

# HOW SIBLING COMPOSITION AFFECTS ADOLESCENT SCHOOLING OUTCOMES WHEN WELFARE REFORM POLICIES INCREASE MATERNAL EMPLOYMENT

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## INTRODUCTION

In light of new welfare policies that encourage or require low-income single parents—the vast majority of whom are women—to work, there is keen interest in the question of whether and how children are affected by changes in maternal employment. Most research on this question has focused on young children because they are viewed as especially vulnerable to increased maternal employment [Blau and Grossberg, 1992; Desai, et al., 1989; Han, et al., 2001; Harvey, 1999; Morris et al., 2001; Waldfogel, Han and Brooks-Gunn, 2002]. Adolescent children should also be a source of concern. Though adolescents could benefit from changes in community norms and to the presence of working parents as role models, increased employment among low income mothers could reduce supervision of adolescents or place excessive demands on adolescents at a crucial point in their development.

Considerable evidence from random assignment studies of welfare and work programs shows that reforms that increase parents' economic security can have important positive consequences for their elementary school-aged children [Huston et al., 2001; Gennetian and Miller, 2001; Morris et al., 2001; Zaslow et al., 2002]. Analyses of these same random assignment studies, however, show that welfare and work programs have small unfavorable effects on adolescent schooling outcomes [Gennetian et al., 2002]. Researchers have proposed a number of reasons why participation by parents in programs that increase their employment may adversely affect their adolescent-aged children [Brooks et al., 2001; Chase-Lansdale et al., 2002; Gennetian et al., 2002]. The most common explanation is that entry into or increased employment reduces the time that parents have to monitor or supervise their adolescent-aged children, prompting adolescents to engage in risk-taking behaviors, such as skipping school, smoking, or taking drugs. Another explanation is linked to the stress associated with increased employment that can negatively affect a parent's interaction with her adolescent-aged child. Yet a third explanation proposes that adolescents take on adult-like responsibilities, in or out of the home, which can interfere with schooling. Some, albeit very weak, evidence supports each of these and, other,

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hypotheses. Perhaps the strongest evidence to date, however, supports the last hypothesis.

By pooling data from seven experimental studies representing fourteen welfare and work programs, the intent of this paper is to estimate the effects of having a younger sibling on low-income adolescent schooling outcomes when welfare policies increase their parent's employment. What the studies underlying the data used for this paper have in common is that they all were evaluated using a random assignment design, and therefore, the estimates of the effects of policy on an adolescent outcome can be clearly attributed to the welfare or employment policy and not to other characteristics of the family. If indeed adult role taking explains why welfare and work policies negatively affect adolescents, the subgroup of adolescents with a younger sibling should have the most pronounced negative effects.

The findings confirm that welfare and work programs unfavorably affect a variety of adolescents' schooling outcomes. Furthermore, welfare and work programs increase the likelihood that adolescents who in particular have a younger sibling will be suspended or expelled and will drop out of school. There is some weak evidence that this is because adolescents are taking on adult-like responsibilities in the home, such as caring of younger siblings or increasing their own employment. Sibling composition has no relationship, however, with the unfavorable effects of welfare and work programs on adolescent's performance in school.

## **CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW**

The economic model of the family underlies the analyses in this paper [Becker, 1981; Haveman and Wolfe, 1994]. Parents care about their children's well-being and provide inputs to produce positive child outcomes. In this household production model, child outcomes are posited to be a function of the quantity and quality of family members' time inputs and market-purchased goods and services (including paid child care). A higher amount of parental resources expended on a child is associated with more desirable child outcomes, (that is, higher "child quality"). The increased labor force participation of women has focused attention on how these parental inputs are changing and the impact of these changes on child outcomes.

In the literature, hypotheses abound about how welfare and work policies such as those examined here, which are targeted at adults, can indirectly affect young children [Child Trends, 1999; Huston, 2002; Morris et al., 2001]. Our specific focus is how welfare and work programs affect adolescent outcomes. The key policies under examination here—work mandates, earnings supplements, and welfare time limits, all described in more detail in the next section—are designed to raise maternal employment levels and family income and to reduce receipt of public assistance, and some are also designed to raise family income. Most of these programs achieved their targeted goals of increasing parental, primarily maternal, employment, and depending on the program, have also achieved their targeted goals of reducing welfare receipt or increasing income [Bloom and Michalopoulos, 2001; Grogger et al., 2002]. These effects on parent's employment and income, in turn, will affect time and resource investments in their children. The effects of welfare and work policies on

adolescents are likely to hinge not only on the overall effects of changes in employment and economic security but also on the interaction between the changes in adolescents' lives caused by these policies and the developmental processes of adolescence.

The key question of interest in this paper is how does sibling composition influence the effects of welfare and work policies on adolescents, given that these same policies affect parental time and resource investments.<sup>1</sup> The usual effect of siblings is attributed to resource dilution [Blake, 1989] or a tradeoff between child quantity and quality [Becker, 1981]. Both of these explanations predict a negative effect of the total number of siblings on child outcomes. In the context of welfare and work policies this would not explain why a difference exists between adolescent outcomes in program group families (whose parents are experiencing increased work effort or income) and adolescent outcomes in control group families (whose parents are not), but could influence the magnitude of observed differences between these two groups. The level of resources per child in the program group families will depend on the number of children in the family.

Sibling composition can be an important determinant of children's well-being, primarily because of its implications on the allocation of resources within a family. In one theory, if parents only care about human capital investments, investment in each of their children will proceed according to the rate of return that is expected on that investment [Becker, 1981; Becker and Tomes, (1979) 1986]. This implies that when families are financially constrained, parents will invest more in children whose expected rate of return on human capital is higher. In another theory, parents care about lifetime wealth and earnings, and therefore to reduce earnings inequality, children whose return on investment is low will receive relatively greater resources than children whose return on investment is high. Indeed, researchers have found a relationship between birth order and, separately, sibling sex composition on the educational achievement of children [Haveman and Wolf, 1994; Berhman, Rosenzweig and Taubman, 1994; Butcher and Case, 1994; Kaestner, 1997]. And, other related research has found a relationship between the biological mix of siblings in a family and children's achievement [Case, Lin and McLanahan, 2000; Gennetian, 2002].

In the context of these proposed economic theories of resource allocation, according to the latter theory, if adolescent-aged children are considered a "low rate of return" investment, welfare and work policies that increase the economic security of low-income families are expected to increase investment in adolescents compared to younger siblings, while according to the former theory, it would lead to decreased investment in adolescents compared to younger siblings. And, furthermore, these investment effects should be most pronounced in the subset of programs that had the largest or most striking effects on income (in addition to increased employment).

Research has also documented that in low-income communities, adolescents are increasingly required to assume adult responsibilities including those in the home, such as babysitting younger siblings, and those outside the home, such as having paid employment, when their parent increases his or her work effort. This is often because of the complexities of coordinating the lives of multiple children with low-

wage, sometimes unpredictable, work. While taking on adult roles may afford adolescents greater autonomy and an improved self-image, it may also disrupt their schooling or encourage them to engage in delinquent behavior [National Academy of Sciences, 1998]. If, as these findings suggest, low-income single parents consider their adolescent aged children to be “adults”, this presents an alternative theory why investment decisions are targeted to the younger children in the family. Though, unlike a pure “investment” decision, this proposed theory suggests that having a younger sibling should negatively affect adolescents when programs generally increase parent’s employment, irrespective of increased economic resources.

In summary, whether because of the two theories previously described or because of other aspects of resource allocation that are not easily measured, such as parental preferences, having a younger sibling is predicted to influence the effects of welfare and work policies on adolescent well-being. The policy implications of such an effect depend, in part, on the underlying causes as to why having a younger sibling matters. If low-income parents are allocating resources because of perceived or real rates of return on their investment in adolescents or, because of preferences, there is little room for policy intervention.<sup>2</sup> If instead, there is evidence that adolescents are taking on responsibilities in the home, then policy can be designed to alleviate these responsibilities (that is, expand child care resources to accommodate the needs of younger children).

## DATA, MEASURES AND SAMPLE

The studies included in the pooled data set represent a broad range of geographic areas, urban and rural, in the United States and Canada. All were begun in the early to mid-1990s and evaluated with random assignment designs, and all were conducted to estimate the effects on low-income families of programs designed to increase parental employment. Many were experimental programs tested by individual states under waivers of the rules governing Aid to Families with Dependent Children (AFDC), the welfare system that was replaced in 1996 by Temporary Assistance for Needy Families (TANF). A brief description of each of the studies, the key policies approaches tested, time period, and response rates are shown in Appendix Table 1. Although the studies mixed and matched a number of policies, three key policies stand out—earnings supplements or financial incentives to work, mandatory employment services, and time limited welfare.

Earnings supplements or financial incentives to work were designed to make work more financially rewarding, usually by increasing the earnings disregard (the amount of earnings that is not counted as income in calculating the amount of a family’s welfare benefit) so that families could keep part of their welfare dollars when they went to work. As expected, such make-work-pay strategies increased employment *and* income [Bos et al., 1999; Michalopoulos et al., 2001; Miller et al., 2000]. Mandatory employment services were requirements that recipients participate in employment-related activities as a condition of receiving their welfare benefits. The primary tool used to enforce participation mandates is sanctioning, whereby a recipient’s welfare grant is reduced if she or he does not comply with program

**TABLE 1**  
**Distribution of Age of Adolescents, Total and by Study**

Age at Baseline	Total Number	Jobs First	FTP	LA GAIN	MFIP	New Hope	NEWWS	SSP
Age 9	15	0	0	0	0	2	0	13
Age 10	1,789	250	168	88	204	68	756	255
Age 11	1,547	220	124	86	196	41	669	211
Age 12	1,518	201	132	86	176	44	645	234
Age 13	1,181	177	72	73	135	35	514	175
Age 14	528	147	0	64	113	39	10	155
Age 15	258	1	0	51	40	37	0	129
Age 16	29	0	0	3	0	26	0	0
Total Number of Adolescents	6,865	996	496	451	864	292	2,594	1,172
Total Number of Families	5,270	774	413	322	615	199	2,006	941

Calculations based on follow-up survey data from the following studies: FTP, Jobs First, Los Angeles Jobs-First GAIN, MFIP, New Hope, NEWWS, and SSP.

requirements. Programs with mandatory employment services increased employment, but did not always succeed in increasing income since welfare income was often reduced dollar-for-dollar with increased earned income [Hamilton, et al., 2001]. Time limits on receipt of public assistance are intended to reduce welfare dependence, encouraging parents to work. The federal welfare law of 1996 sets a lifetime limit of five years on cash assistance receipt, but states may shorten or extend the limit by using state funds. The few random assignment tests that include time-limited policies suggest that such programs increase employment and income, but only in the short-term prior to when families hit the time limit [Bloom et al., 2000; Bloom et al., 2002].

The seven studies in the pooled data represent fourteen different welfare and work programs. Two of the studies—MFIP and NEWWS—included a multi-research group (three research groups in MFIP) or multi-site, multi-research group design (three sites with three research groups and one site with two research groups in NEWWS). In all but one of the studies, families were recruited into the study at the time of their application or re-determination application to welfare (the only exception to this is the New Hope study, that includes both welfare-recipient and non-welfare recipient families that met income requirements).

Data in each study were compiled from a variety of sources. Basic demographic information is available for all sample members from a Background Information Form (BIF) completed just prior to random assignment. Staff in the financial offices interviewed each sample member and collected important demographic information, such as the sample member's age, educational attainment, prior work history, and prior welfare receipt. Data from state administrative records are used to track families' benefit receipt and employment during the follow-up periods. Public assistance benefits records include monthly information on public assistance benefits provided

to each member of the research sample. Unemployment insurance earnings records provide quarterly earnings information for each sample member, as reported by employers to the Unemployment Insurance (UI) system. These data exclude earnings that are not covered by or not reported to the UI system—for example, jobs in the informal economy. Earnings and benefit data are available for each sample member for six months to one year prior to random assignment and for two to five years following random assignment, depending on the study.

Importantly, all of the studies collected survey data in the home or over the telephone, two to five years after baseline, depending on the study. The survey in each study had many common questions. The core section of the survey took approximately 30 to 45 minutes to administer. It was designed to obtain employment information not available from administrative records (such as hours worked and wage rates) plus more general measures of family circumstances (such as household composition, sources of income, and material hardship) and questions about the well-being of all children in the family. As indicated on Appendix Table 1, the percentage of sample members who responded to the follow-up surveys was generally about 80 percent. Response rates for the survey in each study rarely fell below 70 percent. Nonresponse bias analyses were conducted for each study, and in each case find that any bias due to nonresponse is minimal [Bloom et al., 2000; Bloom et al., 2002; Freedman et al., 2001; Hamilton et al., 2001; Michalopoulos et al., 2001; Miller et al., 2000].

Although the child-related questions on the surveys primarily focused on preschool and elementary school-aged children, they also included some questions about all children, including adolescents. Most pertained to children's school outcomes, school-related behavior, and teen parenting. These include a measure of school performance (coded on a five point scale ranging from 5 = "very well" to "1 = not well at all"), grade repetition, suspensions or expulsions from school, currently not in school because dropped out, receipt of special educational services and teen parenting (measured in response to the question "Has your child had, or fathered, a baby?" and "How old was your child when he or she had his or her first baby?").

All of these outcomes were measured using maternal reports. At first, this may appear to be a problem because adolescents may not share information about all of their activities with their parents or parents may understand things differently than their adolescents do. Fortunately, as will be described in detail later, because of the random assignment design of the data, there is no reason to believe that the prevalence of misreporting differs between research groups; and hence, results from analyses that compare outcomes between research groups will not be compromised by misreporting. Moreover, most of the outcomes relate to important events in an adolescent's life that a parent is likely to know about (for example, suspensions or expulsions, school drop out, and teen childbearing). Many of these measures of parental reports of adolescent outcomes are available in all of the studies. The two notable exceptions are the measure of achievement that was not collected in the NEWWS study (representing seven of the fourteen welfare and work programs in the seven random assignment studies) and the measure of teen parenting that was not collected in LA GAIN, MFIP, New Hope and SSP (representing five of the fourteen welfare and work programs in the seven random assignment studies).

Our data consist of over 6,800 observations of adolescents in 5,270 single parent families that were part of seven random assignment studies of welfare and work programs. As shown in Table 1, adolescents range in age from nine to sixteen at the beginning of the studies. While the adolescents in this sample do span the entire adolescent age range, the largest sample of adolescents and the most representative sample across the various studies are those aged ten to fourteen at the beginning of the study period. All of these adolescents were aged twelve to eighteen at the time of the survey follow-up in which information was collected about adolescent outcomes. Note that the specific age range of adolescents varies by study because of differing lengths of follow-up. For example, because the data from NEWWS is from a five-year follow-up, adolescents were aged ten to thirteen at the time of study entry. In contrast, we were able to capture adolescents throughout the nine to sixteen-year-old age range in New Hope because the survey was conducted at about the 24-month follow-up point.

Table 2 presents selective adolescent, parent, family and other characteristics of the sample overall and by research group. This table shows that 71 percent of the adolescents had a younger sibling at study entry and that the average age of the adolescent at time of follow-up was sixteen. The average age of the youngest child in the family was about eight, and the average number of children in the family was three, with 16 percent of adolescents in a family with one child and about 24 percent in a family with four or more children. Approximately 40 percent of parents of these adolescents had been employed at some time prior to entering the random assignment study, and 54 percent had a high school degree or GED. The majority had been previously married and either separated or divorced by study entry, and 40 percent are White, 39 percent are Black, and 14 percent are Latino. As can be seen on this table, there are virtually no differences in these observed characteristics between those families and children who were randomly assigned to the program or treatment group and those families and children who were randomly assigned to the control group. This is expected given the random assignment design of the study.

On average, mothers in the control group rate their adolescent's school performance as relatively high (3.6 on a 5-point scale). Nineteen percent of adolescents were reported to have repeated a grade, nearly 13 percent attended a special class or received special help, 11 percent were not in school at the time of the survey follow-up because they dropped out and 9 percent had or fathered a baby as a teen by the time of the survey follow-up (not shown). Perhaps surprisingly, these schooling outcomes are not highly correlated with each other (Pearson correlation coefficients range from 0.04 to 0.24). Only 5 percent of these adolescents were reported to have been suspended or expelled and currently not in school because they dropped out.

## EMPIRICAL STRATEGY

In each study in the pooled data set, single parents were randomly assigned to one or more program groups or to a control group at baseline. Because single parents were randomly assigned to the research groups single parents in the program group should not differ in any observed or unobserved characteristics as compared to single parents in the control group. Thus, any differences in outcomes between the groups

**TABLE 2**  
**Descriptive Characteristics of Adolescents and their Families**

	<b>Full Sample</b>		<b>Control Group</b>		<b>Program Group</b>	
	Mean	Std. Dev. <sup>a</sup>	Mean	Std. Dev. <sup>a</sup>	Mean	Std. Dev. <sup>a</sup>
<b>Adolescent characteristics:</b>						
Has younger sibling (%) <sup>b</sup>	70.8		70.8		70.7	
Age at survey follow-up	16.0	1.6	16.0	1.6	16.1	1.6
<b>Parent's characteristics:</b>						
Received high school degree or GED (%) <sup>b</sup>	54.4		55.3		53.7	
Employed in year prior to study entry (%)	42.2		42.9		41.7	
Earnings in year prior to study entry (\$1000)	2.6	5.7	2.7	5.6	2.5	5.8
Parents age at child's birth						
was less than 18 (%)	18.6		18.7		18.4	
Never been married (%) <sup>b</sup>	39.0		38.2		39.6	
Separated/Divorced (%) <sup>b</sup>	58.3		59.3		57.6	
Black (%)	38.9		37.0		40.4	
White (%)	40.3		41.3		39.5	
Latino (%)	14.3		15.5		13.4	
<b>Family characteristics:</b>						
Age of youngest child in family <sup>b</sup>	7.7	3.9	7.7	3.9	7.7	3.8
Number of children in family <sup>b</sup>	2.7	1.3	2.7	1.3	2.8	1.3
1 child in the family (%) <sup>b</sup>	16.1		6.5		15.8	
2 children in the family (%) <sup>b</sup>	31.9		31.9		31.9	
3 children in the family (%) <sup>b</sup>	28.4		28.2		28.6	
4 or more children in the family (%) <sup>b</sup>	23.6		23.4		23.7	
<b>Other:</b>						
In program group	57.2					
In Jobs First	14.5		15.7		13.7	
In FTP	7.2		8.5		6.3	
In LA GAIN	6.6		7.9		5.6	
In MFIP	12.6		10.9		13.9	
In New Hope	4.3		4.6		4.0	
In NEWWS	37.8		33.5		41.0	
In SSP	17.1		18.9		15.7	
Elapsed time between study entry and follow-up	3.9	1.1	3.8	1.1	4.0	1.1
Sample Size (N=6,865)			2,939		3,926	

Calculations based on follow-up survey data from the following studies: FTP, Jobs First, Los Angeles Jobs-First GAIN, MFIP, New Hope, NEWWS, and SSP.

a. Standard deviations not shown for dichotomous measures.

b. These items were measured at study entry.

after study entry can be attributed to the program or policies being tested. To estimate the effects on adolescent outcomes of the welfare and work programs in these studies in the pooled data, the following equation is estimated:

$$(1) \quad Y_i = \alpha + \beta P_i + \sum_{n=1}^k \beta_n X_{ni} + \varepsilon_i$$

where  $i$  represents each adolescent observation of outcome  $Y$ ;  $P$  represents an indicator of whether or not the parent of the adolescent was randomly assigned into an experimental welfare and work program; and  $\mathbf{X}$  represents a vector of baseline or pre-random assignment characteristics (prior earnings of the parent, prior earnings squared, education, prior marital experience, age of youngest child in the family, total number of children in the family, race/ethnicity); length of survey follow-up, age of adolescent at follow-up and a series of indicators for each study to control for study or site specific variation. This analysis will establish the basic effects of these welfare and work programs on the range of adolescent outcomes previously described. Based on prior research, it is expected that  $\beta < 0$  for the measure of school performance and  $\beta > 0$  for many of the other measured adolescent outcomes (that is, an increase in grade repetition or dropping out of school that would similarly indicate an unfavorable effect on adolescent well-being) [Gennetian, et al., 2002]. The empirical model is estimated using ordinary least squares for the 1 to 5 scale measure of school performance and using probit estimation techniques for the dichotomous measures. In both cases, standard errors are adjusted for the presence of multiple siblings in a family.

The next step in the empirical estimation is to examine whether or not sibling composition influences program effects on adolescent outcomes. The main strategy employed to empirically test this is to expand equation (1) to include a series of interaction terms between “being in the program group” and “having a younger sibling.” This model will control for the general effect of resource dilution (the interaction of program participation with number of children in the family at study entry). If taking on adult roles, including care of a younger sibling, or targeting of resources to younger children in the family (that is, parents care about human capital investments and adolescents are a low rate of return investment), were an underlying reason why negative effects were occurring on adolescent outcomes then it is expected that the interaction term with “having a younger sibling” will be statistically significant.

Next, I try to empirically examine whether or not the adult role-taking hypothesis can be separated from the hypothesis related to intra-family resource allocation by exploiting the variation in program effects on parent’s employment and income that correspond to the key policy approaches implemented in the programs. More specifically, while all of the programs increased parental employment, only programs with earnings supplements increased both parental employment and income. If intra-family resource allocation were the primary underlying reason why welfare and work programs negatively affect adolescents who have a younger sibling then, assuming that income is the primary means in which resources are being allocated, the negative younger sibling effect should occur only in programs with earnings supplements. If instead, adult role-taking was the primary underlying reason why welfare and work programs have a negative effect on adolescents with a younger sibling, then the negative younger sibling effect should occur for programs with and

**TABLE 3**  
**Estimates of the Effects of Welfare and Work Programs on Available Adolescent Schooling and Behavior Outcomes**

	<b>School Performance</b>	<b>Repeated a Grade</b>	<b>Received Special Educational Service</b>	<b>Suspended or Expelled</b>	<b>Dropped Out of School</b>	<b>Had or Fathered a Baby</b>
In program group	-0.16 <sup>a</sup> (0.04)	3.34 <sup>a</sup> (1.16)	0.89 (1.04)	0.68 (1.43)	1.42 <sup>b</sup> (0.65)	-0.23 (0.76)
R-Squared	0.03	—	—	—	—	—
Wald $\chi^2$ statistic	—	389.42 <sup>a</sup>	136.16 <sup>a</sup>	110.37 <sup>a</sup>	544.84 <sup>a</sup>	280.60 <sup>a</sup>
Sample size	3,435	5,075	4,269	4,585	5,304	3,849

Calculations based on pooled follow-up survey data from the following studies: FTP, Jobs First, Los Angeles Jobs-First GAIN, MFIP, New Hope, NEWWS, and SSP.

All adolescent outcomes are based on maternal reports. The following covariates, measured at or prior to study entry, were included in each regression model: whether the child had a younger sibling, number of children in the household, study flags (for example, FTP, LA GAIN, etc.), earnings in prior year, earnings in prior year squared, employed in prior year, had a diploma or GED, marital status, age of youngest child, and race/ethnicity; also included were the following additional covariates: in program group indicator, age of adolescent at follow-up, elapsed time between study entry and follow-up, and whether the child's parents age was less than 18 at the time of their birth.

Standard errors of the estimate are shown in parentheses below their respective regression coefficient and are adjusted to account for shared variance between siblings.

Statistical significance levels are indicated as: a = 1 percent; b = 5 percent; c = 10 percent.

Effects on school performance were estimated using OLS. Effects on other outcomes were estimated using probit models. The coefficients for the probit models are converted and presented as marginal effects.

without earnings supplements. This assumes that parents in these programs that increased their employment respond similarly by relying on their adolescent-aged children to take on more home responsibilities.

### **Results**

Table 3 presents the effects of parent's treatment status, (that is, random assignment into a welfare and work program), on the available adolescent schooling and behavior outcomes using the pooled data of seven random assignment studies. This table shows that welfare and work programs for parents decreased school performance among adolescents (on average as well as increasing the likelihood of performing below average and decreasing the likelihood of performing above average), increased grade repetition (by about 3 percentage points) and the likelihood of not being in school at the time of follow-up because of dropping out (by about 1 percentage point). These welfare and work programs had no effect on receiving special educational services, suspensions or expulsions, or on teen parenting. The findings for all of the covariates in the model for the schooling performance outcome are presented in Appendix Table 2. These findings are similar to what has been previously

**TABLE 4**  
**Estimates of the Effects of Welfare and Work Programs on Available Adolescent Schooling and Behavior Outcomes, Adding Interactions with Sibling Composition**

	School Performance	Repeated a Grade	Received Special Educational Services	Suspended Expelled	Dropped Out of School	Had or Fathered a Baby
In program group	-0.26 <sup>a</sup> (0.09)	5.66 <sup>b</sup> (2.63)	1.46 (2.44)	0.03 (3.51)	2.83 <sup>c</sup> (1.47)	0.81 (1.84)
In program group*has a younger sibling	-0.05 (0.09)	-0.61 (2.70)	-1.06 (2.34)	8.66 <sup>b</sup> (3.49)	4.01 <sup>b</sup> (1.72)	-0.95 (1.87)
In program group*number of children in family	0.05 (0.03)	-0.72 (1.08)	0.04 (1.00)	-1.97 (1.25)	-1.53 <sup>a</sup> (0.55)	-0.12 (0.64)
R-Squared	0.03	—	—	—	—	—
Wald $\chi^2$ statistic	—	389.54 <sup>a</sup>	136.63 <sup>a</sup>	119.18 <sup>a</sup>	548.17 <sup>a</sup>	280.59 <sup>a</sup>
Sample size	3,435	5,075	4,269	4,585	5,304	3,849

Calculations based on pooled follow-up survey data from the following studies: FTP, Jobs First, Los Angeles Jobs-First GAIN, MFIP, New Hope, NEWWS, and SSP. See notes for Table 3.

reported, using meta-analytic techniques to average program effects across many of these same studies [Gennetian, et al., 2002].

Table 4 presents the effects of welfare and work programs on these same adolescent outcomes adding in program group interactions with measures of sibling composition. This table shows that having a younger sibling did not influence the negative effects of welfare and work programs on school performance or on grade repetition but did affect suspensions or expulsions and dropping out of school. More specifically, for school performance, the main effect of parent's participation in a welfare and work program is negative and statistically significant and the interactions of program with the sibling composition variables are not statistically significant. The same pattern follows for grade repetition. In contrast, though there is no overall effect of welfare and work programs on suspensions/expulsions, adolescents with a younger sibling are 9 percentage points more likely to be suspended or expelled from school. Adolescents with younger siblings in program group families are also significantly more likely to not have been enrolled in school because of dropping out.

Further analyses were also conducted using alternative definitions of sibling composition—whether or not the younger sibling was younger than six and, in separate analyses, whether or not the adolescent had an older sibling. Having a sibling younger than six interacted with the program group indicator only approached statistical significance for some of the adolescent schooling outcomes. This suggests

that if adolescents are increasing their care-taking responsibilities when their mothers increase employment, these care-taking responsibilities are not clustered among the families with very young children. In fact, analyses of data from three of the studies in the pooled data do show that welfare and work programs are more likely to increase adolescent care-taking of their elementary-school aged siblings [Gennetian et al. 2002]. As expected, having an older sibling has no significant interaction effect with program group status on the adolescent schooling outcomes.

In summary, having a younger sibling, whether because of intra-family resource allocation or because of increased adult-like responsibilities, influences the negative effects of welfare and work programs on only some of the measures of adolescent schooling outcomes. Sibling composition does not influence the unfavorable effects of welfare and work programs on adolescent's school performance and grade repetition, but does influence participation in school, (suspensions/expulsions and dropping out).

Table 5 presents the effects on adolescent schooling outcomes and teen parenting separating out the effects of programs with earnings supplements compared to other non-earnings supplement programs. Programs with earnings supplements significantly increased parent's average quarterly employment, average quarterly earnings, as well as their income (measured as the sum of earnings and public assistance). Other non-earnings supplement programs also increased parent's employment and earnings but decreased income, because any gain in earnings was more than offset by a loss in public assistance.<sup>3</sup> Therefore, contrasting the effects of these two programs on adolescent outcomes according to their sibling composition can illuminate the role that increased income played for program group families when their employment also increased. If welfare and work programs are increasing the likelihood that adolescents with younger siblings are suspended or expelled from school because they are taking on adult-like responsibilities such as babysitting younger siblings, this effect should exist for both the earnings supplement as well as non-earnings supplement programs (because both equivalently increased parent's employment). If instead, program group parents are "investing" in their adolescents differently compared to younger siblings in the family, this effect should only exist for programs with earnings supplements (that increased income as well as employment).<sup>4</sup>

Table 5 shows some very weak support for the hypothesis that welfare and work programs are increasing adolescent's suspensions or expulsions from school because they are taking on responsibilities in the home when their parents' employment increased. Although the coefficient on the interaction of program group with having a younger sibling for programs with earnings supplements is bigger (coefficient = 21.9), it is not significantly different from the coefficient on the interaction of program group with having a younger sibling for other programs (coefficient = 4.22). Therefore, adolescents with younger siblings appear to fare worse whether or not the program increased family income. This result also resonates with ethnographic research among low-income mothers, in which mothers speak about having to rely on their eldest children to take care of younger children because of mismatches in work schedules and hours of child care or schooling, regardless of their income status [London and Scott, 2003].

**TABLE 5**  
**Estimates of the Effects of Welfare and Work Programs on Available Adolescent Schooling and Behavior Outcomes, Adding Interactions with Sibling Composition**

	School Performance	Repeated Grade	Received Special Educational Services	Suspended Expelled	Dropped Out of School	Had or Fathered a Baby
<b>Programs with an Earnings Supplement</b>						
In program group	-0.29 <sup>a</sup> (0.11)	6.14 (4.76)	-0.57 (4.90)	4.30 (6.89)	2.64 (1.77)	1.51 (1.34)
In program group*has a younger sibling	-0.08 (0.11)	0.16 (4.92)	-1.24 (4.94)	21.86 <sup>a</sup> (7.24)	2.93 (2.46)	-0.61 (1.06)
In program group* number of children in family	0.07 <sup>c</sup> (0.04)	-1.04 (2.04)	-0.91 (2.18)	-6.72 <sup>a</sup> (2.17)	-1.09 (0.72)	-0.25 (0.32)
R-Squared	0.04	-	-	-	-	-
Wald $\chi^2$ statistic	-	200.65 <sup>a</sup>	40.49 <sup>a</sup>	66.69 <sup>a</sup>	185.37 <sup>a</sup>	172.60 <sup>a</sup>
Sample size	2,607	2,078	1,260	1,175	1,852	877
<b>All Other Programs</b>						
In program group	-0.17 (0.17)	5.97 <sup>c</sup> (3.07)	3.06 (2.84)	-1.74 (4.13)	2.92 (2.11)	-0.03 (2.54)
In program group*has a younger sibling	0.00 (0.19)	-1.98 (3.05)	-1.65 (2.60)	4.22 (3.93)	5.19 <sup>b</sup> (2.34)	-0.70 (2.52)
In program group* number of children in family	0.02 (0.06)	-0.61 (1.17)	0.19 (1.10)	-0.17 (1.52)	-1.91 <sup>b</sup> (0.76)	0.00 (0.88)
R-Squared	0.04	-	-	-	-	-
Wald $\chi^2$ statistic	-	68.80 <sup>a</sup>	92.73 <sup>a</sup>	69.54 <sup>a</sup>	399.08 <sup>a</sup>	211.01 <sup>a</sup>
Sample size	828	2,997	3,009	3,410	3,452	2,972

Calculations based on pooled follow-up survey data from Jobs First, MFIP, New Hope, and SSP for earning supplement programs and from FTP, Los Angeles Jobs-First GAIN, and NEWWS for non earnings supplement programs. See notes for Table 3.

Table 5 also shows that welfare and work programs *without* an earnings supplement are increasing the likelihood that adolescents are not enrolled in school because of dropping out, an effect that is especially pronounced among adolescents with younger siblings. Again, although the coefficient is bigger among programs without an earnings supplement (coefficient = 5.19), it is not significantly different from the coefficient on the younger sibling interaction term suggesting that in both cases, having a younger sibling increases the likelihood that adolescents in the pro-

gram group are dropping out of school. Since programs without an earnings supplement increased parents' employment and earnings, but decreased income overall, adolescents may be seeking paid employment out of the home to help supplement or support the family.<sup>5</sup> As prior research suggests, this is another form of taking on adult-like responsibilities.

## DISCUSSION AND CONCLUSION

The effects of maternal employment, and, in turn, welfare policies, on adolescent children have received considerably less attention than paid to the effects on younger children.<sup>6</sup> Though there are many good reasons for this, early evidence from a number of random assignment studies of welfare and work programs suggest that welfare policies can have unfavorable effects on some aspects of adolescents' schooling. Why welfare policies have these effects is still a relatively open research and policy question. Using a pooled data set of seven experimental studies representing fourteen welfare and work programs, this paper specifically examines the role of sibling composition in understanding the effects of welfare and work policies on adolescents.

Theory predicts that having a younger sibling can affect the way low-income parents—most of whom are experiencing increased employment or income in the experimental welfare and work programs—allocate their resources or rely on their oldest, often adolescent-aged, children to take on more adult-like responsibilities. The analyses pursued in this paper first attempt to empirically establish that sibling composition does play a role in how welfare and work policies affect adolescent outcomes. Then, analyses attempt to empirically untangle the underlying causes why having a younger sibling matters.

The findings confirm that welfare and work programs unfavorably affect a variety of low-income adolescents' schooling outcomes; decreasing their school performance, increasing grade repetition and increasing the likelihood of dropping out of school. At first glance, these findings seem to contradict recent findings from another study that concludes that transitions from welfare to employment among low-income families has neutral effects on adolescent development and beneficial effects on adolescent self-esteem [Chase-Lansdale et al., 2003]. Differences in the design and samples of the studies may explain why the findings differ. Importantly, the Chase-Lansdale et al. [2003] work is based on longitudinal data collected in 1999 and 2001 from working poor, married and single parent families in three cities whereas this paper relies on data from random assignment studies of welfare and work programs implemented prior to 1996 and that were specifically designed to answer questions about the causal effects of welfare reform policies on a sample of largely welfare-reliant single mothers.

Having a younger sibling does influence the effects of welfare and work programs on some of the examined adolescent schooling outcomes.<sup>7</sup> More specifically, adolescents with younger siblings in the program group are significantly more likely to experience suspensions or expulsions and to drop out of school, compared to ado-

lescents without younger siblings in the program group and compared to all adolescents in the control group. There is some weak evidence from analyses pursued here as well as ethnographic findings to suggest that this is because adolescents are taking on adult-like responsibilities in the home, such as caring of younger siblings, or increasing their own employment in response to parents increased employment rather than because younger siblings get more resources within the family as compared to their older sisters or brothers. Sibling composition, however, has no relationship with the unfavorable effects of welfare and work programs on adolescent's performance in school or on grade repetition. Some other factor, such as lack of supervision or monitoring or changes in parent-child interaction, could be why such programs are negatively affecting these aspects of adolescents' schooling.

Two interesting policy implications emerge from this work. First, the explanation for the underlying cause as to why welfare and work programs unfavorably affected adolescent well-being varies by the outcome being measured. Any hypotheses that link these effects to the size or composition of children in the family lend no support for explaining why adolescents experienced poor school outcomes. Consequently, any policy response to these findings should carefully be targeted to an outcome-based goal (that is, improving adolescent's school performance or decreasing the likelihood of dropping out of school).

Second, adolescents may be taking on adult-like roles in the family when their mothers increase their work effort. Such responsibilities seem to be interfering with participation or enrollment in school. This implies that adolescents could benefit from expanded childcare resources that fit the needs of younger children in low-income families (or, adolescents could benefit from more flexible work schedules for low-income parents). It also implies that a policy response of increasing access to youth programs may not be adequate if adolescents are needed to take on more responsibilities within the family.

**APPENDIX TABLE 1**  
**Descriptions of the Studies and Programs**

Study	Program(s) Tested	Key Policy Features					When Study Began and Length of Follow-Up	Response Rates for Follow-Up Surveys
		Mandatory Employment Services	Earnings Supplements	Time	Limits	Site(s)		
National Evaluation of Welfare-to-Work Strategies (NEWWS)	Human Capital Development (HCD) and Labor Force Attachment (LFA)	✓				Atlanta, GA Grand Rapids, MI and Riverside, CA	1991 60 months	73-93 percent
Los Angeles Jobs-First Greater Avenues for Independence (LA GAIN) Evaluation	Employment focused, with mixed initial activities Los Angeles Jobs-First GAIN	✓	✓			Portland, OR Los Angeles County	1996 24 months	74 percent
Minnesota Family Investment Program (MFIP) Evaluation	Full MFIP for long-term recipients Full MFIP for recent applicants	✓	✓			Seven countries in Minnesota	1994 36 months	81 percent
Self-Sufficiency Project	MFIP Incentives Only for long-term recipients Self-Sufficiency Project	✓	✓			Two Canadian provinces Milwaukee, WI	1992 36 months 1994 24 months	81 percent 79 percent 80 percent
New Hope Project	New Hope Demonstration	✓				Escambia County, FL	1994 48 months	48 months
Family Transition Program (FTP) Evaluation	Family Transition Program Jobs First	✓	✓	✓	✓	New Haven and Manchester, CT	1996 36 months	80 percent

a. Values in this column represent the range of response rates across sites for which separate impact estimates may be computed and across samples for whom differing data on children were collected

**Appendix Table 2**  
**Effects of Baseline and Other Covariates on**  
**Adolescent School Performance**

Covariate Used in Regression Model	S.E.	
Adolescent characteristics:		
Has younger sibling (%) <sup>d</sup>	0.02	(0.06)
Age at survey follow-up	-0.02	(0.01)
Parent's characteristics:		
Received high school degree or GED (%) <sup>d</sup>	0.11 <sup>a</sup>	(0.04)
Employed in year prior to study entry (%)	-0.07	(0.05)
Earnings in year prior to study entry (\$)	-0.01	(0.01)
Earnings in year prior to study entry squared (\$)	0.00 <sup>a</sup>	(0.00)
Parents age at child's birth was less than 18 (%)	0.00	(0.06)
Never been married (%) <sup>d</sup>	0.06	(0.15)
Separated/Divorced (%) <sup>d</sup>	0.08	(0.15)
Black (%)	-0.03	(0.09)
White (%)	-0.21 <sup>a</sup>	(0.08)
Latino (%)	0.02	(0.10)
Family characteristics:		
Age of youngest child in family <sup>d</sup>	0.00	(0.01)
Number of children in family <sup>d</sup>	-0.04 <sup>b</sup>	(0.02)
Other:		
In program group	-0.16 <sup>a</sup>	(0.04)
In FTP	0.09	(0.09)
In LA GAIN	-0.19 <sup>b</sup>	(0.10)
In MFIP	-0.17 <sup>b</sup>	(0.07)
In New Hope	-0.11	(0.11)
In SSP	-0.28 <sup>a</sup>	(0.07)
Elapsed time between study entry and follow-up	-0.02	(0.05)
Sample Size (N=3,435)		

Calculations based on pooled follow-up survey data from the following studies: FTP, Jobs First, Los Angeles Jobs-First GAIN, MFIP, New Hope, NEWWS, and SSP.

Adolescent school performance is based on maternal reports using a 5-point scale. This table shows estimates for all covariates used in the school performance model of Table 3.

Standard errors of the estimate are shown in parentheses next to their respective regression coefficient and are adjusted to account for shared variance between siblings. Statistical significance levels are indicated as: a = 1 percent; b = 5 percent; c = 10 percent.

d. These items were measured at study entry.

## NOTES

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1. Here and throughout the paper, I assume that the single parent is the primary and only decision maker in the household.
2. There is room for policy intervention if it is possible to identify how or why preferences or perceived rates of return are socially or environmentally motivated.
3. The specific estimates of how much earnings, employment, and income were affected by these program types are available from the author upon request.
4. Increased income may also be used to buy more or better child care which would also alleviate any adult-like responsibilities being placed on the adolescent aged child in the home.
5. See footnote 3.
6. See Reichman et al. in this issue for one study examining infants.
7. Note that the analyses in this paper do not fully control for a number of characteristics that may be associated with having a younger sibling, except for the number of children in the family.

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