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Marriage Markets and Nonmarital Fertility in the United States*

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We merge census microdata with vital statistics data to examine the effect of women's marriage opportunities on nonmarital fertility rates and ratios across 75 U.S. metropolitan areas. Measures of the quantity and "quality" of marriageable men simultaneously specific for women's age, race, education, and place of residence reveal especially poor marriage prospects for highly educated black women. The effect of mate availability on nonmarital fertility is generally modest. Among white women, marriage opportunities are associated inversely with the nonmarital fertility rate, perhaps reflecting an increased likelihood that a premarital conception will be legitimated. Marriage opportunities also reduce nonmarital fertility ratios for young black and white women. The nonmarital fertility rate is lower among women whose marriage pool includes a large percentage of nonemployed males. Only a small proportion of the racial difference in nonmarital fertility appears attributable to differences in the marriage markets of black and of white women.

Recent research on the determinants of nonmarital fertility in the United States has tended to adopt one of three approaches. One approach identifies the proximate causes of childbearing outside marriage, such as sexual activity among unmarried women, patterns of contraceptive use and abortion, and marriage among premaritally pregnant women (Cooksey 1990; Cutright 1971; O'Connell and Rogers 1984), and quantifies their impacts on nonmarital fertility (Nathanson and Kim 1989; Smith and Cutright 1988).

A second approach examines individual-level risk factors either for having a premarital birth or for one or more of the proximate determinants. For example, the probability of having a birth outside marriage has been shown to vary by age and race (Abrahamse, Morrison, and Waite 1988), by social class (Hogan and Kitagawa 1985), by education (Bumpass and McLanahan 1989; Leibowitz, Eisen, and Chow 1986), by family background (Duncan and Hoffman 1990), by various social psychological attributes (Hanson, Myers, and Ginsberg 1987), and by prior experiences with drugs (Yamaguchi and Kandel 1987). The probability of engaging in premarital sexual intercourse varies by many of these factors, as well as by sex (Furstenberg et al. 1987; Rosenbaum and Kandel 1990).

A third approach searches for the causes of nonmarital fertility in the more distal social structural environment. Several studies in this tradition examine the effects of government

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welfare policies on childbearing outside marriage, although with somewhat equivocal results (Janowitz 1976; Moore and Caldwell 1977; Plotnick 1990). Some studies focus on the influence of school and neighborhood (Hogan and Kitagawa 1985; Plotnick 1988); others emphasize the role of economic opportunities for women and for men (Hyle 1989; White 1979).

One factor occasionally discussed in this last approach is the marriage market for women, particularly the quantity and quality of men eligible to serve as sexual partners and spouses. The ostensible deficit of desirable marriage partners for women lies at the heart of Wilson's (1987; Wilson and Neckerman 1986) explanation for both the increase and the racial difference in the number of female-headed families, and plays a prominent role in other explanations of changes in family structure and stability (Darity and Myers 1984; Espenshade 1985; Guttentag and Secord 1983). Generally, however, characteristics of marriage markets have not occupied a central role in empirical models of nonmarital fertility. Although a crude measure of women's mate opportunities - the sex ratio - has appeared in a few macro-level studies of childbearing outside marriage (Hyle 1989; White 1979), the possible impact of marriage market imbalances on nonmarital fertility has been treated only in cursory fashion. The purpose of this paper is to examine in greater detail the impact of women's marriage opportunities on the level of, and the racial difference in, nonmarital fertility. We compute nonmarital fertility rates and ratios, simultaneously specific for a woman's age, race, and education, for a sample of U.S. metropolitan areas. We also construct measures of the quantity and quality of potential mates available to these unmarried women, and estimate their effects on nonmarital fertility, net of other conventional predictors.

Marriage Markets and Family Formation

The potential impact of marriage market imbalances on family formation and marital timing has been approached from several disciplines. Demographers emphasize the numerical constraints on marriage rates created by marriage squeezes (Schoen 1983; Schoen and Kluegel 1988). Economists see marriage market disequilibria as influencing the rewards and costs of marriage, and thus affecting marriage rates and patterns of assortative mating (Becker 1974, 1981; Heer and Grossbard-Shechtman 1981). Sociologists and social psychologists describe how imbalanced sex ratios bestow power on the gender in short supply, and hence condition the exchanges between men and women (Guttentag and Secord 1983; South and Trent 1988). Although these theoretical perspectives emphasize somewhat different mechanisms linking marriage markets to marriage rates, all three imply that female marriage rates are related positively to the supply of available men.

Analyses of trends and of interarea differentials in marriage rates usually support this hypothesis. Cox (1940), Frieden (1974), Guttentag and Secord (1983), Lichter, LeClere, and McLaughlin (1991), Preston and Richards (1975), and White (1981) all report generally positive relationships between the sex ratio and women's rates of marriage across U.S. marriage markets. This relationship appears to hold both within other countries (Ermisch 1981; Schoen and Baj 1985) and cross-nationally (South 1988; South and Trent 1988).

The deficit of marriageable men is believed to be especially acute among African-Americans, primarily because of a larger sex differential in mortality among blacks and because of the high incarceration and institutionalization rates of black males (Staples 1985; Tucker 1987; Wilson 1987). Greater enlistments in military service and higher rates of exogamy also tend to remove a disproportionate number of black males from black females' field of eligibles. Spanier and Glick (1980) suggest that the shortage of marriageable African-American males creates pressures for black women to marry much

older men, men with comparatively little education, and men who have married before. The deficit of black men has been shown to affect black women's marital and relationship status (Bennett, Bloom, and Craig 1989; Lichter et al. 1991; Tucker and Taylor 1989). Yet only a modest proportion of the racial difference or of recent changes in marriage rates can be attributed to differentials in women's marriage opportunities (Farley 1988; Schoen and Kluegel 1988; South and Lloyd forthcoming).

Another perspective on the impact of the marriage market on family formation and structure emphasizes the quality, rather than the simple quantity, of potential spouses (Oppenheimer 1988; Wilson 1987). In this view, women's marriage opportunities are limited by the lack of men with desirable economic characteristics, especially steady employment, and not merely by a shortage of men. Oppenheimer (1988), for example, criticizes conventional marriage models for ignoring the economic attributes of potential husbands, and suggests that the retreat from marriage is largely a function of men's declining financial situations. Especially among blacks, men's high rates of unemployment and low educational attainments render marriage a less attractive option for women because these qualities in a potential husband reduce women's gains in marriage. In support of these hypotheses, Lichter et al. (1991) find that the economic status of males in the marriage market has strong effects on female marriage rates. Similarly, O'Hare (1988) reports significant inverse effects of black male employment (but nonsignificant effects of the black sex ratio) on the growth of African-American female-headed families between 1970 and 1980.

Marriage Opportunities and Nonmarital Fertility

As shown by the above review, most research on the consequences of imbalanced marriage markets concentrates on female marriage rates. Yet considerable theory (Guttentag and Secord 1983; Wilson 1987) and several empirical studies suggest that the impact of marriage market characteristics extends beyond marriage rates to include women's labor-force behavior (Grossbard-Shechtman 1985b) and educational attainment (South and Trent 1988), marital dissolution (South and Lloyd forthcoming), and female family headship (Darity and Myers 1984; Fossett and Kiecolt 1991b; O'Hare 1988). The few studies that directly examine the relationship between women's marriage opportunities and nonmarital fertility have produced conflicting results. Data from the United States show that trends in women's marriage opportunities inversely parallel trends in nonmarital fertility (Grossbard-Shechtman 1985a; Heer and Grossbard-Shechtman 1981). Further, cross-nationally the sex ratio is related inversely to the illegitimacy ratio (South 1988; South and Trent 1988). Most studies, however, have examined the effect of women's marriage opportunities on nonmarital fertility across spatially bounded marriage markets within the United States, and here the evidence is less conclusive. Hyle (1989) and South and Lloyd (forthcoming) find significant effects of women's marriage opportunities on nonmarital fertility; Lloyd (1990), Plotnick (1988), and White (1979) do not. Hence the impact of women's marriage opportunities on nonmarital fertility warrants reevaluation.

Theoretically, women's marriage opportunities could affect the nonmarital fertility *rate* (births per 1,000 unmarried women), the nonmarital fertility *ratio* (the percentage of births that occur to unmarried, as opposed to married, women), or both. Several observers have outlined the steps that a young woman must take to have a nonmarital birth (Cutright 1971) and the events that must occur if a birth is to be nonmarital rather than marital (Nathanson and Kim 1989). The quantity and quality of men available to that woman could influence the occurrence of critical events at several junctures.

When concern lies with the probability of having a nonmarital birth—the aggregate

counterpart being the nonmarital fertility rate—the availability of males could affect the probability of premarital intercourse and/or the probability that a premaritally pregnant woman will marry before giving birth. Regarding the former mechanism, Spanier and Glick (1980) suggest that a deficit of potential marriage partners may induce young unmarried women to engage in sexual intercourse in order to maintain intimate relationships. Moreover, in view of its impact on women's marriage rates, male availability is also likely to increase the probability of marrying before giving birth (assuming that premarital intercourse leads to pregnancy). Although no study has examined how the quantity of men affects this probability, the "quality" of available men, as indicated by their employment status, has been examined. Testa et al. (1989) find that employed fathers are more than twice as likely as the nonemployed to legitimate a premarital conception.

When attention is shifted to the probability that a birth is nonmarital rather than marital—a probability whose analogue at the aggregate level is the nonmarital fertility ratio—then the possible impact of male availability on the probability of marriage before conception also must be considered (Nathanson and Kim 1989). Insofar as women's marriage opportunities increase the percentage of married women in the female population, mate availability can be expected to decrease the probability that a given birth is nonmarital. That is, higher marriage rates concomitant with greater male availability will diminish the population at risk of having a nonmarital birth. An effect of marriage opportunities on the probability of marriage before conception implies an effect of marriage opportunities on the nonmarital fertility ratio that would not be expected to operate for the nonmarital fertility rate, because the latter effectively controls for marital status. Some ambiguity remains, however, because an effect of marriage opportunities on the probability that a pregnant woman marries before birth would be reflected in effects on both the nonmarital fertility ratio and the nonmarital fertility rate.

In sum, the central hypotheses guiding our analysis are that both the nonmarital fertility rate and the nonmarital fertility ratio will be related inversely to the numerical supply of marriageable men. Moreover, both measures of nonmarital fertility should be associated positively with the proportion of nonemployed men in each woman's marriage pool. Finally, we anticipate that at least some of the racial difference in nonmarital fertility will be attributable to racial differences in the quantity and quality of potential spouses.

Data and Methods

Prior studies of the consequences of imbalanced marriage markets for women's sociodemographic behavior recognize that women's marriage opportunities vary by age (e.g., Goldman, Westoff, and Hammerslough 1984), race (e.g., Lichter et al. 1991), educational attainment (e.g., Schoen and Kluegel 1988), and geographic area (e.g., South and Lloyd forthcoming), but few studies incorporate all of these marriage market characteristics into a single analysis. In this study we use a research design that finely disaggregates measures of both women's marriage opportunities and nonmarital fertility by all four of these attributes. Then, using regression analysis, we estimate the effects of the quantity and the quality of eligible men on the incidence of nonmarital fertility among women in the various age/race/education/SMSA groups.

The data for this analysis come primarily from two sources: the National Center for Health Statistics (NCHS) data files on births occurring in 1980 and 1981 (NCHS 1983a, 1984) and the Public Use Microdata Samples (PUMS) of the 1980 U.S. Census (U.S. Bureau of the Census 1983a). The NCHS data are used to cross-tabulate the number of births simultaneously specific for women's marital status (married, unmarried), race (white, black), age (in four five-year age groups from 15–19 to 30–34), education (three categories

of years of school completed: 0–11, 12, and 13 or more), and metropolitan area of residence. The breakdowns by age, race, education, and place are especially important because both women's marriage opportunities and nonmarital fertility are known to vary by these factors (Abrahamse et al. 1988; Bumpass and McLanahan 1989; Hyle 1989). The number of births to unmarried women in each cell of this cross-tabulation constitutes the numerator for the nonmarital fertility ratio and the nonmarital fertility rate. Where necessary, we weight these counts of births according to the NCHS sampling frame, and make adjustments for missing data by apportioning the cases with missing values across the cells according to the proportional distribution of nonmissing observations within each SMSA.[1] In order to increase the stability of these counts, we use averages for 1980 and 1981.

Of course, even with approximately 3 1/2 million births per year, too few births occur in the smaller SMSAs to support such a detailed analysis. It is clearly necessary to limit the analysis to the largest SMSAs. Initially the target sample was the 100 largest SMSAs. Sixteen of these, however, are located in one of the three states (California, Texas, and Washington) that do not report mother's education to the NCHS, and thus were excluded from the sample.[2] Nine other SMSAs, located in New England, had to be excluded because the NCHS uses New England County Metropolitan Areas (NECMAs) as the geographic referent for this region, whereas the PUMS data with which the NCHS data must be matched use New England SMSAs, a different spatial entity. Thus only 75 of the largest 100 SMSAs are included in the analysis.[3] Although this figure is not large in absolute terms, it compares favorably to Janowitz's (1976) sample of 58 SMSAs and White's (1979) sample of 90 urban places, neither of which disaggregates measures of nonmarital fertility by age and education. Moreover, the use of SMSAs is an improvement over studies of the effect of marriage opportunities on marriage rates which, because of NCHS tabulating procedures, must rely on states as the units of analysis (Schoen and Kluegel 1988). When pooled over age, race, and education categories, the maximum sample size is thus 1,800 (75 SMSAs x 4 age groups x 2 races x 3 educational categories). Of course the effective sample size is considerably less than the maximum because some of the cells contain too few births or too few women to warrant analysis (e.g., black women age 15–19 with 13 or more years of schooling).

The PUMS data are used in the following ways.[4] First, the denominator for the nonmarital fertility rate—the number of unmarried women—is extracted. The nonmarital fertility rate is thus operationalized as the number of births to unmarried women, expressed per 1,000 unmarried women. (The nonmarital fertility ratio, operationalized as the percentage of all births occurring to unmarried women, requires only vital statistics data for its computation.)

We also use the PUMS data to construct a measure of marriage opportunities available to each category of women, as well as a measure of the employment status of the men in each woman's field of eligibles. The measure of women's marriage opportunities is the availability ratio developed by Goldman et al. (1984) and adapted to these data with minor modifications. The availability ratio has as its numerator the number of suitable men available to women of a particular age, race, education, and SMSA; as its denominator it has the average number of women who are suitable for men in the numerator (i.e., the number of women "competing" with each woman in the demographic category considered, including women in that category as well as in other categories). Like most prior studies, "suitability" entails that prospective husbands and wives be currently unmarried, belong to the same race, and live in the same metropolitan area.

Placing age and educational constraints on the men available to women (and vice versa) is less straightforward. Following Fossett and Kiecolt (1991a), we use the strategy of weighting the number of unmarried men (and the women available to them) by the

proportional distribution of marriages in the entire United States occurring to those women (and men) in 1980. For example, 27.2% of 1980 brides age 15–19 with less than a high school education married men of that age with some high school education (NCHS 1983a). Thus, for women with these characteristics, the number of men in each SMSA age 15–19 with some high school education receives a weight of .272. For each category of women, the weights sum to 1 across all categories of men. We use similar procedures to calculate the number of women suitable for those men. Conceptually, then, the sex/age/educational distribution of the unmarried population in each SMSA is judged by how it deviates from the national average of brides and grooms. Availability ratios greater than 100 imply a favorable marriage market for unmarried women; ratios less than 100 indicate a deficit of unmarried males. The formal definition of the availability ratio is given in Table 1.[5]

The availability ratio as computed here has several key advantages over the simpler but more popular sex ratios employed by Hyle (1989), Plotnick (1988), White (1979), and others: it uses education as a factor influencing marriage opportunities; for each age group of women, it takes into account the supply of men in all age categories rather than only in that age group; it takes into account competition for the same men from women in all other age and education categories; it limits the marriage market to currently unmarried persons; and it derives preferences for spouses with given characteristics from observed marriage patterns rather than from hypothetical or arbitrary models. These features of the availability ratio are potentially quite important because various measures of women's marriage opportunities are not empirically interchangeable (Fossett and Kiecolt 1991a; Goldman et al. 1984).

As noted earlier, one argument in the marriage squeeze literature emphasizes the lack of *desirable* males; "desirability" is defined as having a steady job (Wilson 1987). In our study the employment status of the men suitable to a particular group of women is measured by the percentage of men in the numerator of the availability ratio ($\Sigma\Sigma m_{ij}M_{ij}$) who report being not employed—that is, either unemployed or out of the labor force. Whereas the availability ratio measures the total number of unmarried men available to a group of women, the variable labeled "male nonemployment" indicates the desirability of those men in terms of their employment status. As shown in Table 1, male nonemployment, like the availability ratio, takes into account the distribution of men across all age and education groups rather than simply joblessness among men in a woman's own age or education category.

Prior research suggests that variables other than age, race, education, and marriage opportunities affect nonmarital fertility. Of specific concern here are those features of marriage markets which might covary both with women's marriage opportunities and with nonmarital fertility rates and ratios. Following other aggregate analyses of nonmarital fertility (Hyle 1989; Janowitz 1976; Moore and Caldwell 1977; White 1979), our models also include as explanatory variables AFDC payments per family (U.S. Bureau of the Census 1982); race-specific female and male median incomes for year-round, full-time workers, in thousands of dollars (U.S. Bureau of the Census 1983c); SMSA population size (logged) and the percentage of SMSA residents who live in the central city or cities (U.S. Bureau of the Census 1982); and a dummy variable for SMSAs in the census-defined south. The values of these variables vary across SMSAs, but not across age and education groups within SMSAs. The munificence of AFDC payments has been linked to higher nonmarital fertility by Janowitz (1976) and by Plotnick (1990), although other studies question this effect (Duncan and Hoffman 1990; Moore and Caldwell 1977). The effects of females' relative income are somewhat difficult to anticipate; although higher income is thought to reduce nonmarital fertility by raising the opportunity costs of childbearing outside marriage (White 1979), it also reduces female gains in marriage (Goldscheider and Waite 1986) and thus could reduce the probability of legitimating a nonmarital pregnancy. Economic

Table 1. Coding and Measurement of Variables

Name of Variable	Measure/Coding
Dependent Variables	
Nonmarital fertility rate	Births per 1,000 unmarried women, by age, race, and education
Nonmarital fertility ratio	Percentage of all births to unmarried women, by age, race, and education
Independent Variables	
Years of school completed	Dummy coded in three categories: 0-11, 12, 13 or more
Availability ratio	$[\Sigma_j\Sigma_i m_{ij}M_{ij}/(\Sigma_j\Sigma_i w_{ij}W_{Mij}M_{ij}/\Sigma_j\Sigma_i m_{ij}M_{ij})]$x100 where M_{ij} denotes the number of suitable men age i in educational level j; W_{Mij} denotes the number of women suitable for the M_{ij} men; m_{ij} are weights reflecting the proportion of brides who marry grooms of age i and educational level j; and w_{ij} are weights reflecting the proportion of grooms of age i and educational level j who marry brides of age i and educational level j (Goldman et al. 1984, pp. 7–8).
Male nonemployment	$(\Sigma_j\Sigma_i m_{ij}UM_{ij}/\Sigma_j\Sigma_i m_{ij}M_{ij})$ x 100 where UM_{ij} denotes the number of nonemployed (but otherwise suitable) men age i in educational level j; and other terms are as defined above.
Male income	Median male personal income for full-time year-round workers (race-specific)
Female income	Median female personal income for full-time year-round workers (race-specific)
AFDC payments	Mean AFDC payments per recipient family
SMSA population size	SMSA population size, natural log
Percentage in central city	Percentage of population living in central city of SMSA
Census south	Dummy variable scored 1 for SMSAs in census south, 0 otherwise

resources also increase the ability to raise a child with an absent father. Traditional family arrangements are thought to be less common in more urban settings (Espenshade 1985) and more common in the south (Hyle 1989).

Our analytical strategy is to estimate OLS regression equations for both the nonmarital fertility rate and the nonmarital fertility ratio. Preliminary analyses showed that the effects of male availability vary by age and race, perhaps because women's desire to marry also varies by these factors. Thus we estimate the equations separately for the four age groups, and for blacks and for whites. In order to increase the stability of the rates, we select only those cells which contain at least 10 births and at least 10 (unweighted) unmarried women.

Of course, for the SMSAs drawn from the 1% PUMS, these 10 women represent 1,000 women, whereas for the SMSAs drawn from the 5% PUMS, they represent 200 women.[6] This criterion makes 1,439 groups of women suitable for analysis, representing more than 2.5 million total births, 570,000 nonmarital births, and 8.4 million unmarried women. To give more weight to categories containing a larger number of women and births, the analyses weight each category by its proportional share of the denominator of the dependent variable. That is, the observations for the nonmarital fertility ratio are weighted by the proportion of all births that occur to women in that cell, whereas the equations for the nonmarital fertility rate are weighted by the proportion of unmarried women.[7]

Results

Table 2 shows the means of the key variables—the availability ratio, male nonemployment, and the nonmarital fertility rate and ratio—disaggregated by age, race, and educational attainment. The means of the availability ratio imply that there are 93.1 and 72.6 marriageable men respectively for every 100 unmarried white and black women. For both races, male availability declines sharply with age, reflecting the effects of both higher male mortality and higher male remarriage rates. Among white women, the fewest males are available for women who have completed 12 years of school, perhaps because these women must "compete" for eligible men with women having both less and more education. Among black women, the fewest males are available to those with some college, probably in large part because of black men's low educational attainments. At all ages and in all educational categories, black men have higher nonemployment rates than white men. Male nonemployment is highest for women at the youngest ages, at least partly because eligible husbands are attending school. For both races, male nonemployment declines monotonically as women's education increases.[8]

The nonmarital fertility *rate* for this sample peaks for women age 20–24, whereas the nonmarital fertility *ratio* is highest at ages 15–19. Although both the rate and the ratio are consistently higher among blacks than among whites, the racial differential is proportionally greater at the highest educational levels (see also Bumpass and McLanahan 1989). For the nonmarital fertility rate, the black mean is 3.6 times the white mean at the lowest educational level, and increases to 10.2 times the white mean for women with some college. The corresponding black-to-white ratios for the nonmarital fertility ratio are 2.5 and 11.6 respectively.

Table 3 presents the regression results for the white nonmarital fertility rate and ratio. The effect of education is similar to that in Table 2; women with more education have both lower nonmarital fertility rates and lower ratios. As predicted, the availability ratio has uniformly inverse effects on the nonmarital fertility rate. Yet although the coefficient of the availability ratio is statistically significant in three of the four equations, the overall effect is rather modest. As argued above, the effects of increased marriage opportunities on the nonmarital fertility rate could operate either by decreasing sexual activity among unmarried women, as Spanier and Glick (1980) suggest, or by increasing the probability that a premaritally pregnant woman will marry before giving birth.

The availability ratio also tends to be associated inversely with the nonmarital fertility ratio, although the coefficients are significant only for the two youngest age groups. As suggested earlier, in addition to the other mechanisms, marriage opportunities might increase the percentage of all births that occur to married women by increasing the percentage of married women in the female population.[9] Perhaps the impact of spouse availability is limited to the youngest women because older unmarried women have less desire to marry and therefore are affected less by marriage opportunities.

Table 2. Means of Marriage Market Characteristics and Nonmarital Fertility Measures for U.S. Women, by Age, Race, and Education: 75 SMSAs, 1980

	Availability Ratio		Male Nonemployment		Nonmarital Fertility Rate		Nonmarital Fertility Ratio	
	Whites	Blacks	Whites	Blacks	Whites	Blacks	Whites	Blacks
Age								
15–19	100.7	89.4	33.7	54.7	15.3	91.3	39.3	89.6
20–24	100.8	73.3	24.9	42.6	21.2	122.6	12.8	62.6
25–29	77.8	53.1	18.2	36.2	17.3	89.6	4.9	41.4
30–34	58.4	41.4	16.6	34.7	12.0	50.8	4.0	33.0
Years of School Completed								
0–11	90.0	81.2	36.7	55.7	31.6	115.1	32.8	81.4
12	89.4	71.0	24.0	41.8	19.9	120.5	9.5	58.7
13+	98.2	63.8	22.5	36.9	4.4	44.9	3.2	37.0
Total	93.1	72.6	27.0	45.5	17.0	95.6	11.3	61.3

Table 3. Regression Analysis of the White Nonmarital Fertility Rate and Ratio by Age: 75 SMSAs, 1980
(metric coefficient with standardized coefficient in parentheses)

Independent Variables Age:	Nonmarital Fertility Rate				Nonmarital Fertility Ratio			
	15–19	20–24	25–29	30–34	15–19	20–24	25–29	30–34
Years of School Completed[a]								
12	−8.08**	−110.54**	−58.51**	−26.20**	−15.71**	−14.17**	−15.32**	−13.94**
	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)
13+	−19.00**	−132.26**	−75.16**	−33.80**	−12.87**	−17.07**	−18.36**	−16.88**
	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)
Availability Ratio	−.04*	−.13*	−.20**	−.11	−.10**	−.04**	−.00	.02
	(−.08)	(−.06)	(−.13)	(−.09)	(−.14)	(−.11)	(−.01)	(.05)
Male Nonemployment	−.13**	−.34*	−.35	.08	.02	.04	.08	.16**
	(−.11)	(−.05)	(−.06)	(.02)	(.01)	(.03)	(.06)	(.12)
Male Income	−1.28**	−2.03**	−2.14**	−2.21**	−1.92**	−1.59**	−1.02**	−.95**
	(−.30)	(−.11)	(−.17)	(−.29)	(−.29)	(−.37)	(−.35)	(−.36)
Female Income	2.41**	4.44**	4.88**	5.96**	3.67**	3.39**	2.20**	2.22**
	(.28)	(.13)	(.21)	(.43)	(.28)	(.40)	(.39)	(.45)
AFDC Payments per Family	−.03**	−.03	−.02	−.01	.05**	.01	−.00	−.00
	(−.31)	(−.06)	(−.06)	(−.06)	(.31)	(.06)	(−.01)	(−.03)
SMSA Population Size (ln)	−.20	−.37	1.06	.21	1.19*	.38	.12	−.21
	(−.02)	(−.01)	(.04)	(.01)	(.08)	(.04)	(.02)	(−.04)
Percent in Central City	.09**	.11*	.12**	.09*	.05*	.04**	.02	.01
	(.18)	(.06)	(.09)	(.11)	(.06)	(.08)	(.05)	(.04)
Census South (0 = no; 1 = yes)	−7.01**	−6.89**	−4.54*	−2.45	−7.19**	−2.23**	−.69	−.43
	(−.34)	(−.08)	(−.08)	(−.07)	(−.24)	(−.11)	(−.05)	(−.03)
Intercept	46.74	170.13	87.98	26.31	25.77	16.85	14.12	12.93
R^2	.70	.87	.77	.64	.75	.80	.86	.86
N	225	213	199	190	225	213	199	190

[a] Reference category is 0–11 years of school completed.
* Coefficient is at least 1.5 times its standard error.
** Coefficient is at least twice its standard error.

The other aspect of women's marriage pool—male nonemployment—tends to be associated inversely with the nonmarital fertility rate, although its coefficient is small and is significant only for the two youngest age groups. Like their married counterparts, unmarried couples may limit their fertility in difficult financial circumstances. Male nonemployment is associated *positively* with the nonmarital fertility ratio; this finding suggests that women are less likely to marry when their field of eligibles experiences unstable economic circumstances. Again, however, the effects are modest, and are statistically significant only for the oldest age group. The comparative strength of the effects of the availability ratio at the younger ages, and of male nonemployment at the older ages, may mean that the economic status of potential husbands is more important to older women. In a related vein, younger men's employment status may not be an accurate indicator of future economic success because those who will be financially successful may currently be attending school.

Stronger and more consistent effects are exhibited by male and female median income. Nonmarital fertility is higher in SMSAs with lower male incomes and higher female incomes. The positive impact of female income may reflect a comparatively low economic incentive for women to marry in areas with high female wage rates, which increase women's ability to maintain a fatherless household (Farley 1988). The inverse effect of male income implies that earnings might be a more important quality than employment status in determining the quality of eligible males in the marriage market.

The other aggregate variables have sporadic effects on nonmarital fertility. At the youngest ages, welfare payments are associated inversely with the nonmarital fertility rate but positively with the nonmarital fertility ratio. The former effect is partially consistent with the findings of Moore and Caldwell (1977; see Plotnick 1990); the latter may suggest that young white women are less likely to marry in states with more generous welfare programs. As expected, nonmarital fertility tends to be higher in SMSAs with populations concentrated in the central city and lower in the south.

Table 4 presents the results of parallel equations for black women. Although the availability ratio is associated consistently and inversely with the nonmarital fertility rate, all of the coefficients are weak and none is statistically significant. As among whites, the availability ratio is related significantly and inversely to the nonmarital fertility *ratio* among black women age 15 to 24. The significant impact of the availability ratio on the nonmarital fertility ratio, in conjunction with its weak effect on the nonmarital fertility rate, implies that mate availability influences black nonmarital childbearing primarily by increasing the prevalence of marriage among black women. Nonemployment in the pool of marriageable men tends to reduce black women's nonmarital fertility rate and appears to have stronger effects among blacks than whites. There is little evidence, however, that male nonemployment is a driving force behind the black nonmarital fertility ratio.

The effects of the other explanatory variables differ somewhat for blacks and for whites. Unlike the results for whites, black nonmarital fertility tends to be higher in metropolitan areas with high male incomes, and lower in areas with high female incomes. The coefficients for these variables, however, are not consistently significant across age groups. Although further work is needed to substantiate these differential effects, it appears that the opportunity costs of nonmarital childbearing are more likely to operate for blacks than for whites. Nonmarital childbearing among black women is consistently higher in larger metropolitan areas, but the effects of AFDC payments, central city concentration, and location in the south are generally weak and inconsistent.

Although the quantity and quality of available men have moderate effects on the nonmarital fertility of both white and black women, relatively little of the racial *difference* in out-of-wedlock childbearing can be explained by racial differences in the mate-opportunity structure (see Wilson 1987). In regression decompositions using the white population as the standard, we find that for each age group no more than 14% of the racial

Table 4. Regression Analysis of the Black Nonmarital Fertility Rate and Ratio by Age: 75 SMSAs, 1980 (metric coefficient with standardized coefficient in parentheses)

Independent Variables Age:	Nonmarital Fertility Rate				Nonmarital Fertility Ratio			
	15–19	20–24	25–29	30–34	15–19	20–24	25–29	30–34
Years of School Completed[a]								
12	2.38	−65.57**	−26.62**	−14.72**	−9.23**	−12.67**	−19.03**	−17.63**
	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)
13+	−85.47**	−179.21**	−92.49**	−48.36**	−14.77**	−25.15**	−34.43**	−31.18**
	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)
Availability Ratio	−.20	−.19	−.14	−.30	−.07**	−.15**	−.08	−.02
	(−.08)	(−.02)	(−.02)	(−.06)	(−.16)	(−.14)	(−.04)	(−.01)
Male Nonemployment	−.62**	−1.44**	−1.84**	−1.16**	−.03	.04	−.00	.02
	(−.19)	(−.19)	(−.39)	(−.44)	(−.06)	(.04)	(−.00)	(.01)
Male Income	6.31**	6.69**	4.11	1.26	.09	.43	.86*	.85*
	(.40)	(.20)	(.21)	(.11)	(.00)	(.08)	(.13)	(.14)
Female Income	−6.31*	−10.88*	−5.16	−4.51	.10	−.83	−1.30	−1.75*
	(−.27)	(−.21)	(−.17)	(−.26)	(.02)	(−.11)	(−.13)	(−.19)
AFDC Payments per Family	−.07*	.00	.01	.04	−.01	.01	.01	.01
	(−.18)	(.00)	(.01)	(.16)	(−.13)	(.07)	(.05)	(.06)
SMSA Population Size (ln)	2.48	10.48**	12.40**	9.35**	.87**	2.76**	3.47**	3.33**
	(.07)	(.14)	(.29)	(.39)	(.15)	(.24)	(.24)	(.25)
Percent in Central City	−.03	.04	.10	.18*	−.02	−.05*	−.00	.04
	(−.02)	(.01)	(.04)	(.16)	(−.06)	(−.09)	(−.01)	(.07)
Census South (0 = no; 1 = yes)	1.37	−2.91	.20	1.36	−2.26**	−2.06	−2.26*	−1.11
	(.02)	(−.02)	(.00)	(.03)	(−.19)	(−.09)	(−.08)	(−.04)
Intercept	108.37	169.72	28.25	17.48	89.22	41.77	15.59	10.63
R^2	.67	.80	.61	.56	.66	.79	.88	.88
N	176	171	145	120	176	171	145	120

[a] Reference category is 0 − 11 years of school completed.

* Coefficient is at least 1.5 times its standard error.

** Coefficient is at least twice its standard error.

differential in the nonmarital fertility rate—and no more than 6% of the difference in the nonmarital fertility ratio—can be attributed to racial differences in the availability ratio.[10] Moreover, because of the inverse (or nil) associations between male nonemployment and nonmarital fertility, together with higher nonemployment among blacks than among whites, assigning the white mean to the black equations would tend to increase rather than to reduce (or leave unchanged) the racial differential in the nonmarital fertility rate and ratio. Clearly, most of the racial differential in nonmarital childbearing must be explained by factors other than marriage market characteristics. This finding is consistent with studies showing that relatively little of the racial differential in marriage rates can be explained by differences in the age/sex composition of the black and the white populations (Schoen and Kluegel 1988; South and Lloyd forthcoming).

Discussion and Conclusion

Prior analyses of nonmarital fertility tended to concentrate on the characteristics of women that influence the probability of having a nonmarital birth. Indeed, recent research shows that individual-level risk factors such as age, race, education, and social class play a paramount role in childbearing outside marriage. Yet, as this study documents, the larger social structural context is also important for explaining variation in nonmarital fertility. In particular, two features of the marriage market—the quantity and the employment status of marriageable men—have at least modest effects on the fertility behavior of U.S. women. For white women, more numerous marriage opportunities reduce both the nonmarital fertility rate and the ratio, indicating effects of mate availability on the probability of premarital intercourse, the probability that a premarital pregnancy will be legitimated, and/or the marriage propensities of nonpregnant women. For black women, marriage opportunities are significantly related only to the nonmarital fertility ratio, most likely because these opportunities increase the percentage of women in the population who are married.

It may be profitable to speculate on why the impact of marriage opportunities on the nonmarital fertility rate is not stronger, in view of the prominence of marriage opportunity in current theory. One possibility is that the availability of marriage partners simultaneously signals the availability of unmarried sexual partners as well. All else being equal, an abundance of potential sexual partners will increase exposure to intercourse and hence to nonmarital pregnancy and premarital birth (Billy and Moore 1991). In support of this interpretation, Billy et al. (1989) find *positive* and frequently significant effects of the state, county, and tract sex ratio on the probability of premarital intercourse among teenage women (see Spanier and Glick 1980). The formation of nonmarital sexual relationships apparently responds to mate availability in much the same way as do marital unions. Hence the net impact of mate availability on the nonmarital fertility rate could comprise two countervailing forces: a positive effect through exposure to intercourse and an inverse effect through the increased legitimation of premarital pregnancies. The findings reported here suggest that the latter effect is slightly stronger than the former.

The employment circumstances of eligible men also influence the nonmarital fertility rate, although not in the way envisioned by recent theory (e.g., Wilson 1987). Rather than increasing childbearing outside marriage, male nonemployment appears to reduce the nonmarital fertility rate (while having relatively little effect on the ratio). Unmarried women presumably are less motivated to incur a nonmarital birth when the economic prospects of potential husbands (and fathers for their children) are poor. Nonmarital fertility may resemble marital fertility by declining when the male partner's employment situation is unstable.

Among whites, the median incomes of male and female workers exhibit considerably stronger associations with nonmarital fertility than does either the quantity or the employment status of eligible males. This finding suggests that cross-sectional variation in nonmarital fertility, as with changes over time in the nation as a whole (Farley 1988), is attributable more to variation in women's incentive and ability to maintain a single-parent family than to intermetropolitan variation in marriage opportunities. The apparently different effects of aggregate income on black nonmarital fertility, however, deserve further study.

Finally, although the quantity and quality of marriageable men affect the nonmarital fertility of both white and black women, relatively little of the substantial racial difference in nonmarital childbearing can be explained by racial differences in male availability and employment. Contrary to earlier suggestions, explanations for this disparity are unlikely to be found in the dissimilar marriage markets encountered by black and by white women, at least as those markets are conceptualized here.

In future research on the impact of marriage market characteristics on nonmarital fertility, investigators would do well to explore the mechanisms linking male availability and employment to childbearing outside marriage. Because of the lack of vital registration data on sexual activity and on the marriage propensities of pregnant women, these analyses will require the use of surveys and will call for a contextual research design. Obviously, because of their smaller size, such analyses are not well adapted to documenting the reduced-form effects of marriage opportunities for women across marriage markets delimited by age, race, education, and metropolitan area; the aggregate analysis presented here is better suited to that purpose. Even so, incorporating measures of marriage market features into surveys of fertility and marital behavior should help to clarify the ways in which women (and men) respond to opportunities to form marital and nonmarital relationships. The accumulating evidence suggests that these opportunities are a salient dimension of demographic structure and composition.

Notes

[1] SMSAs in seven of the 48 states available for analysis do not report data on the mother's marital status. This information is imputed by NCHS on the basis of other data on the birth certificate. For a description of these procedures, see NCHS (1983b).

[2] The lack of data for SMSAs in Texas and California prohibits a separate breakdown by Hispanic origin.

[3] Nonmarital fertility levels in these SMSAs do not appear to differ much from the universe of U.S. metropolitan areas. Although nonmarital fertility rates are not readily available for women in all metropolitan areas, the mean nonmarital fertility ratio for this sample of 75 SMSAs is quite similar to that for women in all SMSAs: the former value is 19.8, and the latter 19.7. Nor is the sex composition of these SMSAs unique: the total number of men per 100 women age 15 and over for this sample is 93.6, compared to 94.0 for all SMSAs. Finally, the effect of marriage opportunities on the nonmarital fertility ratio reported here is consistent with Fossett and Kiecolt's (1991b) report of a significant inverse association between marriage opportunities and the black nonmarital fertility ratio for a sample of 252 SMSAs, as well as with similar effects across states found by Guttentag and Secord (1983). Overall, then, it seems unlikely that our findings are unique to the particular sample of metropolitan areas suitable for this analysis.

[4] When the SMSA can be identified in the 5% (A) sample of the PUMS, we use that file. For SMSAs not identifiable on the A sample, we use the 1% (B) sample. (For a description of these samples, see U.S. Bureau of the Census 1983b.) Of the 75 SMSAs, 40 can be identified on the A sample.

[5] One problem that plagues virtually all studies of marriage market imbalances is census undercount, which is known to be greater among young black males than among other groups.

Because estimates of the undercount specific for age, education, marital status, and metropolitan area are not available, it is not possible to adjust the availability ratios for underenumeration. Fortunately, however, several recent studies suggest that the undercount does not seriously impair measures of marriage opportunities (Fossett and Kiecolt 1991a; Passel and Robinson 1984). Moreover, it seems reasonable to assume, as do others (Spanier and Glick 1980), that men who are not counted by the census tend to have social and economic characteristics, such as homelessness or joblessness, that make them undesirable husbands.

[6] Schoen and Wooldredge (1989) use a similar criterion for computing marriage rates.

[7] The use of different cutoffs for the inclusion of observations does not appreciably alter the results, primarily because of this weighting. Rates and ratios based on small numbers of women and births receive such little weight under this procedure that their impact on the parameter estimates is minimal. The use of weights also obviates the need for conventional weighted least squares regressions.

[8] Single unemployed males in SMSAs with relatively low overall nonemployment might be selected into unemployment on the basis of undesirable characteristics for both employment and marriage. If this is so, then using the nonemployment rate for single men, rather than for all men, may misrepresent the desirability of these men in the marriage market. Nonetheless, using a measure of male nonemployment based on the total population results in similar findings. Indeed, the two measures of male nonemployment have an average correlation of .93 across the age/race categories. We are grateful to an anonymous reviewer for alerting us to this possibility.

These rates of male nonemployment are somewhat higher than those reported by Lichter et al. (1991). It should be remembered that these rates, unlike the findings of Lichter et al., are for unmarried men, who are less likely to be in the labor force than married men. The use of data from only the largest metropolitan areas may also explain some of the difference.

[9] Of course, it is also possible for women's marriage opportunities to inversely affect the *nonmarital* fertility ratio by positively influencing the *rate* of *marital* fertility. In additional analyses, however, we did not observe significant positive effects of the availability ratio on the marital fertility rate; this finding suggests that women's marriage opportunities are the causal mechanism linking mate availability to the nonmarital fertility ratio.

[10] Of course, different results would be obtained if a different standard population were used. It seems most meaningful to use the white population as the standard because relevant social policies presumably would seek to increase the availability of black men (e.g., through mortality reduction, lower incarceration rates) rather than to limit the availability of white men.

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