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Abstract

This project first reports descriptive evidence of the characteristics of mothers in the American South and compares them to mothers in other regions of the country. Women in the South (and West) tend to have their children at younger ages than those in the Midwest and Northeast. Mothers in the South (and West) also have much lower levels of education and are more likely to be African American or Hispanic compared to women in the Midwest and Northeast. Next, this paper attempts to link the characteristics of the mothers in the American South to the high rates of poverty there. Results using data from the National Center for Health Statistics and the Current Population Survey suggest that low-education levels as well as the racial composition of the South largely contribute to the high rates of poverty there. Increases in educational attainment among mothers in the South to the level of those in the New England division are predicted to reduce poverty rates there between 16 and 26 percent. Changing the racial composition of the South to that in the New England division is predicted to reduce poverty rates between 10 and 14 percent.

Since at least the early 1800s when Thomas Malthus developed the first economic theory of fertility, social scientists have written extensively trying to understand the relationship between fertility and a family's economic well-being. Among the most prominent research in this area is the work of Gary Becker (1960, 1991; Becker and Lewis 1973) who developed a variety of models to explain the negative relationship between family income and total fertility in developed countries. More recently, social scientists have shown that single-motherhood often leads to poverty (Duncan and Rodgers 1991; Eggebeen and Lichter 1991) and that over the course of the last 40 years there has been considerable growth in single motherhood among women with poor economic prospects (Ellwood and Jencks 2004). McLanahan (2004) argues that women in the United States are now following two different trajectories. On the one hand, high socio-

economic status women are delaying childbearing until they are more emotionally and financially capable of caring for their children. These women are more likely to work and are less likely to divorce, all of which advance their economic position. On the other hand, low socioeconomic status women continue to have children at a relatively young age, are less likely to work, and more likely to divorce when married. Collectively, the evidence suggests a large and growing division between the "haves" and "have-nots" in the United States and that family structure decisions play a large role in the economic well-being of these families.

Poverty is not randomly distributed in the United States. In 2003, 35.9 million people or 12.5 percent of the United States population was poor. Nine of the ten states (including the District of Columbia) with the highest proportion of poor people were located in the southern Census region (DeNavas-Walt, Proctor, and Lee 2004).[1] Since most of the poorest states are in the South, it is not surprising that this region has the highest poverty rate, 14.1 percent, compared to 11.3 percent in the Northeast, 10.7 percent in the Midwest, and 12.6 percent in the West (DeNavas-Walt, Proctor, and Mills 2004).

Given the links researchers have established between family structure decisions and poverty as well as the disproportionate number of low-income families in the America South, one might expect to find disproportionate numbers of mothers vulnerable to poverty there. This study models the relationship between poverty and

[1] The poorest ten states based on averages between 2002 and 2004 were Mississippi, Arkansas, New Mexico, Louisiana, the District of Columbia, Texas, West Virginia, Alabama, Kentucky, and Tennessee.

maternal characteristics, namely the importance the mother's educational attainment, marital status, number of children, race and ethnicity, and age with data from the Current Population Survey (CPS). Given the results from this model, the project simulates poverty rates in the nine Census divisions in the United States, using mean variable values for maternal characteristics in each division focusing primarily on results from the American South. By changing the mean values of the average maternal characteristics, the author derives estimates of the importance different characteristics play in the poverty rates in the different Census divisions.

Previous Research

Motherhood could influence poverty through a variety of channels. Below, I describe several potential mechanisms identified in the literature, acknowledging that these factors are inter-related, that contribute to maternal poverty and why they may have a disproportionate impact on families in the American South.

Since most children do not work and contribute to family income, the more children in a family, the more likely the family is to be poor, all else equal. Consider a woman who lives alone and earns $11,000 per year. In 2004, the poverty threshold for this woman was $9,827, and although she is not earning a considerable sum of money, she would not have been identified as poor that year. If, however, she has a child, both must live on the same income. The poverty threshold for a single person with one child in 2004 was $13,020. Given her income, both the mother and her child would have been counted among the poor. All else equal, the number of children a mother has may

contribute to her poverty status. If women in the American South have higher numbers of children, then one might expect higher levels of poverty there.

The marital status of mothers has also been shown to influence the economic well-being of families. In 2003, 5.4 percent of married couples were poor compared to 28 percent of single-mother households (DeNavas-Walt, Proctor, and Lee 2005). Single mothers suffer because they have less earning capacity than married couples, both due to sheer numbers of bread-winners in the household and because women earn less than men on average, and because they do not experience the benefits of scale economies (Garfinkel and McLanahan 1994). Further, mothers who divorce experience immediate declines in their financial wellbeing (Duncan and Hoffman 1985). We also know that once poor, many female-headed households are less likely to exit poverty compared to male-headed households (Stevens 1994). If the mothers are less likely to marry before the birth of their child and/or are more likely to divorce if married in the South, then one should expect them to have higher poverty rates.

One might expect differences in economic well-being due to differential levels of human capital accumulation as well (Becker 1975; Mincer 1974). Theoretically, women with high levels of human capital, acquired through education and work experience, merit higher wages in the labor market. Mothers who have children at a young age have less time to accumulate human capital than those who delay their childbearing and are more likely to receive welfare and to be classified as poor (Geronimus & Korenman, 1992; Hoffman, Foster, & Furstenberg, 1993; Klepinger, Lundberg, & Plotnick, 1995, 1999; Levine, Pollack, & Comfort, 2001). Once a mother, these young women often cease

their human capital accumulation either dropping out of school or quitting work to care for their children (Harris 1993), which may further exacerbate the problem.

The South lags the rest of the country in educational attainment. It has the highest dropout rate in the country: almost 18 percent of individuals aged 25 or older have less than a high school education (Stoops 2004). Further, only 25.3 percent of adults 25 or older have a bachelor's degree or more in the South compared to 26 percent in the Midwest, 28.7 percent in the West, and 30.3 percent in the Northeast (Stoops 2004). If mothers in the South are more likely to have their children at a young age or simply less likely to obtain high levels of education, one would expect that they are more likely to be poor.

The descriptive demographic literature regularly notes different fertility rates among racial and ethnic groups. In 2001, the general fertility rate for women aged 10 to 49 was 65.3 per 1,000 in the U.S. Among non-Hispanic, white women, the rate was 57.7, compared to 69.1 for non-Hispanic African American women and 96 for Hispanic women (Hamilton, Sutton, and Ventura 2004). Table 1 reports the percentage of the U.S. population by region that was white, non-Hispanic white, African American, and Hispanic (of any race) in 2000. This table shows that the South has the highest proportion of African Americans, nearly 19 percent. The South also has the second highest percentage of Hispanics, 11.6 percent, well behind the West. Given the high proportion of African Americans and Hispanics, one might expect higher fertility rates in the South due to the racial and ethnic composition of the region.

[Table 1 about here]

Data

This study analyzes data from a variety of sources. Data from the NCHS detailed natality series are used to obtain population data on the number of births to females aged 15 to 44 by race/ethnicity i.e., non-Hispanic white (hereafter referred to as "white"), non-Hispanic African American (hereafter referred to as "African American"), Hispanic (which includes Hispanic white and Hispanic African American), Asian or Pacific Islander (both Hispanic and non-Hispanic), and American Indian (both Hispanic and non-Hispanic) in each state from 1990 to 1999.[2] These data are collected from birth certificates and contain information on nearly all children born in the United States. To generate fertility rates, I use publicly available annual state population estimates by age, race/ethnicity, state, and year created by the U.S. Bureau of the Census. I calculate age*race/ethnicity*state*year-specific fertility rates by dividing the total number of births to females of a given age and race/ethnicity in each state each year by the total number of women of the same age and race/ethnicity (and multiplying the ratio by 1000). These rates are reported by Hamilton, Sutton, and Ventura (2004) in the National Vital Statistics Reports, and I duplicate the rates they report.[3]

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[2] Following Hamilton, Sutton, and Ventura (2004), Aleuts and Eskimos are included in the American Indian category.

[3] A couple of exceptions are noteworthy. Hamilton, Sutton, and Ventura classify Hispanics as any individual regardless of race who reports being Hispanic. Given the small numbers of Asian or Pacific Islanders and American Indians who report being Hispanic, I include African Americans and whites who report being Hispanic in the Hispanic category only and include Hispanic Asian or Pacific Islanders in the Asian or Pacific Islander category and Hispanic American Indians in the American Indian category.

In 1990, Oklahoma did not report on the Hispanic origin of births and in 1990 through 1992 New Hampshire did not report the Hispanic origin of births. Rather than assume that these births were non-Hispanic, I have removed them from the analysis.

The NCHS natality data also includes information on the mother's education, her marital status, her race and ethnicity, age, and the birth order of the child born that year.[4] As explained in greater detail below, to link the characteristics of mothers reported in the NCHS to regional poverty rates, I combine information from 1998 NCHS natality data set with data collected in the June 1998 Current Population Survey (CPS). The CPS is a monthly survey of approximately 50,000 households conducted by the U.S. Bureau of the Census for the Bureau of Labor Statistics. The primary purpose of the CPS is to provide labor force statistics for general consumption. At irregular intervals over time during the month of June, the CPS has completed a fertility and marital history supplement for the individuals interviewed in the main CPS. This supplement includes information on the dates of all births and marriages for all individuals aged 15 and older in the surveyed households. The latest fertility supplement available that corresponded with the NCHS data was 1998. To the data in the NCHS and CPS, I merged state unemployment rates.

Descriptive statistics on all women who gave birth in 1998 from the NCHS are reported in Table 2 and descriptive statistics for all mothers in the June 1998 CPS are reported in Table 3. While most of the information on the women in the CPS was current as of June 1998, the income information, and thus poverty status, was based on income over the previous year. Therefore, I used the poverty thresholds from 1997 to create an indicator for poverty status in 1997.

[4] Definitions for all of the variables used in this analysis can be found in Appendix A.

Since I am using two different sources of information on mothers, it is important that the mean values reported in the CPS are similar to those reported in the NCHS, the population of all women who gave birth in 1998. The mean education value for maternal education is 12.81 in the CPS and ranges between 12.24 and 13.66 in the NCHS data.[5] Similarly, values for the proportion married, number of children, the proportion in the racial and ethnic groups, and the unemployment rates all fall within the ranges one sees in the different Census divisions. One exception is the differences in the means of the age variables. I use indicators for the age of the mother in both data sets. Because the NCHS reports the age range for mothers who had a child in 1998, while the CPS includes all women who are mothers in 1998 regardless of their age when they had the children, the proportion that is older in the CPS is much higher than the proportion that actually had a child in 1998 (the NCHS).

[Table 2 and Table 3 about here]

Methods

I begin by comparing the mean differences in the maternal characteristics across regions. This descriptive evidence shows that while the overall fertility rates in the southern Census divisions are similar to those in the rest of the country, the ages that mothers bear their children is much different by region. These results also show important differences in maternal education and race and ethnicity. To determine how those

[5] To categorize the regions and divisions within the regions, I follow the U.S. Bureau of the Census' definitions. These definitions are described in Appendix B.

differences translate into different poverty rates, I estimate the following probit model of the poverty status of mother *i* in state *s* using the CPS data described above:

(1) $\Pr(Y_{is}=1) = \Phi(\beta_0 + \beta_1 Ed_{is} + \beta_2 M_{is} + \beta_3 K_{is} + \beta_4' \mathbf{R_{is}} + \beta_5' \mathbf{A_{is}} + \beta_6 UR_s)$,

where Y is an indicator variable equal to one if the household in which the mother resided was classified as poor based on the 1997 Census Bureau poverty thresholds. The variable Ed is a continuous measure of the mother's education level, M is an indicator variable for her marital status, K is a continuous measure of the number of children she had by 1998, R is a vector of race and ethnicity indicators, and A is a vector including indicators equal to one if the mother was between the ages of 15 and 19, another if she was 20 to 24, 25 to 29, 30 to 34, and one if she was 35 to 39. Aged 40 to 44 is the omitted category. The variable UR is a continuous measure of the state unemployment rate in 1997. Obviously, the strength of the economy is directly related to poverty rates; thus, I control for this factor to reduce any potential omitted variable bias in the estimated coefficients for the maternal characteristics due to the strength of the macroeconomy.

Given the coefficient estimates from the CPS, I then substitute the mean values of each maternal variable from each division observed in the NCHS natality data from 1998 (as well as the 1998 unemployment rates) and predict poverty rates for each Census division. More specifically, I predict the probability of poverty ($\hat{Y}$) for Census division *d* as follows:

(2) $\hat{Y}_d = \Phi(\hat{\beta}_o + \hat{\beta}_1 \overline{ED}_d + \hat{\beta}_2 \overline{M}_d + \hat{\beta}_3 \overline{K}_d + \hat{\beta}_4' \overline{R} + \hat{\beta}_5' \overline{A}_d + \hat{\beta}_6 \overline{UR}_d)$,

where the outcome is the predicted probability of poverty, the coefficient estimates are derived from model 1 using the CPS data, and the covariate values represent the variable means from Census division, *d*, using the NCHS data.

This predicted poverty rate serves as the baseline measure of poverty in Census division *d*. Next, to estimate the influence of the different covariates, I substitute the value from a particular covariate from the New England division, the division with the lowest predicted poverty rate, and predict the "new" division poverty rates. Importantly, I will only substitute one covariate at a time holding the others at their observed rate in the census division. For instance, to determine the importance of education in every division (except New England), I will substitute the maternal education value from New England ($\overline{ED}_{NE}$) for the division value in Census division *d* ($\overline{ED}_{d}$) and predict the probability of poverty.

$$(3) \qquad \hat{Y}_{d'} = \Phi(\hat{\beta}_o + \hat{\beta}_1 \overline{ED}_{NE} + \hat{\beta}_2 \overline{M}_d + \hat{\beta}_3 \overline{K}_d + \hat{\beta}_4{}' \overline{R} + \hat{\beta}_5{}' \overline{A}_d + \hat{\beta}_6 \overline{UR}_d)$$

The difference between the predicted probability in equation 2 and 3, $\hat{Y}_d - \hat{Y}_{d'}$, represents the change in poverty one would predict if maternal education in division *d* increased to the level found in the New England division. In addition to education, I will simulate changes in poverty using all of the covariates.

Results

I begin by describing the fertility patterns of women in the nine different Census divisions. Figure 1 displays the annual fertility rate per 1,000 women aged 15 to 44 by Census division averaged from data over the 1990s. The New England division had the

lowest annual fertility rate at just over 58 births per 1,000 females. The three southern divisions had average annual fertility rates ranging from 62.6 to 71.4 births per 1,000 females. Rates in the South Atlantic and the East South Central divisions were similar to rates in the Middle Atlantic, East North Central, and West North Central divisions, while the rate in the West South Central division falls just under the rates in the Mountain and Pacific divisions. Obviously, the South did not have the lowest average annual fertility rates during the 1990s, but it did not have the highest either.

[Figure 1 about here]

Averaging fertility rates from ages 15 to 44 smoothes out the differences in the age when women are having their children. Figure 2 shows annual age-specific teen fertility rates averaged during the 1990s for women in the four Census regions. Teenage fertility rates, which are typically measured from age 15 to 19, are higher in the South than any other region of the country. Further, around age 22 the fertility rates appear to peak in the South, then mostly decline for every age through 44. In fact, after age 28, the fertility rates in the South are lower than any other region until age 41. These rates demonstrate that while average fertility rates in the South are no different from the rest of the country, the age profile of fertility in the South is much different, with southern women having their children at younger ages. Women in the West have high fertility rates throughout their fertile years. Women in the Northeast have the lowest fertility rates until their mid-20s and the highest rates throughout most of their 30s.

[Figure 2 about here]

Figure 3 is similar to Figure 2, this time breaking women up by racial/ethnic category and South/non-South residence. This figure illustrates a couple of noteworthy points. First, African American and Hispanic women appear to have age profiles that are consistent regardless of region of the country. In other words, there does not appear to be an interaction between the South and these racial/ethnic groups. If there is any relationship for teenagers at all, it appears that African American and Hispanic teenagers had lower fertility rates in the South relative to the rest of the country. Among white women, there does appear to be a difference in the age-fertility profile by region, however. Southern white women are much more likely to have children at a young age compared to white women who reside in other regions of the country. Interestingly, in their late 20s, southern white women become less likely to have children than white women in the rest of the country, with non-southern white women having higher rates at every age thereafter. As was the case for African American women, there does not appear to be much difference in the age-specific fertility of Asian or Pacific Islander women by region. On the other hand, the fertility rates of American Indian women outside the South appear to be higher than the fertility rates of American Indian women in the South. Of course, this racial group represents such a small proportion of the population that these differences probably do not explain much of the difference in regional fertility.

[Figure 3 about here]

The results reported above emphasize not only the importance of regional differences in age but also race and ethnicity. Table 2 shows the mean values for the

background characteristics of women who had a child in 1998 in the nine different Census divisions. One of the most striking regional differences is the mean education level for women in the Northeast and Midwest compared to those in the South and West. Mothers in New England have nearly 1.5 more years of education than those in the West South Central division and the Pacific division. Over 70 percent of mothers in the New England division were married when they had their child in 1998 compared to less than 65 percent in the South Atlantic division and the East South Central division. Mothers in the New England division also had fewer children but the differences here are much smaller. As expected, the mothers in the South are much more likely to be African American and the mothers in the West are more likely to be Hispanic. As illustrated in Figure 2, the mothers are younger in the West and South relative to the mothers in the Northeast and Midwest.

To determine the relative importance of these mean differences, below, I estimate a model of poverty based on data from the CPS and report results in Table 4. All of the coefficient estimates are statistically significant and in the expected direction. In addition to the coefficient estimates and standard errors, I also report marginal effects. These marginal effects should be interpreted as the change in probability of poverty associated with a one unit increase in the covariate. Thus, the marginal effect for education suggests that a one year increase in educational attainment is associated with a 3.6 percentage point decline in the predicted poverty rate. The marginal effect for marital status is quite large: 21.8 percentage points. Of course, this marginal change represents an unrealistically large change: a shift from a situation in which all mothers

are unmarried to one in which all mothers are married. Each child a mother has increases her probability of being poor by 5.4 percentage points. Results from the probit model also show that relative to being non-Hispanic, white, every other racial/ethnic category is positively associated with poverty. The age indicators all suggest higher poverty rates relative to mothers who are aged 40 to 44. The largest marginal effect is for mothers aged 20 to 24 presumably because many teen mothers continue to reside with their parents and are not classified as poor. Finally, a one-unit increase in the state unemployment rate is associated with a 1.3 percentage point increase in the probability of poverty, all else equal.

[Table 4 about here]

In Table 5, I report predicted probabilities of poverty using the covariates estimates from the CPS and the mean characteristics of mothers in the nine different Census divisions. The baseline results range from a low in the New England division of 10.2 percent to a high of 23.7 percent in the West South Central division. As expected, rates are higher in the South and West than in the Northeast and Midwest. It is difficult to find Census division estimates of women's poverty rates in 1998. In 1998, poverty rates overall were higher in the West (14 percent) and South (13.7 percent) than in the Northeast (12.3 percent) and Midwest (10.3 percent). We also know that 29.9 percent of single-female households overall were poor in 1998 with rates as high as 40.8 percent for African American women and 43.7 percent for Hispanic women (Dalaker 1999). Thus, these predicted rates seem to fall comfortably within the range one would expect.

Importantly, changes in the predicted probabilities in the different divisions depend on the magnitude of two factors: the difference in the mean characteristics between the divisions and the estimated coefficient for that particular factor. Given the large differences in the education levels and racial/ethnic composition between the southern divisions and the New England division, the division with the lowest predicted poverty rates, these two factors surface as potential sources for the large differences in poverty. In Table 5, I simulate new poverty rates by changing the value for the observed covariates in a given division with the observed mean in the New England division. I chose this division since the predicted poverty rates were lowest there; thus, creating a reasonable bound for change in the poverty rates. While I report results changing all of the covariates, I focus on the changes due to shifts in educational attainment the racial/ethnic composition of the divisions given that these were the characteristics which differed so dramatically across regions.

The third column (labeled "NE Educ.") reports the predicted poverty rate using the mean education level from the New England division. The predicted poverty rate in the South Atlantic division falls 15.5 percent (from 18.1 to 16.7), in the East South Central division the rate falls 19 percent, and in the West South Central division the rate falls 26.2 percent.[6] The predicted change in the rates is large in the other regions as well: a 20.2 percent decline in the Mountain division and a 25.8 percent decline in the Pacific division. Declines in the predicted rates in the Northeast and Midwest range between

[6] Since the probit model is based on individual level data and the simulation uses mean values from the different divisions, I will often describe the predicted outcome as the proportion poor rather than the probability of poverty.

8.8 percent and 14.7 percent. Of all characteristics modeled, these changes are by far the largest.

In the fourth and fifth columns, I report results replacing the marital status measure and the number of children, respectively, with values from the New England division. While these changes do reduce poverty rates, the magnitude of the changes is not nearly as large as that found with changes in education ranging from a 0.5 percent decline to 7.7 percent decline depending on the region and variable.

In the sixth column, I report results using the racial and ethnic composition of the New England division. Given the large differences in the South, one finds fairly large reductions in the predicted probabilities here as well. The predicted probability declines 14.4 percent in the South Atlantic division, 9.7 percent in the East South Central division, and 14.3 percent in the West South Central division. Declines in the West range from 6 (Mountain) to 12.7 percent (Pacific), and the proportion falls by 10.7 percent in the Middle Atlantic division. In the Midwest, the poverty rate changes range from a decrease of 6.1 percent (East North Central) to an increase of 1.6 percent (West South Central).

Changes due to the age composition and to unemployment rates are also nontrivial and mostly create declines in predicted poverty rates. With the age composition in the New England division, the percentage change in the proportion poor ranges between a 1.8 percent decline in the Middle Atlantic division to a decline of 10.3 percent in the East South Central division. Unemployment rates, not surprisingly, can also change poverty rates fairly dramatically. While the predicted poverty rate would

rise slightly in the West North Central region, predicted poverty rates are 10.5 percent lower in the West South Central region, 13.1 percent lower in the Middle Atlantic, and 16.1 percent lower in the Pacific division.

Conclusions

Researchers have been interested in the relationship between fertility and poverty for quite a long time. Few, however, have studied how fertility and the characteristics of mothers are related to regional poverty rates in the United States. Using data from the NCHS natality series, I find that while mean fertility rates are similar throughout the United States, women in the South are unique in a variety of dimensions that may explain the high rates of poverty there. Women in the South tend to have their children at younger ages than those in the Midwest and Northeast. Mothers in the South also tend to have much lower levels of education and are more likely to be African American or Hispanic. Interestingly, the characteristics of women in the West are quite similar to those in the South.

Results from the June, 1998 CPS suggest that many characteristics of mothers are statistically significantly related to poverty status, including the mother's race/ ethnicity and education level. Given the sizeable differences in education and race/ethnicity between the regions, I find that an increase in educational attainment among mothers in the South to the level of those in the New England division would reduce poverty rates there between 16 and 26 percent. Interestingly, an increase in educational attainment to the level of New England suggests large reductions in poverty in the West as well: 20.2

percent decline in the Mountain division and a 25.8 percent decline in the Pacific division. Declines in the predicted poverty rates in the Northeast and Midwest range between 8.8 percent and 14.7 percent. Changing the racial composition of the South to that in the New England division would reduce poverty rates between 10 and 14 percent, while declines in the Mountain division would fall 6 percent and in the Pacific division, 12.7 percent.

From a policy perspective, this analysis provides some direction for policy makers: it suggests that changes in maternal education and changes in the racial and ethnic composition of the South and West regions may reduce poverty rates there appreciably. While changes in the racial and ethnic composition of a region are largely outside the realm of topics policymaker normally address, educational status is not. Many of the welfare reforms of the 1990s, particularly the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), set goals to delay the fertility of young women. These results suggest that any program that delays fertility AND increase the educational attainment of these young women should reduce poverty. Furthermore, these programs are most likely to have large impacts in the American South and West. Obviously, when a mother is poor, her circumstances also influence the lives of her children. Results from this study suggest that educational attainment is one way to make the country more equal in terms of economic well-being.

Appendix A – Data Definitions

NCHS Natality Data Set

Race/ethnicity-age-specific fertility rate: total number of births to women of a given age and race/ethnicity divided by the total population of females of the same age and race/ethnicity in the state; I use the *Bridged-Race 1990-1999 Intercensal Population Estimates (Single-year of Age Detail) for Calculating Vital Rates* downloaded from the U.S. Census Bureau Web page: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm. Accessed March 2, 2005.

Education: a continuous measure of the years of education.

Married: an indicator equal to one if the mother was married at the time of the birth.

Number of children: reported as the live birth order for the current child.

African American: indicator variable equal to one if the mother's race/ethnicity was reported as non-Hispanic African American.

Hispanic: indicator equal to one if the mother's race/ethnicity was reported as for Hispanic white or Hispanic African American.

Asian or Pacific Islander: indicator equal to one if the mother's race/ethnicity was reported as non-Hispanic Asian or Pacific Islander or Hispanic Asian or Pacific Islander.

American Indian: indicator equal to one if the mother's race/ethnicity was reported as non-Hispanic American Indian or Hispanic American Indian. This indicator also includes Aleuts and Eskimos.

Age: a set of indicator variables: 15-19, 20-24, 25-29, 30-34, 35-39; 40-44 was the omitted category.

State Unemployment Rate: mean state unemployment rate from 1998 merged using state of residence identifier in the NCHS data set.

June 1998 CPS

For this analysis, I selected all female between the ages of 15 and 44 who had at least one child in the June, 1998 CPS.

Poor: an indicator equal to one if the family is low-income. The CPS reports family income categorically, which makes classifying families poverty status imperfect. The family income measure includes all income for family members aged 15 or older during the last 12 months. The CPS June file reports the total number of persons living in the household rather than family members. I used the following decision rules to define the poverty status of the household based in large part on the poverty thresholds reported by the U.S. Bureau of the Census (2002):

The mother was defined as poor if:

1) Total family income was less than $9,999 regardless of household size

2) Total family income was $10,000 to $12,499 and household size was two or more
3) Total family income was $12,500 to $$19,999 and household size was four or more
4) Total family income was $20,000 to $24,999 and household size was 6 or more
5) Total family income was $25,000 to $29,999 and household size was 8 or more
6) Total family income was $30,000 to $34,999 and household size was 10 or more

Education: The highest grade completed in the CPS is also reported categorically. I used the following decision rules to generate a continuous measure of education:

For the category "less than 1st grade", I assigned 0 years of education.
For the category "1-4th grade", I assigned 2.5 years of education.
For the category "5th or 6th grade", I assigned 5.5 years of education.
For the category "7th or 8th grade", I assigned 7.5 years of education.
For the category "9th grade", I assigned 9 years of education.
For the category "10th grade", I assigned 10 years of education.
For the category "11th grade", I assigned 11 years of education.
For the category "12th grade, no diploma", I assigned 11.5 years of education.
For the category "High School Grad-Diploma or equiv (GED)", I assigned 12 years of education.
For the category "Some college but no degree", I assigned 13 years of education.
For the category "Associate degree", I assigned 14 years of education.
For the category "Bachelor's degree", I assigned 16 years of education.
For the category "Mater's degree", I assigned 1 years of education.
For any professional degree or doctorate, I assigned 20 years of education.

Married: an indicator equal to one if the respondent reported "married, spouse present" or "married, spouse absent," 0 otherwise.

Number of children: response to the question "How many live births, if any, has the {the respondent} ever had?

African American: indicator variable equal to one if the mother's race/ethnicity was reported as non-Hispanic African American. The race and ethnicity variables were reported separately.

Hispanic: indicator equal to one if the mother's race/ethnicity was reported as for Hispanic white or Hispanic African American.

Asian or Pacific Islander: indicator equal to one if the mother's race/ethnicity was reported as non-Hispanic Asian or Pacific Islander or Hispanic Asian or Pacific Islander.

American Indian: indicator equal to one if the mother's race/ethnicity was reported as non-Hispanic American Indian or Hispanic American Indian, Eskimo, or Aleut.

Age: a set of indicator variables: 15-19, 20-24, 25-29, 30-34, 35-39; 40-44 was the omitted category.

All data are weighted by the household weight.

State unemployment rate: merged based on state of residence. To derive Census division estimates the author weighted the state specific rates in the division by the population in the state in 1997.

Appendix B - United States Census Regions and Divisions

Northeast

New England
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

Middle Atlantic
New Jersey
New York
Pennsylvania

Midwest

East North Central
Illinois
Indiana
Michigan
Ohio
Wisconsin

West North Central
Iowa
Kansas
Minnesota
Missouri
Nebraska
North Dakota
South Dakota

South

South Atlantic
Delaware
Florida
Georgia
Maryland
North Carolina
South Carolina
Virginia
Washington, DC
West Virginia

East South Central
Alabama
Kentucky
Mississippi
Tennessee

West South Central
Arkansas
Louisiana
Oklahoma
Texas

West

Mountain
Arizona
Colorado
Idaho
Montana
Nevada
New Mexico
Utah
Wyoming

Pacific
Alaska
California
Hawaii
Oregon
Washington

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Table 1: Percentage of Population by Region, Division, and Race/Ethnicity: 2000

Region	White	Non-Hispanic/Latino White	African American	Hispanic or Latino (of any race)
Northeast	77.5	73.4	11.4	9.8
New England	86.6	83.9	5.2	6.3
Middle Atlantic	74.3	69.7	13.6	11.0
Midwest	83.6	81.4	10.1	4.9
East North Central	81.6	79.0	12.0	5.5
West North Central	88.4	86.9	5.7	3.4
South	72.6	65.8	18.9	11.6
South Atlantic	72.0	66.8	21.3	8.2
East South Central	77.0	76.2	20.1	1.8
West South Central	71.3	58.5	14.4	22.4
West	68.5	58.4	4.9	24.3
Mountain	80.3	70.9	2.9	19.5
Pacific	63.7	53.4	5.7	26.2

Source: U.S. Bureau of the Census (2001), Table 2.

Table 2: Descriptive Statistics for Mothers who Gave Birth in 1998, NCHS Natality Data

	New England	***Middle Atlantic***	***East North Central***	***West North Central***	***South Atlantic***	***East South Central***	***West South Central***	***Mountain***	***Pacific***
Education	13.66	13.20	13.01	13.29	12.94	12.71	12.24	12.68	12.26
	(2.47)	(2.61)	(2.53)	(2.437)	(2.59)	(2.35)	(2.83)	(2.68)	(3.22)
Married	0.719	0.672	0.668	0.711	0.651	0.648	0.665	0.695	0.682
	(0.450)	(0.469)	(0.471)	(0.453)	(0.477)	(0.487)	(0.472)	(0.460)	(0.466)
Number of children	1.93	2.03	2.08	2.07	1.98	1.95	2.05	2.13	2.12
	(1.07)	(1.22)	(1.23)	(1.22)	(1.13)	(1.10)	(1.18)	(1.29)	(1.27)
Non-Hispanic, African American	0.074	0.171	0.157	0.078	0.269	0.256	0.161	0.030	0.060
	(0.262)	(0.377)	(0.364)	(0.268)	(0.444)	(0.437)	(0.367)	(0.172)	(0.238)
Non-Hispanic, White	0.788	0.619	0.733	0.827	0.602	0.712	0.484	0.630	0.421
	(0.409)	(0.486)	(0.443)	(0.378)	(0.490)	(0.453)	(0.500)	(0.483)	(0.494)
Hispanic	0.099	0.153	0.083	0.050	0.098	0.019	0.318	0.269	0.391
	(0.299)	(0.360)	(0.275)	(0.218)	(0.297)	(0.135)	(0.466)	(0.443)	(0.488)
American Indian	0.003	0.002	0.004	0.019	0.005	0.003	0.012	0.045	0.013
	(0.057)	(0.048)	(0.060)	(0.136)	(0.071)	(0.050)	(0.111)	(0.208)	(0.112)
Asian or Pacific Islander	0.011	0.022	0.008	0.005	0.006	0.003	0.006	0.008	0.066
	(0.011)	(0.148)	(0.088)	(0.071)	(0.080)	(0.048)	(0.078)	(0.092)	(0.247)
Age 15-19	0.079	0.089	0.122	0.112	0.131	0.165	0.163	0.132	0.112
	(0.270)	(0.284)	(0.327)	(0.316)	(0.337)	(0.372)	(0.370)	(0.339)	(0.315)
Age 20-24	0.166	0.192	0.241	0.246	0.250	0.306	0.293	0.280	0.237
	(0.372)	(0.394)	(0.428)	(0.430)	(0.433)	(0.461)	(0.455)	(0.449)	(0.425)
Age 25-29	0.265	0.270	0.287	0.296	0.271	0.274	0.269	0.281	0.273
	(0.441)	(0.444)	(0.452)	(0.456)	(0.445)	(0.446)	(0.443)	(0.449)	(0.445)
Age 30-34	0.306	0.280	0.231	0.227	0.222	0.171	0.180	0.194	0.231
	(0.461)	(0.449)	(0.422)	(0.419)	(0.416)	(0.377)	(0.384)	(0.396)	(0.421)
Age 35-39	0.156	0.141	0.101	0.101	0.106	0.071	0.080	0.094	0.121
	(0.363)	(0.348)	(0.301)	(0.302)	(0.308)	(0.257)	(0.272)	(0.292)	(0.326)
Age 40-44	0.028	0.028	0.018	0.017	0.019	0.012	0.015	0.019	0.026
	(0.165)	(0.165)	(0.132)	(0.131)	(0.137)	(0.109)	(0.120)	(0.137)	(0.160)
Unemployment Rate in 1997	3.51	5.07	4.00	3.28	4.08	4.50	4.96	4.39	5.74

Notes: data from NCHS natality series from 1998; unemployment rate calculated as the weighted mean state unemployment rate with weights determined by the state population within each division.

Table 3: Weighted Descriptive Statistics of Mothers in the June 1998, CPS

Variable	*Mean* *(Standard Deviation)*
Poor	0.211 (0.408)
Education	12.814 (2.577)
Married	0.678 (0.467)
Number of children	2.127 (1.077)
Non-Hispanic, African American	0.152 (0.359)
Non-Hispanic, White	0.659 (0.474)
Hispanic	0.142 (0.349)
Asian or Pacific Islander	0.039 (0.193)
American Indian	0.010 (0.100)
Age 15-19	0.025 (0.155)
Age 20-24	0.091 (0.288)
Age 25-29	0.156 (0.363)
Age 30-34	0.216 (0.411)
Age 35-39	0.259 (0.438)
Age 40-44	0.254 (0.435)
State unemployment rate	4.97 (0.980)

Notes: data from the June CPS, 1998; all statistics weighted by the household weight.

Table 4: Results from Probit Model of Mother's Poverty Status

	Coefficient (Standard Error) [Marginal Effect]
Education	-0.154** (0.008) [-0.036]
Married	-0.819** (0.033) [-0.218]
Number of children	0.231** (0.014) [0.054]
Non-Hispanic African American	0.544** (0.042) [0.151]
Hispanic	0.371** (0.047) [0.098]
Asian or Pacific Islander	0.292** (0.089) [0.077]
American Indian	0.402** (0.124) [0.112]
Age 15-19	0.417** (0.091) [0.116]
Age 20-24	0.669** (0.057) [0.198]
Age 25-29	0.500** (0.051) [0.136]
Age 30-34	0.318** (0.049) [0.081]
Age 35-39	0.186** (0.046) [0.045]
State unemployment rate	0.058** (0.016) [0.013]
Constant	0.580** (0.119)

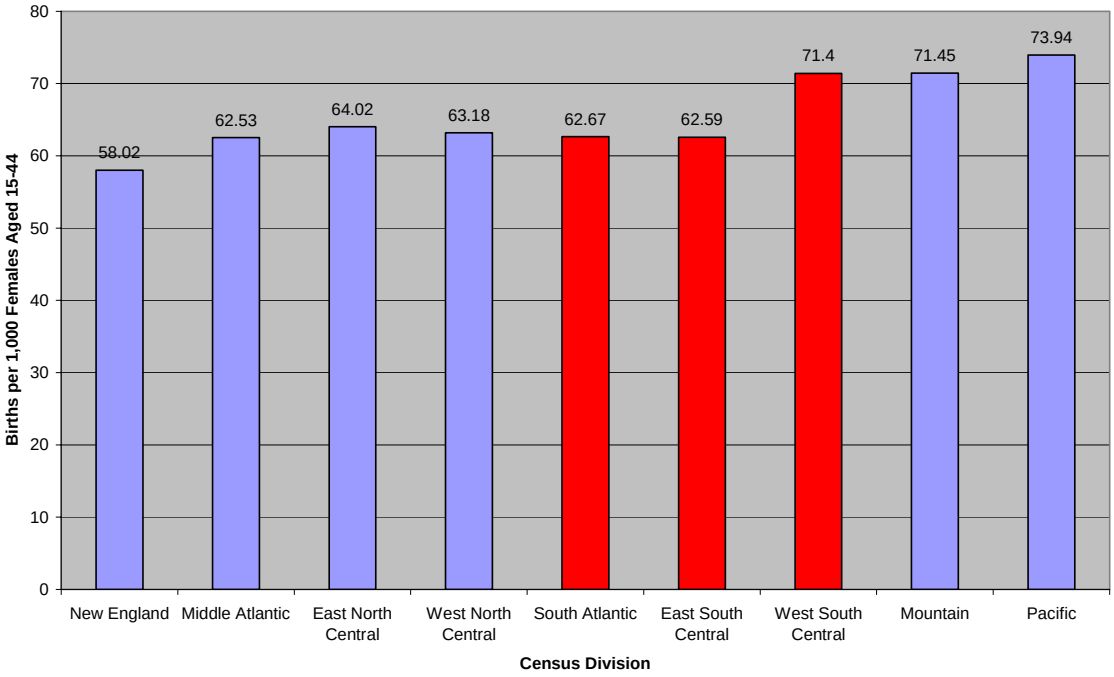
Notes: **p<0.01; the data source is the June 1998 CPS; marginal effects are the change in the probability associated with a one-unit increase in the regressor.

Table 5: Predicted Poverty Rates by Census Division

Census Division	Baseline	NE Educ. (% change)	NE Marriage Rate (% change)	NE Parity (% change)	NE Racial/ Ethnic Comp. (% change)	NE Age Comp. (% change)	NE Unemp. Rate (% change)
New England	0.102						
Middle Atlantic	0.168	0.150 (-10.7)	0.158 (-6.0)	0.162 (-3.6)	0.150 (-10.7)	0.165 (-1.8)	0.146 (-13.1)
East North Central	0.163	0.139 (-14.7)	0.153 (-6.1)	0.155 (-4.9)	0.153 (-6.1)	0.152 (-6.7)	0.156 (-4.3)
West North Central	0.125	0.114 (-8.8)	0.124 (-0.8)	0.119 (-4.8)	0.127 (+1.6)	0.116 (-7.2)	0.128 (+2.4)
South Atlantic	0.181	0.153 (-15.5)	0.167 (-7.7)	0.178 (-1.7)	0.155 (-14.4)	0.170 (-6.1)	0.172 (-5.0)
East South Central	0.195	0.158 (-19.0)	0.180 (-7.7)	0.194 (-0.5)	0.176 (-9.7)	0.175 (-10.3)	0.180 (-7.7)
West South Central	0.237	0.175 (-26.2)	0.223 (-5.9)	0.229 (-3.4)	0.203 (-14.3)	0.216 (-8.9)	0.212 (-10.5)
Mountain	0.183	0.146 (-20.2)	0.178 (-2.7)	0.171 (-6.6)	0.172 (-6.0)	0.168 (-8.2)	0.170 (-7.1)
Pacific	0.236	0.175 (-25.8)	0.227 (-3.8)	0.223 (-5.5)	0.206 (-12.7)	0.226 (-4.2)	0.198 (-16.1)

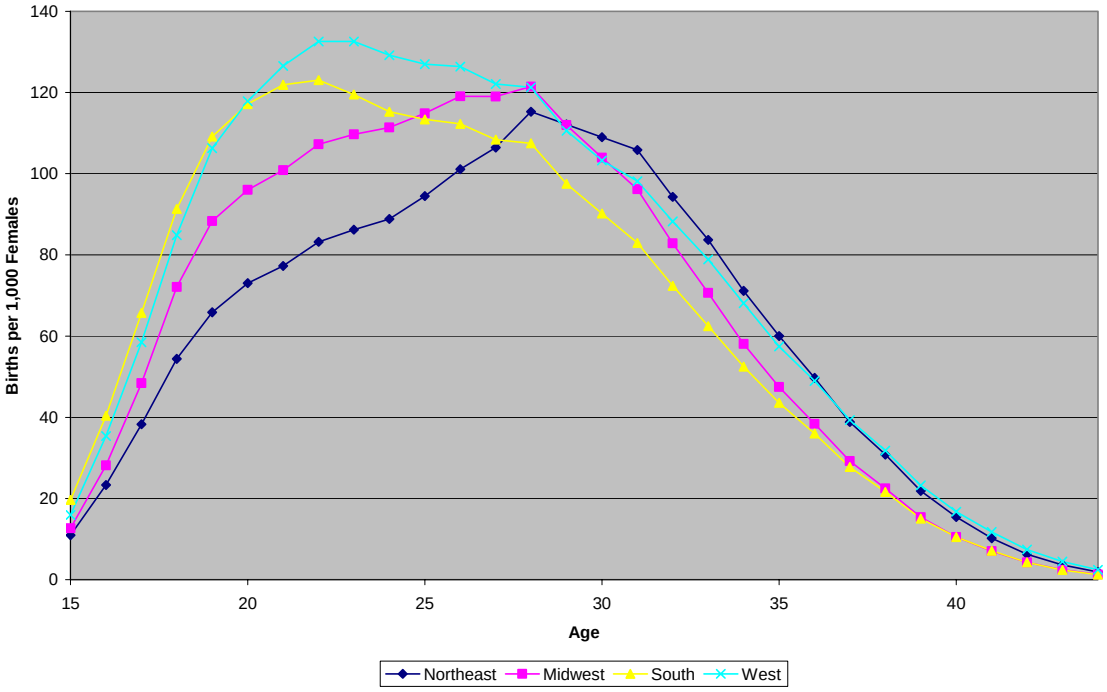
Notes: probabilities are predicted using coefficient estimates from the probit model reported in Table 4 substituting mean values for the covariates by Census division; percentage change compared to the baseline model reported in parentheses.

Figure 1: Fertility Rates by Census Division



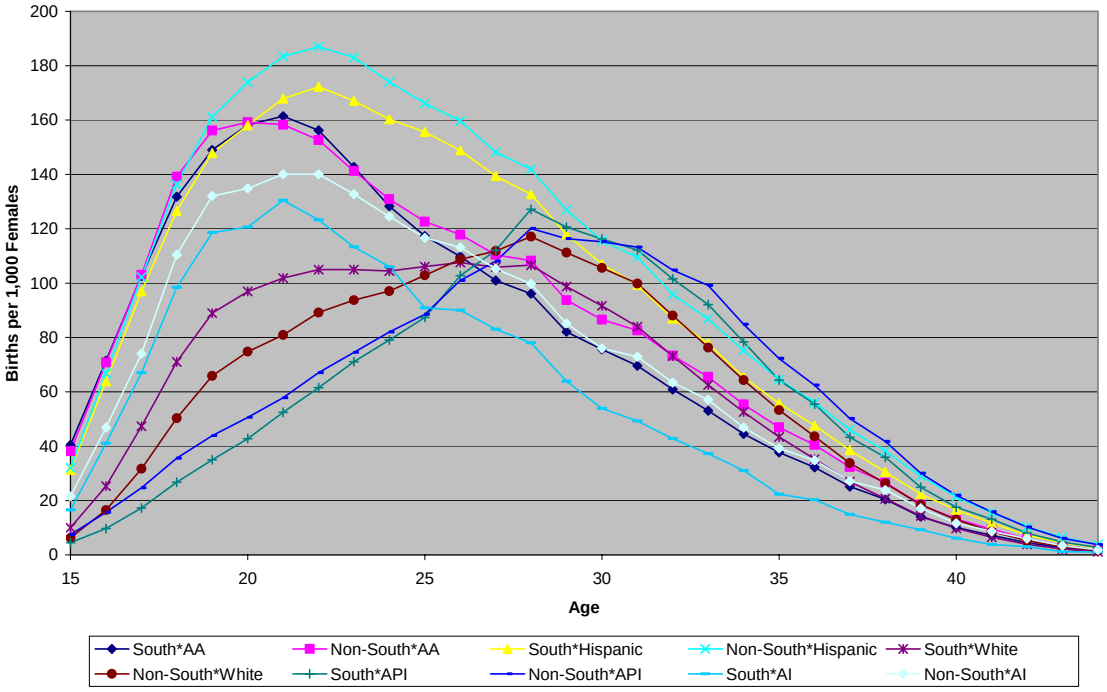
Source: Author's calculations using data described in text.

Figure 2: Age-Specific Fertility Rates by Region



Source: Author's calculations using data described in text.

Figure 3: Age-Specific Fertility Rates by Race/Ethnicity and Region



Source: Author's calculations using data described in text.