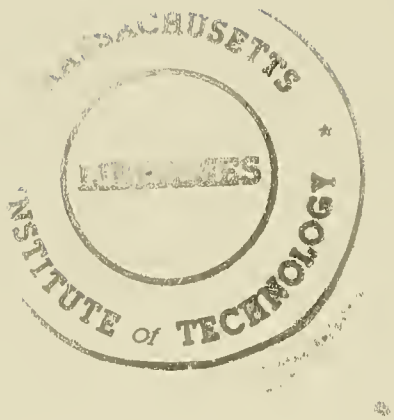
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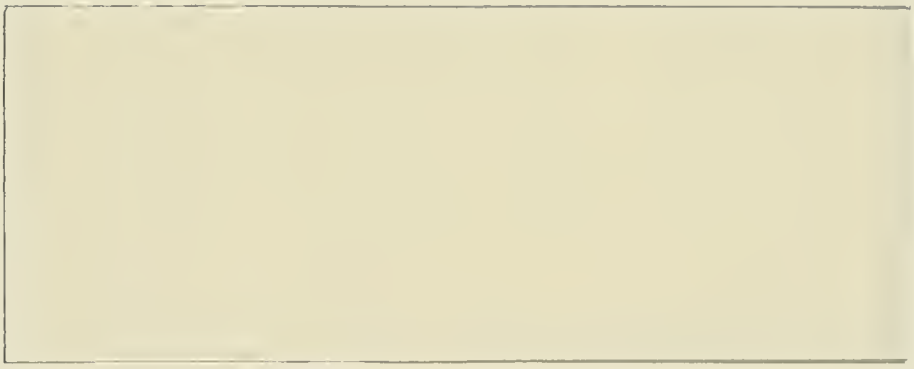

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Abstract

The stated goal of the Aid for Families with Dependent Children program is to improve the well-being of children in poor families. The program has come under considerable attack in recent years from critics who argue that participation in AFDC is associated with maternal behaviors that are bad for children. We investigate this question using birth weight as a measure of child health. We find that participation in AFDC during pregnancy is associated with delays in obtaining prenatal care, smoking and drinking during pregnancy, younger maternal age at the birth, and ultimately with lower birth weights even when observable characteristics of the mother are controlled for. However, we show that when unobservable characteristics of the mother are controlled for, there is actually a positive association between participation in AFDC and the birth weights of children of white women from poor families. We find no association between birth weight and maternal participation in AFDC among black children.

I. Introduction

Aid to Families with Dependent Children (AFDC) was introduced in 1935 as a way to protect children against poverty. For the most part, the program involves cash transfers to single mothers. In 1988, the average monthly number of AFDC recipients was 11 million and the total annual expenditure on the program was 19 billion dollars (Committee on Ways and Means, 1990).

The doubts of policy-makers about the efficacy of a cash transfer program are reflected in the fact that since the late 1960s, an increasing proportion of relief has been provided in the form of in-kind transfers under the Food Stamp, Medicaid, the Special Supplemental Feeding Program for Women Infants and Children (WIC), and public housing programs (Robert Moffitt, 1992). Recently this trend has accelerated: In 1991, 31 states froze nominal AFDC benefits and 9 states proposed deep cuts in cash benefits (Elaine Knapp, 1992).

These policy changes have taken place in a vacuum, since the effects of maternal participation in the AFDC program on the well-being of children have not been investigated.[1] This paper examines the relationship between a mother's participation in AFDC during pregnancy and the birth weight of her child. Birth weight is the single most important indicator of infant health. It is a significant predictor of infant mortality and morbidity, and of health and learning disabilities in later life.[2]

AFDC transfers may increase birth weight by increasing income,

and hence by enabling mothers to purchase "inputs" like prenatal care which improve birth outcomes. A second reason to expect a positive effect of participation is that AFDC mothers have access to a range of other services from the welfare system. For example, over our sample period Medicaid eligibility for those who were not aged, blind, or disabled was closely tied to participation in the AFDC program.[3] Most AFDC mothers also participate in the Food Stamp Program and they are also often given priority in the allocation of public housing and rent subsidies. A positive effect of participation in AFDC given income, might reflect access to these services.

On the other hand, critics like Charles Murray (1984, 1986) argue that the welfare system undermines initiative and self-esteem, and promotes irresponsible behavior. If this is true then participation in AFDC may well have a negative effect on birth weight. For example, income transfers associated with AFDC might be used to purchase products like cigarettes and alcohol which have been shown to have a detrimental effect on birth weight when used during pregnancy.

However, since mothers choose whether to participate in AFDC during pregnancy or not, a negative relationship between birth weight and AFDC participation could reflect characteristics of the mother which both increase the probability of participation and decrease birth weight. Since not all relevant characteristics of the mother are likely to be observed, it is important to control

for both observed and unobserved characteristics of the mother when investigating the relationship between AFDC use and birth weight. Important unobserved characteristics might include the "wantedness" of the child, perceptions of welfare "stigma", illegal drug use, supportiveness of parents, adequacy of housing, stress, and so on.

The next section sketches the conceptual model underlying our empirical work. It is followed by a description of the data, a discussion of our methods and results, and by our conclusions.

II. Conceptual Model

In the tradition of Gary Becker (1965, 1981), Becker and H. Gregg Lewis (1974), and Becker and Nigel Tomes (1976) we assume that household utility depends on consumption, and on the quantity and quality of children. Birth weight is an index of child quality and is "produced" by combining inputs in the manner implied by a birth weight production function.

Previous studies which have estimated birth weight production functions include Hope Corman et al. (1987), Michael Grossman and Theodore Joyce (1990), Mark Rosenzweig and T. Paul Schultz (1982, 1983, 1988) and Rosenzweig and Kenneth Wolpin (1989). Since the modeling issues involved are well laid out in these studies, we offer only the following brief outline.

Given the household budget constraint, the mother maximizes utility subject both to this constraint and to the birth weight production function. Inputs such as prenatal care, cigarette

consumption, and alcohol consumption are chosen directly by the parents. Maternal and neighborhood characteristics such as healthiness, education, and availability of medical care are likely to affect the way such inputs are chosen as well as the efficiency with which they are used. The child's genetic endowment will also affect the shape of the production function.

This maximization problem can be solved to yield a reduced form equation: $BW = f(x_h, x_n, x_c, p, e)$, where birth weight depends on household, neighborhood, and child characteristics, prices, and an error term which reflects unobservable factors. Alternatively the problem can be solved to yield input demand functions which depend on the same set of variables.

Of course, the existence of the AFDC program and of marriage markets imply that the household budget constraint is "kinked" and that the mother chooses to locate on a given segment as part of her maximization problem. If she chooses AFDC, then she cannot work and she usually cannot marry without losing benefits. Following Robert Pollak (1969) and Duncan Thomas et al. (1990, 1991) we estimate birth weight production functions conditional on the mothers' observed choices. In our empirical work, we take care to control for the endogeneity of welfare participation and for the possibility that important variables are unobserved.

III. Data

This study takes advantage of one of the few data sets which makes it possible to link the mother's participation in AFDC during pregnancy to the birth weight of her child: the National Longitudinal Survey of Youth (NLSY).[4] The NLSY began in 1979 with 6,283 young women between the ages of 14 to 21. As of 1989, these women had reported more than 9,000 pregnancies resulting in 7,346 live births to 3822 mothers. Mothers were asked about birth weight once per child starting in 1983. Retrospective information was collected for births in previous years. Every year NLSY respondents are asked whether or not they received AFDC in each month of the preceding year, and the average monthly amount received. Excluding children with missing birth weight or AFDC data leaves approximately 5000 children born between 1979 and 1988.

Almost half of the children are black or hispanic. The sample composition reflects oversampling of these groups. The survey also over-sampled poor households: 73% of the black children, 78% of the hispanic children and 32% of the other children are from the supplemental "poverty" sample. Hence, the sample focuses on the population of young, poor, minority women who are most likely both to receive AFDC and to bear children of low birth weight.

We merged the NLSY data with published annual state and county-level information from several sources. The data is merged using the respondent's state and county of residence in 1979. Conditions in the mother's home in 1979 may or may not be more

important determinants of behavior than conditions in the current place of residence, but since only 13% of mothers moved between 1979 and the birth year, the two sets of measures are highly correlated. Using measures from the place of residence in 1979 minimizes any biases due to endogenous migration decisions.[5]

The state-level information includes the infant mortality rate per 1,000 live births; the number of physicians per 100,000 residents; the number of AFDC, Food Stamp, and Medicaid recipients per 1,000 residents; the average payment per recipient in each of these three programs; the maximum AFDC payment schedule; the state need standard for a family of four[6]; whether pregnant women without other children were eligible for AFDC during pregnancy[7]; whether the state had a "Medically Needy" program covering pregnant women with incomes above the AFDC cutoff; and the maximum of the AFDC, Medically Needy, or federally mandated income cutoff for pregnant women seeking Medicaid coverage.

The county-level data comes from the Department of Commerce (1991) and include population, employment, per capita income, total unemployment benefits paid, and total Food Stamp Program benefits paid. Finally, we merged in the Consumer Price Index All Items (1977=100) from 28 SMSA's and 4 regions. All income and payment variables are deflated using this index. Variable definitions and sources are given in Appendix Table 1.

Measurement error presented serious problems. We "cleaned" the income data by examining movements over time in each component

of the mother's and the spouse or partner's income and identifying large single year changes. In many cases, these changes appeared to be due to double counting: For example, it was not uncommon for a mother to report the same amount for spouse's wage income and the spouse's self-employment income. Further details are given in the data appendix.

We also used the AFDC and Food Stamp Program schedules to "correct" cases in which households reported more AFDC or Food Stamp Program income than the maximum amount they were entitled to. Several women appeared to be reporting the total AFDC income received in the year as the average monthly amount received.[8] Data on birth weight are comparatively accurate, and the distribution of birth weights corresponds well to vital statistics data.[9]

Means of important variables are shown in Table 1 by race and ethnicity. We conduct separate analyses by race and ethnicity because of evidence of systematic differentials in birth weight (c.f. James Cramer, 1987). Mothers received AFDC during pregnancy in about 17% of all births. Black mothers were 16% more likely to have received AFDC than white mothers and 11% more likely to have receive AFDC than hispanic mothers. However, the AFDC benefit per family member was lowest for blacks at $49. per month.

The family composition measures are taken from the interview which took place in the birth year, and adjusted for the presence of the new baby. Children born to women who received AFDC during pregnancy are more likely to have a sibling than those who were

not, which reflects the fact that in many states women were not eligible to receive AFDC for a first pregnancy. Women who received AFDC were less likely to have either a spouse or partner present in the birth year than those who did not[10], and white women on AFDC were more likely to live with their parents.[11]

The last section of Table 1 shows that on average, black children are of lower birth weight than white or hispanic children and that children whose mothers received AFDC during pregnancy are of lower birth weight than other children of the same race. The percentage of children who are of low birth weight (medically defined as less than 2500 grams) is also higher for blacks and AFDC recipients.

Finally, the table lists means for several variables which have been identified as important "inputs" into the production of birth weight. In general, participation in AFDC during pregnancy is associated with behaviors that are known to decrease birth weight. For example, white and hispanic mothers who receive AFDC during pregnancy are more likely to delay obtaining prenatal care beyond the first trimester; black women who received AFDC are more likely to report drinking in the twelve months prior to the birth; women in each racial group are more likely to report that they smoked in the twelve months prior to the pregnancy if they received AFDC; and white AFDC recipients are about a year younger than other white women on average.

IV. Estimation Results

a: Birth Weight Production Functions

We estimated separate models for blacks, hispanics, whites from the poverty sample (poor whites), and non-poor whites. We did not distinguish between poor and non-poor blacks or hispanics because of the small number of black and hispanic mothers who did not belong to the poverty sample.

Regressions of birth weight on participation in AFDC and on a constant term yielded statistically significant negative coefficients on participation for blacks and poor whites: Participation in AFDC is associated with losses of 2.5 and 3 ounces among blacks and poor whites respectively. We did not find any statistically significant association among hispanics or whites who were not from poor families.

Estimates of birth weight production functions which control for observable characteristics of the mother are presented in Table 2. Only estimates for blacks and poor whites are shown because we did not find any statistically significant effects of participation in AFDC on birth weights or on the choice of birth weight inputs among hispanics or non-poor whites.

Measures of the child's endowment which are included are the child's sex, whether the child is the first-born[12], and the mother's height. The included maternal characteristics are: The Armed Forces Qualifications Test (AFQT) score[13]; whether the mother was in a grade appropriate for her age in 1979 ("on time")[14];

whether she lived in an urban area at age 14; the highest grade completed by the mother's mother (the grandmother); the number of mother's siblings; and a dummy variable equal to one if there was an adult male in the household who worked when the mother was 14.

Measures of "neighborhood" characteristics include state-level measures of the quality of medical care (number of physicians, and the infant mortality rate); the rate of welfare recipiency (number of Medicaid, AFDC, and Food Stamp Program recipients per 1000 residents); and all of the county-level variables described above. Dummy variables for the South, the Northeast, and the West were also included in order to capture unobserved regional differences.

Column (1) shows that when observable characteristics of the mother are controlled for, the negative association between AFDC participation and birth weight among blacks becomes statistically insignificant. However, column (5) indicates that among poor whites the negative correlation becomes stronger when observable characteristics are controlled for. Children of these mothers are estimated to weigh an average of 4 ounces less if the mother was on AFDC during pregnancy.

Columns (2) and (6) suggest that some of the negative correlation between birth weight and AFDC participation reflects the fact that mothers on AFDC have low household incomes. When household income is included in an OLS regression, the coefficient on AFDC drops in absolute value and becomes statistically

insignificant in the equation for poor whites. Household income itself has a significantly positive effect: Black birth weights rise .4 of an ounce for each $1000. increment to household income.[15] Poor white birth weights rise a quarter of an ounce. We obtained very similar results using total household income less mother's earned income and AFDC benefits as the measure of income.[16]

Measures of birth weight inputs are added to the models shown in columns (3) and (6). These inputs were chosen on the basis of previous research which has shown them to be important (Rosenzweig and Schultz (1982, 1983, 1988); Rosenzweig and Wolpin (1989)). For blacks, the inclusion of birth weight inputs has little impact on the estimated AFDC and income coefficients although the estimates confirm that smoking has a detrimental effect on birth weight.

In the equation for poor whites, the coefficient on household income becomes statistically insignificant and the point estimate on AFDC participation is reduced in absolute value when birth weight inputs are included in the regression. Smoking during pregnancy appears to have a much bigger negative effect on birth weight among poor whites then it does among blacks: White children of smokers are 11 ounces lighter while black children are only 4 ounces lighter than children of non-smokers.[17]

In a fourth specification which is not shown, we investigated the possibility that the presence of a parent, spouse, or partner might have an effect on birth weight apart from the person's

contribution to household income. We did not find any evidence of a statistically significant effect.[18]

As discussed above, AFDC participation, household income, and birth weight inputs all reflect maternal choices to some extent. The ordinary least squares estimates discussed above do not control for the endogeneity of these variables, but they do suggest that the ordinary least squares coefficients on AFDC participation are biased downwards by the omission of important variables.

In columns (4) and (8) we present two-stage least squares estimates of the effect of AFDC participation on birth weight. In principal, these estimates are purged of omitted variable bias. In addition to the exogenous variables included in the birth weight production functions, the first stage regressions include the following measures of the generosity of state welfare programs: The maximum grant and need standards for a family of four; the average AFDC, Food Stamp Program, and Medicaid payments per recipient; a dummy variable equal to one if a pregnant woman without other eligible children is eligible for AFDC; and the Medicaid income cutoff for pregnant women.

These first-stage regressions are shown in Appendix Table 2. The table shows that the instruments account for 14% of the variation in the probability of AFDC participation for poor whites, and 23% of the variation in this probability for blacks.

The two-stage least squares estimates suggest that all of the observed negative correlation between AFDC participation and birth

weight is due to omitted variables bias: The point estimates become positive when these biases are controlled for and the coefficient for poor whites is statistically significant, if imprecisely determined. The last row of Table 2 shows that the over-identifying restrictions cannot be rejected at conventional levels of confidence.

Turning to the other coefficients reported in Table 2, we observe that the included exogenous variables have less explanatory power for black than for poor white birth weights. Among blacks, we find that genetic endowment is important: Male children and children of taller mothers are heavier. The family background and neighborhood characteristics have little explanatory power with the exception of the dummy variable for whether there was an adult male in the mother's household at age 14 who worked which has a positive effect, and the dummy variable for residence in the Northeast which has a negative effect.

Gender and mother's height are also important determinants of birth weight among poor whites. In addition, first born children are lighter. We also find that mothers with higher AFQT scores have heavier babies. Residence in a county with high Food Stamp Program payments or in a state with high Medicaid recipiency rates is also associated with higher birth weights, while residence in the South is associated with lower birth weights.

b: First Differences

A second method of controlling for omitted variables is to restrict the sample to mother's with more than one child and estimate models which include a "fixed effect" for each mother. We first sort the children of each mother by birth order, and then take first differences. Any factors which are common to both births are "differenced out" by this procedure.[19]

Table 3 shows mean differences in important variables. In 13% of the cases, a mother who received AFDC during the most recent pregnancy, did not receive AFDC during the preceding pregnancy. Hence, these mothers entered AFDC sometime between the births. Exits from AFDC are defined similarly. More mothers entered than exited which reflects the fact that many mothers were ineligible for AFDC during their first pregnancy.

Overall, mothers were also more likely to have gained a spouse than to have a lost a spouse between pregnancies, and they were more likely to have moved away from their parents than to have moved in with them. These changes reflect the aging of the sample. However, women who entered AFDC were more likely to have lost than to have gained a spouse, while 39% of women who exited AFDC gained a spouse. This figure can be compared to Moffitt's (1992) calculation that about half of all exits from AFDC occur because marriage makes a mother ineligible to receive benefits.

More than half of the mothers who entered AFDC were poor in both birth years compared to 25% of all mothers and 39% of mothers

who exited AFDC. Clearly, exit from AFDC by reason of marriage does not necessarily imply escape from poverty. The next row shows that mothers who exited AFDC experienced a gain of only $4000. in household income on average.

The next two rows show differences in the birth weights of siblings by AFDC status and the proportion of the differenced observations which are differences between second and first-born children. First-born children from non-poor families weigh an average of 2 ounces less at birth then second-born children. The differences between children of higher birth order are much smaller and there is no gain in birth weight if the mother was in poverty in both birth years. Since 63% of the observations are differences between second and first-born children and a quarter of the children were born to mothers who were poor in both birth years, the mean difference in birth weights in this sample is only 1.4 ounces. The difference is somewhat smaller for children of mothers who entered AFDC, but children of the relatively few mothers who exited AFDC actually show a mean loss of 1 ounce.

This finding is surprising since the rest of the table shows that mothers who exited AFDC tend to experience reduced delays in obtaining prenatal care, and are more likely to have quit drinking and quit smoking between the births. Mothers who entered AFDC were more likely than other mothers to report that they began drinking between the births.

We used the differenced data to estimate models in which the

difference between sibling birth weights depends on whether the mother entered or exited AFDC, whether she was poor in both birth years, whether she gained or lost a spouse, dummy variables which indicate whether the first child was a boy and the second a girl and vice-versa, and a dummy variable if the difference is taken between a second-born and a first-born child.

The results are shown in Table 4. Alternative specifications which included the change in household income, the change in the number of months of delay in obtaining prenatal care, whether the mother began or quit smoking or drinking, and the change in the mother's age at the birth (the birth interval) are not shown. These variables were not statistically significant in any regression.

Column 1 shows that neither entry into AFDC nor exit from AFDC has a statistically significant effect on the difference in birth weight. The two are not jointly significant either. An F-test of the restriction that both are zero yields a test statistic of 1.602 with a p-value of .206. A dummy variable equal to one if the mother was in poverty for both births is entered in column 2. Such long-term poverty significantly reduces the difference in birth weight, but including it in the regression has little effect on the estimated coefficients on exit or entry into AFDC. Including dummy variables equal to one if the mother gained or lost a spouse between the birth years also increases the explanatory power of the model without altering the estimated AFDC coefficients.

Table 4 confirms that when omitted variables are controlled

for by "differencing out" mother fixed effects, there are no statistically significant effects of entry or exit from the AFDC program on birth weight.[20] One interpretation of this result is that the AFDC program provides an effective safety net: Children of mothers who are forced to enter AFDC as a result of a negative shock such as the loss of a spouse, do not suffer negative consequences.

c: Amounts of AFDC Received

A third way to control for the fact that AFDC reflects choices made by the mother is to focus only on the subset of mothers who actually received AFDC and to see whether the amount that they received had an impact on birth weight. We estimated several sets of models similar to the ordinary least squares models in Table 2. Each set of models included one of the following amounts measured as the real amount received per family member during the pregnancy: The average monthly AFDC payment; the number of months AFDC was received; the average monthly amount of AFDC and Food Stamp Program income combined; the total amount of AFDC income received; and the total amount of AFDC and Food Stamp Program income combined. None of the estimated coefficients were statistically significant.

This result must be interpreted with caution because of the small sample sizes, and measurement error in the reported amounts received. However, taken at face value and coupled with the small effects of income which were found in Table 2, it suggests that

AFDC payments are too small to have a direct effect on birth weight. In this case the positive effect of participation in AFDC on the birth weight of poor whites reflects better maternal access to social services rather than a direct effect of the income transfer.

d: Input Demand Functions

As noted above, the mother's maximization problem can be solved to yield input demand functions which depend on the same variables as the birth weight production functions. Tables 1 and 3 suggested that women on AFDC were less likely have adequate prenatal care, and more likely to smoke and drink. White AFDC mothers were also younger than other mothers.[21]

In this section, we investigate the extent to which these findings represent omitted variable bias. Table 5 confirms using ordinary least squares that participation in AFDC is associated with behaviors detrimental to birth weight among both blacks and poor whites, even after observable child, mother, county and state-level characteristics are controlled for. Similar findings were obtained using probits for the dichotomous variables. We did not find statistically significant effects of AFDC participation among non-poor whites or hispanics.

In Table 6, AFDC participation is instrumented using the measures of state welfare program generosity, and the child, mother, county and state-level variables discussed above. All of

the coefficients on AFDC participation become statistically insignificant with the exception of the coefficient in column 2: Black mothers on AFDC are more likely to smoke during pregnancy than those who do not receive AFDC.

Table 6 also shows that black mothers in higher population and higher income counties are less likely to delay obtaining prenatal care while poor white mothers are less likely to delay obtaining prenatal care beyond the first trimester if it is their first child. White mothers with higher AFQT scores are also less likely to delay.

Taller black women and those in states with higher infant mortality rates are more likely to smoke. Among white women, smoking is less likely if the mother was "on time" in school at age 14. Mothers with higher AFQT scores are more likely to drink, as are black women who had a working adult male present in the household at age 14 or who live in the Northeast. Poor white women who live in higher per capita income counties are also more likely to drink. Hence drinking seems to be positively associated with economic status.

The exogenous variables explain more of the variation in mother's age at the birth than of the other inputs. Mother's age at the birth increases with mother's height, being on time in school at age 14, having a working adult male present at age 14, living in a higher per capita income county, living in a state with high AFDC recipiency rates, and living in the South. For blacks,

living in an urban area at age 14, or in the West is associated with lower maternal age. For poor whites, maternal age increases with grandmother's education and decreases with total county food stamp payments and Medicaid recipiency rates.

The Chi-squared statistics in the last row of the table show that although the over-identifying restrictions are not rejected in the equations for delay in obtaining prenatal care, drinking, or smoking, they are decisively rejected in the equations for maternal age. This result suggests that the generosity of state AFDC programs has a direct effect on maternal age which is not captured by the other variables included in the model.

Estimation of the reduced form equations indicated that higher maximum AFDC grants and AFDC eligibility for pregnant women without other eligible children are associated with lower maternal age. Participation in AFDC remained statistically significant and negative in the reduced forms, but it is difficult to draw any causal inference about participation and maternal age given the possibility of omitted variables bias in OLS regressions.

V. Extensions

One of the most important potential limitations of the work discussed above is that we have not controlled for two sources of selection bias. The first is that the existence of the program may encourage women to have children out of wedlock. The evidence in support of this proposition is weak. Kirstin Moore and Steven

Caldwell (1977), Gregg Duncan and Saul Hoffman (1990), and David Ellwood and Mary Joe Bane (1985), all show that AFDC benefit levels are not related to the probability of an out-of-wedlock birth.[22]

A related issue is that the sample of births is a selected sample of pregnancy outcomes (Joyce (1987), and Grossman and Joyce (1990a, 1990b)). Since the vast majority of abortions are obtained by unmarried women[23] the probability of having an out-of-wedlock birth is likely to be inversely related to the probability of having an abortion. If participation in AFDC increases the probability that an infant from the lower tail of the birth weight distribution is born rather than aborted or lost, then selection effects could mask an increase in birth weight among the other infants.

This possibility is investigated in Currie and Cole (1991). We do not find any affect of participation in AFDC on the probability that the pregnancy terminates in an abortion or a pregnancy loss.

We have also experimented with including state dummies, and excluding first-born children from the analysis. Estimates based on taking first-differences between sister's children (i.e. controlling for maternal background characteristics) are presented in Currie and Cole (1991). None of these procedures changed our substantive conclusions.

Finally, like the previous literature, we have focused on birth weight rather than on the probability that a child is of low

birth weight. Rachel Schwartz (1989) reports that neonates weighing less than 2500 grams account for 9% of neonatal hospital caseloads and 57% of the cost of neonatal hospital care, hence these cases are of special interest. But since children of low birth weight are only a small fraction of our sample, we find that estimates of the effects of participation in AFDC on the probability of low birth weight are very imprecise. However, evidence surveyed in Barbara Devaney et al. (1991) indicates that among low income women increases in mean birth weight of even 1 ounce pay for themselves by reducing the need for costly neo-natal care.[24] This result provides a justification for examining birth weights.

VI: Discussion and Conclusions

Our results suggest that critics like Charles Murray are correct in observing that participation in AFDC is associated with undesirable maternal behaviors. Mothers on AFDC are more likely to have children at younger ages, to smoke, to drink, and to delay obtaining prenatal care. It is hardly surprising then that women who participate in AFDC during pregnancy bear children of lower birth weight than other mothers with similar observable characteristics.

However, we show that the association between participation in AFDC and poor pregnancy outcomes disappears when omitted unobservable variables are controlled for using either instrumental

variables techniques, or models with mother fixed effects. In fact instrumental variables techniques yield a positive, if imprecisely estimated, effect of participation in AFDC on the birth weights of children born to white women from the poverty sample. These findings suggest that the same mothers who are most likely to participate in AFDC are also most at risk of having low birth weight babies but that this relationship is not causal.

The first-differenced estimates show that children of mothers who entered AFDC between two births, do not experience any loss in birth weight relative to children of mothers who did not. Hence the AFDC program appears to provide an effective safety net for these mothers.

However, our finding that given AFDC participation, the amount of AFDC received has no effect on birth weight suggests that the main effect of AFDC on birth weight is through access to the other services that the "deserving poor" are entitled to. This finding should be viewed with caution given the small sample sizes, but it does suggest that future research be directed at identifying those services which are most important.

Finally, it should be kept in mind that birth weight is only one measure of child health and that maternal participation in AFDC may well have impacts on the health and development of older children.

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1. The only exceptions that we know of are investigations of the inter-generational transfer of welfare dependency (see Moffitt (1992) for a recent survey) and work by Anne Hill and June O'Neill (1992) which shows that children of mother's who were long-term recipients of AFDC have lower scores on standardized tests.

2. As examples of the extensive literature on the negative effects of low birth weight see L. Baumgartner (1962), Deborah Carran (1989), Steven Chaikind and Hope Corman (1990), H.C. Chase (1969), V. Eisner et al. (1979), Nancy Klein et al. (1989), and Jessie Francis Williams and Pamela Davies (1974).

3. Since April 1987, there has been a dramatic expansion of Medicaid coverage to pregnant women. The last children in our sample were born in 1988, so this expansion post-dates most of our sample. Unfortunately, the data do not allow us to identify whether a pregnant woman was covered by Medicaid if she was not on AFDC. However, Currie and Cole (1991) shows that restricting the sample to children born before 1988 does not change our substantive conclusions.

4. For example, the Survey of Income and Program Participation contains better information about participation in entitlement programs but does not include birth weight.

7. See Moffitt (1992) for a review of the literature on welfare and migration.

6. The need standard determines whether a family is eligible to receive AFDC benefits. Normally, the state only pays a fraction of this standard.

7. As of 1988, 31 states and the District of Columbia allowed women without other eligible children receive AFDC benefits, with eligibility beginning in the sixth or seventh month of pregnancy. Since 1981, 5 states have adopted such laws and 4 states have discontinued them. Pennsylvania canceled an existing program in 1982 and reinstated it in 1985 (U.S. Department of Health and Human Services, various years).

8. We cannot check the accuracy of the participation data. However, there is some evidence that participation is more accurately reported than amounts received. In a comparison of responses to the Survey of Income and Program Participation to administrative records, Kent Marquis and Jeffrey Moore (1990) found that fewer than 2% of respondents erroneously reported participation or non-participation in AFDC or the Food Stamp

Program.

9. In contrast, the distribution of gestational ages in the NLSY has a pronounced peak at 39 weeks which is not present in vital statistics data. Hence, we rejected gestational age as an alternative measure of infant health.

10. Forty percent of the "spouses or partners" of women on AFDC were unmarried partners. Of women who participated in AFDC during pregnancy and reported a spouse present in the birth year, 103 reported that the spouse was present in the year before the birth, 55 did not report that a spouse present in the previous year, and in 13 cases it could not be determined whether a spouse was present in the previous year.

11. These results are consistent with David Ellwood and Mary Joe Bane's findings using the Survey of Income and Education (1985).

12. First-born children are usually lighter. Differentiating between children of higher birth order did not increase the explanatory power of the regression.

13. The AFQT score was administered to all respondents in 1979. Since the mothers were of different ages, we normalize the scores by dividing by the average score for mothers of each age.

14. Because of the young age of our sample we felt that it was inappropriate to use the highest grade completed by the mother as the measure of educational attainment: The mother's highest grade might be determined simultaneously with her fertility decisions.

15. The fact that income and birth weight are positively correlated is well established (c.f. James Cramer, 1987).

16. This measure of "unearned income" is arguably less subject to endogeneity bias than total household income.

17. This finding is consistent with evidence that white women who smoke during pregnancy typically smoke more than black women (James Cramer, 1987).

18. This result is consistent with the findings of Rosenzweig and Wolpin (1992).

19. Twenty observations with differences greater than 80 ounces in absolute value were deleted.

20. We recognize that entry and exit may be viewed by some as endogenous choices of the mother, even when all fixed maternal characteristics are controlled for. We tried instrumenting entry and exit using both the measures of state welfare program generosity discussed above and the maternal characteristics included in Table 2. However, these variables explained less than 4% of the variation in the entry and exit probabilities, and the two-stage least squares results were extremely sensitive to the specification chosen. Some of these results appear in Currie and Cole (1991). The coefficients on changes in AFDC status were not statistically significant.

21. For a discussion of the controversy surrounding the effects of the mother's age at the birth see Arleen Geronimus and Sanders Korenman (1990).

22. However, Arleen Leibowitz, et al. (1986) and Grossman and Joyce (1990) find that Medicaid coverage is associated with an increase in the probability of an out-of-wedlock birth and a decrease in the probability of obtaining an abortion, respectively. Similarly, Moffitt and Barbara Wolfe (1990) find that the potential loss of Medicaid benefits has much greater work disincentive effects than even large changes in benefit levels.

23. According to Stanley Henshaw, et al. 82% of abortions are obtained by unmarried women (1991)).

24. The low income populations they study are recipients of the Supplemental Feeding Program for Women, Infants, and Children (WIC) from several states.

Table 1

Means of Key Variables

	Black		White		Hispanic	
	All	AFDC	All	AFDC	All	AFDC
Family Income and Composition						
AFDC During Pregnancy	.282	...	.116	...	.171	...
Monthly AFDC Payment per Family Member	...	.049 (.002)[1]	...	.057 (.002)	...	.067 (.003)
Household Income (1000's)	5.441 (.168)	3.570 (.126)	11.660 (.176)	5.086 (.268)	8.889 (.263)	4.787 (.414)
# Household Members	3.100 (.031)	3.457 (.060)	3.456 (.020)	3.494 (.071)	3.465 (.039)	3.597 (.111)
# Children	1.768 (.026)	2.316 (.054)	1.627 (.017)	2.019 (.060)	1.749 (.033)	2.244 (.099)
Spouse or Partner	.332	.150	.827	.475	.703	.351
One or Both Maternal Parents	.450	.389	.136	.255	.259	.254
Poverty Sample	.731	.731	.313	.468	.783	.793
Birth Weight and Birth Weight Inputs						
Mean Birth Weight (ounces)	111.137 (.616)	109.532 (1.223)	118.391 (.441)	116.053 (1.422)	116.259 (.765)	114.726 (1.850)
Low Birth Weight	.125	.142	.073	.091	.088	.104
Delayed Prenatal Care	.225	.237	.185	.323	.263	.311
Mother's Age at the Birth	21.338 (.085)	21.639 (.145)	22.413 (.064)	21.601 (.171)	21.815 (.107)	21.704 (.256)
Mother Drank	.345	.393	.528	.506	.314	.326
Mother Smoked	.312	.436	.451	.681	.203	.289
Number of Observations[2]	1229	346	2279	263	800	135

[1] Standard error of the mean in parentheses.
[2] The unit of observation is the birth, not the mother.

Table 2

Regression of Birth Weight on AFDC Participation

	Black				Poor White			
	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) OLS	(6) OLS	(7) OLS	(8) 2SLS
AFDC During Pregnancy	-2.112 (1.605)[1]	-.664 (1.644)	-.265 (1.648)	5.217 (12.665)	-4.340 (2.237)	-3.248 (2.297)	-1.206 (2.246)	25.610 (15.230)
Household Income (1000's)		.447 (.122)	.456 (.132)			.248 (.124)	.106 (.131)	
Birth Weight Inputs								
Delayed Prenatal Care			-2.145 (1.526)				-.832 (2.054)	
Smoked			-3.633 (1.459)				-11.229 (1.659)	
Drank			-.174 (1.387)				-2.930 (1.703)	
Mother's Age at Birth			-.303 (.288)				.055 (.333)	
Child and Mother Characteristics								
Child Male	3.344 (1.264)	3.397 (1.257)	3.330 (1.257)	3.516 (1.264)	5.972 (1.635)	5.926 (1.631)	6.135 (1.570)	5.859 (1.775)
Child Firstborn	.702 (1.415)	2.009 (1.451)	1.267 (1.515)	2.789 (3.941)	-3.979 (1.706)	-3.919 (1.703)	-3.987 (1.688)	-.031 (2.808)
Mother's Height	1.069 (.225)	1.056 (.224)	1.126 (.225)	1.066 (.226)	1.198 (.329)	1.154 (.329)	1.188 (.317)	1.445 (.362)
On Time in School	1.192 (1.484)	.332 (1.495)	.459 (1.496)	1.781 (1.445)	1.105 (2.172)	.872 (2.170)	-.292 (2.096)	3.115 (2.401)
AFQT Score	2.491 (2.656)	.974 (2.673)	.340 (2.689)	3.655 (3.173)	7.791 (2.993)	6.800 (3.026)	7.177 (3.041)	12.493 (3.841)
Urban at 14	.146 (1.720)	.576 (1.714)	.293 (1.719)	.042 (1.679)	-3.466 (2.010)	-3.241 (2.009)	-2.529 (1.935)	-2.822 (2.182)
Grandmother's Education	-.124 (.274)	-.185 (.273)	-.200 (.272)	.120 (.303)	.522 (.380)	.378 (.386)	.467 (.374)	.366 (.418)
# Mother's Siblings	.028 (.207)	.013 (.206)	-.023 (.206)	.121 (.203)	-.022 (.359)	-.028 (.359)	.003 (.345)	.185 (.394)
Adult Male in HH Worked	1.865 (1.307)	1.277 (1.309)	1.522 (1.329)	2.120 (1.417)	.329 (1.847)	-.194 (1.861)	-.482 (1.825)	2.035 (2.223)
County Characteristics								
Population (millions)	-.038 (.359)	-.069 (.357)	-.066 (.357)	-.140 (.350)	.460 (.641)	.368 (.641)	.308 (.618)	.730 (.701)
Employment (millions)	.775 (5.651)	.921 (5.619)	1.032 (5.617)	1.826 (5.502)	-13.089 (10.131)	-11.618 (10.133)	-9.859 (9.739)	-12.610 (10.400)
Per Capita Income (millions)	-.878 (.588)	-.961 (.585)	-.886 (.586)	-1.192 (.564)	.021 (.819)	-.246 (.827)	-.299 (.801)	-.045 (.872)

Table 2 (continued)

	Black				Poor White			
	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) OLS	(6) OLS	(7) OLS	(8) 2SLS
UI Benefits Paid (millions)	-.004	-.003	-.003	-.007	-.036	-.035	-.033	-.053
	(.012)	(.012)	(.012)	(.012)	(.050)	(.049)	(.048)	(.055)
Food Stamp Benefits Paid (millions)	.006	.010	.010	.020	.269	.283	.228	.163
	(.031)	(.031)	(.031)	(.031)	(.140)	(.140)	(.135)	(.142)
State Characteristics								
# Physicians (per 100,000)	.030	.030	.032	.026	-.009	-.011	-.022	-.022
	(.019)	(.019)	(.019)	(.018)	(.030)	(.030)	(.029)	(.032)
Infant Mortality Rate (per 100,000 births)	-.094	.087	-.053	-.113	.193	.417	.398	-.313
	(.483)	(.482)	(.522)	(.491)	(.722)	(.729)	(.766)	(.795)
Medicaid Recipients (per 1000)	.072	.065	.079	.031	.163	.175	.147	.030
	(.061)	(.061)	(.061)	(.060)	(.067)	(.067)	(.066)	(.093)
AFDC Recipients (per 1000)	-.191	-.207	-.223	-.114	-.245	-.262	-.186	-.059
	(.120)	(.119)	(.120)	(.122)	(.165)	(.165)	(.162)	(.184)
Food Stamp Recipients (per 1000)	-.012	-.007	-.008	-.024	.036	.032	.014	.051
	(.036)	(.036)	(.036)	(.037)	(.049)	(.049)	(.048)	(.056)
South	-2.234	-3.062	-3.092	.334	-7.036	-7.904	-6.745	-.519
	(3.002)	(2.994)	(3.042)	(4.532)	(3.747)	(3.763)	(3.707)	(4.597)
North East	-6.014	-5.962	-5.855	-4.161	-2.827	-3.027	-.304	4.146
	(2.860)	(2.844)	(2.852)	(4.072)	(3.698)	(3.691)	(3.579)	(4.796)
West	-1.531	-1.199	-2.436	.912	-.548	-.816	-1.271	2.517
	(4.255)	(4.232)	(4.252)	(4.606)	(3.006)	(3.001)	(2.890)	(3.547)
Degrees of Freedom	1093	1092	1088	1186	617	616	612	663
Intercept	45.975	45.702	50.820	41.280	21.526	24.830	31.173	-2.474
	(15.616)	(15.528)	(16.660)	(16.944)	(23.249)	(23.251)	(23.773)	(26.803)
R-squared	.049	.061	.069	.052	.105	.111	.185	.092
Chi-squared Test of the Overidentifying Restrictions[2]				6.731				3.123

[1] Standard errors are in parentheses.
[2] The critical value is 12.592.

Table 3

Mean Differences Between Siblings

	All	Entered AFDC	Exited AFDC
Mother Entered AFDC	.127	...	...
Mother Exited AFDC	.043	...	...
Gained Spouse	.152	.102	.386
Lost Spouse	.045	.142	.060
Moved in with Parents	.020	.024	.036
Moved out of Parents	.105	.142	.133
Poor Both Births	.251	.520	.289
Change in Household Income (thousands)	1.705 (.146)[1]	.667 (.254)	3.978 (.865)
Difference in Birth Weight (ounces)	1.378 (.473)	.833 (1.278)	-1.000 (2.447)
% of Differences that are Second minus First-born	.627	.675	.386
Change in Delay (months)	.000 (.055)	.108 (.183)	-0.209 (.246)
Difference in Mother's Age at the Birth (years)	2.657 (.036)	3.004 (.113)	2.711 (.168)
Began Drinking	.140	.176	.078
Stopped Drinking	.129	.106	.182
Began Smoking	.059	.075	.013
Stopped Smoking	.066	.040	.182
Number of Observations[2]	1933	246	83

[1] Standard error of the mean in parentheses.
[2] This is the number of first differenced observations. All differences are between a younger and an older child.

Table 4

Ordinary Least Squares Regressions of Sibling Differences in Birth Weight on Changes in AFDC Status[1]

	(1)	(2)	(3)
Entered AFDC Between Births	-.902 (1.421)[2]	-.046 (1.468)	.279 (1.492)
Exited AFDC Between Births	-2.176 (2.347)	-2.123 (2.345)	-2.584 (2.371)
Poor Both Births		-2.653 (1.166)	-2.694 (1.166)
Gained Spouse			1.948 (1.339)
Lost Spouse			-1.870 (2.327)
Girl then Boy	3.648 (1.160)	3.618 (1.159)	3.565 (1.159)
Boy then Girl	-1.733 (1.159)	-1.745 (1.157)	-1.723 (1.157)
Differences Between 2nd & 1st Born	1.031 (.982)	.379 (1.022)	.149 (1.030)
Intercept	.470 (.924)	1.445 (1.018)	1.373 (1.032)
Degrees of Freedom	1927	1926	1925
R-squared	.010	.013	.014

[1] Differences are between younger and older children.
[2] Standard errors are in parentheses.

Table 5

OLS Regressions of Birth Weight Inputs on AFDC Participation

	Black				Poor White			
	(1) Delayed	(2) Smoked	(3) Drank	(4) M's Age	(5) Delayed	(6) Smoked	(7) Drank	(8) M's Age
AFDC During Pregnancy	.035 (.032)[1]	.122 (.034)	.068 (.036)	-.538 (.182)	.167 (.042)	.219 (.054)	.001 (.052)	-1.262 (.284)
Child and Mother Characteristics								
Child Male	.030 (.025)	-.023 (.027)	-.052 (.028)	-.127 (.143)	.012 (.031)	.010 (.039)	.025 (.038)	.298 (.207)
Child Firstborn	.027 (.028)	-.055 (.030)	-.068 (.032)	-2.028 (.160)	-.052 (.032)	-.014 (.041)	.034 (.039)	-1.197 (.217)
Mother's Height	-.003 (.004)	.016 (.005)	.006 (.005)	.068 (.025)	.006 (.006)	.001 (.008)	-.002 (.008)	.054 (.042)
On Time in School	-.026 (.029)	-.006 (.032)	-.020 (.033)	.743 (.168)	.014 (.041)	-.108 (.052)	-.021 (.050)	.565 (.276)
AFQT Score	-.033 (.053)	-.132 (.056)	.119 (.059)	-.248 (.300)	-.053 (.057)	-.129 (.072)	.438 (.069)	-.414 (.380)
Urban at 14	-.047 (.034)	.006 (.037)	-.035 (.038)	-.681 (.195)	-.005 (.038)	.079 (.048)	-.015 (.046)	-.044 (.255)
Grandmother's Education	-.002 (.005)	-.005 (.006)	.009 (.006)	.020 (.031)	-.001 (.007)	.001 (.009)	.003 (.009)	.223 (.048)
# Mother's Siblings	-.000 (.004)	-.011 (.004)	-.007 (.005)	.023 (.023)	.006 (.007)	.003 (.009)	-.004 (.008)	-.048 (.046)
Adult Male in HH Worked	.002 (.026)	-.018 (.028)	.090 (.029)	1.003 (.148)	-.023 (.035)	-.058 (.044)	.054 (.043)	1.392 (.234)
County Characteristics								
Population (millions)	-.017 (.007)	.009 (.008)	-.001 (.008)	.019 (.041)	.013 (.012)	-.006 (.015)	-.016 (.015)	.101 (.081)
Employment (millions)	.225 (.112)	-.098 (.120)	.049 (.126)	-.090 (.639)	.013 (.192)	.199 (.243)	.102 (.234)	-.943 (1.286)
Per Capita Income (millions)	-.020 (.012)	.020 (.012)	-.002 (.013)	.148 (.067)	-.006 (.016)	-.027 (.020)	.043 (.019)	.345 (.104)
UI Benefits Paid (millions)	.001 (.000)	.000 (.000)	-.000 (.000)	-.005 (.001)	-.002 (.001)	-.000 (.001)	.002 (.001)	.001 (.006)
Food Stamp Benefits Paid (millions)	-.000 (.001)	-.000 (.001)	.001 (.001)	.008 (.004)	-.002 (.003)	-.003 (.003)	-.004 (.003)	-.032 (.018)
State Characteristics								
# Physicians (per 100,000)	.000 (.000)	-.000 (.000)	-.001 (.000)	.008 (.002)	-.001 (.001)	-.001 (.001)	-.000 (.001)	.012 (.004)
Infant Mortality Rate (per 100,000 births)	-.001 (.010)	.024 (.010)	.003 (.011)	-.760 (.055)	-.003 (.014)	.004 (.017)	.002 (.017)	-1.062 (.092)
Medicaid Recipients (per 1000)	.001 (.001)	.004 (.001)	-.002 (.001)	-.001 (.007)	-.003 (.001)	-.001 (.002)	-.002 (.002)	-.038 (.009)

Table 5 (continued)

	Black				Poor White			
	(1) Delayed	(2) Smoked	(3) Drank	(4) M's Age	(5) Delayed	(6) Smoked	(7) Drank	(8) M's Age
State Characteristics (continued)								
AFDC Recipients (per 1000)	-.001 (.002)	-.008 (.003)	.004 (.003)	.046 (.014)	.006 (.003)	.003 (.004)	.010 (.004)	.084 (.021)
Food Stamp Recipients (per 1000)	-.000 (.001)	-.001 (.001)	-.001 (.001)	.005 (.004)	-.000 (.001)	-.001 (.001)	-.002 (.001)	.011 (.006)
South	.006 (.059)	-.184 (.064)	.067 (.067)	2.078 (.340)	.087 (.071)	.025 (.090)	.157 (.086)	2.779 (.476)
North East	.052 (.057)	.031 (.061)	.178 (.064)	-.489 (.324)	.157 (.070)	.180 (.089)	.157 (.085)	-.026 (.469)
West	-.068 (.084)	-.187 (.090)	.070 (.095)	-1.422 (.481)	.003 (.057)	-.072 (.072)	.069 (.069)	-.018 (.382)
Intercept	.638 (.309)	-.679 (.331)	-.114 (.349)	20.605 (1.767)	-.090 (.441)	.922 (.557)	-.294 (.536)	21.511 (2.951)
Degrees of Freedom	1093	1093	1093	1093	617	617	617	617
R-squared	.029	.086	.047	.366	.062	.085	.151	.391

[1] Standard errors in parentheses.

Table 6

2SLS Regressions of Birth Weight Inputs on AFDC Participation

	Black				Poor White			
	(1) Delayed	(2) Smoked	(3) Drank	(4) M's Age	(5) Delayed	(6) Smoked	(7) Drank	(8) M's Age
AFDC During Pregnancy	.091 (.284)[1]	.574 (.328)	.635 (.355)	-.309 (1.622)	-.498 (.313)	.426 (.337)	-.367 (.334)	-.073 (1.792)
Child and Mother Characteristics								
Child Male	.028 (.026)	-.036 (.030)	-.068 (.033)	-.133 (.150)	.018 (.037)	.009 (.040)	.028 (.039)	.288 (.211)
Child Firstborn	.043 (.085)	.074 (.098)	.094 (.107)	-1.963 (.487)	-.139 (.056)	.013 (.060)	-.014 (.059)	-1.042 (.319)
Mother's Height	-.004 (.005)	.014 (.005)	.004 (.006)	.067 (.026)	.002 (.008)	.002 (.008)	-.005 (.008)	.061 (.044)
On Time in School	-.026 (.029)	-.006 (.034)	-.020 (.037)	.743 (.168)	-.021 (.051)	-.097 (.055)	-.041 (.055)	.627 (.295)
AFQT Score	-.024 (.067)	-.065 (.078)	.203 (.084)	-.214 (.384)	-.148 (.080)	-.100 (.087)	.385 (.086)	-.244 (.461)
Urban at 14	-.045 (.037)	.027 (.042)	-.009 (.046)	-.670 (.209)	-.002 (.045)	.078 (.049)	-.014 (.048)	-.049 (.259)
Grandmother's Education	-.001 (.006)	.000 (.007)	.015 (.008)	.022 (.035)	.002 (.009)	.000 (.009)	.005 (.009)	.218 (.049)
# Mother's Siblings	-.001 (.004)	-.011 (.005)	-.007 (.005)	.023 (.024)	.007 (.008)	.002 (.009)	-.003 (.009)	-.051 (.046)
Adult Male in HH Worked	.004 (.028)	.001 (.033)	.113 (.036)	1.012 (.162)	-.056 (.044)	-.048 (.048)	.037 (.047)	1.450 (.253)
County Characteristics								
Population (millions)	-.017 (.007)	.009 (.008)	-.001 (.009)	.019 (.041)	.006 (.015)	-.004 (.016)	-.020 (.016)	.115 (.085)
Employment (millions)	.221 (.114)	-.133 (.132)	.006 (.143)	-.107 (.652)	.050 (.228)	.188 (.246)	.122 (.244)	-1.009 (1.308)
Per Capita Income (millions)	-.019 (.012)	.023 (.014)	.001 (.015)	.149 (.067)	-.007 (.018)	-.027 (.020)	.043 (.020)	.347 (.105)
UI Benefits Paid (millions)	.001 (.000)	.000 (.000)	-.000 (.000)	-.005 (.001)	-.001 (.001)	-.000 (.001)	.003 (.001)	.000 (.006)
Food Stamp Benefits Paid (millions)	-.000 (.001)	-.000 (.001)	.001 (.001)	.008 (.004)	-.001 (.003)	-.004 (.003)	-.003 (.003)	-.035 (.018)
State Characteristics								
# Physicians (per 100,000)	.000 (.000)	-.000 (.000)	-.001 (.000)	.008 (.002)	-.001 (.001)	-.001 (.001)	-.000 (.001)	.012 (.004)
Infant Mortality Rate (per 100,000 births)	.000 (.011)	.032 (.012)	.012 (.013)	-.756 (.061)	.004 (.016)	.002 (.018)	.005 (.018)	-1.073 (.094)
Medicaid Recipients (per 1000)	.001 (.001)	.003 (.001)	-.002 (.002)	-.001 (.007)	-.000 (.002)	-.002 (.002)	-.001 (.002)	-.042 (.011)

Table 6 (continued)

	Black				Poor White			
	(1) Delayed	(2) Smoked	(3) Drank	(4) M's Age	(5) Delayed	(6) Smoked	(7) Drank	(8) M's Age
State Characteristics (continued)								
AFDC Recipients (per 1000)	-.001	-.007	.005	.046	.004	.004	.009	.087
	(.002)	(.003)	(.003)	(.014)	(.004)	(.004)	(.004)	(.022)
Food Stamp Recipients (per 1000)	-.000	-.001	-.001	.005	-.001	-.001	-.002	.012
	(.001)	(.001)	(.001)	(.004)	(.001)	(.001)	(.001)	(.007)
South	.022	-.057	.227	2.142	-.001	.053	.108	2.937
	(.099)	(.115)	(.124)	(.567)	(.094)	(.101)	(.100)	(.537)
North East	.065	.139	.314	-.434	.042	.215	.094	.179
	(.088)	(.102)	(.110)	(.504)	(.099)	(.106)	(.105)	(.565)
West	-.060	-.117	.157	-1.387	-.044	-.058	.043	.066
	(.095)	(.110)	(.119)	(.543)	(.071)	(.077)	(.076)	(.407)
Intercept	.595	-1.029	-.554	20.428	.344	.787	-.055	20.736
	(.379)	(.437)	(.474)	(2.165)	(.559)	(.604)	(.598)	(3.207)
Degrees of Freedom	1093	1093	1093	1093	617	617	617	617
R-squared	.0283	.069	.039	.362	.032	.063	.143	.373
Chi-squared Test of Overidentifying Restrictions[2]	5.434	1.664	3.327	86.946	4.558	11.331	5.590	35.511

[1] Standard errors in parentheses.
[2] The critical value is 12.592.

Table A1. Definition and Source of Variables

Variable	Definition	Source[1]
I. Income and Family Composition:[2]		
AFDC During Pregnancy	1 if AFDC was received during pregnancy, prior to birth month	NLSY[a]
Monthly AFDC Payment	Average monthly receipt of AFDC per family member	NLSY[b]
Household Income	Total household income in the birth year (Income of the mother's parents is used for women under age 19 and residing with parents)	NLSY[b]
Unearned Income	Total household income net of mother's earnings and AFDC	NLSY[b]
#Household Members	Total number of related household members excludes foster family members and boarders)	NLSY[a]
#Children in Household	Number of mother's own and step children	NLSY[a]
Spouse or Partner	1 if spouse or partner is present in household	NLSY[a]
One or Both Maternal Parents	1 if mother's own or step parents are present	NLSY[a]
II. Birth Weight and Birth Weight Inputs:		
Birth Weight	Birth weight in ounces	NLSCM
Low Birth Weight	1 if birth weight is 5.5 pounds or less	NLSCM
Mother's Age at the Birth	Age of mother at the interview in the birth yr	NLSCM
Delayed Prenatal Care	1 if care was initiated after the 1st trimester	NLSCM
Mother Drank	1 if alcohol was consumed in 12 mos. prior to birth	NLSCM
Mother Smoked	1 if mother smoked in 12 mos. prior to birth	NLSCM
III. Child and Mother Characteristics:		
Child Male	1 if child is male	NLSCM
Child First Born	1 if child is firstborn	NLSCM
Mother's Height	Mother's height at the 1985 interview (inches)	NLSCM
On Time in School	1 if mother's highest grade completed was within one grade of the expected grade, given her age, as of the 1979 interview	NLSY
AFQT Score	Armed Forces Qualifying Test score (standardized by the mean score of all NLSY women of the same age)	NLSCM
Poverty Sample	1 if mother is in the supplemental poverty sample	NLSY
Urban at Age 14	1 if mother resided in an urban area at age 14	NLSCM
# Mother's Siblings	Number of siblings as reported in the 1979 interview	NLSCM
Grandmother's Educ	Highest grade of maternal grandmother	NLSCM
Adult Male in HH Worked	1 if adult male in household worked when mother was age 14	NLSCM
IV. Changes Between the Births of Consecutive Siblings		
Entered AFDC Exited AFDC Began Drinking Stopped Drinking Began Smoking Quit Smoking	Dichotomous variables measuring the change in status between consecutive pregnancies for the same mother.	
Gained Spouse Lost Spouse Moved in With Parents Moved Out of Parents	Dichotomous variables measuring the change in status between the interviews occurring during the birth years of consecutive births, for the same mother.	
Poor Both Births	1 if Mother was in poverty during both birth years	
Mother's Age	Change in mother's age between births	
Delay	Number of months difference in the delay in obtaining prenatal care	
Birth Weight	Difference in birth weight of consecutive siblings, in ounces	
Household Income	Difference in income during the birth years of consecutive siblings	

[1] Sources: NLSY - National Longitudinal Survey of Youth main file
NLSCM - NLSY Merged Child-Mother File

[2] All variables are measured during the birth year unless otherwise noted.

[a] Variable is taken from the NLSY main file - interview conducted in the birth year.

[b] Variable is taken from the NLSY main file - interview following the birth year (during each interview respondents are surveyed for income data regarding the past calendar year.)

Table A1. (continued)

Variable	Definition	Source
V. County and State Characteristics		
County Characteristics:		
Population	County population (millions)	Dept. of Commerce, REIS[3]
Employment	Total full and part-time (millions)	" "
Per Capita Income	In millions of 1977 dollars	" "
UI Benefits Paid	Total disbursements (millions, 1977 $s)	" "
Food Stamp Benefits	Total disbursements (millions, 1977 $s)	" "
State Characteristics:		
Infant Mortality Rate	Per 100,000 live births	U.S. Vital Statistics
# Physicians	Per 100,000 residents	U.S. Statistical Abstract
Medicaid Recipients	Per 1000 residents	" "
AFDC Recipients	" "	" "
Food Stamp Recipients	" "	" "
AFDC Payments	Average per recipient, 1977 $s	" "
Food Stamp Payments	" "	" "
Medicaid Payments	" "	" "
AFDC Maximum Grant	For a family of four, 1977 $s	Committee on Ways and Means "Green Book"
AFDC Need Standard	" "	
Medicaid Income Cutoff	Income eligibility for Medicaid coverage of pregnant women, as a percent of poverty level	Medicare and Medicaid Data Book, Green Book, Natn'l Governors' Assoc.
AFDC Eligible First Birth	1 if state of residence covered pregnant women with no other eligible children	" "
South, West, North East	Dummy variables for region of residence at age 14 (Midwest is left out)	

[3] REIS: Department of Commerce, Regional Economic Information System.

Appendix Table 2

First Stage Regressions for Participation in AFDC

	Black	Poor White
Child and Mother Characteristics		
Child Male	.020 (.023)[1]	.006 (.028)
Child Firstborn	-0.298 (.024)	-0.137 (.029)
Mother's Height	.004 (.004)	-0.005 (.006)
On Time in School	-0.004 (.027)	-0.034 (.037)
AFQT Score	-0.145 (.048)	-0.137 (.051)
Urban at 14	-0.030 (.031)	.004 (.035)
Grandmother's Education	-0.012 (.005)	.002 (.007)
# Mother's Siblings	.001 (.004)	-0.000 (.006)
Adult Male in HH Worked	-0.052 (.024)	-0.054 (.032)
County Characteristics		
Population (millions)	-0.001 (.007)	-0.009 (.011)
Employment (millions)	.115 (.114)	.047 (.166)
Per Capita Income (millions)	-0.005 (.011)	-0.002 (.014)
UI Benefits Paid (millions)	.000 (.000)	.001 (.001)
Food Stamp Benefits Paid (millions)	-0.001 (.001)	.001 (.002)
State Characteristics		
# Physicians (per 100,000)	.000 (.000)	-0.001 (.001)
Infant Mortality Rate (per 100,000 births)	-0.013 (.010)	.007 (.013)
Medicaid Recipients (per 1000)	.000 (.001)	.004 (.001)
AFDC Recipients (per 1000)	-0.004 (.002)	-0.002 (.003)
Food Stamp Recipients (per 1000)	.002 (.001)	-0.002 (.001)

Appendix Table 2 (continued)

	Black	Poor White
South	-0.245	-0.112
	(.057)	(.077)
North East	-0.215	-0.129
	(.059)	(.066)
West	-0.250	-0.105
	(.093)	(.058)
Instruments[2]		
Maximum Grant Family of Four	.029	-1.039
	(.796)	(.743)
Need Standard Family of Four	.100	-0.213
	(.191)	(.234)
Average AFDC Payment per Recipient	.142	.266
	(.238)	(.225)
Average Food Stamps per Recipient	.525	.451
	(.477)	(.534)
Average Medicaid Payment per Recipient	-0.120	-0.038
	(.072)	(.067)
Medicaid Income Cutoff	1.846	3.146
	(1.198)	(1.602)
AFDC Eligible First Birth	.051	.084
	(.032)	(.043)
Intercept	.522	.701
	(.364)	(.460)
R-squared	.233	.143
F-test vs. Null that Coefficients on Instruments = 0	2.944	2.892
	(.007)	(.009)

[1] Standard errors are in parentheses.
[2] Instruments are measured at the state level.

Data Appendix

A) Poverty status and Income Variables

Many of the NLSY income variables required some "cleaning" to reduce the impact of measurement error. This cleaning required us to reconstruct the "net family income" variable and the measure of poverty status. It should be noted that special attention is required due to the age of the sample and the fact that many women leave their parent's household during the course of the survey.

The NLSY asks each respondent to report income data in 22 separate categories according to the source of income. The sources of income include: own and spouses wages and salary, self-employment income, military income, unemployment income and educational benefits for self and spouse; AFDC income; Food Stamp Program income; public assistance; SSI; veteran's benefits; alimony and child-support; income from other persons; income from other sources; income of other family members from regular sources and welfare sources; partner's total income.

In addition to asking about the income components, from 1979 to 1986 the NLSY asked respondents to report the total which they call "net family income". The NLSY uses this reported total rather than the sum of the components to define poverty status. In cases in which the self-reported total missing, the NLSY constructed a measure based on the sum of the components. Beginning with the 1987 survey, total income was derived by summing the components in all cases. Net family income was reported by the respondent's parents in all cases in which the respondent was residing in the parents' household. After the 1986 interview all respondents were at least 21 years of age and parents' income was no longer surveyed. For the full sample of NLSY mothers (3822) over the survey years 1979-86, the NLSY based the poverty status calculation on parents' income in 27% of the cases.

We reconstructed net family income in the birth year to take account of the following: a) for consistency, we used the sum of the components in all cases. The individual income components were "cleaned" prior to the construction of net family income (see below); b) partner's income was included in the total (the NLSY construction excludes partner's income); c) net family income was topcoded if any individual component of income is topcoded; d) net family income is taken to be the sum of the income components for all women over the age of 18, regardless of place of residence[1]; and e) whereas the NLSY coded net family income as missing if any component was missing, we did so only if the missing component was on average greater than $1000 for all years for which the component was observed for the respondent. This rule salvaged income data in 57 cases, 18 of which were below the poverty line.

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[1] Rule (d) was adopted so that we could separately control for the effects of income and household composition.

Poverty status was reconstructed using the revised family income measure. We constructed two measures of poverty status, one based on family size and family income, the second based on household size and household income. These measures will differ if the woman resided with her parents after age 18. Women over age 18 were deemed to be in poverty only if both measures placed them in poverty. Poverty status was computed using the NLSY's algorithm (see NLSY Appendix II: Total Net Family Income Variable Creation 1979-1988).

Our re-construction of the poverty status index resulted in the reclassification of 103 children from no-poverty status to poverty status in the birth year; 171 children were reclassified in the opposite direction and 60% of these were due to the inclusion of a partner's income. In fact, among the households with a partner present in the birth year, 72% were classified by the NLSY as below the poverty level; the inclusion of partner's income in the construction of poverty status reduced this number to 23%.

Measurement error in the income data

The income data used in our analysis is income during the birth year, but we used the whole panel of data to "clean" the components of income. Unless otherwise stated, the numbers below refer to the whole population of NLSY women, rather than just the mothers.

1) AFDC and Food Stamp data.

The NLSY reports the following: 1) average monthly AFDC income in the survey year, 2) monthly Food Stamp Program income in the most recent month of the survey year, and 3) months in which the income was received. These data exhibit a large degree of variance in the amounts received primarily due to a small number of gross outliers. Of the 3822 mothers in the survey, 36.6% received AFDC income in at least one year during the period 1978-1988, and 47.5% received Food Stamp Program benefits in at least one year.[2]

To test the accuracy of the data we compared the monthly benefit receipts to the actual maximum allowable AFDC and Food Stamp Program grant levels, given the year, state of residence, and family size. (The AFDC maximum benefit level is specific to the number of children under age 18 residing in the household; the maximum Food Stamp benefit level is specific to household size.) Of the 5611 annual observations of AFDC receipts we found that 3.9% exceeded the maximum benefit level by more than 100 dollars (220 cases); the corresponding figure for Food Stamp receipts is 2.3% of the 7927 observations.

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[2] Given that a mother received AFDC or Food Stamp Program benefits in any year, the average years of receipt is 4 years. The range is 1 to 11 years.

It became apparent to us that the gross outliers were due to the reporting of annual receipt amounts in place of monthly receipts. (The assumption of an annual figure, together with the reported months of receipt, generated a monthly AFDC amount exactly equal to the maximum grant level in 20 cases.) We therefore assumed that the reported monthly figure was actually an annual figure when the maximum grant level was exceeded by at least 100 dollars (to avoid overcleaning of the data, we also required that the receipt exceeded next year's maximum grant level by fifty dollars). Exceptions to our "cleaning" rule were mothers living in California and Illinois. These states have different grant levels according to geographic location. Also if a mother was observed to move to a new state between interviews, the standard for comparison was the maximum of the grant levels in the old and new state.

We imputed monthly receipts of AFDC (Food Stamp income) for 35 (55) observations for which the number of months was reported and the monthly receipt was missing. The imputed value is the average of monthly receipts in adjacent years.

2) Earnings data

Earnings data is reported separately for respondent and spouse in three categories: 1) wages and salary, 2) self-employment income, and 3) military income. An additional variable reports partner's total income. The young age of the sample makes it difficult to infer much about the severity of measurement error in these variables, however some checks on internal consistency were possible. The following steps were implemented:

a) We identified duplicate reporting of earnings as "wages and salary" and self-employment income (this was done separately for respondent income and spouse income). An apparent duplicate was eliminated only if the number of years of positive self-employment income was equal to the sum of: i) the number of duplicates and ii) the number of years of self-employment income when no wages were reported. i.e. if the respondent ever reported positive, non-duplicative income in both categories then the duplicate entries were not "cleaned". This affected 170 observations of spouse earnings and 168 observations of mother's earnings.

b) We identified duplicate reporting of earnings as "wages and salary" and military income, analogous to (a). This affected 405 observations of spouse earnings and 224 observations of mother's earnings.

c) We eliminated duplicate reporting of income in the spouse and partner categories for 47 observations.

d) We identified "isolated" topcodes in the earnings variables and replaced them with the average of the variable in the adjacent years. Isolated topcodes were identified as those that occurred in years in which the average level of the variable in both of the

adjacent years was less than two-thirds the topcode level. (Variables were topcoded at 75,001 in the 1982-84 interviews, and 100,001 in the 1985-88 interviews).

e) Finally, for each woman we identified "outliers" as reported earnings that did not lie within $30,000 of the woman's average earnings after the above cleaning rules were implemented. For spouse outliers we eliminated potential duplicate reporting of wages and self-employment income by taking the maximum of these values to be total earnings. Outliers for own earnings were checked for duplicate reporting in the "own self-employment income" and "spouse self-employment income", and likewise for wages. Further "by hand" review of these outliers resulted in "by hand" changes affecting 76 women.

B) Household Composition Variables

The family size variable was constructed from the NLSY "household enumeration record" and includes: the mother, spouse or partner, own children including the new born, and any step-children.