

# Center for Studies in Demography and Ecology



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## Do Children from welfare families obtain less education

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### Abstract

This study estimates the relationship between parental welfare receipt and children's adulthood educational attainment. Data come from the Panel Study of Income Dynamics. Cross-sectional regression results confirm findings from previous studies: greater parental welfare receipt is significantly associated with children's poorer educational attainment. Fixed-effect regressions indicate that the relationship between parental welfare receipt and children's educational outcomes becomes weaker after controlling for unobserved family characteristics, but do not eliminate the negative relationship. The relationship between parental welfare receipt and children's educational attainment is not uniform across childhood stages. Additional analyses suggest that parental welfare receipt is not negatively related to educational attainment if combined with at least quarter time work by the mother.

## DO CHILDREN FROM WELFARE FAMILIES OBTAIN LESS EDUCATION?

At its peak, in 1994, an average of five million families was receiving AFDC each month. By June 1999, the number of families receiving TANF had dropped to 2.5 million families. The total welfare caseload decreased by 50 percent (Administration for Children and Families, 1999). Various factors affect these changes, but one of the most important factors is the new welfare reform, which created the Temporary Assistance for Needy Families (TANF) program (Ellwood, 2000).

This dramatic change has drawn attention to the well-being of poor children. There is growing concern that the current welfare reform may leave poor families with young children the most vulnerable (Chase-Lansdale & Brooks-Gunn, 1995; Collins & Aber, 1997; Duncan & Brooks-Gunn, 1997; Moore, Zaslow, Coiro, Miller, & Magenheim, 1995). However, the current policy direction does not look easily reversible. Among the public, many worry about the intergenerational transmission of 'welfare culture' (Patterson, 1994).

While there is little doubt that welfare improves the immediate well-being of children, the long-term effects of welfare on children remain in dispute. Many empirical studies on the effect of welfare on children find a negative correlation between parental welfare receipt and children's socio-economic outcomes. In particular, studies of children's educational outcomes show a fairly consistent and negative correlation (Corcoran, 1995). Yet, the findings from most research in this area are limited in several ways.

First, most previous studies have estimated standard regression models by relating youth outcomes to parental welfare receipt during a short period of childhood, usually

during adolescence. The use of a short observation period may bias estimates in previous studies. In addition, little is known about the effect of welfare received in early childhood.

Second, although previous studies rather consistently find a negative correlation between welfare and children's adulthood outcomes after controlling for a wide array of background characteristics, it is unresolved whether or how much the negative correlation reflects causal links. The estimated effects of parental welfare use may incorporate the effects of unobserved disadvantages of welfare families, which affect both welfare use and child outcomes. For example, research shows that members of welfare families are more likely to have health and mental health problems (Blank, 1989; Moffitt & Wolfe, 1992; Danziger et al., 1999).

Third, previous studies do not show the mechanisms by which welfare affects children. While many relevant theories include the role of parental work as a key concept linking welfare to child outcomes, no studies have examined the implication of work among welfare mothers for children. Given that the new welfare reform mainly aims at moving recipients into the work force as a solution to welfare dependency, this is an important question unanswered in previous studies.

This study examines whether parental welfare receipt is associated with children's educational attainment in young adulthood. We discuss empirical and theoretical backgrounds for this study in the next section. The third section explains the modeling methods, the sample drawn from the Panel Study of Income Dynamics, and the variables. Results from the analyses are provided in the fourth section. Discussion and conclusions follow in the final section.

## BACKGROUND

### Findings from prior empirical studies

In the literature on the intergenerational effects of welfare, the most consistent findings come from studies of the intergenerational correlation of welfare use. Most studies find that the probability of a daughter receiving AFDC is significantly higher if her mother received welfare than if her mother did not, even after controlling for a large number of covariates (Gottschalk, 1992; 1996). In research on nonmarital births, some studies find that daughters from welfare families are more likely to have a nonmarital birth as a teenager (Plotnick, 1990; Duncan & Hoffman, 1990; Gottschalk, 1992; 1996). However, An, Haveman, & Wolfe (1993) and Haveman & Wolfe (1994) find a negative but insignificant effect of maternal welfare receipt. Findings from studies of the effects of maternal welfare use on children's work behaviors and earnings are inconsistent (Corcoran & Adams, 1995; Corcoran, 1995). Findings on the effects of maternal welfare use on schooling are fairly consistent. There are 11 relevant studies (McLanahan, 1985; Hill & Duncan, 1987; Haveman, Wolfe and Spaulding, 1991; Brooks-Gunn et al, 1993; Duncan, 1994; Duncan & Yeung, 1995; Knox & Bane, 1994; Haveman & Wolfe, 1994; Peters & Mullis, 1997; Teachman et al, 1997; and Boggess, 1998). All except Haveman & Wolfe (1994), Knox & Bane (1994), and Teachman et al (1997) find a negative effect on any measure of children's educational attainment.

### Effects of welfare by developmental stages

Most studies measure maternal welfare use for a few years, mostly during a child's adolescence. Wolfe, Haveman, Ginther, & An (1996) find that measures of family

experiences during a limited childhood period are only weak proxies for longer-duration measures and empirical estimates using a measure of limited duration are biased. Such a bias may be especially severe for intermittent events, such as welfare receipt. Many single mother families participate in welfare for a short duration, while some of them receive welfare for a much longer time (Bane and Ellwood, 1994). Thus, families receiving welfare during an observed short period are not representative of the welfare population and more heavily represent long-term welfare families. Selection of short observation periods in previous studies may overestimate the effects of welfare since such effects may be positively associated with the length of welfare receipt.

Furthermore, estimates in previous studies do not tell us about the effect of welfare receipt during early childhood. There are reasons to expect that the effects of parental welfare receipt on child outcomes may differ across developmental ages. A developmental perspective holds that events or transitions in an individual life are seen to have long-lasting effects, redirecting subsequent life trajectories, and the effects of those events partly depend on a child's resources and prior experiences (Elder, 1985). This perspective posits that events in childhood have differential effects by developmental timing. Welfare may affect children through different mechanisms in different developmental stages.

One obvious way how welfare may affect children is through a change in family economic resources. Economic theory posits that parents invest monetary resources and time in the human capital of their children, considering benefits and costs (Becker, 1981; Becker & Tomes, 1986). The human capital theory suggests that additional economic resources from welfare increase parental investment in children by reducing the cost.

Recent studies report that family income during early childhood has a bigger positive effect on children's completed years of schooling (Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Levy & Duncan, 2000). The findings are consistent with the view, dominant in child developmental psychology, that intellectual development in early childhood has a persistent effect on later educational attainment. Early experiences have a significant effect on brain development. Delayed cognitive development in the early years may lead to mental retardation and poor school readiness. Poor school readiness results in low academic development and school dropout (Brooks-Gunn, 1995; Chase-Lansdale, 1998; Ramey & Ramey, 1999).<sup>1</sup> A recent study in economics (Heckman, 2000) also presents a life-cycle perspective on human capital formation. This study emphasizes a cumulative nature of human capital formation and the significance of family income at an early age in fostering human capital.

There is an additional reason to expect a stronger positive effect of welfare during early childhood. AFDC recipients were eligible for Medicaid and Food Stamps and given priority in getting housing subsidies. These sources of in-kind income may protect children from hunger, malnutrition, medical risks, and a hazardous home environment. Young children may particularly benefit more from such forms of in-kind income. Perinatal and early childhood medical care and nutritional status are related to various indicators of young children's wellbeing, such as low birth weight, growth, lead poisoning, and cognitive

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<sup>1</sup> Ramey & Ramey (1998) indicate mediating mechanisms by which better early development persists: (1) a child's acquired intellectual skills allows the child learn more from later experiences; (2) the child is motivated to look for further learning experiences; (3) the child has an access to greater and supportive environmental opportunities provided by others, such as parents, teachers, and peers. Entwisle & Alexander (1989) also suggest that poor school readiness may lead to a



development, which in turn affect later school achievement (Brooks-Gunn, Duncan, & Maritato, 1997). These services also may improve children's education by allowing parents to allocate more economic resources to children's education (Currie, 1995; 1998).

Welfare receipt may change cultural and psychological traits of parents and children as well as family income. Because receiving welfare may change multiple dimensions of the family environment, predicting the effect of welfare across developmental stages is more complicated than predicting the corresponding effects of just income.

The welfare culture hypothesis posits that welfare adversely affects what poor parents and children believe. Murray (1984) argues that the welfare system undermines the moral character of poor people by rewarding no work and family breakups and thus, changing conceptions of desirable behaviors. Alternatively, Mead (1986; 1992; 1997a; 1997b) argues that non-working parents on welfare may adversely affect children's preferences for work and economic independence. To him, welfare is a problem mainly because it removes the pressure to work among recipients.

The welfare culture hypothesis suggests that adolescents will be most seriously and negatively affected by parental welfare receipt. Although cultures and beliefs embedded in family routines and parent-child relationship may affect children's personality from very early ages (Lewis, 1968; Sroufe & Fleeson, 1986), adolescents may more actively internalize parental values and behaviors by observational learning.

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bad reputation among teachers or peers and the social identity, internalized by children themselves or labeled by others, may hinder subsequent academic achievement.

Social psychological theories propose other potential links between welfare and children. Ellwood (1994) applies Atkinson's (1964) expectancy model to explain the effects of welfare participation on a recipient's self-efficacy. Under AFDC, work was subject to humiliating scrutiny and often resulted in a reduced welfare check and a medical risk for her children. This barrier to work deprived welfare mothers of opportunities to regain a sense of control over lives.

Welfare stigma-labeling perspectives emphasize the devastating effect of welfare stigma on a recipient's self-esteem (Rainwater, 1982; Goodban, 1985; Nichols-Casebolt, 1986; Elliot, 1996). Welfare recipients lose self-esteem and become isolated, since society defines them as deviant, and recipients share in society's negative evaluations of them. Welfare stigma also may have direct social and psychological effects on children. Some studies have suggested that welfare children are stigmatized by other children and teachers (Rainwater, 1982; Popkin, 1990; Seccombe, 1999; Edin, Scott, London, & Mazelis, 1999).

The social psychological approaches suggest the negative effects of parental welfare receipt will be stronger during adolescence. Parental welfare receipt may reduce adolescents' self-concept. Adolescents may internalize parental failures in achieving economic independence and be more conscious of negative societal attitudes toward welfare receipt. Children's self-concept has been identified as a key determinant of their behaviors (Rutter, 1987; Rosenberg, Schooler, & Schoenbach, 1989). Adolescents' socio-emotional disturbance may have more enduring negative consequences, since they are in transition into multiple lines of adult activities, from work to marriage and childbirth (Elder, 1985; McLanahan & Sandefur, 1994).

## Role of parental work

Most theories include parental work as one of key concepts linking welfare to the well-being of poor families and children, although those theories take different positions in regard to the causes of non-work or less work of welfare parents.

Economic theory suggests that welfare has negative incentive effects on poor parents' work behaviors. The disincentive effects may have negative effects on children's education. According to economic theory, the welfare system increases the costs of work, since poor people who work are less likely to be eligible for benefits or qualify for less assistance. Research shows that the AFDC program generates nontrivial work disincentives (Danziger, Haveman, & Plotnick, 1981; Moffitt, 1992).

Mead (1986; 1992; 1997a; 1997b) proposes the role of work as a central concept in the process of the intergenerational transmission of welfare culture. He argues that children are not well socialized to be disciplined workers by non-working parents, and children from welfare families put less value on the benefits of work and education. According to his argument, government should assume the socializing role by imposing work requirements on recipients.

The social psychological approaches also emphasize parental work. The expectancy model suggests that a successful transition to work and economic independence help recipients to regain self-efficacy. In this theory, a critical problem of the welfare system is that welfare aggravates a sense of failure among recipients by impeding recipients' attempts to work (Ellwood, 1994). The welfare stigma-labeling approach suggests that achieving economic independence through work is essential for recipients to recover their self-esteem.

Maternal work has become a norm. Mothers on welfare are scorned as idle and morally deficient. Recipients feel inferior and personally responsible for being on welfare when comparing themselves with women who work and achieve economic independence (Elliot, 1996).

Research has shown that working is more prevalent among welfare mothers than it is generally known (Edin & Lein, 1996; Harris, 1993; 1996). Studies document that many welfare mothers combine work and welfare to make ends meet. Most studies of low-income families indicate that a mother's employment improves children's cognitive development (Moore & Driscoll, 1997; Zaslow & Emig, 1997), which in turn is likely to increase their educational attainment. Yet, no studies have examined the implication of work among welfare parents for their children's education (or other indicators of well-being).

## METHODS, DATA, AND VARIABLES

### Methods

We first estimate cross-sectional models that are comparable to those in the literature. We estimate linear regression models for the number of years of completed schooling and logit models for high school graduation. The models are specified as:

$$(1) \quad Y_{if} = \alpha X_f + \beta Z_{if} + \gamma W_{if} + \mu_f + \varepsilon_{if}$$

where the dependent variable  $Y_{if}$  is educational attainment for the  $i$ th child in family  $f$ . The outcomes are a function of family-specific variables  $X_f$ , individual-specific variables  $Z_{if}$ , and a measure of maternal welfare receipt  $W_{if}$ . The error term has two components: a

family-specific error term  $\mu_f$  that includes omitted characteristics that are constant across siblings, and a random error term for a child.

A critical problem in the above model is that parental welfare receipt likely is endogenous to unobserved family characteristics. To the extent that a mother's welfare participation ( $W_{if}$ ) is correlated with unobserved family characteristics ( $\mu_f$ ), as Currie & Cole (1993) note, the regression estimate ( $\gamma$ ) may be biased due to omitted unobserved variables.

Fixed effect estimation using a sibling sample is a standard approach to control for unobserved family characteristics. Siblings are likely to be more alike than randomly selected pairs of individuals on a variety of unobserved socio-economic dimensions as well as observed dimensions. Differencing equation (1) across siblings yields:

$$(2) \quad Y_{2f} - Y_{1f} = \beta(Z_{2f} - Z_{1f}) + \gamma(W_{2f} - W_{1f}) + \varepsilon_{2f} - \varepsilon_{1f}$$

where the effect of unobserved family characteristics ( $\mu_f$ ) has been eliminated and the explanatory variables are in differenced forms. Any variables that do not differ between siblings are dropped because the effects of such variables can not be estimated.

The fixed effect approach has been used in other areas (Plotnick & Hoffman, 1999; Aaronson, 1999; Duncan, Yeung, Brooks-Gunn & Smith, 1998, to name a few recent studies). In the literature on the intergenerational effect of welfare, only two studies have used this method to estimate the effects of parental welfare receipt on outcomes during infancy or early childhood (Currie & Cole, 1993; Levine & Zimmerman, 2000). This study

is the first to attempt fixed effect estimation of the long-term effects of parental welfare on children's outcomes as young adults.

### Data

The data come from the Panel Study of Income Dynamics (PSID) 1968-1997. The PSID is a longitudinal study of a nationally representative sample of U.S. families conducted by the Survey Research Center at the University of Michigan (Hill, 1992). The PSID is the only available survey data set that enables us to observe annually the whole childhood history of individuals and their adulthood educational attainment, with a relatively large sample size.

The basic sample for conventional cross-section analyses includes those individuals who remained in the survey for each year from birth to age 14 and whose years of schooling are observed at age 23 or at age 19.<sup>2</sup> The sample for models of completed schooling years by age 23 consists of 1,219 children who were born between 1967 and 1974 and became the age of 23 between 1990 and 1997. The sample for models of high school graduation by age 19 includes 2,512 children who were born between 1967 and 1978 and became age 19 between 1986 and 1997.<sup>3</sup>

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<sup>2</sup> The sample is restricted to children who are the PSID 'sample members'. 'Nonsample member' children are not tracked when they move out from the PSID sample families (Hill, 1992). Initially, 4,284 children born between 1967 and 1978 were the PSID 'sample members'. They were age 19 or older by 1997. While some are dropped from the sample due to nonresponse for one or more years, many are dropped due to attrition. Fitzgerald, Gottschalk, & Moffitt (1998) show that the attrition bias in the intergenerational study using the PSID is quite small and usually not significant. Falaris & Peters (1998) also report that attrition does not affect estimates of the effects of family background variables on schooling in the PSID.

<sup>3</sup> The sample size for the models of schooling years is less than a half of the sample size for the models of high school graduation. About a 40 percent reduction is caused by the reduced range of birth cohorts. The rest is due to attrition between the age of 19 and 23.

The sibling sample includes children drawn from the basic sample who have at least one sibling in the basic sample. The sibling sample consists of all possible sibling pairs in a family.<sup>4</sup> For example, if a family has four children, the number of pairs is six. This method increases the number of sibling pairs from a family, but sibling pairs from the same family may not be independent observations. Accordingly, we use Huber standard errors in the fixed effect estimation.

Some of the pairs have the same birth year or are only a year apart in age. Those pairs should share almost the same family environments and welfare backgrounds. In addition, if siblings are very close in age, differencing maternal welfare receipt is more likely to increase measurement error. Therefore, sibling pairs are included in the analyses only if the age difference is at least two years. The sibling sample for models of completed schooling years by age 23 consists of 269 pairs. The sample for models of high school graduation by age 19 includes 218 sibling pairs.<sup>5</sup> We also estimate the fixed-effect models for years of completed schooling by age 19. Although the variation in the years of completed schooling by age 19 should be smaller, it may be possible to detect more subtle effects of childhood welfare in the fixed-effect models, given the increased number of pairs to be used in the estimation. The corresponding number for models of schooling years by age 19 is 796.

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<sup>4</sup> In many previous studies, as Plotnick & Hoffman (1999) note, researchers have arbitrarily selected two siblings per family. This may aggravate the selection bias, and result in smaller sample size and smaller amount of variation in the variables of interest.

<sup>5</sup> When one estimates logit models, the effect of unobserved family characteristics is swept away only by conditioning on sibling pairs with different outcomes (Chamberlain, 1980). This restriction reduces the sample size, since sibling pairs with the same outcome must be dropped.

## Variables

Children's educational attainment is measured using completed years of schooling by age 23 and high school graduation by age 19. Some studies of children's educational attainment include, in the sample, children whose years of schooling are observed at different ages ranging from age 19 to as late as mid-20s. It's obvious that for youths in this age range, a year difference in ages often means a year difference in years of schooling. This possibly leads to a biased estimate, if the ages of individuals are not random with respect to the relationship between parental welfare receipt and children's education. For this reason, this study measures children's educational outcomes at a uniform age.

The central independent variables are three measures of maternal welfare use during the first 15 years of childhood.<sup>6</sup> The first measure is simply whether a mother was ever on welfare during the 15 years. This is measured by identifying whether a mother had any welfare income during the period. The second is the number of years on welfare. For most of the period, the PSID asks only about annual income. If a mother reported any welfare income in a given year, the year is counted as a year on welfare. The last is annual real welfare income (in 1992 dollars) averaged over the 15 years. Since the amount of annual welfare income in a family increases as a mother receives welfare for more months, this measure captures, to some extent, variation in monthly welfare participation in a given year.

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<sup>6</sup> We follow Bane & Ellwood (1994), with minor changes, to construct the welfare measure in this study. This study restricts welfare income to that of female heads with children. The PSID includes separate questions for AFDC income, Supplementary Security Income, Social Security, and other welfare. This study includes other welfare income as AFDC income. It is known that respondents often confused "other welfare" with AFDC and reported considerable amount of AFDC income as "other welfare" (Bane & Ellwood, 1994; Gottschalk, 1996).



These measures are aimed to capture the extent of parental welfare receipt during the childhood.<sup>7</sup>

In the analyses by developmental stages, the three welfare measures are separately constructed for three childhood subperiods, each five years in length; from birth to age 5, from age 6 to age 10, and from age 11 to age 15. These three periods roughly correspond to early childhood, middle childhood, and early adolescence.

The models include as controls many family and individual characteristics. These include basic individual characteristics such as race, gender, birth order, and the number of siblings averaged over childhood years. Family characteristics include grandparents' poverty status and parents' education.<sup>8</sup> Family income is measured as family cash income plus AFDC and Food Stamp benefits averaged over the childhood period (in 1992 dollars).

The models also include other variables that have been reported to affect children's education in the literature. We include mother's age at the birth of the individual, proportion of years in childhood when a child lived with a single parent, proportion of years when a parent's marital status changed, father's and mother's annual work hours averaged over the childhood years, proportion of years when a mother worked, proportion of years when the head was disabled, and proportion of years when a family moved. Other control variables include the county unemployment rate averaged over the childhood years, and the

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<sup>7</sup> Those measures partly depend on factors other than the extent of a parent's reliance on welfare. For example, the same values of the income measure may reflect different lengths of welfare receipt for individuals living in different states since the benefit level varies from state to state. In the fixed-effect estimation this may be less problematic since siblings may usually live in the same state in childhood.

<sup>8</sup> Information on father's education and other characteristics, such as annual work hours, is not available for some children. A main reason is that those children were born to a single mother. To handle missing variables, we assigned a missing value code of -1 and included missing value dummy variables, following Cohen & Cohen (1983).

proportions of years lived in a region and a residential location. Region is categorized as south, west, northeast, and northcentral. Residential location is measured as a dummy variable indicating whether a child lived in SMSA or not. Finally, a linear control for birth cohort is included in all models. It may be necessary to control for secular trends in education levels because the data include children from 12 birth cohorts.

The average number of completed schooling years by age 23, weighted by the PSID sample weights, is 13.1.<sup>9</sup> The high school graduation rate by age 19 is .80. About 14 percent of children were ever on welfare between birth and age15. The average number of year on welfare is less than .9 year. Among children who experienced welfare at any time between birth and age15, the average number of years was 6.5 years.

One concern with a family fixed effect approach is that the sibling sample may not be representative because it is more likely to consist of children from larger families. The representativeness of the sample in this study does not appear to be a serious problem. Children's educational outcomes and individual and family characteristics in the sibling sample are very similar to those in the individual sample. Appendix Table A-1 shows the descriptive statistics.

## RESULTS

### Cross-sectional Results

Table 1 provides zero-order correlation coefficients of childhood welfare experiences across childhood periods in the individual sample. Contact with welfare is highly correlated

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<sup>9</sup> The PSID oversampled low-income families. This unequal selection probability problem is dealt with using the PSID sample weights assigned to individuals (Hill, 1992).

between each childhood period. The high correlation exists mainly because parents of the majority of children did not use welfare in any stage, and because the majority of children who ever experienced welfare in any stage were on welfare during more than one childhood stage. Table 2 provides the evidence for this second reason. Row 4 shows that 65 percent of children with welfare backgrounds begin involvement with welfare during early childhood. Row 2 (3) shows that, among children on welfare in middle childhood (early adolescence), 65 (62) percent also received it in early childhood. These figures suggest that the composition of children on welfare does not change dramatically from stage to stage. Hence, if there are stage-specific effects of welfare, those effects are unlikely to be due to differences in the kinds of children exposed to welfare, and more likely to reflect real stage-specific differences in impact.

Table 3 shows the coefficients on parental welfare receipt estimated from the models of years of schooling by age 23. Columns (1) through (3) show results from the cross-sectional analyses that use whole childhood measures of parental welfare receipt. Each measure of welfare use is entered by itself. Columns (4) through (6) present results from the cross-sectional analyses that measure welfare use separately during the three childhood stages. The three stage-specific measures are jointly included in each model.

Other control variables, which are not childhood-specific, are added to the models in a hierarchical manner. The base models in columns (1) and (4) include the number of years on welfare in childhood and most exogenous variables, such as race, gender of child, birth order, poverty status of a grandparent, proportion of years when the household head was disabled, the county unemployment rate averaged over childhood periods, birth cohort,

religion, region, and residential location during childhood. In columns (2) and (3) and columns (4) and (6), additional control variables are added in a hierarchical manner, since those are important correlates with children's educational attainment but also are likely to be endogenous to welfare use. Columns (2) and (5) add parental education, family income, and family size. Columns (3) and (6) further add proportion of years when child lived with one parent, proportion of years when parental marital status changed, and number of siblings, annual work hours of father and mother, proportion of years when mother worked during childhood, and proportion of years when family moved. To simplify the table, we omit the coefficients on all control variables.

The first panel shows coefficients on ever being on welfare, while the second and third panels each show coefficients on the number of years on welfare and annual welfare income. In all three measures and all models, the relationship between maternal welfare use and children's years of schooling is negative and significant. Column 1 shows that ever being on welfare is associated with a .85 year decrease in years of schooling by age 23. An additional year on welfare is associated with .1 year decrease in years of schooling. An additional \$1000 welfare income per year is associated with .17 year decrease in the years of schooling. Given that the sample average of the number of years on welfare (welfare income) is about 1.5 (\$600), this means that welfare receipt is associated with about .15 (.12) year decrease in schooling, on average. When parental education and family income are added in the models in column (3), the magnitude of the effect falls by about a third. However, adding the other observed family characteristics in columns 4 through 6 does not change the size of effect very much.

Results from the models of high school graduation by age 19 also show that all three measures of maternal welfare use are negatively and significantly associated with the probability of high school graduation in all the models. These results confirm findings from most past research.

The results are robust to the various specification of family income. To test the sensitivity of the coefficients on maternal welfare use, we used five different specifications of family income. These include a linear specification, a spline function using a \$20,000 cut-off, the natural logarithm of family income, a set of dummies for ranges of the income-to-needs ratio, and a proportion of number of years lived below the poverty line. The estimated effects of maternal welfare use are qualitatively the same, although the coefficients on family income vary substantially. (The results are available from the authors upon request.)

Columns (4) through (6) present childhood-stage-specific effects of welfare use on years of schooling by age 23. The first panel shows that ever being on welfare between age 0-4 or between the age 10-14 is negatively and significantly associated with children's years of schooling. The second and third panels show the results using continuous measures of welfare use. With less controls, the number of years on welfare and welfare income between the age 10-14 have bigger and significant effects on children's schooling. On the other hand, the effects of maternal welfare between age 0-4 become bigger when we add more controls, and significant when the number of years on welfare is used as a welfare measure.

The corresponding results from the high school graduation models show only a slight difference. While the number of years on welfare between age 10-14 has a strong and

consistently significant relationship with the probability of high school graduation, annual welfare income during middle childhood has the most consistently significant relationship with the probability of high school graduation.

Overall, the results show that maternal welfare use during early adolescence (age 10-14) has the strongest negative effect in terms of both significance level and magnitude. Maternal welfare use during early childhood (age 0-4) has a little smaller but significant effect, while that during middle childhood (age 5-9) usually does not have a significant effect. These results are consistent with findings from previous research (Furstenberg, Brooks-Gunn, & Morgan, 1987; Furstenberg, Levine, & Brooks-Gunn, 1990; Brooks-Gunn, Guo, & Furstenberg, 1993; Haveman, Wolfe, & Spaulding, 1991).

#### Fixed-effect Results

Table 4 presents basic estimates from fixed effect models. For comparison, we also report cross-sectional estimates using the sibling sample in the first three columns. These estimates are virtually the same as the cross-sectional estimates using the full individual sample. The model numbers in Table 4 correspond to those in Table 3. The specifications of the fixed-effect models are the same as those of the cross-sectional models, except that all the variables in the fixed-effect models are constructed as the differences between two children in a sibling pair. Race, religion, mother's and father's education, and grandparent's poverty status are dropped since those are the same for siblings. Mother's age at

individual's birth is also dropped, since the difference between siblings is the same as the difference in the value of the birth cohort variable.<sup>10</sup>

The first panel presents the results from the model for years of completed schooling by age 23. The second panel shows the estimates from the model for high school graduation by age 19. The results from the new models for years of completed schooling by age 19 are shown in the third panel. Although the variation in the years of completed schooling by age 19 should be smaller, it may be possible to estimate more precise effects of welfare use due to the increased number of pairs used in the estimation.

In all the cross-sectional models reported in columns (1) through (3), the relationship between parental welfare receipt and adulthood educational attainment is negative and significant. Columns (4) through (6) in the first panel show that the negative effect of the number of years on welfare on schooling years by age 23 becomes only marginally significant at the 10 percent level in the first two fixed-effect models and insignificant in the last model. Yet, the negative relationship between annual welfare income and children's years of schooling remains consistently significant even after controlling for unobserved family characteristics.

Columns (4) through (6) in the second panel show that the number of years on welfare has a marginally significant effect on the probability of high school graduation in only one model, while annual welfare income has a consistently negative and significant effect. In models for years of schooling by age 19, the number of years on welfare has a significant

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<sup>10</sup> The number of sibling pairs with a difference in "ever being on welfare" status is only 33. Therefore this measure of welfare use is not analyzed.

effect in the first two models, and becomes marginally significant in the last model. On the other hand, annual welfare income does not have a significant effect on years of schooling by age 19.

We test for the sensitivity of the estimates to various specifications of family income. We add to model 1 a differently specified measure of family income, such as natural logarithm of family income, income-to-need ratio, and proportion of years in poverty. The results show that the estimates of the effect of welfare are robust to different specifications of family income. There is almost no change in the significance level and the sizes of coefficients are nearly equal. Among various income specifications, proportion of years in poverty has a significant effect only in the model of schooling years by age 19.

Overall, the results show that the negative relationship between parental welfare receipt and children's educational attainment becomes weaker but remains significant when unobserved family characteristics are controlled for.

Table 5 presents the childhood-stage-specific effects of parental welfare receipt on the three educational outcomes. Columns (1) through (3) provide cross-sectional results using the sibling sample. The results show a pattern very similar to that of cross-sectional results using the individual sample, although the significance levels drop due to the decreased sample size. Parental welfare receipt during early adolescence most often has significant effects on children's educational attainment. Parental welfare receipt during early childhood shows significant effects in some models of the probability of high school graduation by age 19 and years of schooling by age 19. Welfare during middle childhood shows significant effects only in two models of high school graduation.



Columns (4) through (6) present fixed-effect results. The first three rows in each panel show that the number of years on welfare during early childhood has no significant effect in any of the models. Conversely, the number of years on welfare during early adolescence has a consistently negative and significant effect on the three educational outcomes. The coefficients are always the largest in any of the models. On the other hand, the number of years on welfare during middle childhood has significant and negative effects on years of schooling by age 23 and the probability of graduating high school by age 19 in most models. It does not have any significant effect in the models of years of schooling by age 19.

The second three rows in each panel show that the effects of welfare income do not have a consistent pattern across the three outcomes. In the models of years of schooling by age 23, annual welfare income during early childhood has the largest negative effect, and welfare income during middle childhood shows a consistently significant effect. Welfare income during adolescence has marginally significant effects in two models. In the models of high school graduation by age 19, only annual welfare income during middle childhood has a significantly negative effect. The third panel shows that welfare income in any childhood period does not have a significant effect on the number of years of schooling completed by age 19.

### Sensitivity Tests

Welfare use may result from unobserved events and subsequent changes in a mother's unobserved characteristics, both of which may adversely affect children's academic development and educational attainment. If this is the case, the fixed effect estimates may

incorporate the negative influence of unobserved events and the estimates may be biased in a negative direction.

One way to assess the degree of this potential bias is to examine whether estimates of welfare's effects are sensitive to the inclusion of events for entering welfare in the models. Family structure changes and income changes are known to be main events leading to welfare participation. A reasonable assumption is that family structure changes or other unidentified events are more stressful events than income changes, because the former changes are accompanied by serious income losses or need increases. We use the method in Bane & Ellwood (1994), with minor modifications, to classify events for entering welfare into four categories: family structure change, income change, other change, and left-censored.<sup>11</sup> We add four dummy variables indicating each type of event to the cross-sectional models. The omitted category is never being on welfare.

Welfare entrance due to a family structure change or other events has a significantly negative effect on children's educational attainment in many models, while welfare entrance due to income changes does not have a significant effect in most models. However, the inclusion of the variables indicating each type of events does not change the effects of parental welfare receipt very much. In the cross-section models, maternal welfare use is

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<sup>11</sup> We followed a mother's whole welfare history to find the year when she began using welfare. If a mother's status in her family changed from a wife or a dependent to a female head, or if a female head had a birth a year before, a year after, or in that year, her event for entering welfare is coded as a family structure change. If there was no change in family structure and if family income net of AFDC decreased by at least \$1,000 (in 1992 dollars) in the year, her entering event is coded as an income change. If neither of the changes is found at the beginning of welfare, her entering event is coded as "other changes". An "other change" may also be the result of a change in family size caused by something other than a new birth, a move to a new county or state, or other unidentified events. If a mother was already on welfare in the beginning years of the survey (1967 or 1968), the mother was classified as left-censored because the entering event could not be identified.

significantly associated with children's education even after controlling for events for entering welfare.<sup>12</sup>

The same sensitivity test is not informative in the fixed-effect analyses. Among many sibling pairs both siblings experience the same events and there is very little variation in the events. Yet, there is some suggestive evidence that there are not serious biases due to the difference in underlying events. First, such a bias is more likely to occur if a sibling experiences maternal welfare use and a counterpart sibling does not. Yet, in most sibling pairs, both siblings experienced maternal welfare receipt if a sibling was ever on welfare. Second, the bias is less likely to be serious if the fixed effect estimates are mainly based on long-term welfare (or high welfare income) families. It may be reasonable to assume that the independent effect of an unobserved event may fade away over time. We examined whether the fixed effect results are true for long-term welfare (or high welfare income) pairs. If any of a sibling pair experiences welfare for more than five years (has average welfare income more than \$1,000), the pair is classified as a long-term welfare pair (a high welfare income pair). Table 6 shows that the effect of maternal welfare receipt among long-term welfare pairs (high welfare income pairs) is consistently significant.

Another concern is that a child's disadvantaged characteristics, such as illness or poor health, may result in both maternal welfare use and a child's poor educational attainment. In this case, the fixed effect estimates may be negatively biased. The only relevant variable

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<sup>12</sup> Although it's still possible that subsequent unobserved events after entering welfare may contribute to both longer-term welfare use and lower educational attainment, it's empirically difficult to sort out the independent effect of those events. A basic difficulty lies on the fact that it's hard to decide whether those subsequent events are independent of prior welfare experiences. It may not be legitimate to control for those unobserved changes in parental characteristics, given the strong theoretical arguments that welfare may change unobserved cultural or psychological traits of family members.

available in the PSID is low birth weight. Low birth weight may be correlated with a child's later health status, which may cause both maternal welfare participation and the child's poor educational attainment. To examine the degree of this potential bias, we added a dummy variable indicating low birth weight to all the cross-sectional and fixed effect analyses and reestimated the models. The inclusion of the low birth weight dummy leads to virtually no change in the estimates of maternal welfare use in all the models. (The results are available from the authors upon request.)

#### Effect of Patterns of Parental Involvement with Work

Table 7 presents the effect of welfare mothers' work patterns on children's years of schooling by age 23. The first panel shows that the effect of welfare depends greatly on average work hours of welfare mothers. If a mother was ever on welfare and worked, on average, less than 500 hours per year, childhood welfare has a consistently significant and negative effect. Conversely, for mothers on welfare who worked more than 500 hours, welfare is not related to children's educational attainment.

It may be possible that mothers who worked more were on welfare shorter than those who worked less. If this is the case, Table 7's results may reflect the difference in extent of welfare dependency, rather than the difference in work behaviors. We examine this possibility in Table 9. We classify welfare mothers into four categories. The first one is short-term (5 or less years on welfare) welfare users who work more than 500 hours per year on average during their child's first 15 years (31 percent of welfare mothers). They were on welfare for 2.4 years on average. The second category is long-term (6 or more years on welfare) welfare users who work more than 500 hours per year (9 percent). They were on

welfare for 7.7 years on average. The next category is short-term welfare users who work less than 500 hours (20 percent). They were on welfare for 2.9 years. The last category is long-term welfare users who work less than 500 hours. They were on welfare for 11.1 years on average (40 percent).

Table 9 shows that the effect of childhood welfare is substantially modified by a mother's work behavior. The first panel reports the results from the models of years of schooling by age 23. The first two rows show that if a mother worked more than 500 hours, childhood welfare does not have a significant effect on children's years of schooling by age 23. Conversely, if a mother worked less than 500 hours, welfare use has a consistently significant and negative effect, regardless of the number of years on welfare, as shown in the next two rows. Notably, long-term welfare use does not have a significant effect if a mother worked more than 500 hours, while short-term welfare use has a consistently significant effect if a mother worked less than 500 hours. The second and third panels provide results from the models of high school graduation by age 19 and years of schooling by age 19. The results show generally the same pattern as in the top panel, although short-term welfare combined with more than 500 hours of maternal work has significant and negative effects in a few models.

## DISCUSSION AND CONCLUSION

This study estimates the relationship between parental welfare receipt and children's adulthood outcomes using family fixed-effect and conventional cross-sectional regression methods. The cross-sectional results confirm findings from previous studies. Greater parental welfare receipt is significantly associated with children's poorer educational

attainment. The fixed-effect results indicate that the relationship between parental welfare receipt and children's educational outcomes becomes weaker after controlling for unobserved family characteristics. Yet, the fixed effect estimation does not eliminate the negative relationship.

It is of note that the relationship between parental welfare receipt and children's educational attainment is not uniform across childhood stages. The results from the cross-sectional analyses show that welfare during early childhood and young adolescence often has significant negative effects, while welfare during middle childhood does not. The fixed-effect results confirm the strong negative effect of welfare during adolescence. Yet, the negative effect of welfare during early childhood, often found in the cross-family analyses, disappears in all the fixed-effect models, while welfare during middle childhood becomes more significant in the fixed-effect analyses.

The finding that parental welfare use during early childhood may have no effect on children's later educational attainment is consistent with studies which have examined the effect of parental welfare receipt on young children's cognitive development (Hill & O'Neill, 1994; Levine & Zimmerman, 2000). Studies have found that family income during early childhood has a bigger positive effect on children's educational attainment (Duncan et al., 1998). Combined with this evidence, our finding of no effect of welfare during early childhood suggests that while welfare may have some positive effects on children's education by increasing family income, the effect is not easily detectable due to the low benefit level of welfare.

The causal interpretation of the consistently negative relationship between welfare during adolescence and later educational attainment is not straightforward. The theories reviewed earlier offer some guidance. If children from welfare families set a career goal that deviates from economic independence, those children would be less motivated to attain a higher education level. Alternatively, welfare receipt may create harm by reducing the social and psychological resources of parents and adolescent children, which in turn adversely affects children's educational attainment. Finally, the stronger negative effect of welfare during adolescence may be because parental welfare receipt during a child's adolescence reflects more serious adversity than welfare received during early childhood.

These findings on the negative effect of welfare on children's education should be considered in balance with the fact that parental welfare receipt reduces extreme poverty. It should also be kept in mind that children's educational attainment is only one measure of child well-being. Parental welfare receipt may have a positive impact on other fundamental outcomes such as children's health (Currie & Cole, 1993).

Additional analyses suggest that parental welfare receipt is not negatively related to educational attainment if combined with at least quarter time work by the mother. The educational attainment of children of long-term welfare mothers who work at least at a minimal level is not negatively affected, while even short-term welfare receipt is negatively related to educational attainment if mothers work little. This finding argues against the hypothesis that contact with welfare itself harms children by creating a deviant culture, although it is not clear why a mother's work so greatly modifies the effect of welfare on children. Working mothers may regain a sense of control, self-esteem and social

connections, which in turn positively affect their children (Elliot, 1996). Working mothers also may help children to recognize the significance of work and to prepare for future economic careers (Mead, 1997a). Or a mother's work may represent the availability of familial or extrafamilial support, which enables the mother to work and benefits children at the same time (Edin & Lein, 1997).

While research suggests that work is beneficial for mothers and their children in general, there is little evidence that full-time work without welfare is a better option for single mother families than combining work and welfare (Kulis, 1988). Studies show that many of welfare mothers who voluntarily leave welfare do not achieve economic independence and are often overwhelmed by conflicts between work and family responsibility (Harris, 1996; Edin & Lein, 1996). Full-time work may not be realistic, especially for many single mothers with young children (Ellwood, 2000). Part-time work combined with welfare may better benefit those mothers and children.

The TANF era of welfare policy has sought to rapidly move welfare recipients into jobs and to reduce welfare receipt, and has experienced considerable success in doing so. The findings from this study provide suggestive evidence that this thrust will improve the long term educational attainment of children of TANF recipients. However, TANF also ushered in many other major changes in the design and operation of welfare programs. Some of these, such as possible reductions in total welfare income during childhood due to time limits, may adversely affect schooling and other child outcomes. Future research using TANF-era data will be needed before we will understand the long run impact on children of this dramatic experiment in social policy.



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