth was marital; no differences existed for pregnant brides or legitimating-marriage women (Table 3B). Among African-American women, the type of first birth bore no relationship to a woman's lifetime fertility (Table 3C), despite the relatively large sample size in each cell of the table.

As with other measures, women's lifetime fertility is correlated with numerous background variables (Table 8). Birth cohort exhibits strong effects, with fertility the highest among women born between 1920 and 1934 (the mothers of the Baby Boom). Ethnicity is also correlated: African-Americans had higher fertility than non-Hispanic whites, while Hispanics did not differ significantly from whites. All else being equal, women with less than a high school degree had higher fertility than women who were high school graduates, while there was no difference in the lifetime fertility of women with a high school degree or more. Because it is important to distinguish between the separate effects of early reproduction and type of first birth on a woman's total fertility, we present separate models with and without age at first birth. Controlling for background characteristics, lifetime fertility still varied greatly by type of first birth, although the pattern changes dramatically when age at first birth is added to the model. When age at first birth is absent (Model 1), pregnant brides and women who marry immediately after their first birth have significantly higher fertility (approximately an additional half child) than women who married well before birth; nonmarital first births (narrowly defined) are not significantly different from marital first births. When age at first birth is factored in (Model 2), pregnant brides and legitimized births are not significantly different from marital births, whereas women with nonmarital

Table 8: Total lifetime fertility

	Model 1			Model 2		
	Coeff.	Std. error		Coeff.	Std. error	
Intercept	2.58	0.11	***	5.95	0.24	***
Born before 1920 (reference)	—	—		—	—	
Born 1920-24	0.73	0.15	***	0.66	0.14	***
Born 1925-29	0.88	0.14	***	0.68	0.14	***
Born 1930-34	0.72	0.14	***	0.40	0.14	**
Born 1935-39	0.38	0.14	**	0.04	0.14	
Born 1940-44	-0.09	0.14		-0.41	0.13	**
Born 1945-49	-0.32	0.13	*	-0.56	0.13	***
White non-Hispanic (reference)	—	—		—	—	
Hispanic	-0.11	0.12		0.10	0.12	
African-American	0.94	0.11	***	0.84	0.10	***
Elementary-school education	1.19	0.12	***	0.98	0.12	***
Attended some high school	0.71	0.11	***	0.53	0.11	***
High school graduate (reference)	—	—		—	—	
Attended some college	-0.08	0.12		0.04	0.11	
Graduated from college	-0.23	0.13	+	0.15	0.13	
First birth was marital (reference)	—	—		—	—	
Pregnant bride	0.44	0.13	**	0.06	0.12	
Legitimized soon after birth	0.56	0.27	*	0.21	0.26	
Nonmarital birth (narrowly defined)	0.06	0.13		-0.27	0.13	*
Age at first birth	—	—		-0.13	0.01	***
N	2,684			2,684		
F	35.74			52.16		
p	0.0001			0.0001		
R^2	0.167			0.238		

\+ $p < 0.10$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

first births (narrowly defined) have 0.27 fewer children over the course of their lives.

5. Discussion

Although nonmarital births can occur at later parities, and to women who have been, but are not currently, married (e.g., Foster and Hoffman 1996, Brown 2000), here we have focused on the relationships of type of first birth to a woman's later life. Drawing on life history theory, we posit that a nonmarital first birth affects a woman's life in numerous ways that reflect [1] the value of a committed, investing mate, and [2] the reduction in a woman's "value" in the mating market due to having existing children. Our results are consistent with this theoretical perspective. A woman's later life course appears to be strongly influenced by whether her first birth is within marriage, or whether she is pregnant when she married, marries shortly after her first birth, or experiences a nonmarital birth with no committed father.

At the same time, we are not able here to measure some factors that are included in other studies: presence of welfare in a woman's natal family, inter-sibling similarities in behavior, whether a woman was cohabiting before birth (or continues to cohabit and remain unmarried subsequent to birth). Each of these factors has, in some studies, been shown to influence subsequent life patterns; they are undoubtedly important factors in the lives of the women we study, and it is regrettable that we cannot control for these variables with the current dataset. Unexplained heterogeneity, self-selection and phenotypic correlation remain for us, as for most authors, a difficult problem.

Our results reflect the fact that overall fertility patterns in the U.S. are strongly influenced by race and education. Many scholars (e.g., Luker, 1996) find that in both the UK and the U.S., total fertility has declined over the last 30 years, while age at marriage and at first birth have been increasing. Significant secular trends have also been observed in patterns of divorce, separation, remarriage, and nonmarital births. The results of these social changes include postponed marriage and fertility, increases in single-parent families, stepfamilies and "blended" families. Similarly, Martin (1999; see also Bloom and Bennett, 1990) found that, compared to 1975-79, more women of most educational levels in 1990-95 remained childless until age 30. After this age, women with college degrees (but not others) had comparatively increased fertility, due to high marriage rates and marital birth rates.

In concert with these changes, attitudes about illegitimacy, and thus the relative costs to nonmarital births, have changed. Before the 1960s sexual "revolution" and the *Roe vs. Wade* 1973 Supreme Court decision, U.S. black and white attitudes toward nonmarital births were similar (e.g., Rains, 1971; Solinger, 1992; Hendrix, 1996), and women's options were both more constrained and more similar than they are today. Hendrix (1996: 156) suggests

that black communities today, while ambivalent in attitude, are nonetheless more relaxed regarding nonmarital births than most white communities. The racial differences we find (e.g., Table 3) are consistent with such suggestions, but shed no light on them.

Technological changes (e.g. effective and non-obvious birth control such as the birth control pill) have shifted women's options, and attitude changes are probably influenced by these shifts, although such options may well affect marital birth rates differently from nonmarital rates (cf. Gill, 1977: 38). Some of the cohort effects we observed are undoubtedly related to these historical shifts. Similarly, South (1999), using event history analysis on a PSID sample of 2794 women, found that the risk of premarital birth was highest for black and Hispanic women, for women from relatively poor families (this difference declines as women age) and mother-only families, and for women growing up in poor neighborhoods. Black-white differences declined over time in his sample (1968-1993), but Hispanic vs. non-Hispanic differences widened.

Effects of Nonmarital First Births on Marriage Patterns

Among women in this sample whose first birth was nonmarital – those who could not convince a male to commit to marriage close to the time of a birth – a significant proportion (~17%) did not marry by age 45. Bennett, Bloom, and Miller (1995; see also Bloom and Bennett, 1990), using data from Cycle IV of the NSFG, from NSFH, NLSY, and NSYW (total 8450 respondents), similarly found a negative association between nonmarital childbearing (broadly defined) and the likelihood of marrying by age 30. We also found cohort effects consistent with the historical shifts mentioned above (Tables 1, 2). Zavodny (1999), examining the behavior of male partners after a nonmarital birth, found racial and social differences in men's willingness to commit. Among African-American men, older men living in the South who grew up in families never on welfare were more likely than others to legitimatize their children. Among non-Hispanic white men, the most likely to legitimate their children were employed, had completed high school, and grew up in families never on welfare. In one sample (NSLY, 1980-1990), but not another (NSLY, 1967-1979) men enrolled in school were also more likely than others to legitimate their children. In our sample, we could not assess the influence of male characteristics. Most of the first births in our sample precede the initiation of the longitudinal collection of the PSID, and thus the men associated with these births who did not marry the mothers, or who divorced soon after marriage, were not recruited into the survey; these men may differ in significant ways from the available sample of men who committed for the long-term. Additionally, self-selection plays an important role determining what type of partner an individual marries (e.g., Anderson, 2000; Schoen and Weinick, 1993), or whether a man has low confidence of paternity (thereby

increasing the likelihood that a pregnancy will be terminated, or his relationship with the woman dissolved; see Anderson et al., 2002). Lastly, we do not address the issue of whether women decide to terminate a pregnancy or bear a live birth (see Hill and Low, 1992); the decision to have a first birth, regardless of marital status, is treated as an exogenous variable in our analyses, although in reality it is of course endogenous. We acknowledge the role of self-selection in the type of first birth, the men women choose to mate with, and the decision to bear a child, but we cannot directly address self-selection with the current dataset.

Nonmarital First Births and Women's Total Lifetime Fertility

Morgan and Rindfuss (1999), using data from the 1980, 1985, and 1990 Current Population Surveys, found the association between early fertility and nonmarital births has been growing stronger – early-reproducing women are increasingly likely to be unmarried (cf. Luker, 1996). They also found a weakening association between age at first birth and [1] rapid subsequent childbearing, and [2] higher completed fertility, as did Rank (1989). Their patterns for African-American and white women differed (whites showed a continuously decreasing association, African-Americans showed a non-linear pattern). In our sample, this association was not clear; however, we have restricted this analysis to women who were over 45 and had completed their fertility, so changes in recent cohorts may not be apparent.

Driscoll et al. (1999) examined the effects of never-married (similar to a subset of our nonmarital births, narrowly defined), pre-marital (a mixture of what we classify as nonmarital births and legitimized births), and post-marital births (a combination of pregnant brides and marital births, under our definitions) on the probability of having another birth. They found that never-married and previously-married women were the most likely to have an additional nonmarital birth. We found that controlling for the age at first birth, women whose first birth was nonmarital (narrowly defined) had fewer children than those whose first birth was marital (Table 8). Women who married just before or after their first birth did not have more or fewer children than women whose first birth was marital. Perhaps contrary to popular opinion, total lifetime fertility is not increased by nonmarital births. Rather, the decreased probability of obtaining a secure lifelong male partner to invest in one's children results in women whose first birth is nonmarital having decreased fertility throughout the life course.

Nonmarital First Births and Women's Life Courses

Race and ethnicity, in part because they are correlated with age-specific mortality patterns, may influence a woman's options. Geronimus (1996a, b) and Geronimus et al. (1996) have argued that poor urban black women face, as they age, not only a small and declining population of marriageable men, but also declining health and female support systems (see also Brien, 1997). Thus early fertility, even if it is nonmarital, may be a woman's best choice. This is true, they suggest, despite the fact that married mothers are typically better off than single mothers (e.g., Driscoll et al., 1999). That is, the decay of support systems means simply that teen childbearing is the least bad choice of a limited and sub-optimal set of choices.

Different samples and methodologies can lead to divergent estimates of the impact of early childbearing on women's subsequent lives. Geronimus and Korenman (1992) compared sisters in the NLSY and found that the fixed effects estimates of effects of teen birth are typically very small and non-significant. Hoffman, Foster, and Furstenberg (1993a, b) used PSID data to compare teen mothers with their sisters; the results suggested that teen childbearing may have additional negative effects on these women's lives. These studies find that different aspects of women's lives were most affected. In particular, in the PSID data, poverty status, high school graduation, and marriage were affected; in the NLSY data poverty status, welfare receipt, post-secondary schooling were most influenced. Hoffman et al. (1993b) suggested that taking full account of family background reduces, but does not eliminate, the consequences of early childbearing. The important differences in the findings are small.

Because we focus on the status of first births as they affect women's later lives, we are looking at births at relatively early ages. A woman's age, in most samples, interacts with other factors. Hofferth (1984), using PSID data on women over 60 in 1976, found that older mothers (women who bore their first child at age 30 or above) were likely to be well-established professionally and secure economically, and to have relatively high incomes and standards of living. They also received more income from relatives than women whose first child was born before they were age 30.

We suspect these older women, even when their births are nonmarital in the narrow definition we use here, pay a smaller cost than women whose first birth is early and nonmarital. Foster et al. (1998) examined nonmarital childbearing in older mothers, using a sample from the PSID. During the 1980s and 1990s, nonmarital births increased (c.f. Foster and Hoffman, 1996), but the rate of increase was higher for women 20-24 (69%), 25-29 (67%), and 30-34 (82%) than for teens (61%). Foster, Jones and Hoffman (1998) found older single mothers slightly – *very* slightly – better off than teen mothers, and worse off than older married women who had children. Older single mothers worked more than teen mothers (some of whom remained in school) in the year before the birth, but less than married women. Older single mothers were more like teen single mothers than like married mothers their own age. Among older single mothers, women who began childbearing as teens were economically

worse off than others, and later births appeared to exacerbate the difference. Women cohabiting at the time of birth were much better off than single mothers, reflecting the contributions of their partners, but were still worse off than married women.

5. Conclusions

This paper applies evolutionary life history theory to women's life history outcomes in the context of their ability to obtain secure long-term male commitments for their reproductive careers. Our results suggest that it is useful to distinguish among different types of "nonmarital births"–those not associated closely with marriage, those followed by a quick marriage, and marriages of pregnant brides. Both births more than seven months after marriage and "pregnant bride" births are considered marital by the usual definitions – yet the probable life courses of women experiencing these two types of births are likely to differ. Similarly, "legitimizing marriage" births, and nonmarital births not associated with any commitment are both usually considered "nonmarital" – yet, again, the fortunes of the two types of women are very different. The relationships of each differ with other aspects of women's life histories, and the impacts also differ by race and education. Using a retrospective sample of births and marriages to American women over age 45, we find that women who are unmarried at their first birth, and who do not secure a husband shortly thereafter, have fewer children over the life course than women who marry before or shortly after birth. They also differ significantly in their lifetime marital patterns, i.e., in the number of years they have access to secure male investment in their children. This is consistent with an evolutionary model in which trade-offs and the collective action problem of parental care exert strong influences individual life histories (although we recognize that finding a correlation between the type of first birth and life history outcomes does not mean we have demonstrated a causal relationship; unobserved background characteristics may explain the association). In this sample, we do not have good measures of "risk factors" of nonmarital births; however, we strongly suspect that risk factors will differ for the three types of birth we analyze here. If they do, then the policy implications may also differ.

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Notes

[1] Unobserved heterogeneity, self-selection into marital and fertility status, and phenotypic correlations make interpretation of causal models difficult in real-life situations. Women may differ in ways we cannot measure that may affect the patterns we see. Women may also self-select into marital and fertility categories for reasons we cannot observe or control for. This may produce phenotypic correlations, i.e. expected trade-offs between life history traits are not observed because of underlying differences between individuals. For example, families with greater resources may exhibit both greater fertility, and higher per capita invest in offspring, than families with fewer resources. This obscures the predicted trade-off between offspring quality and quantity, if underlying differences between families are uncontrolled. Ideally, life history tradeoffs are best observed using experimental manipulation, which is typically impossible for humans due to obvious ethical and practical considerations. (See Hill and Hurtado 1996, Lessells 1991.)