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Race and Childlessness in America, 1988 – 2002

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*This paper bridges the literature on childlessness, which often focuses on married White couples, to the literature on race and fertility, which often focuses on why total fertility rates and nonmarital births are higher for Blacks than Whites. Despite similarity in levels of childlessness among Black women and White women, Black trends have been largely ignored. Recent research has not adequately explored the extent to which factors driving childlessness may vary among Black and White women. We attempted to fill this gap using the National Survey of Family Growth (*N = *3,628) and found many similarities in the predictors of childlessness for both races. Exceptions were the role of marital status and educational attainment.*

In recent decades, low fertility in industrialized nations has captured the attention of researchers and policymakers. Although fertility levels in the United States are not below replacement levels as in some European countries and Japan, the growth in the proportion of American women who are childless at the end of their childbearing years has sparked research into the causes and consequences of this trend (Abma & Martinez, 2006; Heaton, Jacobson, & Holland, 1999; Jacobson & Heaton, 1991; Park, 2002). Despite similarity in levels of childlessness among Black women and White women, Black childlessness has not been closely examined. This paper bridges the sociological literature on childlessness, which often focuses on married White couples, to the literature on race and fertility, which often focuses on why total fertility rates and nonmarital births are higher for Blacks than Whites. We introduce a new perspective by focusing on the similarity of racial trends in childlessness and by examining how the factors influencing childlessness trends vary, if at all, for Black and White women.

Following World War II, childlessness was generally higher among Whites than Blacks; this began to change by the 1970s, when childlessness for both groups started to converge (Bloom & Trussell, 1984; Boyd, 1989b). In the last 3 decades, childlessness among all American women doubled (Dye, 2005), and there is no longer any racial difference in childlessness levels among women past their reproductive years, a fact often overlooked. Data from the Current Population Survey, presented in Figure 1, show childlessness broken down by race and by education among women aged 40–44. Childlessness for all Black women (indicated by the dotted line) has increased from 15% to 22% and from 10% to 18% for all White women (indicated by the solid line). These racial differences in levels are not statistically significant, suggesting little racial difference in the trend.

Childlessness among Black and White women is more prevalent when limited to those with college degrees, as indicated by the trend lines with triangles. Although there is more fluctuation over time among Black women than White women, college-educated women of both racial groups are 5% to 10% more likely to be childless

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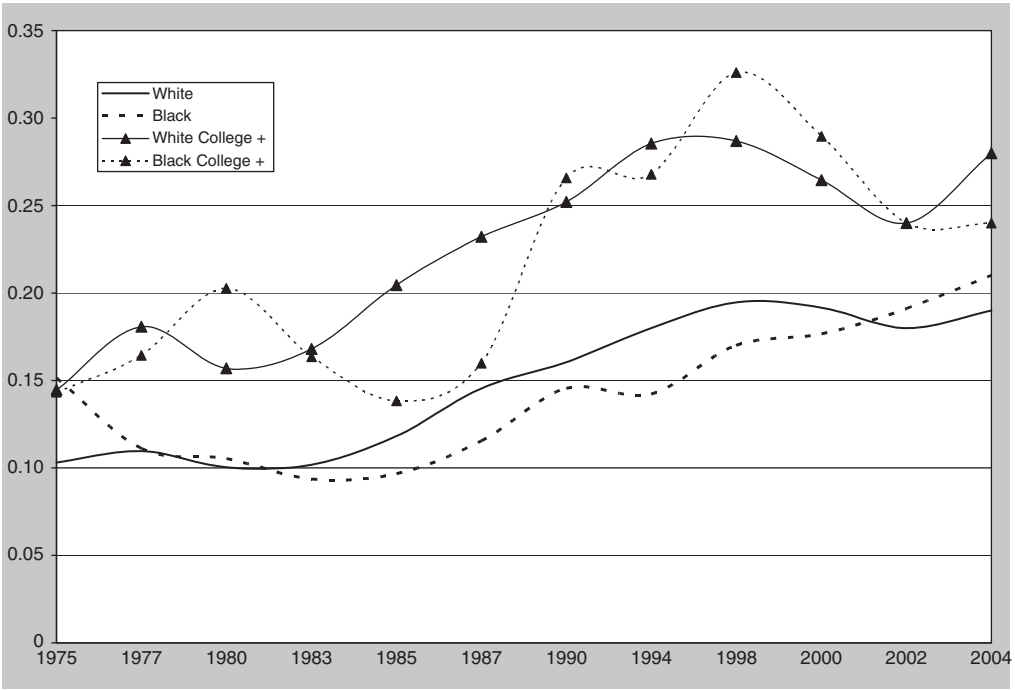
FIGURE 1. PROPORTION OF CHILDLESS BY RACE AND EDUCATIONAL ATTAINMENT, U.S. 1975 – 2004



Note: Authors' calculations using weighted data from the Current Population Survey, 1975 – 2004

at any given point during the time period than are women of all educational levels.

These figures show that childlessness is a growing social phenomenon for Black and White American women, particularly among those with higher educational attainment. This racial similarity is of particular interest given that most academic investigation of race in family formation trends is premised on the existence of large racial gaps, such as those in marriage, divorce, nonmarital childbearing, and teen childbearing, to name a few. Popular conceptions of childlessness portray it as a trend mainly among White, high-powered career women who either postpone childbearing until it is too late or make a conscious choice to remain child free (Cain, 2001; Carroll, 2000; Hewlett, 2002). Similarly, academic analyses are often limited to samples containing only White women (Heller, Tsai, & Chalfant, 1986; Park, 2002; Poston & Kramer, 1983) or to samples of Black women past childbearing years that are so small as to preclude separate analyses in their own right (Abma & Martinez, 2006; Heaton et al., 1999; Jacobson & Heaton, 1991; Jacobson, Heaton, & Taylor, 1988; Mosher & Bachrach, 1982). In this paper we compare Black childlessness to White childlessness directly to understand whether the factors that drive childlessness vary by race.

LITERATURE REVIEW

In the past half century, significant changes in the structure of American families have led to declining fertility and increasing childlessness. Some reasons for this decline in fertility include the postponement of marriage, lower marital rates, increases in divorce rates, widespread availability of effective contraception and abortion, and postponement of childbearing within marriage. A key factor related to all of these changes is the growing social, political, and economic emancipation of women. This paper examines whether the social and economic forces that drive childlessness operate in the same ways for Black and White women. Given racial inequalities in U.S. economic and social opportunity structures, we hypothesize that,

although the causes of childlessness are probably similar for both groups, some factors may intersect with race to generate sometimes differing relationships for Black women to childlessness.

Marital Structure

Compared with White women, Black women face reduced availability of marriageable same-race men because of their higher unemployment, incarceration, and mortality rates. The ratio of single men to single women dramatically differs by racial group and is linked to reduced Black marriage rates (Lichter, LeClere, & McLaughlin, 1991). To the extent fertility decisions are influenced by marriage prospects, the relative lower availability of marriageable men may affect Black childlessness differently than White childlessness.

Age at first marriage has increased for all women and is correlated with smaller completed family sizes. But whereas White women's average age at first birth has increased in tandem with their age at first marriage, Black women's age at first birth has not (National Center for Health Statistics, 1999). Increasing age at first birth is linked to the incidence of age-related infertility. But although White women are more likely to delay motherhood, they are also likely to have access to greater financial resources to seek out and obtain infertility treatment.

Marriages are starting later and ending earlier as a result of the prevalence of divorce. Early divorce is likely to cut short reproductive plans, and the general threat of divorce may also make childlessness more appealing. Divorce has risen for all groups, but Black rates of marital dissolution are more than twice those of Whites (Fields & Casper, 2001).

All of these trends point to important racial differences in the role of nonmarital childbearing, and past studies show that race differences in the correlates of fertility emerge strongly in the nonmarital context (Rindfuss & Parnell, 1989). Historically, nonmarital childbearing has been more common among Blacks than Whites and less stigmatized in the Black community (Pagnini & Morgan, 1996), although recent years have brought about an increase in nonmarital births for all women, with nonmarital births now comprising 27% of all White births and 69% of all Black births (Ventura & Bachrach, 2000). Even though Black women face reduced opportunities for marriage and higher rates of divorce than White women, nonmarital childbearing may be prevalent and normative enough in the Black community to offset some of the ways in which these trends might otherwise constrain fertility. Therefore, we hypothesize that marriage, age at marriage, and divorce may be less important in influencing Black women's childlessness than White women's childlessness.

Socioeconomic Status

Higher education and income have consistently been linked to childlessness (Abma & Martinez, 2006; DeJong & Sell, 1967; Mosher & Bachrach, 1982). But in contrast to the way childlessness among (predominantly White) women today is often depicted, Black childlessness in the mid-20th century was framed as involuntary and attributed to the effects of poverty and discrimination, including poor health care, malnutrition, disease, and coercive sterilization (Boyd, 1989b; Farley, 1970). Black women's investment in human capital increased significantly throughout the late 20th century, ostensibly reducing such correlations between poverty and childlessness. Between 1970 and 2004 the percentage of adult women completing a bachelor's degree rose for all women, although more so for White women than for Black women (Current Population Survey, 2004). The fact that higher education contributes to greater female employment opportunities (and greater subsequent opportunity costs for childbearing) suggests that childlessness for both Blacks and Whites should now be linked to higher socioeconomic status. Because White women still have more educational opportunities and access to high-quality employment than do Black women, one might expect higher overall childlessness rates among White women than Black women. This is in line with classic majority-minority group fertility theory, such as the social characteristics hypothesis, which argues that higher minority group fertility levels result from their marginalized socioeconomic status (Goldscheider & Uhlenburg, 1969). On the other hand, the minority group status hypothesis (also out of the Goldscheider and Uhlenburg tradition) predicts *lower* fertility among minority groups as a strategy for social and economic integration and advancement. Although this hypothesis has not always found support (Johnson, 1979), one

analysis of married couples aged 35 – 44 found that college-educated and high-income Blacks had higher childlessness rates than did similar Whites (Boyd, 1989a). Boyd (1989a) argued that upwardly mobile Blacks constrict their fertility in an effort to assimilate into mainstream upper-middle-class culture. A more recent variation of this argument was offered by Clarke (2009), who theorized that college-educated Black women have difficulty finding marital partners, yet consciously forgo nonmarital childbearing because of racial stigmas associated with single parenting. These arguments suggest that, rather than socioeconomic status operating similarly for both Black and White women in predicting childlessness, it might have stronger causal effects for Blacks than for Whites. We thus hypothesize that high socioeconomic status should be a strong predictor of childlessness for both groups of women, but more strongly so for Blacks than for Whites.

Pronatalist Orientation and the Issue of Voluntary Childlessness

The literature has also argued that childlessness may be viewed differently through the prism of ethnicity and culture. The minority cultural hypothesis, another variant of Goldscheider and Uhlenburg's (1969) minority-majority fertility theory, posits that differences in fertility levels stem from profamily cultural orientations of minority groups. There is some evidence that childlessness is considered less desirable by Black women, with earlier studies finding lower rates of voluntary childlessness among Blacks (Jacobson et al., 1988; Mosher & Bachrach, 1982). Supporting this is the more recent study by Heaton et al. (1999), who analyzed 19- to 36-year-olds' reported desires for childlessness in 1988 against their realized fertility 6 years later. The authors found that Blacks were consistently less likely than Whites to desire childlessness and less likely to remain childless by the end of the study. On the other hand, a more recent study found that Blacks were more likely than Whites to agree with the statement that ''a man/woman can have a fulfilling life without children'' (Koropeckyj-Cox & Pendell, 2007).

Unfortunately, the absence of attitudinal measures on the value of childlessness in our data leaves little opportunity to test hypotheses about whether childlessness outcomes are influenced more by normative orientations for one group than another. The fact that Black and White childlessness levels are similar to begin with, however, is an indicator that values relating to childlessness probably do not vary substantially enough to impact behavior across both groups. This discussion brings to light a related issue: the more general challenge of accurately assessing voluntary versus involuntary fertility.

Despite the temptation to classify childlessness into mutually exclusive categories as either a ''voluntary'' or ''involuntary'' decision, emerging evidence suggests these may be impossible to disentangle. Childless individuals often come to the decision only indirectly after a long process of fertility postponements and alternating fertility preferences over time (Rindfuss, Morgan, & Swicegood, 1988). Because family building occurs during the same stage of life as career building and because American workplaces provide few incentives and supports to combine work with motherhood, some women may delay having children until they are finished with formal education and established in their careers. Delayed childbearing increases the likelihood of age-related infertility issues and raises the possibility of involuntary childlessness. Indeed, American fertility preferences and desires generally outnumber actual family sizes (Quesnel-Vallée & Morgan, 2004). And although childlessness has doubled over the last 30 years, there has been no parallel increase in reported preferences for childlessness; the percentage of individuals desiring no more than 0 to 1 children has grown from only 3% to 5% (Hagewen & Morgan, 2005). But given the social desirability of parenthood, ambivalent prospective parents may also avoid declaring a choice for childlessness and instead may realize this choice indirectly by voluntarily postponing parenthood until age-related infertility ''forces'' the decision on them. Women who are biologically unable to reproduce may well have decided not to have children even if they could have done so. Thus, even biological infecundity, a seemingly clear-cut instance of involuntary childlessness, is not so straightforward. Therefore, although we do examine the influence of infertility on childlessness in this paper, we avoid classifying our childlessness outcome measure as being clearly either voluntary or involuntary.

Method

In the analyses that follow, we focus on women who are at the end point of their childbearing years and assess how marital structure, socioeconomic status, and other fertility and demographic controls contribute to remaining childlessness for Black and White women. Because childlessness is still a rare status among American women who are at the end of their childbearing years, it was a challenge to locate fertility data sets with sufficient sample sizes of women past their reproductive years, much less ones with adequate numbers of Black women in this age range. We remedied this paucity of data with retrospective fertility and family formation histories by combining the three most recent waves of the National Survey of Family Growth (NSFG) from 1988 (Cycle 4), 1995 (Cycle 5), and 2002 (Cycle 6). The NSFG is a periodic survey conducted by the National Center for Health Statistics that gathers nationally representative data on fertility, reproductive health, and household formation and dissolution from women ages 15–44.

Using Cox Proportional Hazards regression, we modeled the likelihood of remaining childlessness among Black women and White women from the onset of their menstrual periods until last observed at ages 40–44. In these models we predicted the hazard of a first birth and the risk for each woman upon the date of her first menses until a first birth occurred or upon her right censorship at the end of the time period (childless women who adopted were censored upon adoption at any point during the time period). Cox Proportional Hazards regression enabled us to include truncated or censored observations (i.e., women who never have a child) in calculating the hazard that any one respondent has of bearing a child. Moreover, this semiparametric method operated on an unspecified, arbitrary baseline hazard using maximum partial likelihood estimation, and estimates were asymptotically unbiased (Allison, 1995). This method also enabled the inclusion of time-varying covariates and could accommodate tied events, which we handled with the Efron method.

Although the event history models estimate the effects of covariates on the hazard of a first birth, our interest lies in predicting childlessness. Because our outcome of interest in the event-history analyses is a nonevent, that is, remaining childless, our discussion is oriented toward the inverse relationship between the independent variables and the event hazard. Although the underlying Cox model predicted the event of becoming a mother, we transformed the hazard ratios generated by this modeling approach by multiplying the coefficient by −1 and exponentiating the result to generate the hazard ratio of remaining childless. Therefore, a hazard ratio greater than 1 indicated a higher hazard of the nonevent (childlessness) in question and a hazard ratio less than 1 indicated a lower hazard. The hazard ratios for covariates told us the proportional change in the hazard of remaining childless given a 1-unit change in the covariate.

A less complicated approach would be to model childlessness as a cross-sectional logistic regression outcome; such analyses, however, cannot incorporate the time-changing nature of the control variables and thus run the risk of conflating the causes with the consequences of childlessness. Cox Hazards regressions allowed us to use variables that were measured in time-changing intervals of the respondents' lives so that we could measure their effect *prior* to the outcome event (having a child or not).

It is important to note that we were modeling monthly ''survival,'' from the onset of menses until ages 40–44, without becoming a mother through a live birth. This is distinct from modeling the hazard of lifetime childlessness because it is possible, though statistically quite rare, for a woman to become a first-time mother after the ages of 40–44. By using this oldest cohort available in our NSFG sample, we hoped to vastly reduce right-censoring (becoming a first-time mother after age 40–44) in order to model childlessness rather than delayed motherhood. Although a few childless women in the 40–44-year age bracket may eventually become mothers, the first birth rate for this age group was extremely low (Dye, 2005). Thus, childlessness in our sample may be slightly overestimated, but we believe the effect to be negligible.

Measures

We examined the effects of four groupings of variables: basic demographic characteristics, family structure, socioeconomic background, and reproductive histories. The retrospective nature of the NSFG surveys ensured that most of our independent variables were sequenced in consecutive order leading up to the outcome

we wished to predict. We also included some non-time-changing variables that are fixed upon birth (race, foreign-born, etc.). Demographic characteristics included age at menarche (which stands in as a duration measure for the hazards analyses), race or ethnicity, nativity, and date of survey. We limited the sample to non-Hispanic Black and White women. Foreign-born indicates whether the respondent was born outside of the United States, with native-born serving as the reference group. We included nativity because immigrants tend to have higher fertility, although this may vary by country of origin. We also included a variable indicating the date of survey to control for cohort differences.

Family structure indicators included marital and cohabitation histories. We used a set of time-varying dichotomous variables to measure whether the individual was married, currently divorced and not remarried, or cohabiting during each month of her life. The reference category was never married and a very small number of widows. Because of data limitations, only first cohabiting unions are reported for Cycle 4, whereas Cycles 5 and 6 have full cohabiting histories.

Socioeconomic status background variables included educational attainment, maternal education, and maternal employment (the respondent's employment history was not collected retrospectively in all waves of the NSFG and thus could not be included in the model). Education was measured as a set of dummy variables indicating the respondent's highest level of educational attainment. These included high school diploma, some college, or a college degree or more, with high school dropouts serving as the reference category. To capture family of origin socioeconomic background, we included two dummy variables indicating whether the respondent's mother was employed when respondent was age 14 and whether the respondent's mother had a college education. We used the respondent's mother's employment and education for two reasons. First, data on mothers tend to be more reliable, particularly in the event of divorce or separation. Second, we thought the respondent's mother's educational and labor force engagement might influence the respondent's own education and employment and, indirectly, fertility more so than the father's.

In addition to dates of live births, extensive reproductive histories included age at first sex, dates of medical sterilization, abortions, miscarriages, and cross-sectional variables documenting infecundity issues and intentions for more children (unfortunately, complete contraceptive histories were not collected retrospectively in all waves of the NSFG). Younger onset of sexual activity may affect the likelihood of motherhood. Sterilization, abortion, and miscarriage measures may indicate undesired fertility and potential fecundity. In the descriptive table we note the age at which miscarriages occur as a rough indication of age-related infecundity. The infecundity variable is the only variable in the model with unknown timing in the life histories of the respondents. It combines the two variables ''ever sought medical help to become pregnant'' and ''ever had difficulty getting pregnant or carrying baby to term'' that were asked as of the interview date. Thus, it is possible that infecundity issues refer to experiences *subsequent* to a first birth. Nevertheless, the variable is the closest we have to a control for secondary infertility.

Results

Descriptive Analyses

Before we present the findings from our multivariate event-history analyses, we show descriptive results in Table 1, and we summarize the unadjusted survival distributions of remaining childless over time in Figure 2. In all descriptive analyses, we tested for significant differences by racial group in the distributions of measures and of survival curves. Although our survival analyses used time-changing covariates, for ease of presentation the characteristics shown in Table 1 were measured as of the interview date when respondents were ages 40–44. We used the constructed weights provided by the NSFG to account for its complex sampling design, and because we combined three NSFG cycles, we divided the weights by the number of cycles.

Demographic variables toward the bottom of Table 1 show that the childless cohorts of both races were most highly represented in the middle NSFG cycle (1995) and least represented in the earliest cycle (1988). There were no significant differences in childless levels across racial groups. Although equal proportions of childless women and mothers were foreign born among Whites, Black immigrants were less likely than

Table 1. *Weighted Means of NSFG White Nonmothers (n = 486), White Mothers (n = 2,155), Black Nonmothers (n = 136), and Black Mothers (n = 851), Ages 40–45*

	White		Black		
	Childless	Mothers	Childless	Mothers	
Variables	*M* (*SE*)	*M* (*SE*)	*M* (*SE*)	*M* (*SE*)	Variable Range[a]
Family structure					
Ever married[b,c,d,e]	0.64 (.05)	0.98 (.01)	0.48 (.09)	0.8 (.02)	0–1
(Age at first marriage[b,c,e])	24.4 (.75)	20.3 (.14)	26.6 (2.28)	21.2 (.33)	0–1
(Ever divorced[c,e])	0.36 (.07)	0.34 (.02)	0.21 (.14)	0.37 (.04)	0–1
Ever cohabited[c,e]	0.5 (.05)	0.4 (.02)	0.4 (.08)	0.52 (.03)	0–1
Reproductive history					
Age at menarche	12.5 (.13)	12.6 (.07)	13.1 (.30)	12.5 (.11)	6.3–24.9
Age at first sex [b,c,d,e]	21.2 (.48)	18.8 (.12)	19.1 (.55)	17.4 (.18)	8.8–41.1
Virgin	0.06 (.02)	n/a	0.02 (.01)	n/a	0–1
Intends to have a(nother) child?[b,c]	0.09 (.02)	0.02 (.00)	0.1 (.03)	0.03 (.01)	0–1
Age at first birth[e]	n/a	23.3 (.19)	n/a	21.1 (.27)	10.9–43.2
Ever adopted[b,c,e]	0.06 (.04)	0.02 (.01)	0.04 (.04)	0.01 (.00)	0–1
Ever had abortion[b,c,e]	0.2 (.03)	0.16 (.01)	0.15 (.04)	0.22 (.02)	0–1
Ever had miscarriage[b,c,d]	0.14 (.02)	0.3 (.02)	0.24 (.08)	0.3 (.03)	0–1
(Age at first miscarriage[b,c,e])	27.8 (1.81)	25.4 (.45)	26.7 (1.58)	24.9 (.65)	11.4–44.4
Infecundity issues[e]	0.30 (.05)	0.25 (.02)	0.30 (.07)	0.23 (.02)	0–1
Ever sterilized[b,c,e]	0.22 (.04)	0.5 (.02)	0.34 (.08)	0.65 (.03)	0–1
Human capital					
High school dropout[b,c,d,e]	0.05 (.02)	0.11 (.02)	0.13 (.07)	0.24 (.03)	0–1
High school graduate[c]	0.28 (.04)	0.35 (.02)	0.33 (.08)	0.38 (.03)	0–1
Some college[b]	0.23 (.04)	0.24 (.02)	0.27 (.09)	0.22 (.03)	0–1
College graduate[b,c,d,e]	0.45 (.05)	0.3 (.02)	0.27 (.07)	.17 (.02)	0–1
Socioeconomic characteristics					
Mother attended college[c,d,e]	0.34 (.05)	0.24 (.01)	0.18 (.06)	0.14 (.02)	0–1
Mother worked full time[d,e]	0.33 (.04)	0.29 (.02)	0.49 (.09)	0.5 (.03)	0–1
Demographic variables					
Cycle 4[e]	0.2 (.00)	0.29 (.00)	0.27 (.01)	0.34 (.00)	0–1
Cycle 5[e]	0.44 (.00)	0.46 (.00)	0.39 (.00)	0.4 (.00)	0–1
Cycle 6[e]	0.36 (.00)	0.25 (.00)	0.35 (.00)	0.27 (.00)	0–1
Age at interview	41.7 (.015)	42 (.06)	41.7 (.24)	41.9 (.09)	40–44
Foreign born [bd]	0.04 (.02)	0.04 (.01)	0.04 (.00)	0.06 (.02)	0–1

Note: Data from Waves 4, 5, and 6 of the National Survey of Family Growth. n/a: not applicable.

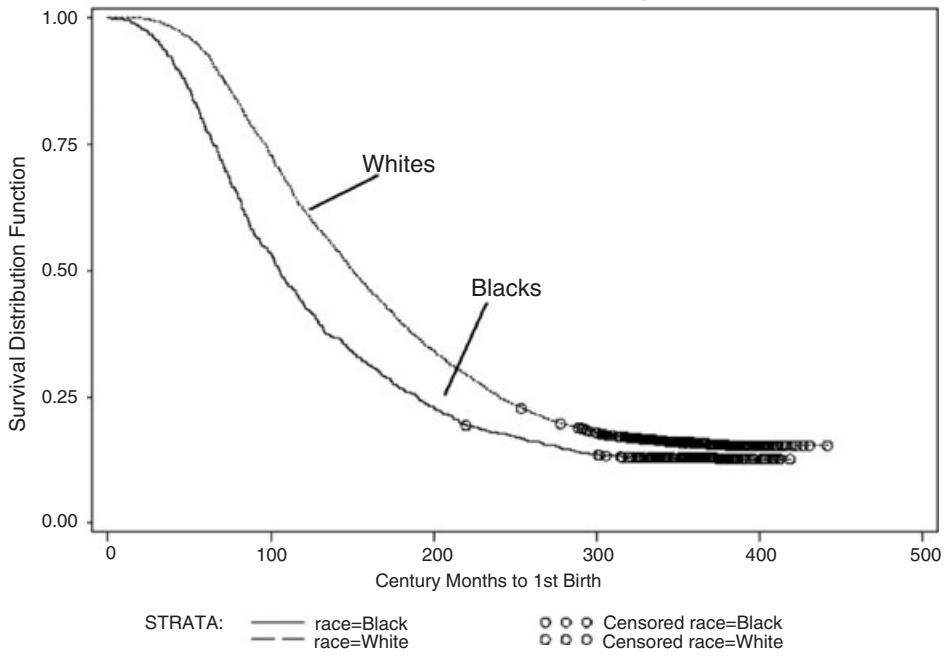
[a]Dummy variables: 0 = *no* 1 = *yes*, Continuous variables: age in person months. [b]Significant differences between childless Black women and Black mothers. [c] Significant differences between childless White women and White mothers. [d] Significant differences between childless White women and childless Black women. [e] Significant differences between White and Black mothers.

Black native-born women to be childless at ages 40–44.

Turning to family structure, never marrying was linked to childlessness for both racial groups, but more strongly for Black women. More than half of Black childless women were never married compared to just over a third of White childless women. Later ages at first marriage were associated with childlessness and did not differ by race. Among White women, divorce was slightly higher for the childless. Among Black women the pattern was reversed: Black mothers were more likely to be divorced. Similarly, for Black women, cohabitation was more common among mothers than the childless, whereas cohabitation was more common among childless women for Whites.

Reproductive history measures showed there was no significant difference by race in age at menarche. Mothers became sexually active at

FIGURE 2. SURVIVAL CURVE FOR CHILDLESSNESS BY RACE



younger ages than the childless for both groups, but as a group Black women had overall earlier ages of sexual initiation than White women. Very few childless women were virgins at ages 40 – 44. Most women by this age did not intend to have children in the future, but more childless women (10%) than mothers intended to have a(nother) child. There were no racial differences in such intentions. One strategy would be to delete these women from our analysis altogether under the assumption that they would not have been childless if the NSFG interviews had occurred at ages 45 – 50 instead of 40 – 44. To ensure robustness of findings, we ran models deleting respondents with future intentions to have a child. Coefficients, significance, and directions of relationships were unchanged with their exclusion. Given these findings and the fact that intentions were known to be poor predictors of fertility (Morgan, 2001), we retain childless women with fertility intentions in our models presented below.

Age at first birth was younger for Black mothers than for White mothers. Only a small percentage of women adopted, but it was more common among childless women. Among Whites, childless women were more likely to have reported an abortion, whereas among Blacks mothers were more likely to have reported an abortion. There was, however, no racial difference in abortion reported among the childless.

Miscarriages appeared to be more common among mothers than childless women. But although miscarriages among mothers did not differ by race, among the childless, Black women reported more miscarriages. It was difficult to discern whether miscarriages indicated age-related or more generalized infecundity. To examine this, we tabulated the ages at which miscarriages occurred for each group. Within each race group, childless women miscarried at about 2 years older than mothers. This suggests that miscarriages for childless women may be linked to fertility delay.

Perhaps surprisingly, there was no difference between childless women and mothers in reports of past infecundity issues. Among mothers, White women reported having had significantly more infecundity issues than Black women, but there was no statistically significant racial difference on this measure among

childless women. The most striking difference among the reproductive variables was the variation in medical sterilization. Mothers of both races were more likely than childless women to have been medically sterilized, indicating that sterilization most often occurs following completed fertility. Among mothers, a significantly larger percentage of Black women had a sterilization procedure than did White women. For childless women, however, the racial difference in sterilization was not significantly different. Unfortunately, we were unable to examine sterilization further. Cycle 6 collected only reasons for sterilization procedures for women within the last few years leading up to the survey, and most women of our sample's age range had sterilization operations performed earlier. On the basis of data from just Cycles 4 and 5, however, the vast majority of women reported birth control as their primary reason for electing medical sterilization.

Socioeconomic indicators showed that childless women had higher educational attainment, but this association was stronger for Whites. Maternal college education was also more common among the childless, but only among White women.

We next show how Black and White women in the sample compare in respective childlessness over the period of observation. Figure 2 shows survival curves for remaining childless during the observation period (menarche onset to ages 40–44), where time is measured in months. At the beginning of the observation period indicated by the leftmost end of the x-axis, all women were childless, and, hence, the percentage ''surviving'' the risk of having a first child was 100%. Thereafter, individuals who had their first child left the survival curve in the month of that child's birth, creating its downward trend. The figure shows that the proportion of women remaining childless converged by the end of the observation period, confirming national trends. The shape of the survival functions leading to convergence in childlessness differs, however. The earlier drop of the survival curve for Black women compared to White women indicates that their first children tended to arrive at younger maternal ages. White women experienced longer intervals before the arrival of first children. We next turn to multivariate analyses to measure how demographic, socioeconomic, and reproductive factors together affect the hazard of childlessness for both groups of women.

Multivariate Findings

How do the characteristics described in Table 1 shape the likelihood of being childless for Black and White women? Tables 2 and 3 summarize these findings. The first two columns of Table 2 show the coefficients and standard errors predicting the likelihood of a first birth, but this discussion focuses on the third column, the Childlessness Hazard Ratio (i.e., the hazard ratio for the *non* event of childlessness ($\text{Exp}(-1 \times B)$). Table 2 shows two event-history models separated by race: The first presents predictors of Black childlessness, and the second presents predictors of White childlessness. The final column indicates whether the racial differences shown are statistically significant across the models, as determined from a pooled model testing race interactions (not shown).

The most striking racial difference was the role of marriage and childlessness. For White women, being married reduced the hazard of childlessness by 62%. Among Black women, however, marriage was associated with an increased 24% hazard of childlessness. (Cohabitation had no impact on childlessness for either race.) Marriage was the only variable that worked in opposite directions for Black women compared to White women in the models. Although less dramatic, other notable racial differences emerged in the results. Whereas infecundity issues were not significantly related to childlessness among White women, infecundity lowered the hazard of Black childlessness. And whereas maternal educational attainment did not predict childlessness among Black women, White women with college-educated mothers had a 16% higher hazard of childlessness compared to White women whose mothers were less educated.

The remaining factors did not differ between White and Black women in the direction of their relationship to childlessness, but the strength of effects sometimes differed significantly by race. The strongest predictors of childlessness for both groups generally were divorce and educational attainment. Getting a divorce increased the hazard ratio for childlessness by about 2.5 times for Black women and White women. As for education, each increase in educational level increased the hazard for childlessness. This effect was especially strong for White women, where obtaining a college degree more than tripled the hazard of remaining childless. The

Table 2. *Event History Results for Selected Characteristics on the Risk of Becoming a Mother (vs. Remaining Childless), for Black (n = 987) and White (n = 2,641) Women*

Predictor	Black Women			White Women			Race Difference Across Models?
	B	*SE B*	$(-1 \times e^b)$	*B*	*SE B*	$(-1 \times e^b)$	
Family structure							
Married	−0.21	0.07	1.24**	0.98	0.08	0.38***	yes
Cohabiting	−0.08	0.14	1.08	−0.32	0.18	1.38	no
Divorced	−0.85	0.20	2.35***	−1.04	0.08	2.84***	no
Reproductive history							
Age at first menarche	0.12	0.02	0.88***	0.15	0.01	0.86***	no
Age at first sex	−0.13	0.01	1.14***	−0.13	0.01	1.14***	no
Previous abortion	−0.25	0.09	1.29**	−0.45	0.06	1.57***	yes
Previous miscarriage	−0.58	0.09	1.8***	−0.24	0.04	1.27***	yes
Infecundity issues	0.18	0.09	0.83*	−0.10	0.05	1.11	yes
Human capital							
High school graduate (vs. dropout)	−0.23	0.10	1.31**	−0.71	0.08	2.04***	yes
Some college (vs. dropout)	−0.50	0.11	1.65***	−0.78	0.08	2.18***	no
College degree (vs. dropout)	−0.63	0.12	1.88***	−1.21	0.08	3.36***	yes
Socioeconomic characteristics							
Mother college graduate	0.09	0.11	0.91	−0.15	0.06	1.16**	no
Mother full-time worker	−0.02	0.07	1.02	0.01	0.05	0.99	no
Demographic characteristics							
Foreign born	0.19	0.15	0.83	−0.10	0.11	1.10	no
NSFG cycle 4 (vs. cycle 6)	0.30	0.09	0.74**	0.69	0.06	0.50***	yes
NSFG cycle 5 (vs. cycle 6)	0.28	0.09	0.76**	0.34	0.06	0.72***	no
X^2	325.30***			1285.90***			
Df	16			16			
%censored (childless and adoptive parents)	13.9			18.9			

Note: $-1 \times e^b$ = childless hazard ratio. Although the underlying Cox model predicts the event of becoming a mother, we transform the hazard ratios generated by this modeling approach by multiplying the coefficient by negative 1 and exponentiating the result to generate the hazard ratio of remaining childless. Therefore, a hazard ratio greater than 1 indicates a higher hazard of the nonevent (childlessness) in question and hazard ratios less than 1 indicate lower hazard. The hazard ratios for covariates tell us the proportional change in the hazard of remaining childless given a 1-unit change in the covariate.

$^*p < .05$. $^{**}p < .01$. $^{***}p < .001$, two-tailed tests; significant differences by race were estimated from a pooled model testing race interactions.

net effect of education for Whites was also influential at each of the other schooling levels, doubling the hazard of childlessness. Although education was strongly linked to childlessness for Black women, the magnitude of its impact was smaller. A college degree almost doubled the hazard of childlessness for Black women. Among Black women, some college was associated with a 65% greater hazard of childlessness, and a high school diploma increased the hazard of childlessness by 31%.

Many of the reproductive history variables did not differ in their effects by race. Age at menarche was negatively related with the hazard of childlessness for both groups of women, whereas age at first sexual intercourse was positively linked with childlessness; each year of delayed first sexual intercourse was associated with a 12% to 14% increase in the hazard of childlessness. The effects on the hazard of childlessness of a previous abortion or a miscarriage were similar by race, though they did differ in their degree. Having had an abortion increased the hazard of childlessness more strongly for Whites than for Blacks. The reverse pattern was true for the effect of miscarriage, increasing Black women's hazard of childlessness more so than Whites'.

Foreign-born status did not impact the hazard of remaining childless for either racial group. Finally, the changing incidence of childlessness over time was indicated by the NSFG cycle

Table 3. *Event History Results for Selected Characteristics on the Risk of Becoming a Mother (vs. Remaining Childless) for Black (n = 987) and White (n = 2,641) Women, With Marriage Interactions*

	Black Women			White Women			Race Interaction Difference
Predictor	*B*	*SE B*	$(-1 \times e^b)$	B	*SE B*	$(-1 \times e^b)$	Across Models?
Family structure							
Married	−2.04	0.43	7.66***	−3.21	0.47	24.7***	
Cohabiting	0.01	0.14	0.99	−0.64	0.19	1.90***	
Divorced	−0.79	0.20	2.20***	−1.05	0.08	2.86***	
Reproductive history							
Age at first menarche	0.14	0.02	0.87***	0.16	0.02	0.85***	
Age at first sex	−0.17	0.02	1.19***	−0.30	0.03	1.35***	
Married × age at first sex	0.08	0.03	0.93**	0.19	0.03	0.83***	no
Previous abortion	−0.24	0.09	1.27**	−0.16	0.13	1.18	
Married × previous abortion		n/a		−0.33	0.14	1.39*	yes
Previous miscarriage	−0.58	0.10	1.78***	0.02	0.13	0.98	
Married × previous miscarriage		n/a		−0.69	0.19	1.99***	no
Infecundity issues	0.15	0.09	0.86	0.54	0.18	0.59**	
Married × infecundity issues		n/a		1.17	0.20	0.31***	no
Human capital							
High school graduate (vs. dropout)	−0.30	0.10	1.35**	−1.77	0.19	5.86***	
Married × high school graduate		n/a		1.17	0.20	0.31***	yes
Some college (vs. dropout)	−0.70	0.13	2.00***	−1.67	0.20	5.32***	
Married × some college	0.50	0.18	0.60**	1.00	0.22	0.37***	yes
College degree (vs. dropout)	−0.97	0.16	2.64***	−3.15	0.27	23.39***	
Married × college degree	0.58	0.20	0.56**	2.11	0.28	0.12***	yes
Socioeconomic characteristics							
Mother college graduate	0.13	0.11	0.88	−0.15	0.06	1.16**	
Mother full-time worker	−0.03	0.07	1.03	0.03	0.05	0.97	
Demographic characteristics							
Foreign born	0.20	0.15	0.82	−0.07	0.11	1.07	
NSFG cycle 4 (vs. cycle 6)	−0.03	0.12	1.03	0.75	0.07	0.47***	
Married × NSFG cycle 4	0.81	0.16	0.45***		n/a		yes
X^2		403.09***			1449.95***		
Df		20			23		
% censored (childless and adoptive parents)		13.9			18.9		

Note: n/a: not applicable.

*$p < .05$. **$p < .01$. ***$p < .001$, two-tailed tests; significant differences by race were estimated from a pooled model testing race interactions.

dummy variables (the omitted category was the most recent cycle from 2002). Childlessness has increased for both Black women and White women within each successive wave of interviews. (Note that neither sterilization status nor virginity status were included in the analyses because, as perfect predictors of childlessness, they drop out of the sequential times-series analyses models; in separate models predicting sterilization prior to a first birth, however, we found no racial difference in the likelihood of sterilization except that Blacks were more likely to sterilize outside of marriage whereas Whites were more likely to sterilize within marriage.)

Although Cox models assume proportional hazards, the models can easily be extended to allow for nonproportional hazards. The simplest adjustment occurs with the addition of time-varying covariates in the model: Time covarying covariates change at different rates for different respondents, and the introduction of these measures both demonstrates that the underlying hazards are not proportional and serves as the correction for that nonproportionality. Cox Proportional Hazards models, however, assume that the effect of each time-invariant covariate is the same at all points in time. We have several time-invariant covariates in our model, for

example, race or ethnicity, nativity status, infecundity issues, mother's education, and mother's employment status. To test whether the effects of these variables change over time (and therein violate the proportional hazards assumption) and to check on the robustness of our results, in supplemental analyses we included statistical interactions for these variables with time. Although several of these interactions were significant, indicating, for example, that the effect of mother's education more strongly deters fertility in the early part of the observation period, none of these interactions varied by race or ethnicity, and our primary findings reported above were robust. Thus we are confident in our conclusions of racial similarity in the direction and significance of the correlates of childlessness presented in Table 2.

Given the extreme difference by race in Table 2 regarding the role of marital structure in predicting the hazard of childlessness, Table 3 introduces interactions to see how factors predicting the hazard of remaining childless are moderated by marital status. Statistically significant differences across the two models indicated in the far right column were determined by three-way Race × Marriage interactions from a pooled model (not shown).

In predicting the hazard of remaining childless, Table 3 demonstrates that marital status significantly interacts with educational attainment, and to a lesser extent with age at first sex, abortion, miscarriage, infecundity, and birth cohort. Most notably, marital status significantly mediated the influence of education on the hazard of childlessness. Education increased the hazard of childlessness much more for unmarried women than for married women. College degree attainment, for instance, increased the hazard ratio of childlessness by 23 times for unmarried White women and about tripled the ratio for married women (e.g., $\text{Exp}(-1(-3.152 + 2.108))$). Similarly, attending college without obtaining a degree increased the hazard of childlessness by more than fivefold among single White women and doubled the hazard for married women. A similar pattern was found for the effects of a high school diploma.

For Black women, the interaction of education with marital status was similar but weaker. A college degree more than doubled the hazard ratio of childlessness for unmarried Black women and increased the childlessness ratio among married Black women by roughly 50% (e.g., $\text{Exp}(-1(-0.971 + 0.579))$). This stronger effect of education among unmarried (compared to married) Black women held at the some college level, although not as strongly.

Marital status also interacted with abortion to predict childlessness for White women. Among married White women an abortion increased the hazard of childlessness by about 60%; abortion raised the hazard of childlessness by only 18% for single White women. Abortion did not interact with marital status to predict childlessness for Black women. Among White women, having miscarriages and infecundity issues increased the relative risk of childlessness for married women but decreased the hazard of childlessness for single women. Among Black women, miscarriages increased the hazard of childlessness and infecundity reduced it, but there were no differences as there were for Whites by marital status.

Marital status mediated the effects of other factors in expected ways. Although delayed age at first sex was positively related to childlessness regardless of marital status, being married reduced the strength of its effect. Finally, for Black women childlessness within marriage increased over time between the earliest wave of interviews (Cycle 4) and the most recent wave of interviews (Cycle 6). There was no evidence for equivalent growth in marital over nonmarital childlessness among White women.

Discussion

In this paper we sought to examine whether and how the factors associated with childlessness differ by racial group. We discuss our findings in light of past research and theoretical arguments about childlessness and racial group differences in these trends.

A striking racial difference to emerge from this study is the contrasting importance of familial structures in which childlessness occurs. We originally predicted that not marrying would more strongly increase the likelihood of remaining childless for Whites than for Blacks, given differences in nonmarital childbearing norms. This was true, but not only was remaining unmarried a stronger predictor of remaining childless for Whites but, surprisingly, for Black women childlessness was more strongly associated with marriage than was childbearing. This reflects the fact that the majority of births among Black women are nonmarital. Although

childlessness has increased over each cohort of NSFG women, for Black women childlessness has increased most among married women. That married Black women are more likely to be childless than unmarried Black women may seem counterintuitive when thinking back to the cross-sectional data in Table 1 showing that many more Black mothers are ever married than Black childless women. This simply reflects, however, the fact that most Black women marry at some point *after* giving birth rather than prior to giving birth. The role of cohabitation, on the other hand, does not follow this racial pattern and appears to be uncorrelated with childlessness for both groups of women. Overall, given the strength of the connection between marriage and childbearing for Whites, it is not surprising that marriage interacts with more predictors of childlessness for Whites than for Blacks in the subsequent interaction analyses. For White women, the role of past abortions, miscarriages, and infecundity issues factors in predicting childlessness mainly only for married women and is unrelated to marital status in predicting childlessness for Black women.

Unlike marriage, divorce operates strongly for *both* races as a noteworthy predictor of childlessness. Divorce interrupts subsequent childbearing among Blacks to the same extent as it does Whites. We originally hypothesized that the greater acceptability of nonmarital childbearing among Black women should lessen their likelihood of childlessness following the dissolution of a marriage. Yet divorce is the strongest predictor of childlessness in the models for Black women. It is likely that Black women who marry prior to childbearing are a select group (such as being more highly educated) and are thus less likely than other Black women to have a nonmarital birth after a marriage ends prematurely.

Childlessness, primarily for White women, has been characterized as a phenomenon experienced by women with greater educational attainment and higher socioeconomic status. We found support for this characterization. Maternal education is positively correlated with childlessness, and the respondent's own educational attainment is one of the strongest predictors in the models. That the effect is so powerful among unmarried women in particular fits with popular perceptions of highly skilled women emphasizing careers over families. Yet we found that educational attainment positively predicts the likelihood of remaining childless for Black women as well, although the relationship is substantially smaller in magnitude. The stronger findings of education for White women, regardless of marital status, counter the minority status hypothesis, which states that education should predict childlessness more strongly for minority group couples than for majority group couples. Contrary to common arguments regarding the cultural normativity of nonmarital childbearing among all Black women, highly educated Black women, similar to their White counterparts, are still more likely to remain childless than their less educated peers. As with Whites, education plays a stronger role in predicting childlessness for unmarried Black women compared to married Black women. Although this partially supports Clarke's (2009) position that unmarried college-educated Black women may disassociate themselves from nonmarital childbearing trends that have become increasingly normative in the Black community, college-educated Black women are still far more likely to have a nonmarital birth than college-educated White women.

The centrality of education in predicting childlessness also contradicts historical arguments that Black childlessness arises from poverty, disease, and inadequate access to health care. Instead, childlessness is associated with higher educational and socioeconomic status for Black women, just as it is among White women.

To further tap into the effect of reproductive histories and how such factors might differently affect fertility outcomes for Black and White women, we included measures of miscarriage, infecundity, and abortion in our multivariate analyses. Cross-sectional measures in Table 1 also included future fertility intentions, medical sterilization, and age at miscarriage, which help to contextualize the time-series results. Although much of the academic and popular media focused on White childlessness describe it as the result of either voluntary lifestyle choice or the result of delaying fertility too long, our results suggest that this is equally the case for Black childless women. The same numbers of both childless groups report still wanting a first child by age of interview (Table 1), indicating unmet fertility preferences because of delay. Miscarriages are slightly more correlated to childlessness for Blacks than for Whites, and the descriptive data indicate that miscarriages among the childless of both races tend to take place at older ages, suggesting somewhat more age-related infecundity for Black women. Evidence for more purposeful

childlessness is similarly supported across both races. Comparable numbers of both Black and White childless women elect sterilization procedures, a probable indication of voluntary childlessness. And abortions also predict childlessness for both races, although they are somewhat more linked to ultimate childlessness for Whites than for Blacks. Given previous evidence that White women are less likely than women of other races to underreport abortion (Jones & Forrest, 1992), it is probable that, in actuality, the abortion effect is little different across the two groups.

In sum, we have sought to remedy the absence of Black women from the literature on childlessness. Despite the fact that national rates of childlessness are similar for White and Black women, the pathways taken by Black women to childlessness have been largely unknown. Our analyses indicate that the few existing theories that might predict Black childlessness do not seem to apply. Although Black and White childlessness share many similarities, there are two major differences. Marital status is a key difference in predicting childlessness by race, with unmarried Black women far less likely to be childless than unmarried White women. In addition, the role of socioeconomic selectivity in predicting childlessness is notably more influential among White women than it is among Black women. The estimation of more detailed processes leading to childlessness and the resolution of the voluntary versus involuntary nature of childlessness are both important goals that are beyond the scope of our data. This paper is a first step toward recognizing Black childlessness as an equally important topic in the rapidly growing interest in American childlessness.

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