

Getting a Piece of the Pie? Declining Teen Birth Rates During the 1990s

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Abstract

This study seeks to examine whether declining teen fertility rates in the United States during the 1990s were responsive to the unprecedented economic expansion of that decade. Poisson regression models were estimated to assess the relationship between rates of first and second births and state specific unemployment among black and white women aged 10 to 29 from 1970 to 1999. Falling unemployment rates in the 1990s were associated with decreased fertility among African-American women aged 15 to 24. Young black women, especially older teens, may have adjusted their reproductive behavior to take advantage of expanded labor market opportunities.

The birth rate for teens between the ages of 15 and 19 in the United States reached a recent peak in 1991 and then steadily declined over the 1990s. By 2000, the number of births per 1,000 women was 48.7 compared to 62.1 in 1991 (Ventura, Mathews and Hamilton 2001). Compared to other racial/ethnic groups and teenagers as a whole, the birth rate among African American teens fell more precipitously. Between 1991 and 2000, the birth rate among black teens decreased by 31.4% to 79.2 per 1,000 women while nonHispanic white teens experienced a 24.4% decline (Ventura et al. 2001).

Preliminary explanations for the substantial drop in birth rates among adolescents in the United States have been suggested. Researchers emphasize the stabilization of the proportion of teens who are sexually active and changes in contraceptive usage as primary factors driving recent declines in teen pregnancy and childbearing (Darroch and Singh 1999; Donovan 1998; Hogan, Sun, and Cornwell 2000; Kaufmann et al. 1998; Manlove et al. 2000; Saul 1999; Ventura, Mathews and Curtin 1998; Ventura and Freedman 2000). For example, reports based on data from the National Survey of Family Growth illustrate that the proportion of adolescents aged 15 to 19 who ever had sexual intercourse declined from 53% in 1988 to 50% in 1995 (Abma et al. 1997). Results from the National Survey of Adolescent Males reflect a similar trend (Sonenstein et al. 1998).

Among teens, contraceptive utilization at first intercourse increased from 65% to 75% during the period of time between 1988 and 1995. This trend has been primarily attributed to the significant rise in condom use that has been occurring since the 1970s (Darroch and Singh 1999). Furthermore, adolescents appear to be relying on more effective, long lasting methods of birth control, such as Depo Provera and Norplant. Although both methods only became widely available in the early 1990s, by 1995 10% of current contraceptive users aged 15 to 19 reported utilizing the injectable and 3% the implant as a method of pregnancy prevention (Darroch and Singh 1999). The increased reliance on long-term contraceptives has been coupled with a decline in the proportion of adolescents who report currently using oral contraceptive pills (Piccinino and Mosher 1998). It appears as if young women are switching to methods of birth control with extremely low typical use failure rates that do not depend heavily on user compliance.

While reduced levels of sexual activity and increased use of contraception among sexually active individuals are likely proximate mechanisms through which the teen birth rate decreased in the mid to late 1990s, other distal factors may have motivated these apparent behavior changes. In particular, this decade witnessed a period of unprecedented economic expansion that, among other things, reduced unemployment rates to historic lows. Due to the increased likelihood of occupational advancement, young women, especially adolescents living in low-income communities, may have been more optimistic about the rewards associated with educational attainment and employment experience. Therefore, women who might otherwise have borne their first birth during their teenage years may have been motivated to delay childbearing until later ages in order to take advantage of increasingly palpable economic possibilities.

To our knowledge, no one has systematically examined the association between recent macroeconomic fluctuations and trends in adolescent birth rates in the United States. Studies that have investigated distal causes of the decline in teenage childbearing during the 1990s tend to focus on family background characteristics, such as living arrangements or maternal education, that do not capture recent changes in occupational opportunities (Hogan et al. 2000; Manlove et al. 2000). However, lower levels of family income as well as decreases in family income have

been shown to increase the likelihood of having a premarital birth net of family background characteristics (Wu 1996).

There is also mounting evidence to suggest that living in a neighborhood characterized by high poverty or residential segregation increases the likelihood that women will experience their first birth as a teenager, even after controlling for individual and/or family socioeconomic characteristics (Billy and Moore 1992; Brooks-Gunn et al. 1993; Crane 1991; Hogan and Kitagawa 1985; South 1999; South and Baumer 2000; Sucoff and Upchurch, 1998). The specific mechanisms through which neighborhood disadvantage influences fertility timing remain unclear. Premarital childbearing among both black and white women has been found to be more common in neighborhoods with limited job availability for women (Billy and Moore 1992; Olsen and Farkas 1990). For adolescents faced with restricted chances of employment, motherhood may offer a way in which they can achieve adult status within their families and communities as well as engage in work that will be challenging and meaningful (Geronimus 1996b). However, these results also suggest that adolescents may consider the opportunity costs associated with childbearing and decide to postpone motherhood in order to pursue educational or occupational objectives when the possibility of obtaining gainful employment appears to be an achievable goal.

While the relationship between income and fertility has been studied before (Becker 1960; Becker 1973; Butz and Ward 1979; Easterlin 1966; Easterlin 1976; Easterlin 1980; Freedman and Thornton 1982; Macunovich 1995; O'Malley Borg 1989; Willis 1973), extant economic models of fertility behavior may have limited applicability to teen childbearing. First, most theoretical approaches emphasize the importance of completed family size rather than maternal age at first birth.¹ Second, standard economic models often assume that childbearing occurs within a nuclear family structure in which the father occupies the role of the family breadwinner, the mother is expected to fulfill most of the childcare responsibilities, and both will remain in a stable marital union. This does not reflect the reality in which most teen childbearing occurs. By 2000, almost 80% of all teen births were to unmarried women (Ventura et al. 2001).

In particular, economic models of fertility that place a heavy value on the financial contributions of a male spouse may not provide an accurate framework with which to predict decisions regarding childbearing in the African American communities where teen childbearing is most common. In the United States teen mothers represent a select group of young women, many of whom face substantial socioeconomic disadvantage prior to any decisions they make regarding sexual activity, pregnancy, and childbearing. Teen mothers are disproportionately African American and Hispanic due to the comparatively high rates of births exhibited by young women between the ages of 15 and 19 in these racial/ethnic groups (Ventura et al. 2001). Furthermore, many live in high poverty communities whose residents face limited opportunities for upward social mobility owing to severe residential segregation, high rates of unemployment, and substandard educational quality. Even during the 1990s, a decade of expansive fiscal growth, the disparity between occupational opportunities for white and black men remained entrenched. The unemployment rate for white men in the U.S. steadily decreased from a recent high of 7.0 in

¹ Although previous research efforts have established a link between age at first birth and subsequent fertility (Bumpass, Rindfuss, and Janosik 1978; Trussell and Menken 1978), this association appears to be substantially waning as more recent cohorts of women reach the end of their childbearing years (Morgan and Rindfuss 1999).

1992 to 3.4 in 2000, while the unemployment rate for black men fluctuated between 15.2 in 1992 and 8.1 in 2000 (Bureau of Labor Statistics 2001). In high poverty, residentially segregated, urban neighborhoods, job availability may be even more restricted. For example, 46% of men in a randomly selected sample of Harlem residents reported not being employed between the years of 1992 and 1994 (Diez-Roux et al. 1999; Northridge et al. 1998). Furthermore, Western and Pettit (2002) conclude that during the 1990s, when U.S. incarceration rates rose to their highest level in history and disproportionately affected black men, standard labor force statistics, which do not include incarceration data, underestimate black-white employment differences among young men by approximately 45%.

Conversely, compared to white women, African American women have historically exhibited a greater attachment to the labor force. Although the gap has been closing in recent years, black families still rely heavily on the earnings of their female members who are more likely than their white counterparts to be the head of the household (Bianchi and Casper 2000; Fields 2001; Williams, 2002). Many African American women do not have the luxury to decide to focus exclusively on childrearing or labor force participation no matter at what age they become mothers. Instead, they must do both simultaneously, often while juggling responsibilities associated with the care of older family members. Thus, more conventional understandings of how women weigh the opportunity costs involved in having a child may have limited applicability in this population.

Two additional considerations bear on decisions poor African American women must make concerning the opportunity costs associated with different childbearing ages. One is that mothers residing in high poverty areas face a different set of tradeoffs from other mothers related to their own early health deterioration, or “weathering” (Geronimus 1992a, 1996a; Geronimus, Bound, and Waidmann 1999). This significant *worsening* of health over the reproductive years suggests that peak health for childbearing occurs at a younger age for African American than for white women. Second, teen mothers often rely on extended kin networks to provide instrumental, emotional, and financial support, at least in high poverty African American communities which have been studied most extensively. Responsibility for the provision of childcare, whether it is temporary or of a more permanent basis, often resides with fictive kin or extended family members (Burton 1990; Hogan, Hao, and Parish 1990; Geronimus 1992b, 1996b; Jarrett 1998; Sandven and Resnick 1990; Stack 1974; Stack 1996; Stack and Burton 1993). For poor black women the costs and benefits associated with childbearing may be spread throughout fluid kin networks rather than limited to the static setting of a nuclear family. In general, decisions related to pregnancy resolution or fertility timing may be made by teens in conjunction with older relatives (Burton, 1990; Geronimus 1992b, 1996b; Stack and Burton 1993; Sullivan 1989).

In African American communities, there is some ethnographic evidence to suggest that family elders play a specific role in encouraging or discouraging childbearing among particular teenagers (Burton 1990; Ladner 1971; Stack and Burton 1993). For example, elders discourage those adolescents who show the most academic promise and appear to have the best chance at achieving upward social mobility from participating in dating activities and having children at early ages. During periods of economic recessions when the returns to education are severely limited and attempts at upward social mobility are more likely to result in failure, a limited number of low-income adolescents -- for example, those who display exceptional intellectual ability -- may be encouraged to have their first birth later in life. To the extent that teens or their elders perceive improved educational and occupational opportunities during times of economic

prosperity, it is possible that a greater number of African American adolescents living in high poverty communities may experience both increased individual motivation and encouragement from family members to delay childbearing. The economic expansion of the 1990s, which reduced unemployment rates and generated new occupational opportunities, may have encouraged low-income adolescents to either postpone childbearing altogether or to have fewer children as teens in order to reap the rewards associated with educational attainment and employment experience. Furthermore, elders may feel in a better position to encourage a larger swathe of teens to relax their commitment to “kinwork” (Stack and Burton 1993) for an extended period during an economic boom, due to perceived improvements in the future returns to education or increased current job opportunities that provide ways in which a teen can contribute to the kin network as an economic provider rather than a caretaker.

In an attempt to assess the role of macroeconomic factors on teenage childbearing, generally, and among low-income African Americans, in particular, we consider the following general and particular hypotheses.

General hypothesis:

During the 1990s, increased employment opportunities will be positively associated with reductions in first and second births among teens.

Particular hypotheses:

- 1) Compared to white adolescents, African American teens will be more likely to respond to changes in the labor market by experiencing fewer first and second births.
- 2) Older teens will be more likely to respond to changes in the labor market by experiencing fewer first and second births than either young adolescents or older women who bear children at more socially approved ages (e.g. in their mid to late 20s).

The rationales for particular hypotheses (1) and (2) are delineated below. Regarding the first particular hypothesis, childbearing is statistically more normative among African American compared to white teens. For example, nationwide over 40% of black first births occurred to teens in 1999, compared to only 18% of white.² In racially segregated, high poverty urban environments, black fertility timing distributions are even younger. For example, in low-income neighborhoods located in central Detroit, more than half of black first births were to teens in 1990 while only about 20% were to mothers age 25 and older (Michigan Division for Vital Records and Health Statistics 1989-1991). Early fertility timing among African Americans may provide a way in which to balance the demands of low-wage work and motherhood while minimizing detrimental maternal and infant health outcomes.

In contrast, teen mothers are a clear statistical minority among whites. For a majority of white women, teenage childbearing is seen as a stringent violation of social norms. White

² In addition, in 1999 the median age at first birth was 20 for blacks but 25 for whites. More than 50% of white first births occurred to mothers aged 25 and older compared to only 25% of black first births (National Center for Health Statistics 1970-1999).

adolescents who choose to have their first birth while they are still under the age of twenty may be a more select group of individuals than their black counterparts. The reasons behind their decision to engage in sexual activity and embrace motherhood during their teenage years may have less to do with their expected life chances and more to do with rebelling against authority figures or proving their independence (Lauritsen 1994). Evidence exists to suggest that white adolescents are more likely than African American adolescents to initiate sexual activity following participation in delinquent acts or the utilization of illicit drugs and alcohol (Rosenbaum and Kandel 1990). Therefore, we would expect white teen childbearing rates to be less sensitive to macroeconomic fluctuations than those of African Americans.

Regarding the second particular hypothesis, to the extent that teen childbearing reflects a decision to make the transition to adulthood rather than extend adolescence, this consideration would be more salient for those in their late teen years compared to either girls in their early teen years or women in their mid to late twenties. In periods of economic expansion, the value of continued schooling beyond high school, for example, may be clearer. Indeed, temporal fluctuations in childbearing rates over the past 30 years have been noticeable for older teens while virtually nonexistent for the youngest teens (National Center for Health Statistics 1970-1999). The costs and benefits of childbearing for women in their late twenties are also likely to be different from those faced by women in their late teens. Because they are having children at more socially approved ages and after their educations are likely to be completed, they may not as tightly calibrate their fertility timing decisions with macroeconomic fluctuations, while any perceived benefits of further postponement may be outweighed by the disadvantages, including health considerations.

DATA AND METHODS

In order to accurately model the association between macroeconomic fluctuations and fertility timing, we sought data that captured economic downturns as well as periods of prosperity and accounted for state level variation in the strength of the business cycle. Since 1970, the United States has experienced three major recessions that have disproportionately affected different regions of the country. The Northeast was hardest hit by the economic downturns of the mid 1970s and the early 1990s, while the early to mid 1980s witnessed a recession that particularly impinged upon the economic sufficiency of the Midwest. State specific unemployment rates for the years between 1970 and 1999 were selected to reflect changes in the U.S. economy over time and to account for these regional differences.

In order to capture periods of economic expansion as well as economic recession, data were obtained for the full period between 1970 and 1999. However, these decades also witnessed important secular changes concerning issues such as female labor force participation, the division of labor within the household, and gender role ideology. These transformations had lasting social, political, cultural and economic implications, many of which were expressed in changes in family structure and fertility timing. By focusing on the association between job availability and fertility timing during the 1990s, we were able to limit the affect of these historical trends while including periods of time characterized by fluctuating labor market tightness.

Data for all 50 states as well as the District of Columbia were obtained from the Bureau of Labor Statistics (BLS). Local area unemployment statistics, from which the state level

unemployment rates were drawn, are determined using information from the unemployment insurance (UI) system as well as the Current Population Survey (CPS). Data from the latter survey were first integrated into state specific estimates of labor force characteristics produced by BLS in 1973 (Bureau of Labor Statistics 1997). We used overall unemployment rates as opposed to race and sex specific unemployment rates because estimates of the former are more reliable and available for the period of time studied. Furthermore, the correlation between trends in the overall and race or sex specific estimates tends to be high (see Figure 1).

Fertility data from all 50 states and the District of Columbia for the years between 1970 and 1999 were extracted from detailed birth certificate files generated by the National Center for Health Statistics (NCHS). Two types of period fertility measures were estimated. First, race and age specific *first* birth rates (ASFBRs) for each state were determined by dividing the number of first live births to white or black women in each age group (10-14, 15-17, 18-19, 20-21, 22-24, 25-29) by the estimated population in that age group. Then, race and age specific *second* birth rates (ASSBRs) for each state were calculated in a similar manner utilizing second births rather than first births. Because the proposed hypotheses highlight the association between macroeconomic factors and fertility among young women, especially teenagers, women 30 years and older were excluded from the analyses. Age and race specific fertility measures were restricted to first and second births due to the limited number of third and higher order births among young women in the United States. Our inability to construct age specific fertility rates that accounted for Hispanic origin as well as race is attributable to the fact that standardized information regarding ethnicity of the mother is not included in the NCHS detailed natality files before 1979.

Population estimates, obtained from two different sources, were utilized to create age, race, and state specific birth rates. For years between 1970 and 1990, estimates were calculated by combining population counts from the 1970, 1980, and 1990 Censuses of Population and Housing with estimates of state populations obtained from the United States Census Bureau. For the years between 1991 and 1999, birth rates are based solely on estimates of the population of states by race, sex, and single year of age which were acquired from the United States Census Bureau.

The following formulas were used to calculate intercensal population estimates between 1970 and 1990:

$$P_{ijk} = [(1 - W_t)S_{ik} 70 + (W_t)S_{ik} 80]P_{ij}, \quad j = 1970 - 1980, \quad (1)$$

$$P_{ijk} = [(1 - W_t)S_{ik} 80 + (W_t)S_{ik} 90]P_{ij}, \quad j = 1981 - 1990, \quad (2)$$

where W_t = linear weight, i = state, j = year of measurement, and k = birth cohort. The proportion of women of a given age and race in each state was calculated based on single year of age population counts (S_{ik}) in 1970, 1980, and 1990. Linear weights (W_t) reflect the amount of time that elapsed since the previous census and were utilized to place more emphasis on recent census data. Race and sex specific populations for each state in each year (P_{ij}) were multiplied by these proportions.

Individual sociodemographic cells identified by state of residence, maternal race, maternal age, and birth order are the units of analyses in this study. Given the small size of the population at risk and the relative rarity of births, there are likely to be zero first or second births

among some age, race, and state specific categories. Therefore, Poisson regression analyses were utilized to determine the association between changes in the unemployment rate and the birth rate in each sociodemographic cell (g). It is assumed that the number of births (y_g) follows a Poisson distribution:

$$\Pr[y_g = y] = \frac{(\mu n_g)^y}{y!} \exp[-\mu n_g] \quad \text{for } y = 0, 1, 2, \dots \quad (3)$$

where μ is the mean birth rate and n_g is the population within each cell. The birth rate (μ) depends upon a vector of sociodemographic characteristics (\mathbf{x}) shared by individuals within each cell, such that:

$$\mu = \exp(\mathbf{x}\beta) \quad (4)$$

The maximum likelihood method was used to determine the value of the coefficients (β). We included state and year dummy variables as fixed effects in the regression models to account for geographic and temporal trends that could confound the relationship between the unemployment rate and the birth rate. Robust standard errors were obtained by employing the Huber/White corrected estimates of variance.

In order to test whether the association between the unemployment rate and the birth rate differed during the decade of the 1990s as opposed to the remainder of the time period, we included an interaction term (1990s*unemployment rate) in Poisson regression analyses stratified by race and birth order. Because the interaction term was statistically significant ($P < 0.05$) in many of the sociodemographic cells, we proceeded to estimate identical Poisson regression models for time periods between 1970 and 1989 as well as 1990 and 1999. Race and birth order were also found to have a modifying effect on the relationship between the unemployment rate and fertility among young women; therefore, final multivariate analyses are presented separately for blacks and whites as well as first and second births

Poisson regression models that were limited to African American women relied upon birth certificate data from only those states that have a sizeable black population. Excluded states tend to be clustered in the Rocky Mountain region, the Pacific Northwest, New England, and the Upper Midwest.³ Multivariate analyses were completed using both an unemployment variable lagged by one year (to account for the time between conception and birth) and one not lagged by any length of time. These two analyses did not yield qualitatively different results; therefore, we chose to include a measure of the unemployment rate that was not lagged in our final models. Similarly, we estimated both weighted and unweighted regression models, where weights were determined by averaging the size of the race and age specific population in a given state over the thirty-year time period. The use of weights did not substantially alter the size of the coefficients; therefore, the unweighted results are presented here. All statistical analyses were performed using Stata version 7.0.

³ States excluded from analyses specific to black women are as follows: Alaska, Arizona, Colorado, Connecticut, Delaware, Hawaii, Idaho, Iowa, Kansas, Kentucky, Maine, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Oregon, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, and Wyoming.

RESULTS

Compared to periods of intense fluctuation in U.S. fertility such as the baby boom and the baby bust, the years between 1970 and 1999 witnessed less variation among race- and age-specific birth rates (Figures 2 through 5). Among whites, women aged 20 to 21 have generally exhibited the highest rates of first births during this thirty-year time period (see Figure 2); 18 to 19 year olds and, until the late 1980s, 22 to 24 year olds have also accounted for a large proportion of first births to white women. By 1989, however, ASFBRs for the 22 to 24 year old age group began to decline, while rates of first births among women aged 25 to 29 continued their steady increase that began in 1973. By the end of the 1990s the gap between the birth rates of younger women and women in their late twenties had narrowed dramatically from where it stood at 1970 owing to the combination of declining birth rates to women younger than 25 and increasing birth rates to women aged 25 to 29. Rates of first births among white adolescents aged 15 to 17 fluctuate between a low of 21 per 1,000 in 1986 and a high of 27 per 1,000 in 1994. ASFBRs for women in this age group are significantly lower than those reported for women between 18 and 29, but during the 1990s changes in rates of first birth among these younger teens mirror those exhibited by 18 to 21 year olds. The youngest group of adolescent mothers, those who have their first child between the ages of 10 and 14, account for a negligible portion of first births for white women throughout the thirty-year period. In sum, this figure suggests a large secular shift in the maternal age distribution of white first births between 1970 and 1999 from being highly concentrated among 20 to 21 year olds to being more evenly dispersed between women 18 to 29 years of age.

Age specific first birth rates among African American women in the U.S. between 1970 and 1999 reveal fertility levels that exceed those among their white counterparts. Black women aged 18 to 19 consistently exhibit the highest race specific ASFBRs, which fluctuate between a maximum of 117 births per 1,000 in 1970 and a minimum of 80 births per 1,000 in 1983. Rates of first births among African American women between the ages of 15 and 17 ranged from a high of 79 per 1,000 in 1970 to a low of 45 per 1,000 in 1999. As Figure 3 clearly illustrates, childbearing among black adolescents in this age category fell precipitously between 1993 and 2000. Through much of the 1970s, 15 to 17 year olds had the second highest birth rates; however, in 1978 this changed as ASFBRs for women aged 20 to 21 increased slightly and ASFBRs for teens aged 15 to 17 continued to decline. Rates of first births among black women between the ages of 22 and 24 and between 25 and 29 reveal steady increases during the late 1970s and 1980s. Since reaching recent highs in 1989 and 1990, respectively, ASFBRs for both age groups declined. Increases in fertility rates among black women aged 25 to 29 are not as dramatic as those exhibited by white women aged 25 to 29 during this thirty-year time period. Although rates of first births among African American adolescents between the ages of 10 and 14 are greater than those among white adolescents between the ages of 10 and 14, young black women in this age category account for an extremely small proportion of first births. In sum, between 1970 and 1999 African American first births show some evidence of the secular trend toward being less concentrated at younger ages that is evident among whites, but it is more muted owing primarily to the less dramatic increase in births to black women between the ages of 25 and 29.

Among white women, those exhibiting the highest ASSBRs tend to be in their mid to late twenties (see Figure 4). Before 1980, white women aged 22 to 24 exhibited the greatest rates of second births. In the subsequent two decades, white women between the ages of 25 and 29 surpassed 22 to 24 year olds as the age group most likely to experience a second birth, although

the difference in ASSBRs for women in these two age categories has sometimes been negligible especially in recent years. Not surprisingly, Figure 4 reveals that women between the ages of 20 and 21 have substantially higher rates of second births than women between the ages of 18 and 19. Younger teens, aged 10 to 14 as well as 15 to 17, have extremely modest ASSBRs and these have remained consistently low over this thirty-year time period. The mean rate of second births for adolescents in the latter age category for the years between 1970 and 1999 is 3 per 1,000. ASSBRs for white teens between the ages of 10 and 14 are so negligible that the mean rate of second births for this age category falls well below one (0.0136 per 1,000).

Since 1974, rates of second births among African Americans have been highest for women aged 20 to 21, with rates of second births among women aged 22 to 24 only slightly lower (see Figure 5). Black second births tend to occur at younger ages than white second births, just as their first births tend to occur at younger ages. Unlike white women, it is more common for black women to experience a second birth during their early twenties rather than their mid to late twenties. While ASSBRs ranged from a high of 68 per 1,000 in 1970 to a low of 45 per 1,000 in 1984 for African Americans between the ages of 20 and 21, ASSBRs among African Americans between the ages of 25 and 29 only reached a high of 37 per 1,000 in 1989 and were at their lowest point in 1973 at 25 per 1,000. During the late 1990s, rates of second births for black women increased for those aged 20 to 29, decreased for adolescents aged 15 to 19, and remained constant for teens aged 10 to 14. African American women between the ages of 18 and 19 saw the greatest declines in ASSBRs, which plummeted from a recent peak of 46 per 1,000 in 1992 to 32 per 1,000 in 1999. Compared to rates of second births among black women aged 18 and 19, ASSBRs for African American adolescents between the ages of 15 and 17 were significantly lower. They ranged from a high of 16 per 1,000 in 1970 to a low of 7 per 1,000 in 1999. Similar to white women, the occurrence of second births among teens aged 10 to 14 remains a very rare event among black women. The mean ASSBR for this thirty-year time period among adolescents between the ages of 10 and 14 is 0.133 per 1,000.

Results from Poisson regression analyses are shown in Tables 1 and 2. Table 1 presents information regarding the association between trends in unemployment and age specific *first* birth rates, while Table 2 offers insight into the relationship between trends in unemployment and age specific *second* birth rates. Coefficients indicate the percentage change in the race and age specific birth rate following a one-percentage point change in the unemployment rate. Results are presented for the two time periods of interest: 1970 to 1989 and 1990 to 1999.

For the time period between 1970 and 1989, macroeconomic fluctuations, measured by changes in state specific unemployment rates for the purposes of this paper, are negatively associated with changes in rates of first births for both white and African American women. Among whites, coefficients range from -0.007 for women aged 25 to 29 to -0.044 for young teens aged 10 to 14. Thus, our model predicts that a one-percentage point decrease in the unemployment rate would be accompanied by an increase in the rate of first births between **0.7% and 4.4%**. It appears as if white women of all ages studied show some evidence of procyclical fertility (i.e. being more likely to bear children during periods of economic growth and postponing childbearing during periods of economic recession). Moreover, the strength of the association between fertility and employment prospects seems to diminish as white women grow older.

Among African Americans, coefficients range from -0.010 for women aged 18 to 19 to -0.017 for women aged 25 to 29. For every percentage point decrease in the unemployment rate,

we would expect the rate of first births to increase between **1.0% and 1.7%**. In contrast to the results for whites during this time period, the relationship between changes in state specific unemployment and rates of first births is more pronounced among older black women between the ages of 22 and 29 rather than their younger counterparts. Overall, it appears that for the years between 1970 and 1989 childbearing trends among both black and white women lend support to patterns of procyclical fertility.

In order to examine how the relationship between macroeconomic conditions and fertility timing differed during the decade of the 1990s, Poisson regression analyses were conducted using only data from 1990 to 1999. Results are presented in the last two columns of Table 1. During the 1990s, fluctuations in state specific unemployment rates are not statistically significantly associated with rates of first births among white women, although the point estimates are generally suggestive of continued procyclical fertility. A different story emerges when we examine the results obtained from analyses limited to data from black mothers. Childbearing trends among African American women appear to be significantly associated with changes in unemployment. Unlike the previous analyses which were limited to the years between 1970 and 1989, the relationship between state specific unemployment rates and ASFBRs during the 1990s is positive rather than negative for women between the ages of 15 and 24, thus providing evidence for *countercyclical* fertility. Coefficients that reach statistical significance ($P < 0.05$) range from 0.016 among 20 to 24 year olds to 0.020 among 18 to 19 year olds. Therefore, our model predicts that a one-percentage point decrease in the unemployment rate would be accompanied by a *decrease* in the rate of first births between 1.6% and 2.0%. Although only significant at the 0.10 level, the coefficient for black adolescents between the ages of 15 and 17 also reflects a positive relationship between economic growth and the postponement of childbearing.

Results from analyses conducted using data restricted to second births are shown in Table 2. For the period of time between 1970 and 1989, changes in state specific unemployment are, for the most part, associated with procyclical fertility among white women but do not appear have a substantial effect on the childbearing trends associated with second births among black women. The strength of the relationship between unemployment and ASSBRs appears to grow weaker as white women move through their childbearing years but stronger as black women reach their late twenties. Only one coefficient reaches statistical significance ($P < 0.05$) among African Americans. According to our model, black women aged 25 to 29 will experience a 0.8% increase in rates of second births following a one-percentage point decrease in the unemployment rate.

When we limited the analyses to the time period between 1990 and 1999, fluctuations in unemployment were, for the most part, positively associated with ASSBRs. Coefficients reach statistical significance ($P < 0.05$) only for black women aged 18 and 24. However, the relationship between economic growth and the postponement of childbearing appears to be even stronger when the analyses are restricted to second births rather than first births. Coefficients range from 0.026 for African Americans between the ages of 22 and 24 to 0.031 for African Americans between the ages of 18 to 19. For every percentage point decrease in the unemployment rate, we would expect the rate of second births to decrease between 2.6% and 3.1%. The results from analyses restricted to the time period between 1990 and 1999 suggest that black women aged 18 to 19 are the group most likely to postpone both first and second births during times of extended economic growth.

Coefficients obtained from Poisson regression models based upon data from the 1990s were used to determine the extent to which the fertility decline witnessed during the previous decade was attributable to decreases in state specific unemployment (results not shown).⁴ Between 1992 and 1999, actual rates of first births fell for all white women except those in the oldest age category (25 to 29 year olds). However, our model only predicts declines in age specific fertility for whites between the ages of 10 and 14 (see the third column of Table 1). ASFBRs among young women aged 10 to 14 decreased 16% from 1992 to 1999; 53% of this decline is due to reductions in unemployment rates.

The proposed model appears to more accurately predict childbearing trends during the 1990s for African American rather than white mothers. Our results suggest that as state specific unemployment rates fell between 1992 and 1999, a similar pattern of decline should have been evident for rates of first births among black women between 15 and 24. Actual ASFBRs decreased for African Americans in every age category, with the most extreme declines in fertility being experienced by young women 10 to 14 and 15 to 17 years of age. Persistent reductions in the unemployment rate between 1992 and 1999 account for 17% of the declines in rates of first births among women aged 15 to 17. Improved occupational opportunities appear to have a more influential effect on childbearing trends among African Americans aged 18 to 19 and 22 to 24. 73% and 51% of the reduction in ASFBRs between 1992 and 1999 can be attributed to decreases in the unemployment rate for black women aged 18 to 19 and 22 to 24, respectively. For African Americans between the ages of 20 and 21 the model predicts a decline in fertility of 5%; however, rates of first births only fell by 4%.

According to the results presented in the last two columns of Table 2, we would expect both rates of state specific unemployment and rates of second births to decline among most white and black women during the 1990s. However, actual childbearing trends reveal that white women aged 10 to 21 experienced decreases in actual ASSBRs between 1992 and 1999, while rates of second births among their older counterparts aged 22 to 29 increased. The proposed model, which links changes in fertility to macroeconomic fluctuations, explains 42%, 24%, and 9% of the decline in rates of second births among white women aged 10 to 14, 15 to 17, and 18 to 19, respectively. Therefore, changes in employment possibilities appear to account for sizeable proportions of the reduction in ASSBRs for white teens aged 10 to 17.

Actual rates of second births for black women in every age category fell during the 1990s. Our model accurately predicts both declines in unemployment and ASSBRs for African American women of all ages except those between 25 and 29. Persistent declines in the unemployment rate between 1992 and 1999 explain 33% of the reduction in rates of second births among black women aged 18 and 19. Furthermore, our model accounts for 25% and 4% of the decrease in ASSBRs among African American women aged 10 to 14 and 15 to 17, respectively. Based upon the results of our analyses, we would expect to see more than a 9% reduction in rates of second births among black women between the ages of 20 and 21; however, actual rates of fertility decline for women in this age category only reached 8%. Clearly, improved occupational opportunities appear to account for the greatest proportion of declines in fertility among black teens aged 18 to 19 experiencing their first birth.

⁴ The predicted percent change in the birth rate was calculated by using the following formula: $[\beta(\gamma_{99} - \gamma_{92})] \times 100$, where γ is the national unemployment rate in a given year and β is the coefficient obtained from race, birth order, and time period specific Poisson regression analyses.

DISCUSSION

Our findings provide partial support for our general hypothesis and stronger support for our two particular hypotheses. As our analyses indicate, the relationship between job availability and fertility among African Americans and whites in the United States has changed over time. For a majority of the last 30 years, the association between unemployment and the rates of first births among both black and white women has been negative, leading to the expectation that periods of economic growth would coincide with periods characterized by *increased* childbearing. However, fertility patterns during the 1990s, which was a time of unprecedented economic expansion, do not demonstrate a trend toward procyclical fertility. For white women between the ages of 10 and 29, improvements in occupational opportunities do not appear to significantly affect rates of first births at all. For African American women between the ages of 15 and 24, expanded employment possibilities are associated with *decreases* in fertility. This trend is even more pronounced among black women aged 18 to 24, especially if they are experiencing a second birth.

The first particular hypothesis predicts that compared to white adolescents, African American teens will be more likely to respond to fluctuations in labor market tightness by altering the likelihood of having a first or second birth. Both real and potential benefits associated with the economic expansion of the 1990s seem to have impacted the childbearing patterns of a population that is often left behind during times of fiscal growth, namely young black women. We do not observe a similar relationship between improved employment opportunities and declines in fertility among white teens, with the possible exception of 10 to 14 year olds. However, the evidence for white women does suggest that patterns of procyclical fertility that were apparent in the 1970s and 1980s were muted in the 1990s.

For both blacks and whites, one might speculate that secular trends toward women's labor force participation and away from marriage contribute to these changes in fertility behavior. Procyclical fertility is most easily understood in circumstances marked by high cultural commitment to marital childbearing and childrearing and a gendered division of labor in the household. During periods characterized by expansive occupational opportunities, families who subscribe to this ideal will be better positioned to achieve it than during harder economic times. For whites, weaker evidence of procyclical fertility in the 1990s may reflect the fact that nonmarital fertility, single motherhood, and female labor force participation have become more common among this population (Moffitt and Rendall 1995; Spain and Bianchi 1996; Ventura and Bachrach 2000). However, African American women have been less attached to this ideal historically (Morgan, McDaniel, Miller, and Preston 1993; Pagnini and Morgan 1996; Ruggles 1994), and saw the further erosion of their ability to rely on the significant financial contribution of fathers in the 1990s owing to an upsurge of incarceration rates of black men (Western and Pettit 2000), continued high rates of early mortality and disability among black men (Geronimus et al. 2001), and the fact that substantial percentages of black men, especially in high poverty urban areas, did not benefit from the rising economic tide in the 1990s (Holzer 2001). This may have necessitated that black women become even more sensitive to changes in the labor market in order to maximize the benefits associated with improved employment opportunities while shielding their families from the negative implications of economic downturns.

As noted, white teens aged 10 to 14 show some suggestive evidence of countercyclical fertility in the 1990s. While this finding was not statistically significant and should not be

overinterpreted, it is interesting to speculate why this trend may be emerging. Arguably, 10 to 14 year old mothers represent a distinct population that experiences unique circumstances leading them to motherhood (Ketterlinus, Henderson, and Lamb 1990; Phipps and Sowers 2002; Reichman and Pagnini 1997). Because pregnancy and births among girls of such young ages are more likely to be the result of sexual abuse or statutory rape compared to childbearing among older teens (Donovan 1997; Elders and Albert 1998; Taylor et al. 1999), these young women may have benefited from greater employment opportunities and labor force participation of potential perpetrators in the 1990s.

The second particular hypothesis addresses the likelihood that compared to younger teens or to women in their mid to late twenties, 18 to 19 year olds will show greater sensitivity to decreased unemployment when deciding whether or not to have a child. Results obtained using data from the first two decades under study do not support this hypothesis; however, information gleaned from analyses completed with only data from the 1990s reveal a different story.

During the 1990s, young African American women between the ages of 15 and 24 appear to limit their fertility in response to improved occupational opportunities while younger teens and older women between the ages of 25 and 29 fail to do so. This association appears to be strongest among black women aged 18 to 19. It is at this age that young people typically face choices regarding the paths they will take to reach their educational goals and obtain promising employment. The pattern of countercyclical fertility that is evident among African American teens between the ages of 18 and 19 during the 1990s is also apparent for young black women between the ages of 20 and 24. It seems that periods of extended economic growth may lead to reduced levels of fertility among a wider age range of African American women than was previously predicted. In addition, it is interesting to note that the association between changes in unemployment and childbearing was stronger when the analyses were restricted to second births as opposed to first births. The 1990s, which was a decade characterized by falling rates of unemployment, may have provided black adolescents and young women with a different vision of their future, one that included more rewarding returns to education and improved opportunities for occupational advancement. A substantial number of poor and working-class African American teens may have been convinced that the benefits involved in pursuing their scholastic goals would outweigh the risks associated with postponing childbearing altogether or spacing births more widely.

By the time African American women reach the age of 25, it is likely that the risks associated with postponing childbearing will outweigh the benefits associated with pursuing additional schooling or improvements in occupational status. Although macroeconomic expansion may lead to increased wages, expanded job availability, and a higher return to educational investment, it cannot completely mitigate the detrimental health effects of growing up in or near poverty or the continued adverse health effects associated with racism (James et al. 1987; Krieger 1990; Krieger and Sidney 1996; Williams et al. 1997). By delaying their first birth, low-income or socially mobile African American teens may be at a greater risk of experiencing complications during pregnancy if the financial returns they obtain from increased job availability do not outweigh the health consequences of childhood exposure to social inequalities or the rapidly increasing chance that members of their kin networks, including the father of their children, will experience death or disability (Geronimus et al. 2001; Geronimus et al. 1999).

We are forced to rely on period, rather than cohort, fertility rates to test our hypotheses. The positive association between expanded occupational opportunities and fewer first and second

births among young black women between the ages of 18 and 24 may reflect the propensity of younger cohorts to postpone childbearing rather than a persistent change from procyclical to countercyclical fertility that will continue to shape the childbearing trends of the younger teens as they grow older. In order to fully examine the relationship between expanded employment possibilities in the 1990s and their long-term effect on the childbearing patterns of women in the United States, complete reproductive histories obtained only after women have reached the end of their childbearing years would be needed.

We also rely on state level data to explore the relationship between macroeconomic fluctuations and subsequent levels of fertility among black and white women in the U.S. Our analyses could have been strengthened by the inclusion of local area data. There is much variation within states with regard to employment opportunities and reproductive behavior. By focusing on more homogeneous neighborhoods in both rural and urban areas, we would have been able to measure changes in local economies over time and the effects these trends have on childbearing patterns. However, unemployment statistics are not available for local areas smaller than metropolitan statistical areas (MSAs) in urban communities and counties in rural communities. MSAs as well as counties contain a wide variety of neighborhoods that differ tremendously with regard to aggregate socioeconomic characteristics. Local unemployment statistics based upon information collected at this level would not accurately reflect labor market opportunities available to individuals living in specific neighborhoods.

One question that was not specifically addressed by this study concerns the effect of welfare reform on the association between macroeconomic fluctuations and subsequent fertility patterns. The passage of the Personal Responsibility and Work Opportunity Reconciliation Act in 1996 (PRWORA) drastically changed how aid to families with children was administered. Instead of relying on a matching grant program to provide income maintenance to poor women and their children, states now receive federal block grants to administer Temporary Assistance to Needy Families (TANF). PRWORA places a great deal of emphasis on transitioning recipients from welfare to work within specified time limits. The Welfare to Work Grants program, authorized by the Balanced Budget Act of 1997, also provides additional federal funding and incentives for states to introduce long-term job training efforts. Thus, it could be argued that the association between expanded occupational opportunities and reduced levels of fertility evident in our results may be attributable to recent changes in welfare policy. The delay in second births might also be influenced by family cap policies that were implemented as part of PRWORA in some states. However, declines in state specific unemployment rates as well as rates of first and second births among black and white teens became evident as early as 1992, which is well before the enactment of PRWORA. In addition, because most states have focused more on reducing the welfare rolls than providing job training and/or placement programs since the passage of PRWORA (Danziger 2002), the ability of welfare recipients to move from welfare to work is more dependant on the availability of employment for less-skilled workers than policy initiatives to increase labor force participation among poor women with children.

We believe our findings provide support for the hypothesis that the recent decline in births among adolescents in the United States is, in part, a function of the economic growth of the 1990s, at least among black teens. Efforts by African Americans to achieve social mobility are risky and can involve a great deal of personal, as well as familial, sacrifice. It appears that during the 1990s, African American adolescents and their elders may have been more willing to take this gamble by limiting teen fertility in order to take advantage of improved job availability.

The conclusions we draw based upon the evidence presented here regarding the association between occupational opportunity and reproductive decision-making do not, in any way, diminish the important role that family planning service provision has played during the past 30 years. In fact, effective and accessible contraceptive methods are essential during times in which women want to delay childbearing altogether or increase the intervals between births in order to take advantage of improvements in the labor market. Research efforts that hope to explain the social, economic, and political processes driving population based measures of fertility benefit from the examination of both the proximate mechanisms as well as the root causes contributing to changes in population trends.

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FIGURE 1. RACE AND SEX SPECIFIC NATIONAL UNEMPLOYMENT RATES FOR THE U.S. (1970-1999)

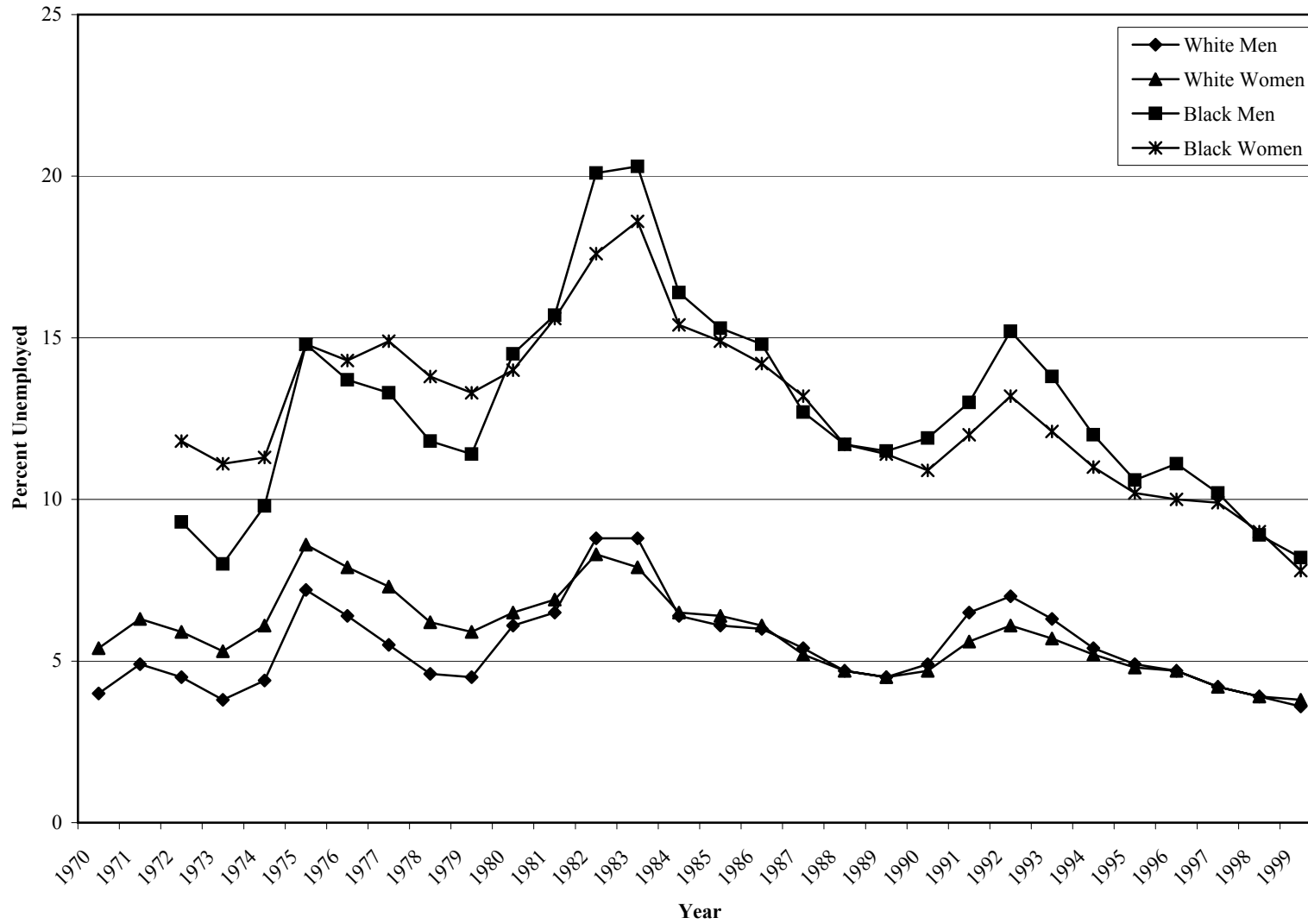


FIGURE 2. TRENDS IN RATES OF FIRST BIRTHS AMONG WHITES IN THE U.S. (1970-1999)

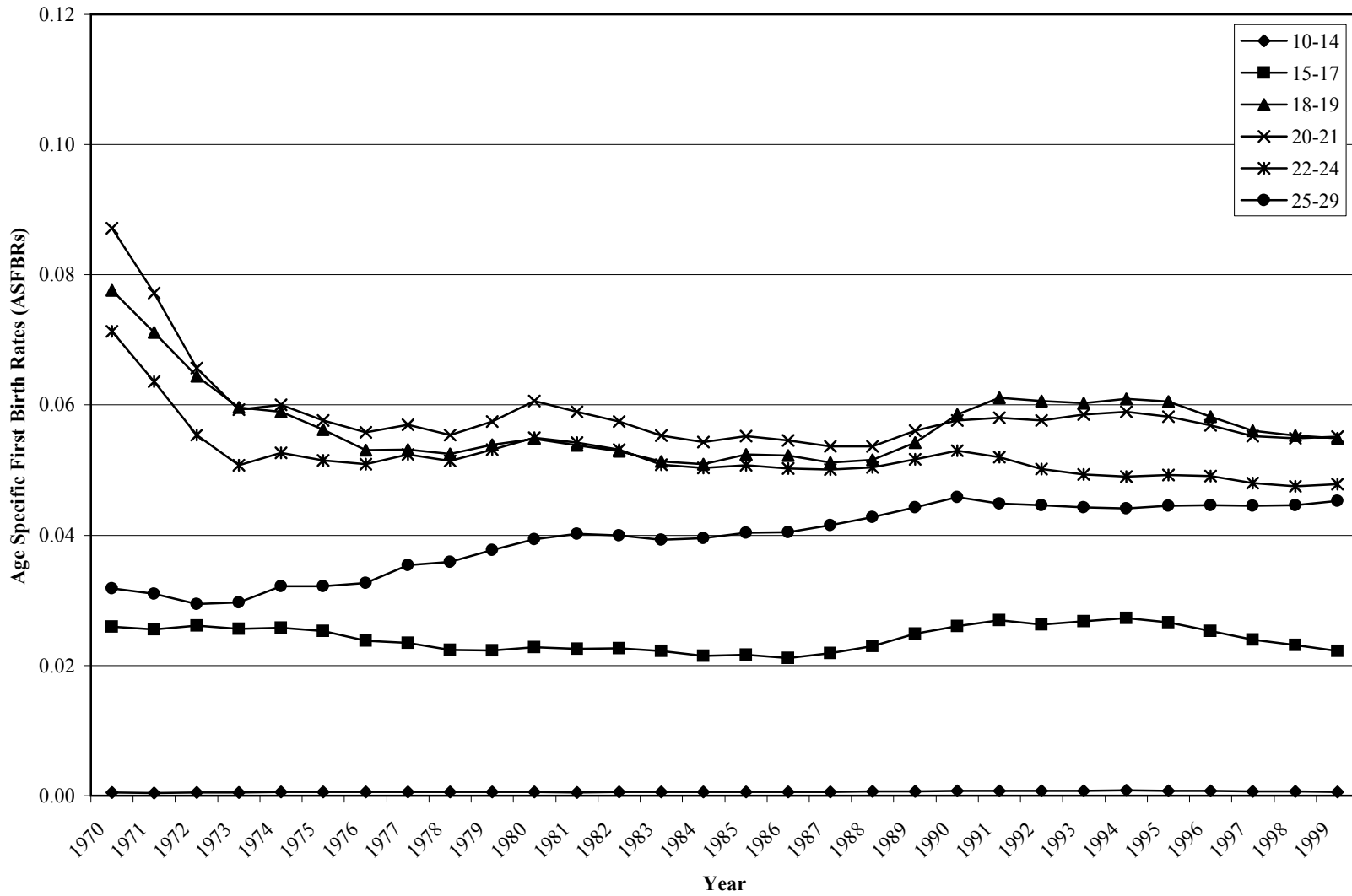


FIGURE 3. TRENDS IN RATES OF FIRST BIRTHS AMONG BLACKS IN THE U.S. (1970-1999)

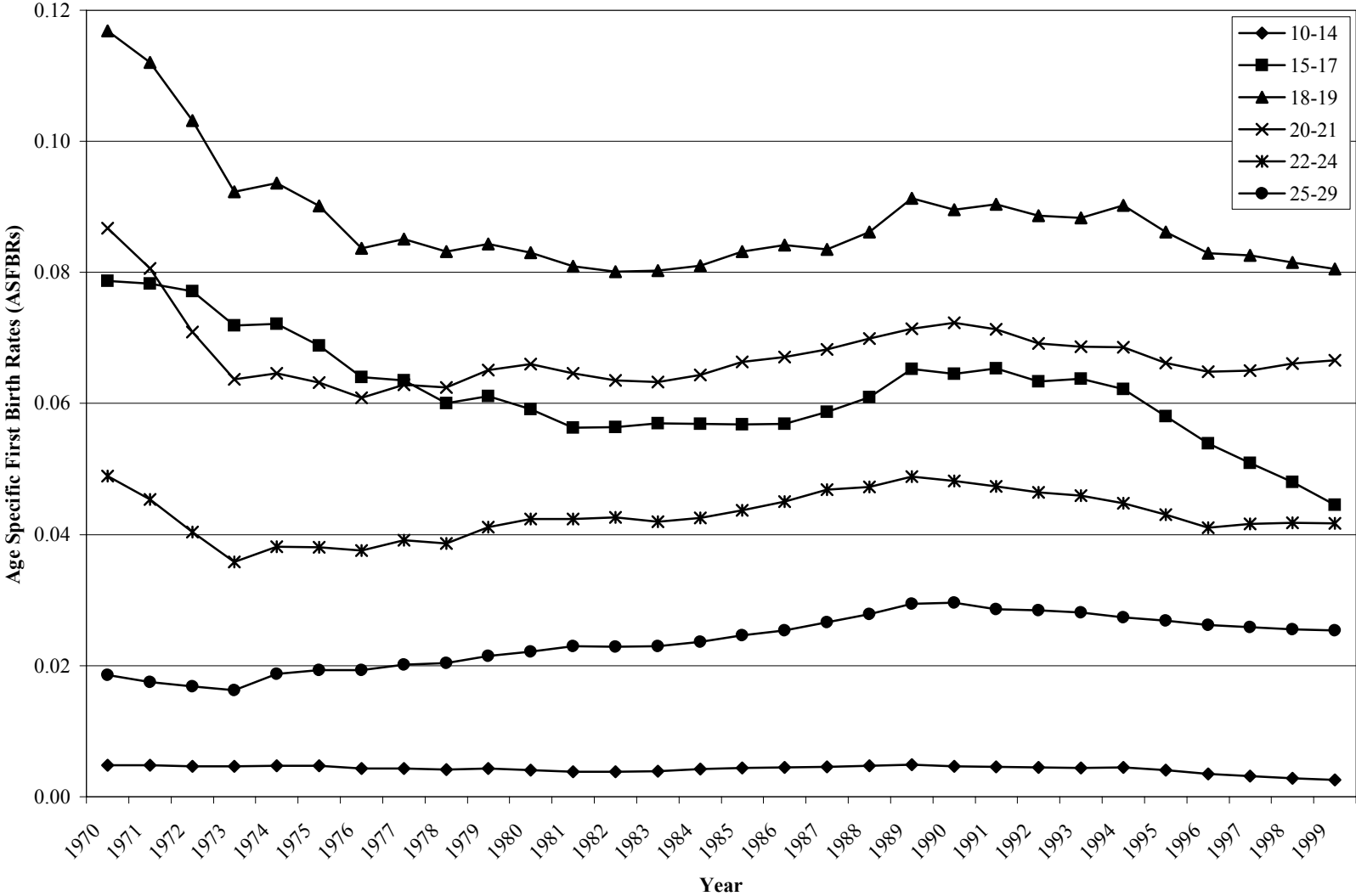


FIGURE 4. TRENDS IN RATES OF SECOND BIRTHS AMONG WHITES IN THE U.S. (1970-1999)

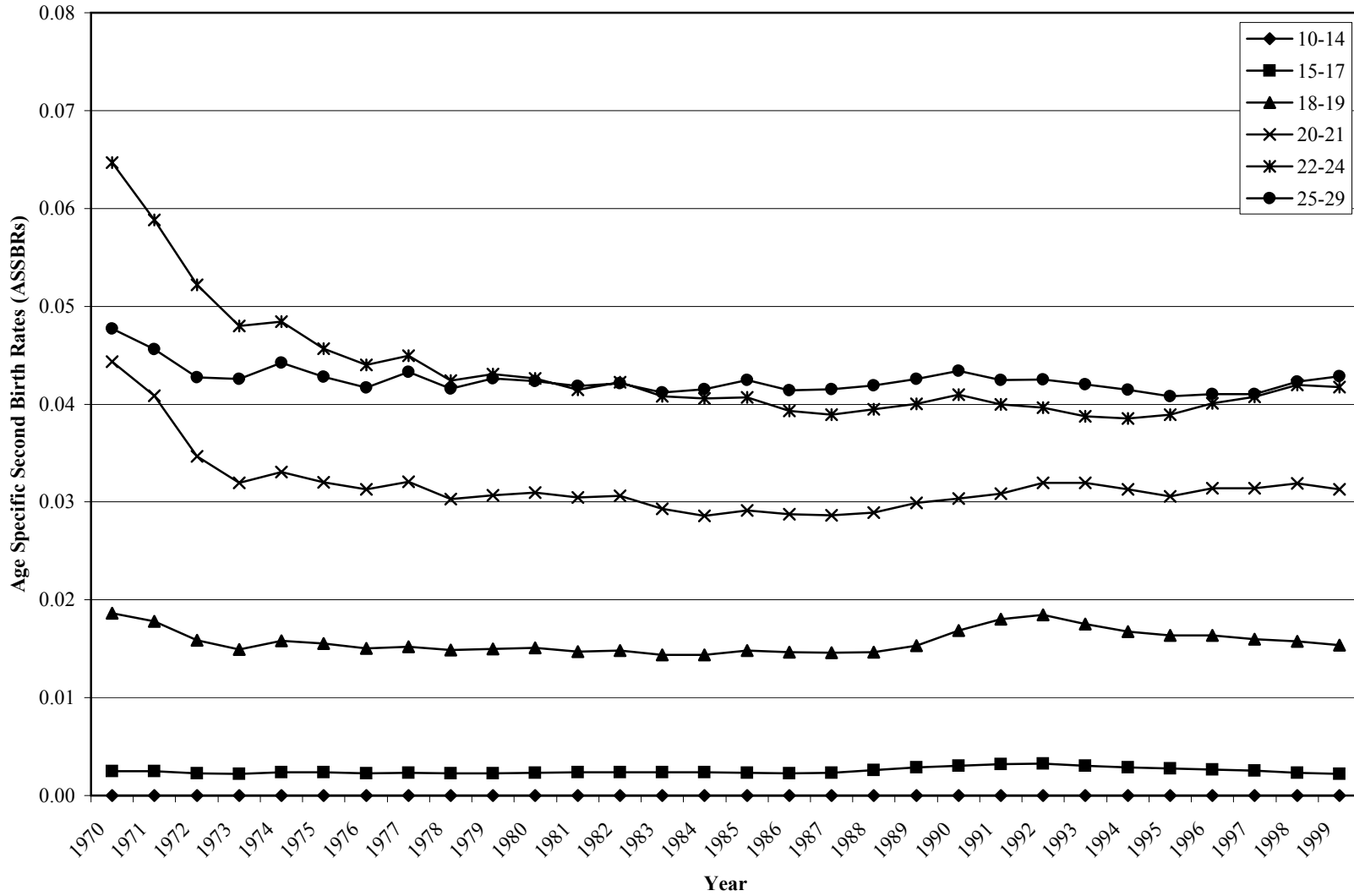


FIGURE 5. TRENDS IN RATES OF SECOND BIRTHS AMONG BLACKS IN THE U.S. (1970-1999)

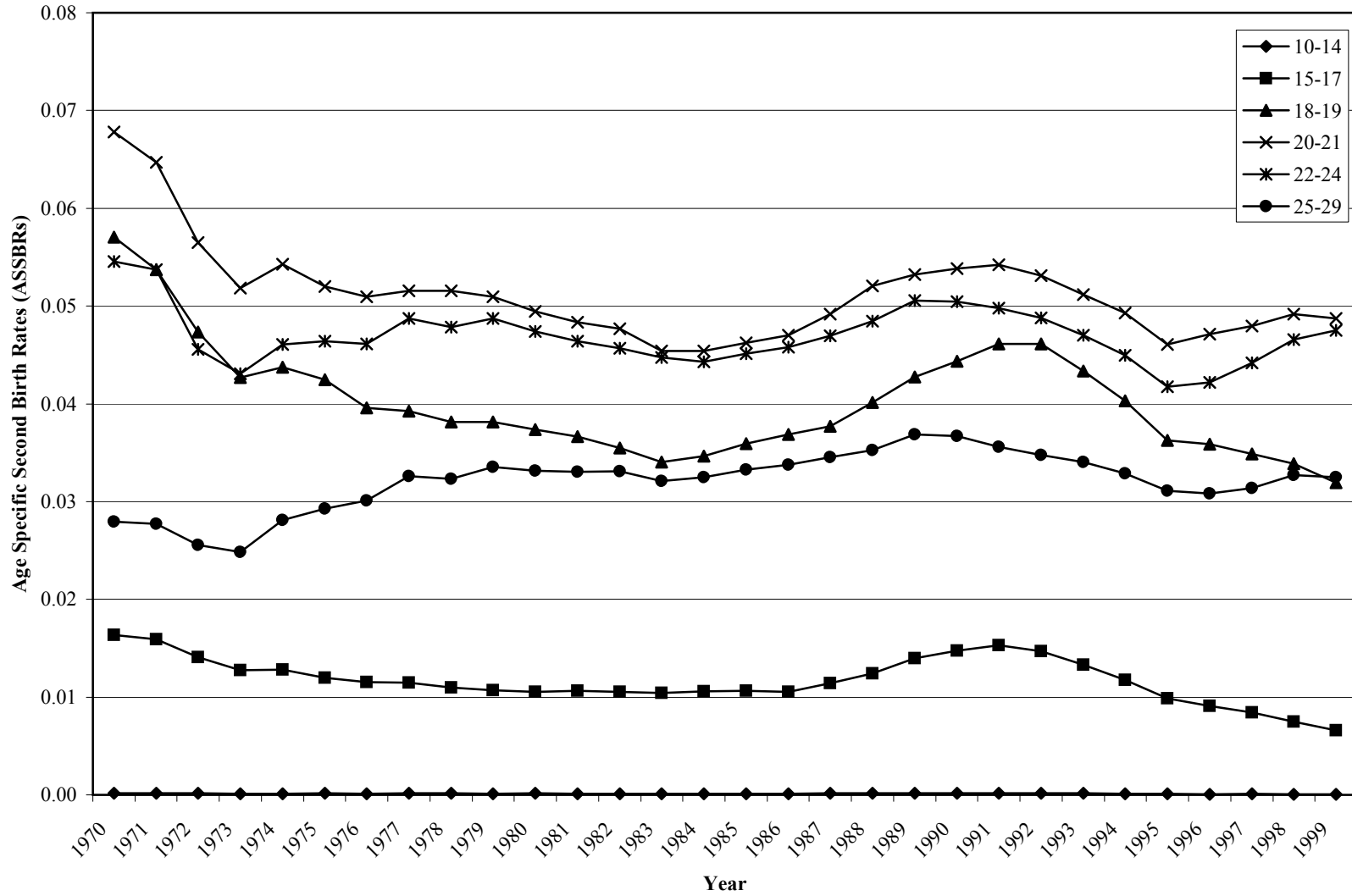


TABLE 1. IMPACT OF STATE SPECIFIC UNEMPLOYMENT ON AGE SPECIFIC RATES OF FIRST BIRTH, BY RACE AND TIME PERIOD

Maternal Age	1970-1989		1990-1999	
	Whites (N ^a = 1530)	Blacks (N ^a = 720)	Whites (N ^a = 510)	Blacks (N ^a = 240)
10-14	-0.0441*** (0.0069)	-0.0104* (0.0042)	0.0260 (0.0183)	-0.0026 (0.0111)
15-17	-0.0294*** (0.0037)	-0.0104*** (0.0027)	-0.0013 (0.0146)	0.0148 [†] (0.0083)
18-19	-0.0176*** (0.0027)	-0.0099*** (0.0028)	-0.0091 (0.0144)	0.0202* (0.0099)
20-21	-0.0135*** (0.0023)	-0.0109*** (0.0030)	-0.0130 (0.0127)	0.0157* (0.0078)
22-24	-0.0073** (0.0022)	-0.0149*** (0.0033)	-0.0096 (0.0114)	0.0156* (0.0077)
25-29	-0.0065*** (0.0014)	-0.0171*** (0.0030)	-0.0093 (0.0129)	-0.0076 (0.0091)

Note: Numbers in parentheses are robust standard errors.

Source: U.S. Detailed Natality Files, Intercensal Population Estimates, and State Specific Unemployment Rates for 1970-1999

^aThe number of observations are discrete sociodemographic cells determined by race-specific state and year data.

[†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

TABLE 2. IMPACT OF STATE SPECIFIC UNEMPLOYMENT ON AGE SPECIFIC RATES OF SECOND BIRTH, BY RACE AND TIME PERIOD

Maternal Age	1970-1989		1990-1999	
	Whites (N ^a = 1530)	Blacks (N ^a = 720)	Whites (N ^a = 510)	Blacks (N ^a = 240)
10-14	-0.1030*** (0.0254)	0.0034 (0.0148)	0.0688 (0.0507)	0.0488 (0.0468)
15-17	-0.0356*** (0.0056)	0.0011 (0.0044)	0.0229 (0.0151)	0.0074 (0.0094)
18-19	-0.0139*** (0.0035)	0.0034 (0.0036)	0.0045 (0.0145)	0.0310** (0.0096)
20-21	-0.0086** (0.0275)	0.0035 (0.0030)	0.0010 (0.0116)	0.0291*** (0.0080)
22-24	-0.0070** (0.0027)	-0.0032 (0.0027)	-0.0002 (0.0085)	0.0261*** (0.0067)
25-29	0.0011 (0.0017)	-0.0082** (0.0027)	0.0016 (0.0085)	0.0002 (0.0075)

Note: Numbers in parentheses are robust standard errors.

Source: U.S. Detailed Natality Files, Intercensal Population Estimates, and State Specific Unemployment Rates for 1970-1999

^aThe number of observations are discrete sociodemographic cells determined by race-specific state and year data.

[†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$