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ABSTRACT

We use data from the National Longitudinal Surveys of Youth 1979 and 1997 cohorts to compare welfare use, fertility rates, educational attainment, and marriage rates among teenage women in the years before and the years immediately following welfare reform. Our first objective is to document differences between these cohorts in welfare use and outcomes and behaviors correlated with "entry" into welfare, and with future economic and social well-being. Our second objective is to investigate the causal role of welfare reform in behavioral change. We find significant differences between cohorts in welfare use and in outcomes related to welfare use. Further, difference-in-differences estimates suggest that welfare reform has been associated with reduced welfare receipt, reduced fertility, reduced marriage, and lower school drop-out among young women who, because of a disadvantaged family background, are at high risk of welfare receipt (relative to those at lower risk). Finally, in the post-welfare reform era, teenage mothers are less likely to receive welfare and are more likely to live with a spouse or to live with at least one parent than in the pre-reform era. Establishing definitively that welfare reform is responsible for these changes among teenagers will require further investigation.

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Introduction

Since the passage of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in 1996, researchers have extensively studied the employment and earnings of women who have left the AFDC/TANF rolls, and they have investigated the reasons for the marked decline in caseloads since the mid 1990s. The effects of welfare reform, however, need not be limited to current or former recipients. Changes in federal and state welfare policy that have made welfare receipt temporary, and that require recipients to work, eliminated the entitlement in the AFDC program to long-term income support for unmarried women with children. Consequently, under the new policy, potential recipients may be discouraged from enrolling in welfare and may begin to make choices that would improve their abilities for self-support. For example, young women from disadvantaged families who were traditionally at elevated risk of welfare receipt may continue with schooling or avoid non-marital childbearing so as to reduce the need for cash assistance. There is little research on the effects of welfare reform on such behaviors among young women.[1] Yet many believe that the success of welfare reform depends on behavioral changes such as these, and the stated intention of reformers was to alter these behaviors as evidenced by the following passage from the welfare reform act:

> "Therefore, in light of this demonstration of the crisis in our nation, it is the sense of the Congress that prevention of out-of-wedlock pregnancy and reduction in out-of-wedlock birth are very important Government interests and the policy contained in part A of Title IV of the Social Security Act … is intended to address the crisis." (H.R. 3734)

The purpose of this study is to investigate whether or not the behavior of young women has changed as the result of welfare reform. Specifically, we compare educational attainment, welfare use, fertility rates, and marriage rates among teens in the years before and after welfare reform. Events in teenage years such as an unwanted pregnancy or dropping out of high school may have long-lasting or even irreversible effects. For example, having a child as a teenager is thought to curtail educational opportunities and to reduce socioeconomic attainment in adulthood.[2] O'Neill and O'Neill (1997) report

[1] Three unpublished papers examine the effect of AFDC waivers on teen fertility using aggregate vital statistics: Levine (2002), Kearney (2001), and Horvath and Peters (1999).
[2] This point is the subject of some disagreement. For example, see Hayes, 1987; Hotz, McElroy and Sanders, 1999.

that 81 percent of women who had a birth out-of-wedlock before age 20 had enrolled in AFDC by age 30. Further, there is an extensive literature that points to the importance of educational decisions at these ages to adult economic status.[3] In short, welfare reform could have large effects that will last into later life if it can change teenage behaviors or outcomes that are a cause of economic dependency throughout the lifecycle. Moreover, if welfare reform alters teenage behaviors in such a way as to make receipt of public assistance less likely throughout life, then controversial aspects of the law such as time-limited benefits, which are often viewed as being punitive, may have unappreciated benefits that should be considered in a complete assessment of its effects.

Empirically, we have two objectives. The first is to document differences between cohorts' welfare use and outcomes and behaviors such as early non-marital fertility that are correlated with welfare use and with future economic and social well-being. The second is to investigate whether welfare reform played a causal role in bringing about the changes observed. The central challenge for this analysis is to form appropriate counterfactual outcomes to answer questions such as: In the absence of welfare reform, what choices would young women have made? What would have been their social and economic status? To address this challenge, we employ multivariate regression methods and a quasi-experimental research design that uses information on family background to form 'treatment' and 'control' groups. Youths from disadvantaged socioeconomic backgrounds are at elevated risk of welfare receipt and their behavior is the target of welfare reform. In contrast, youths from more advantaged socioeconomic backgrounds are at low risk of welfare receipt, and changes in welfare policy are unlikely to affect their behavior. Thus, the higher-status youths can be used as a comparison group to control for changes in behavior between cohorts that are unrelated to welfare policy. We expand on this point below.

Background and Literature Review

Evidence abounds for two developments in the 1990s: welfare rolls have dramatically decreased, and employment among single mothers, especially those with young children, has dramatically increased.

[3] For a recent review, see Ashenfelter and Rouse, 2000.

Between January 1993 and June 2000, welfare caseloads fell by nearly 60 percent, while the employment rate among women with children and no spouse present climbed markedly, especially among those with young children (US DHHS 2000, US DOL 2000, Jencks and Swingle 2000, Kaushal and Kaestner 2001, O'Neill and Hill 2001). Although employment among single mothers increased in the economic expansion of the 1980s, the increase in the 1990s was far larger, and it was far larger than the increase in employment of married mothers during the same period (e.g., Meyer and Rosenbaum 2000, O'Neill and Hill 2001). These comparisons suggest that welfare reform, along with other policy changes in the 1990s, increased the employment of single mothers.

Studies of women leaving welfare link the increase in employment of single mothers and the decline in welfare rolls. These "leaver studies" typically find that about two-thirds of leavers are employed following exits from welfare (Brauner and Loprest 1999); that they work about 30 hours per week on average; that their employment is fairly steady; that their earnings grow with labor market experience at a rate comparable to the rate of other women; and that family income also grows with time following exit (Cancian et al. 1999; Corcoran and Loeb, 1999).

However, studies of welfare leavers are intended primarily to provide descriptive information on the well-being of families leaving welfare. Leaver studies do not provide direct estimates of the effects of welfare reform since many women who exited welfare would have done so even in the absence of reform (Bane and Ellwood 1994). Furthermore, studies of welfare recipients or welfare leavers alone cannot provide information about the effects of reform on entry into the welfare system, although some studies do estimate recidivism rates. Thus, Moffitt (1999) concludes that "…welfare leaver studies have great value but represent only one group potentially affected by welfare reform; they miss those who were diverted or discouraged and even those families remaining on the welfare rolls (pp. 3-4)." Accordingly, the National Academy of Sciences Panel on Data and Methods for Measuring the Effects of Changes in Social Welfare Programs recommended that "… to consider the effects of changes in welfare policies on the outcomes of the low-income population, it is important to study not only leavers, but also stayers and

potential applicants who are diverted from programs or who do not apply" (Moffitt and van Ploeg, 1999, page 5).

With few exceptions, studies that have examined the effects of recent welfare reforms have focused on employment and welfare use among single mothers, especially those with low levels of education, those who are current or former welfare recipients, and those who have young children (e.g., Grogger 2000; Kaushal and Kaestner 2001; Schoeni and Blank 2000; Jencks and Swingle 2000, O'Neill and Hill 2001). But a major goal of welfare reform was to change incentives in the welfare system thought to encourage behaviors that make welfare receipt more likely. A poorly understood aspect of reform, therefore, is whether or not it has reduced the likelihood that a woman would become initially eligible for benefits. Of particular importance is whether or not the qualifying behaviors of young women have changed. For example, has welfare reform lowered the incidence of non-marital birth among those at highest risk of such births?

One might argue that the effects of recent welfare reform legislation on demographic behaviors could be obtained by extrapolation from studies of the effect of welfare policy prior to reform. However, research on the effects of AFDC on marriage and fertility has relied on differences over time and among states in the level of welfare benefits, and no studies exist on the effects of the elimination of the entitlement to benefits on demographic and schooling behaviors. In an extensive review of the literature, Moffitt concluded that such studies have produced divergent results, and, further, that

> "…the resolution of the discrepancies between these studies is important for welfare policy at minimum because the issue of how demographic outcomes are affected by the overall level of welfare benefits is so basic to all discussions of welfare effects. It is also relevant to many of the reforms tested in the states in the past several years and to many of the changes enacted in the 1996 welfare legislation…More generally, the legislation is intended to reduce the welfare caseload and to lower the overall level of welfare benefits provided to low-income populations; it is explicitly intended to have effects on nonmarital fertility of the type with which the research literature is concerned" (Moffitt 1998; page 75).

We intend to contribute to the literature on the effects of welfare reform in three respects. First, we study teens, a group that is of importance for welfare reform because of the potential for welfare reform to produce long-term benefits for this group. Second, we use a cross-cohort approach that allows

us to take advantage of the dramatic changes in policy that occurred in the 1990s. Specifically, we compare cohorts who spent their teen years before welfare reform (i.e., 1979 to 1985) to those who spent a substantial portion of their teen years following welfare reform (i.e., 1997 to 1999). Third, for each cohort, we use longitudinal information on individuals to link outcomes and behaviors of youths to their family backgrounds. Longitudinal data provide controls for characteristics of a youth's family background that are strong predictors of the youth's behaviors and outcomes, including welfare use. Information on family background has not been employed heretofore in studies of recent welfare reform. A potential shortcoming of many existing non-experimental evaluations of welfare reform is the use of current characteristics such as education level or the presence of young children to define "treatment" and "comparison" groups. For example, the effects of welfare reform and other policy changes have been estimated by comparing changes in employment of single mothers with and without children (Meyer and Rosenbaum 1999; Kaushal and Kaestner 2001), single mothers with older and younger children (Grogger 2000), or single mothers with low and high levels of education (Schoeni and Blank 2000; Kaushal and Kaestner 2001). However, characteristics such as education level and presence of young children are potentially influenced by welfare reform. In contrast, a youth's family background—his or her mother's education, or whether or not the youth grew up in a single parent family—should not be influenced by welfare reform. Again, such characteristics provide an alternative way to classify youths as more or less likely to be affected by welfare reform. This classification will be used first, to help identify better the population affected by welfare reform (i.e., “treated” population), and second, to form a comparison group to help identify the effects of welfare reform.

In summary, there is little extant research on the effect of welfare reform on entry into welfare, and on the effect of welfare reform on behaviors of teens that are determinants of welfare eligibility and participation. Such information should help provide a more complete evaluation of welfare reform, particularly since the goals of reform are to deter entry into welfare and increase economic independence.

Data

We use data from the National Longitudinal Surveys (NLS), sponsored by the Bureau of Labor Statistics, in particular, the two cohorts of the National Longitudinal Surveys of Youth (NLSY79 and NLSY97). The NLSY97 is a national probability sample of 8,984 youths, approximately half of whom are female, born between the years 1980 and 1984 (ages 12 to 17 in 1997). Survey information for this cohort is available for 1997, 1998 and 1999, and we select female respondents ages 17 in 1997 and ages 17 and 19 in 1998 and 1999. Nearly all years of "exposure" to the risk of welfare use or non-marital fertility for this group are subsequent to the passage of federal welfare reform; for example, the oldest members of the sample were 16 years old in 1996.

The NLSY79 is a national probability sample of 12,686 young adults, approximately half of whom are female, born between the years 1957 and 1964 (ages 14 to 21 in 1979). Since 1979 the respondents to the NLSY79 have been interviewed on a yearly or, more recently, bi-yearly basis. Again, we limit the sample to female respondents ages 17 and 19. The teenage experiences of this cohort are unaffected by the dramatic state and federal welfare reform efforts of the 1990s, and therefore provide a comparison group for more recent cohorts who attained similar ages under the more restrictive welfare policy environment. Moreover, the two NLSY survey instruments have comparable questions and sample designs.

The NLSY surveys collected considerable retrospective and contemporaneous information from respondents. These data allow us to measure family background and outcomes related to welfare use. The availability of information on family background is essential for our quasi-experimental research design. The NLSY79 has information about family structure at age 14, and parents' education. The NLSY97 has information about family structure at age 12, and parents' education. However, approximately 15 percent of the NLSY97 sample is missing information on family structure at age 12 and for these cases, we used family structure at the time of the 1997 interview when respondents were between the ages of 12 and 17. This family background information is used to identify young adults most at risk of welfare participation.

We examine five outcomes: whether or not a young woman ever received welfare; whether or not a young woman ever had a birth; whether or not she ever had a non-marital birth; if she was ever married, and her current drop-out (education) status. For each outcome, we limit the sample to young women of a specific age; for example, we examine cohort differences in non-marital births of young women aged 17, and similarly for young women aged 19. As noted, the NLSY collects contemporaneous and retrospective information that allows us to construct the dependent variables for most respondents. However, the NLSY79 did not collect information about AFDC receipt prior to 1978. So for respondents age 18 and 19 at the time of the 1979 NLSY survey, we are only able to identify whether or not they received AFDC from age 17. This will tend to underestimate the lifetime incidence of welfare receipt for these young women because a small fraction of these young women will have received welfare at ages 15 or 16 if they had a first birth by that age. Therefore, in our analyses of the lifetime incidence of welfare receipt, we limit the NLSY79 sample to respondents less than 17 years old at the time of the 1979 survey.

Most of our dependent variables are cumulative probabilities, for example, the probability of ever receiving AFDC/TANF by age 19. An alternative is to examine conditional probabilities, for example, the probability of receiving welfare at age 19 among those who did not receive it by that age—or the hazard rate of entry into AFDC program. We have done so in a related report (Kasetner, Korenman, and O'Neill, 2002). However, conditional probabilities may result in biased estimates of the effect of welfare reform because they condition on outcomes (e.g., welfare receipt) that are affected by welfare reform. The unconditional probabilities do not suffer from this potential problem.

The NLSY contains geographic information that allows us to merge information about state-specific welfare policy and state economic conditions to individual records. Using this state-specific information, we can characterize the welfare policy and economic conditions in the respondent's state of residence during her teenage years. Specifically, analyses include controls for the unemployment rate and real value of AFDC benefits for a family of three from age 14 onward.[4] So for analyses of outcomes of

[4] We assume that the state of residence does not change; so if a respondent is age 17 in 1999, we assume that her state of residence from age 14 to age 17 is the same as that observed at age 17.

teens aged 17, we include the unemployment rate in her state of residence at age 14, age 15, age 16, and age 17. We follow a similar procedure for AFDC/TANF (real) benefit levels. Note that changes in the benefit level could be considered a result of welfare reform; however, there have been relatively few changes in the maximum benefit level for a family with no earnings since welfare reform. Changes in other aspects of program generosity have been much more dramatic (e.g., earnings disregards, time limits, work requirements). We therefore regard the control for the maximum benefit level for a family without earnings as a proxy for the generosity of benefits in a state in the pre-reform era, and as a proxy for the generosity of welfare benefits in a state the post-reform era in the absence of welfare reform. Therefore, to more fully characterize recent welfare reform, we construct a measure of the number of years that a respondent's state of residence has had time-limited benefits, since this aspect of welfare reform has been shown to be a particularly strong predictor of employment and welfare receipt of low-income women (Grogger 2000, Kaushal and Kaestner 2001).

Research Design and Statistical Methodology

The central challenge for any analysis of the effects of welfare reform is to construct appropriate counterfactual outcomes that can be used to answer questions such as the following: In the absence of welfare reform, what choices would young women and men have made? What would have been their social and economic status? To address this challenge, we use a research design based on a pre- and post-test (intervention) with a comparison group.

Specifically, we use the following regression model to obtain separate estimates of the effect of welfare reform for two groups of young women who differ by their risk of future welfare receipt: a high-risk (target) group—those who come from single-parent families and/or families with less-educated parents—and a low-risk (comparison) group—those who come from two-parent families and/or families with more-educated parents.

For the high – risk group :

$$(1)\quad Y_{ijt} = \alpha_0 + \alpha_1 AGE_i + \alpha_2 RACE_i + \alpha_3 UN_{jt} + \alpha_4 AFDC_{jt} + \alpha_5 COHORT97_t + \gamma_j + e_{ijt}$$

$i = 1,..., N$ (individuals)
$j = 1,...,50$ (states)
$t = 1,..., T$ (years)

and for the low – risk group :

$$(2)\quad Y_{ijt} = \beta_0 + \beta_1 AGE_i + \beta_2 RACE_i + \beta_3 UN_{jt} + \beta_4 AFDC_{jt} + \beta_5 COHORT97_t + \delta_j + v_{ijt}$$

$i = 1,..., N$ (individuals)
$j = 1,...,50$ (states)
$t = 1,..., T$ (years)

In equations (1) and (2), Y is an indicator of one of five outcomes of interest (welfare receipt, fertility, non-marital fertility, marriage, and school drop-out); RACE is a dummy variable(s) indicating the race and ethnicity of the respondent (three categories); UN is the state-specific unemployment rate (lagged values are also included), AFDC is the real value of AFDC/TANF benefits for a family of three (lagged values are also included); and COHORT97 is a dummy variable indicating whether or not the respondent comes from the NLSY79 (COHORT97=0) or NLSY97 (COHORT97=1). Note also that the regression models include controls for state-effects (γ and δ), but since all states implemented reform and the distribution of the NLSY samples is not too dissimilar between cohorts, state effects are not likely to be a significant confounding influence.

We also estimate a model similar to equations (1) and (2) that includes a variable measuring recent welfare reform—the number of years the state has had time-limited benefits for AFDC/TANF. This model, for high-risk young women, is specified as follows:

$$(1a)\quad Y_{ijt} = \alpha_0 + \alpha_1 AGE_i + \alpha_2 RACE_i + \alpha_3 UN_{jt} + \alpha_4 AFDC_{jt} + \alpha_5(\text{COHORT97}_t \; x \; NOTL_{jt}) + \alpha_6(\text{COHORT97}_t \; x \; YRSTL_{jt}) + \gamma_j + e_{ijt}$$

$i = 1,..., N$ (individuals)
$j = 1,...,50$ (states)
$t = 1,..., T$ (years)

All variables in equation (1a) have been defined except, NOTL and YRSTL. The first, NOTL, is equal to one when a state does not have time-limited benefits for AFDC/TANF, and YRSTL measures the number of years a state has had time-limited benefits for AFDC/TANF. Note that the parameter α_6 measures differences in outcomes between the 1997 cohort affected by welfare reform and the 1979 cohort. The proportion of the 1997 cohort unaffected by welfare reform is too small to use as a separate comparison group, and therefore we simply control for differences between them and the other two groups using a dummy variable (COHORT97 x NOTL).

In equations (1) and (1a), the identification of the effect of cohort differences, or "welfare reform", comes from the within-state differences in young adult outcomes before and after the implementation of welfare reform (and conditional on measured characteristics). Therefore, most of the pre-reform outcomes are associated with the experiences of the original NLSY79 cohort, and all of the post-reform outcomes are associated with the NLSY97 cohort. One problem with this identification strategy is that the effect of welfare reform may be confounded by unmeasured, time-varying factors that affect the outcomes of interest.[5] For example, the monetary return to schooling generally increased in the late 1980s and early 1990s, and the job market improved dramatically in the late 1990s. These changes in economic conditions may affect fertility and marriage decisions of teenage young women, and thus outcomes of the two cohorts may have differed in the absence of welfare reform.

[5] A second problem is the endogeneity of pre-PRWORA reform policies. This is a particularly difficult problem to effectively address (see, for example, Besley and Case, 1994; Case, 1998). However, most of the variation in welfare policy is due to federal reforms that are less likely to be endogenous.

To address this problem, we obtain difference-in-differences (DD) estimates of the effect of welfare reform. The DD estimate is obtained by subtracting β_5 of equation (2) from α_5 of equation (1). Identification in this model comes from within-state difference-in-differences. We first compute the differences in outcomes, before and after welfare reform, for young women from families of low socioeconomic status (SES). We carry out the same calculation for young women from families of high SES. The difference-in-differences estimate is obtained by subtracting the first difference for the high SES group from the corresponding difference for the low SES group. The maintained assumption of this identification strategy is that changes over time in the behavior of young adults that are unrelated to welfare reform are common to young adults from lower-risk and higher-risk families; also, young women from lower-risk families are assumed to be unaffected by welfare reform. Therefore, the difference-in-differences procedure controls for general trends in behaviors and outcomes that are correlated with (but not caused by) changes in welfare policy.

We acknowledge that the assumption underlying identification in the difference-in-differences procedure is quite restrictive. However, we believe that the DD remains useful and estimates obtained using this approach are preferable to simple before-and-after differences. For example, the DD will partially account for changes in fertility and marriage that are driven by broad changes in societal values and norms, or by changes in contraceptive technology and costs. Most importantly, the DD allows us to assess whether or not changes before and after welfare reform in the behavior of disadvantaged young women represents a group-specific trend, as opposed to being simply reflective of broader trends in society, as measured by the behavior of non-disadvantaged teens.

Applying the language of experimental research to the difference-in-differences procedure, young adults from higher-risk families represent the treatment group, and young adults from lower-risk families represent the control group. Obviously, this classification scheme introduces some error, for example, some young adults from low-risk families are at some risk of welfare receipt and will be affected by

welfare reform. However, errors of this nature should produce conservative estimates with the same sign as the "true" parameter.

A preliminary analysis of the original cohort of NLSY79 provides some information as to the extent of the classification error and the usefulness of our family background categories to classify young adults into higher- and lower-risk groups. For this preliminary analysis, we selected all NLSY79 female respondents who were aged 16 or less at the time of the 1979 interview so that we would have complete information for ages 16 to 20. We divided this sample into six groups according to mother's education and family structure at age 14. We then obtained the percentage of young adult women in each of the six family groups that had participated in the AFDC program by age 20. The results are listed in Table 1.

The figures in Table 1 illustrate that family structure at age 14 and mother's education are important predictors of risk of welfare receipt of young women. In fact, the figures in Table 1 indicate that mother's education is a particularly strong predictor of future welfare receipt of young women. Very few women from families with mothers who had more than 12 years of education participated in welfare by age 20. In contrast, a significant portion of women from families with mothers of low education had received welfare by age 20.

In sum, the figures in Table 1 support the use of family background to define target and comparison groups for the difference-in-differences procedure. Young adults from families with characteristics associated with lower SES are at high risk of welfare receipt and are therefore the group for which changes in welfare policy are expected to have the greatest effect. Young adults from families with characteristics associated with higher SES are at much lower risk of welfare receipt, and changes over time in their behaviors should be driven primarily by factors unrelated to welfare policy.

We defined teenage young women to be at high risk if, at age 14 (age 12 in NLSY97), they lived in a family headed by a female who has 12 or fewer years of education, or in a two-parent family with a mother who has completed fewer than 12 years of education. However, the distribution of these family background characteristics is not stable over time. Parental education levels have increased between, say, 1982 and 1998, as has the proportion of single-parent families. Changes in parental education and marital

status between cohorts raise potential problems with using a classification based on these characteristics to define risk groups for the two cohorts. Therefore, we rely on two methods to classify young women in the 1997 NLSY cohort as "high risk" or "low risk" based on family background. One method, which we refer to as classification on the basis of absolute risk, assigns risk according to a fixed threshold of mother's education level and marital status. Here we assume that the true predictor of risk of welfare receipt is the level of mother's education and marital status. In this case, an increase in mother's education between cohorts will cause a decline in the proportion of high-risk youths between cohorts, and this method assumes that this represents a true reduction in risk. On the other hand, one might argue that the smaller high-risk group in the later cohort is more disadvantaged. For example, if risk is determined by mother's relative education level (and marital status), then changes in the proportion of low- and high-risk teens will bias estimates of risk-adjusted, inter-cohort differences in outcomes. The increase between cohorts in parental schooling may have been accompanied by a decline in the quality of education, and therefore may not reduce the risk of adverse outcomes for children. To address this possibility, we also assigned risk using cohort-specific criteria, which we refer to as classification based on relative risk because the proportion classified as "high risk" is similar in the two cohorts. Specifically, the high-risk group in the later cohort (NLSY97) consists of teens that lived with a single mother who has 13 or fewer years of education, or from a two-parent family with a mother who completed 12 or fewer years of education.

Descriptive Analysis

Tables 2 through 6 present descriptive statistics for the NLSY97 and NLSY79 cohorts, classified by risk status based on family background. Data are weighted by baseline (1979 or 1997) sample weights. Table 2 presents information about the lifetime prevalence of welfare receipt by age, cohort, and risk status. About 60 percent of the NLSY79 cohort is classified as "high risk" (either absolute or relative, which is the same for the 1979 cohort). As the figures in Table 2 indicate, lifetime prevalence of welfare receipt is positively associated with age and risk (family background). Among those aged 19 in

the NLSY79, 5.4 percent had received welfare while only 1.3 percent of those aged 17 had received welfare. High-risk 19 year olds had a prevalence of welfare receipt of 9.7 percent whereas low-risk 19 year olds had a prevalence of only 2.0 percent. Similar associations between welfare receipt and age, and welfare receipt and risk, are observed for the 1997 NLSY cohort. Table 2 also shows that there has been a decline in welfare receipt between the two cohorts: welfare receipt among the 1997 cohort is lower than it is among the 1979 cohort. This is particularly true among high-risk young women, and when risk is measured on a relative basis. The proportion of the NLSY97 sample classified as high-risk is only about 45 percent, according to the absolute definition of risk. This proportion increases to approximately 65 percent when the relative definition of risk is used. The latter figure is much closer to the proportion of high-risk young women found in the NLSY79 (60%). For this reason, we tend to emphasize results based on the relative risk classification.

Table 3, which has a similar structure as Table 2, presents sample (weighted) proportions related to fertility—whether or not a teenager has had a child. Note that the larger sample size for NLSY79 respondents age 19 in this table reflects the fact that we have complete fertility histories, whereas we did not have complete information on lifetime welfare use. Again, the probability of having a child is positively associated with age and risk. Overall, there is little difference between the two cohorts' fertility. However, when risk is measured on a relative basis, fertility has declined between the two cohorts among the high-risk population of young women. For example, the proportion of high-risk young women19 year olds who have had a child is 0.188 in the NLSY97 cohort, and 0.278 among the NLSY79 cohort. The difference is statistically significant. Table 3 also shows that there has been an increase in fertility between the two cohorts among the low-risk young women, although only among 19 year olds is the difference statistically significant. The inter-cohort decline in fertility among the high-risk population young women, the group most likely to be affected by welfare reform policies, is suggestive of a welfare reform effect. The inter-cohort increase in fertility among the low-risk population of young women provides additional support for this hypothesis since it suggests that the fertility decline among the high-risk population is not due to a general decline in fertility. Finally, in Table 3, it is clear that the method

for classifying young women into low- and high-risk groups matters. The use of absolute criteria to assign risk suggests little change in fertility, whereas the use of relative criteria suggests the pattern described.

For many policymakers, particularly the authors of PRWORA, non-marital fertility is a key indicator of social progress or decline. Table 4 presents the descriptive information for this outcome. As was the case for the other outcomes, non-marital fertility is strongly related to age and family background. In general, there has been a significant increase in non-marital fertility between cohorts. Since the figures in Table 3 show that fertility has remained fairly constant, the increase in non-marital fertility must be the result of a decrease in marriage. Before confirming this fact, it is worth noting that there appears to be a divergence between inter-cohort differences among low- and high-risk groups. Non-marital fertility has greatly increased between cohorts among the low-risk population of young women, but has increased more modestly between cohorts among the high-risk group. This is particularly true when risk is measured on a relative basis.

Table 5 shows the inter-cohort decline in marriage inferred from Tables 3 and 4. This decrease has been significant, and is evident for both low- and high-risk young women. There is some evidence that the decline in marriage has been greater among high-risk than low-risk young women; marriage rates have fallen by approximately 60 to 70 percent for high-risk young women and only about 50 percent for low-risk young women.

The last descriptive table presents figures on drop out rates. A person is considered to be a drop out if she is not enrolled in school as of May 1 and does not have a high school degree. The figures in Table 6 reveal that there has been a significant decline in dropping out between cohorts. The high-risk group, however, accounts for the entire decline; among low-risk young women, there has been little change between cohorts in the proportion dropping out.

In summary, Tables 2 through 6 show that there are significant differences in welfare use and outcomes related to welfare use between the NLSY79 and NLSY97 cohorts. Among high-risk young women, defined on the basis of a relative risk criterion, welfare use declined, fertility declined, marriage

rates declined, and dropout rates declined. There was no change in non-marital births for this group, as the decline in fertility was offset by a decline in marriage among those who had children. Among low-risk young women (relative definition), there was a decrease in marriage and an increase in non-marital births. One caveat is that these findings are sensitive to how risk is defined, particularly in the case of fertility. Nonetheless, the figures in Tables 2 through 6 are suggestive that the behavior of disadvantaged teenage young women has been affected by welfare reform. In the next section, we put this hypothesis to a more rigorous test by adjusting the cohort differences observed in Tables 2 through 6 for cohort differences in sample composition (age, race/ethnicity), economic conditions, AFDC/TANF benefit levels and state-specific factors.

Adjusted Differences and Difference-in-Difference Estimates

In this section, we present ordinary least squares (OLS) estimates of equations (1) and (2) for the high- and low-risk groups, respectively, and difference-in-difference estimates obtained from the estimates of these two equations. We present estimates from several specifications of equations (1) and (2): a simple model that adjusts for age, race, and ethnicity; a model that adjusts for these factors plus unemployment rate and real AFDC/TANF benefits; and finally, a model that adds controls for state effects to the previous specification. We also present estimates of equation (1a), which adds to the model a variable for the number of years a state has had time-limited benefits. Standard errors for all models are constructed taking account of potential non-independence and clustering by state (Bertrand, Duflo and Mullainathan, 2002).

We continue to divide the sample into two subsamples: young women age 17 and young women age 19.[6] This choice is consistent with the figures in Tables 2 through 6, which indicated differences in the presence and magnitude of cohort differences by age. Intuitively, we may expect welfare reform to have different effects by age—for example, older teens are more independent and government policy may

[6] We also obtained estimates for the sample at ages 16 and 18. Results were similar to those reported for ages 17 and 19, respectively.

have more influence on their behavior than on the behavior of younger young women who are less mature and who may be influenced more by family environment. On the other hand, compared to younger teenagers, a higher proportion of older teenagers will have spent some their early teenage years in a pre-welfare-reform environment.

Table 7 presents the ordinary least squares regression estimates for young women age 17. The top panel presents estimates for high-risk young women, and the bottom panel presents estimates for the low-risk population. Difference-in-differences (DD) estimates are presented in Table 8. Each row (model) of the table presents estimates from a different model specification. Row 1 lists estimates of cohort differences in outcomes from models that hold age, race and ethnicity constant; row 2 adds controls for unemployment rate (and lags), and real AFDC/TANF benefits (and lags); and row 3 adds state dummy variables. Rows 4 and 5 allow the effect of cohort to differ by whether or not the state of residence has time-limited benefits and the number of years this policy has been in effect.

Estimates in row 2 of the top panel of Table 7 indicate that between 1979-84 and 1997-99 there has been a decline in welfare receipt, fertility, marriage and drop out rates among high-risk young women aged 17, although only estimates related to marriage and dropping out are statistically significant. The estimate associated with welfare receipt has a p-value of 0.15. Estimates in row 2 also indicate a statistically significant increase in non-marital births between these periods. The magnitudes of the estimates are quite large; for example, a 2.7 percentage point decrease in birth rates represents an approximate 25 percent reduction (using the NLSY79 mean as the reference). In relative terms, the cohort differences in marriage implied by estimates in row 2 are even larger. Similarly, the effect associated with welfare use is large; a 1.4 percentage point decrease in welfare receipt represents an approximate 50 percent decline between cohorts. The relatively large standard errors associated with the estimated effect of reform on welfare use may be reflective of several aspects of the analysis including the infrequency of this outcome, the small sample size, and the fact that standard errors account for clustering at the state level (Bertrand, Duflo and Mullainathan, 2002).

Estimates are sensitive to model specification. Adding state effects, as in row 3, greatly affects the estimates of cohort differences in welfare use and fertility. The estimates in row 3 suggest that there are no cohort differences in welfare receipt and fertility among high-risk young women but that non-marital childbearing has increased, and marriage and school drop out have decreased. Worth mentioning, however, is the fact that estimates in row 3 are affected by collinearity problems that increase standard errors and make it difficult to separate the effect of welfare reform from effects of other variables (e.g., macroeconomic conditions) with marked cohort differences. To illustrate the magnitude of this problem, we regressed the cohort dummy variable on the other control variables used in the model of row 3. The R-square statistic associated with this regression was 0.84. This suggests that there may not be sufficient independent variation to identify cohort differences with much precision. We also note that adding state dummy variables alone (i.e., dropping state welfare benefit and unemployment controls) produces estimates that are similar to those in row 1. This result is not surprising because cohort and state are not highly correlated.[7]

In rows 4 and 5, we present estimates of the effect of time-limited benefits; specifically, the number of years since time-limited benefits have been in place. This specification adjusts for length of different degrees of exposure to welfare reform policies among the members of the 1997 cohort. These estimates are similar to those in rows 2 and 3, as would be expected since a large portion of the NLSY97 cohort live in states with time-limited benefits. The magnitudes of the estimates differ mainly because of the unit of measurement. However, the estimate of the effect of time-limited benefits on welfare use in row 4 is -0.012 when evaluated at the mean (3.0) and statistically insignificant, and somewhat smaller than the estimate in row 2.

The bottom panel of Table 7 presents estimates for the low-risk group. In general, these estimates suggest that for this group, fertility and to a lesser extent drop out rates have increased, and the marriage

[7] Note that there is much within-state variation in both unemployment rates and welfare benefits, but not much variation in state of residence across cohorts.

rate has decreased between cohorts. As was the case for the high-risk group, estimates are sensitive to model specification—row 3 estimates differ from those in rows 1 and 2.

As noted above, estimates of cohort differences and time-limited benefits in Table 7 do not control for unmeasured factors that affect the outcomes of interest and that may have varied between 1979-84 and 1997-99. One method of addressing this issue is to obtain difference-in-differences (DD) estimates in which cohort differences for the low-risk group are subtracted from cohort differences for the high-risk group. If the unmeasured factors that affect the outcomes of interest have a similar effect on the low- and high-risk groups, then the DD will be a better estimate of the effect of cohort differences for the high-risk group—the group affected by welfare reform. Table 8 contains the DD estimates.[8]

Estimates in rows 2 in Table 8 suggest a significant decline in welfare use, fertility, marriage, and drop out rates between cohorts pre- and post-welfare reform for young women aged 17. Similar findings are revealed by the estimates in row 4 for time-limited benefits, but in this case, estimates indicate somewhat smaller declines in welfare use and fertility, and they are not statistically significant. In rows 3 and 5, only estimates related to the marriage rate and drop out rate remain statistically significant, but as noted, the estimates in rows 3 and 5 are obtained under statistical circumstances (multicollinearity) that make it difficult to estimate reliable effects. Generally, the estimates in Table 8 indicate that many of the cohort differences among high-risk young women aged 17 are not simply the result of general trends that affect all young women, but rather are specific to the high-risk group. This provides support for the hypothesis that welfare reform, which is targeted at the behavior of high-risk young women, may have had an impact. Specifically, welfare reform may have resulted in lower fertility, less use of welfare, and less dropping out of school among young women age 17, as well as less marriage and higher rates of non-marital fertility. We note that cohort differences in drop out rates and marriage are large, perhaps implausibly so in the case of drop out rate. For these outcomes the DD procedure may not be adequately measuring broad trends since few low-risk (non-disadvantaged) young women dropped out or married

[8] Standard errors of the difference-in-difference estimates are obtained under the assumption that the estimates in Table 7 have zero covariance.

prior to or after welfare reform, although we do observe a significant decline in marriage for low-risk young women.

Table 9 presents the results for young women age 19. Estimates in rows 2 and 4 of the top panel indicate that among high-risk young women, welfare use, fertility, marriage rate and drop out rate have decreased between 1979-84 and 1997-99, and pre- and post-welfare reform (as measured by time-limited benefits). Estimates of change in welfare use are not statistically significant (p-value=0.15), but they are relatively large. For example, a 3.0 (row 2) percentage point decline in welfare use among this group represents an approximately 30 percent decline. In rows 3 and 5, estimates lead to a different conclusion; in this case there are no cohort differences in welfare use or fertility, and nonmarital fertility may have increased. As noted, estimates in rows 3 and 5 are plagued by collinearity and standard errors of the estimates are relatively large (nearly twice the size of those in row 2). Again, collinearity makes it difficult to reliably detect cohort differences, or pre- and post-welfare reform differences. The bottom panel of Table 9 presents estimates for the sample of low-risk young women age 19. In this case, estimates in rows 2 and 4 indicate cohort and pre- and post-welfare reform differences that are in stark contrast to those for high-risk young women. Estimates indicate that welfare use and fertility have increased between 1979-84 and 1997-99, pre- and post-welfare reform. In addition, estimates of cohort differences in rates of marriage and drop out are negative, as was the case for high-risk young women, but smaller in magnitude, and the estimated effects on drop out are not statistically significant.

Table 10 formalizes the difference-in-difference estimates just alluded to. Estimates in rows 2 and 4 of Table 10 indicate that there has been a decrease in welfare use, fertility, and rates of marriage and drop out between the NLSY79 and NLSY97 cohort, and pre- and post-welfare reform. Estimates in row 2 of Table 10 even suggest a significant decline in non-marital fertility. The estimates are large in magnitude—in the range of 30 to 50 percent—and in nearly all cases statistically significant. These estimates show that there has been a group-specific trend in these outcomes between 1979-84 and 1997-99, and they are consistent with a welfare reform effect. Estimates in row 4 suggest similar effects, but are somewhat smaller when evaluated at the mean number of years that time-limited benefits have been

effect. Finally, estimates in rows 3 and 5, however, call for more caution. Only one of these estimates is statistically significant, and the estimated effect on welfare use has reversed sign. We have noted the collinearity problem associated with these estimates.

Some estimates in Tables 7 through 10 are suggestive of a significant decline in welfare use. An important question raised by this finding is whether welfare use is falling because behaviors have changed so that young women are less likely to need welfare (e.g., non-marital teen birth rates have fallen), or because welfare take-up among the "would-be" eligible has fallen. We have provided a partial answer to this question because we have reported estimates that also indicate a decline in fertility and, among 19 year olds, non-marital fertility. This pattern suggests that the decline in welfare use is partly the result of a decline in eligibility.

To answer the question of whether or not there has been a decline in take-up among eligible young women, we examine welfare use and living arrangements for young women who have had a birth. These estimates should shed light on the question of whether or not take-up among eligible women has been affected by welfare reform. Estimates are presented in Tables 11 and 12 for young women aged 17 and 19, respectively. We limit the sample to mothers from high-risk families, as the number of births to young women from low-risk families was too small to carry out meaningful analysis. Estimates in row 2 of Table 11 indicate that there has been a significant decline in welfare take-up between cohorts among young women aged 17, although not all estimates are statistically significant. The large standard errors reflect the relatively small sample size—approximately 300 in Table 11. Focusing on row 2 of Table 11, estimates suggest that the welfare take-up rate is approximately 10 percentage points, or approximately 50 percent, lower among the 1997 cohort than among the 1979 cohort.

In contrast to the results for 17 year olds, estimates in Table 12 suggest that the welfare take-up rate is approximately equal among young women aged 19 in the NLS97 and NLSY79. There is some evidence of a decline in current welfare use among this group, but the estimated effects in row 2 and 4 of table 12 are not statistically significant, even though they are quite large in magnitude. Moreover, there is no evidence of an inter-cohort decline in ever receiving welfare. The sample size for this analysis is

substantial—approximately 800 young women—so large standard errors are not caused by small samples. In sum, estimates in Table 12 suggest little change in inter-cohort welfare take-up among young women of this age.

If young women aged 17 are having births as teenagers and not getting welfare, how are they surviving? A partial answer to this question is found in Table 11. Estimates in Table 11 suggest that fertility, marriage, living with parents, and welfare use are all highly related. The most dramatic change between the two cohorts is the enormous jump in the proportion of teen mothers who live with a parent and do not receive welfare; an increase of 32 percentage points (row 2), or a near doubling. The proportion of young mothers living with a spouse and off of welfare, decreased 27 percentage points (row 2). It is tempting to conclude from the evidence in Table 11 that the inter-cohort decline in welfare take-up is the result of a greater reliance on family resources and a substitution of family for public resources. But, estimates in Table 12 also suggest that mothers aged 19 are more likely to be living with a parent and not on welfare, and less likely to be living with a spouse and not on welfare, despite the lack of a marked decline in welfare take-up among this group.

Conclusion

In this paper, we have described changes after welfare reform in welfare use and in behaviors related to the future use of public assistance. Our analysis focused on young women aged 17 and 19. Critical decisions related to schooling and fertility are made in the teen years that are thought to have lasting effects upon economic status. The ability of welfare reform policies to alter behaviors among this group is considered a key to the long-term success of welfare reform.

We find evidence that welfare reform has been associated with reduced welfare receipt, reduced fertility, reduced rates of marriage, and lower rates of dropping out of high school among young women at high risk of welfare receipt. In addition, we find some evidence that welfare reform is associated with reduced non-marital fertility among older high-risk teenagers.

Evidence of lower welfare use among teens implies that the widely noted decline in the welfare caseload is not solely a matter of an increase in the rate of leaving welfare or a decline in recidivism (perhaps because of work requirements and time limits), but also because of a decline in the rate of initial entry.[9] We explored whether the decline in welfare entry is explained by lower take-up among the would-be eligible, or a decline in qualifying behaviors (fertility, marriage, and non-marital fertility), and we found some evidence for both. Although political conservatives and liberals may debate whether declining take up of welfare among poor teen mothers is desirable, liberals and conservatives would probably agree that behavioral changes that reduce the need for welfare would be preferable to decreased take-up among poor teenage mothers.

The pattern of welfare use appears to vary by age. Among 17 year olds, the decline of welfare use is accounted for by a reduction in take-up of benefits among high-risk teen mothers. There was no evidence of change in their "qualifying behaviors" such as reduced non-marital fertility. Among 19 year olds, in contrast, there is little evidence of a decline in take up (ever use) among mothers, but there is some evidence of a decrease in non-marital fertility, which would make them less likely to qualify for welfare. Still, the evidence indicates that "current" welfare use among 19-year-old mothers has fallen. The combination of reduced "current" use with constant "ever" use suggests that welfare reform may have shortened durations of use among 19 year-old mothers.

If teen mothers are less likely to use welfare, how are they getting by? There is evidence that welfare reform has been associated with a substantial increase in living at home (i.e., living with at least one parent) among teen mothers, so that family resources appear to have been substituted, at least to a degree, for public resources.[10] However, the evidence on this point was not definitive, and it further research needs to document whether or not these changes represent continuations of ongoing trends or appear to be more abrupt changes roughly coincident with welfare reform. Nevertheless, whether causally related to welfare reform or not, data on living arrangements clearly help describe how

[9] We present hazard models for initial welfare entry in Kaestner, Korenman, and O'Neill 2002.

disadvantaged teen mothers are surviving without welfare. Whether increased living with a parent is a development that will prove beneficial to teen mothers and their children, and to the grandparents and other family members, remains a subject for future research.

Our results are somewhat sensitive to the model specification, but particularly to the *simultaneous* inclusion of controls for state fixed effects and state unemployment rates and welfare benefits. Our analysis of this issue points to a multicollinearity problem. In particular, the results were not especially sensitive to adding *either* state fixed-effects (not shown in the tables) or state welfare benefits and unemployment rates. Therefore, our preferred results (upon which we base our conclusions) are those from "model 2", which includes controls for age, race, and ethnicity, family background (high or low SES group, defined on the basis of parental education and family structure), and state unemployment rates and welfare benefit levels, but which excludes state fixed effects. The sensitivity of results to the inclusion of state fixed-effects in models than include controls for state policy and economic characteristics is, unfortunately, typical of the AFDC/TANF literature (see Moffitt 2002), and accounts in part for the broad range of research results in that literature.

Finally, because data are currently available to follow the 1997 cohort only through the teen years, we are unable to consider longer-term effects of welfare reform on behavior. For example, welfare reform may have changed only the timing of non-marital fertility; the 1997 cohort may have reduced rates of teen non-marital fertility but elevated rates of non-marital fertility in their twenties. Whether a change in fertility timing induced by welfare reform would ultimately improve long-term economic status remains an open question (e.g., Hayes 1987; Geronimus 1996; Hotz et al. 1999).

[10] Welfare reform is also associated with reduced chances that a teen mother will live with a spouse, but this proportion was small even in the earlier cohort.

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Table 1
Relationship of Family Background to Respondent Welfare Use

Respondent's Family Structure at Age 14, Mother's Education	Number of Observations	Percentage of Respondents Ever to Receive AFDC by Age 20
One-parent, < 12 Yrs. Educ.	307	26.7
One-parent, =12 Yrs. Educ.	155	20.6
One-parent, >12 Yrs. Educ.	60	1.7
Two-parent, < 12 Yrs. Educ.	611	13.6
Two-parent, =12 Yrs. Educ.	539	6.9
Two-parent, >12 Yrs. Educ.	206	1.9

Source: NLSY79

Table 2
Ever Received Welfare (AFDC/TANF) by Age and Risk Status

Sample-Weighted Proportions (Unweighted Sample Counts)

	1979 Cohort, Age 17 and 19 between 1979 and 1984			1997 Cohort, Age 17 and 19 between 1997 and 1999		
Age 17	All	High Risk	Low Risk	All	High Risk	Low Risk
Absolute Risk	0.013 (N=2620)	0.025 (N=1533)	0.003 (N=1080)	0.005** (N=1980)	0.011** (N=929)	0.001 (N=1039)
Relative Risk				0.005** (N=1980)	0.008** (N=1279)	0.001 (N=689)
Age 19						
Absolute Risk	0.054 (N=2549)	0.097 (N=1485)	0.020 (N=1057)	0.043 (N=736)	0.075 (N=363)	0.023 (N=365)
Relative Risk				0.043 (N=736)	0.053** (N=500)	0.029 (N=228)

Notes:
1. Weights are baseline interview sample weights.
2. Observations included in 1979 cohort are aged 17 or less at baseline.
3. High, absolute-risk group: lived in single-female headed family at age 14, mother has 12 or fewer years of education, or two-parent family, mother has fewer than 12 years of education.
4. In 1997, high relative-risk group: lived in single-female headed family at age 12, mother who has 13 or fewer years of education, or two-parent family, mother has 12 or fewer years of education. Absolute and relative risk groups are the same for 1979 cohort.
5. Asterisks (**) next to a number indicate that it is statistically ($p<0.05$) different from the corresponding 1979 figure.

Table 3
Ever Had a Birth by Age and Risk Status

Sample-Weighted Proportions (Unweighted Sample Counts)

	1979 Cohort, Age 17 and 19 between 1979 and 1984			1997 Cohort, Age 17 and 19 between 1997 and 1999		
Age 17	All	High Risk	Low Risk	All	High Risk	Low Risk
Absolute Risk	0.061 (N=2620)	0.109 (N=1533)	0.023 (N=1080)	0.059 (N=1983)	0.113 (N=931)	0.024 (N=1040)
Relative Risk				0.059 (N=1983)	0.083** (N=1281)	0.025 (N=690)
Age 19						
Absolute Risk	0.170 (N=4162)	0.278 (N=2343)	0.085 (N=1811)	0.167 (N=736)	0.240 (N=367)	0.114 (N=367)
Relative Risk				0.167 (N=736)	0.188** (N=505)	0.128** (N=229)

Notes:
1. Weights are baseline interview sample weights.
2. Observations included in 1979 cohort are aged 17 or less at baseline.
3. High, absolute-risk group: lived in single-female headed family at age 14, mother has 12 or fewer years of education, or two-parent family, mother has fewer than 12 years of education.
4. In 1997, high relative-risk group: lived in single-female headed family at age 12, mother who has 13 or fewer years of education, or two-parent family, mother has 12 or fewer years of education. Absolute and relative risk groups are the same for 1979 cohort.
5. Asterisks (**) next to a number indicate that it is statistically ($p<0.05$) different from the corresponding 1979 figure.

Table 4
Ever Had a Nonmarital Birth by Age and Risk Status

Sample-Weighted Proportions (Unweighted Sample Counts)

	1979 Cohort, Age 17 and 19 between 1979 and 1984			1997 Cohort, Age 17 and 19 between 1997 and 1999		
Age 17	All	High Risk	Low Risk	All	High Risk	Low Risk
Absolute Risk	0.035 (N=2620)	0.064 (N=1533)	0.012 (N=1080)	0.057** (N=1983)	0.108** (N=931)	0.024** (N=1040)
Relative Risk				0.057** (N=1983)	0.080 (N=1281)	0.025** (N=690)
Age 19						
Absolute Risk	0.085 (N=4162)	0.148 (N=2343)	0.035 (N=1811)	0.142** (N=736)	0.197** (N=367)	0.101** (N=367)
Relative Risk				0.142** (N=736)	0.157 (N=505)	0.112** (N=229)

Notes:
1. Weights are baseline interview sample weights.
2. Observations included in 1979 cohort are aged 17 or less at baseline.
3. High, absolute-risk group: lived in single-female headed family at age 14, mother has 12 or fewer years of education, or two-parent family, mother has fewer than 12 years of education.
4. In 1997, high relative-risk group: lived in single-female headed family at age 12, mother who has 13 or fewer years of education, or two-parent family, mother has 12 or fewer years of education. Absolute and relative risk groups are the same for 1979 cohort.
5. Asterisks (**) next to a number indicate that it is statistically ($p<0.05$) different from the corresponding 1979 figure.

Table 5
Ever Married by Age and Risk Status

Sample-Weighted Proportions (Unweighted Sample Counts)

	1979 Cohort, Age 17 and 19 between 1979 and 1984			1997 Cohort, Age 17 and 19 between 1997 and 1999		
Age 17	All	High Risk	Low Risk	All	High Risk	Low Risk
Absolute Risk	0.051 (N=2621)	0.087 (N=1532)	0.022 (N=1082)	0.009** (N=1970)	0.015** (N=922)	0.004** (N=1036)
Relative Risk				0.009** (N=1970)	0.011** (N=1272)	0.004** (N=686)
Age 19						
Absolute Risk	0.192 (N=4163)	0.272 (N=2338)	0.130 (N=1817)	0.077** (N=736)	0.085** (N=359)	0.069** (N=361)
Relative Risk				0.077** (N=736)	0.084** (N=495)	0.062** (N=225)

Notes:
1. Weights are baseline interview sample weights.
2. Observations included in 1979 cohort are aged 17 or less at baseline.
3. High, absolute-risk group: lived in single-female headed family at age 14, mother has 12 or fewer years of education, or two-parent family, mother has fewer than 12 years of education.
4. In 1997, high relative-risk group: lived in single-female headed family at age 12, mother who has 13 or fewer years of education, or two-parent family, mother has 12 or fewer years of education. Absolute and relative risk groups are the same for 1979 cohort.
5. Asterisks (**) next to a number indicate that it is statistically ($p<0.05$) different from the corresponding 1979 figure.

Table 6
Drop Out Status by Age and Risk Status

Sample-Weighted Proportions (Unweighted Sample Counts)

	1979 Cohort, Age 17 and 19 between 1979 and 1984			1997 Cohort, Age 17 and 19 between 1997 and 1999		
Age 17	All	High Risk	Low Risk	All	High Risk	Low Risk
Absolute Risk	0.122 (N=2634)	0.209 (N=1543)	0.051 (N=1084)	0.103** (N=1997)	0.167** (N=922)	0.060 (N=1045)
Relative Risk				0.103** (N=1997)	0.132** (N=1289)	0.059 (N=695)
Age 19						
Absolute Risk	0.148 (N=4196)	0.255 (N=2363)	0.064 (N=1825)	0.122 (N=767)	0.219 (N=374)	0.055 (N=385)
Relative Risk				0.122 (N=767)	0.160** (N=517)	0.056 (N=242)

Notes:
1. Weights are baseline interview sample weights.
2. Observations included in 1979 cohort are aged 17 or less at baseline.
3. High, absolute-risk group: lived in single-female headed family at age 14, mother has 12 or fewer years of education, or two-parent family, mother has fewer than 12 years of education.
4. In 1997, high relative-risk group: lived in single-female headed family at age 12, mother who has 13 or fewer years of education, or two-parent family, mother has 12 or fewer years of education. Absolute and relative risk groups are the same for 1979 cohort.
5. Asterisks (**) next to a number indicate that it is statistically ($p<0.05$) different from the corresponding 1979 figure.

Table 7
Cohort Differences in Welfare Receipt, Fertility, Marriage and Education of Young Women Age 17 by Relative Risk Status

Model	Cohort Difference	Ever AFDC/TANF	Ever Had Birth	Ever Nonmarital Birth	Ever Married	Current Drop Out
	High Risk 97 – High Risk 79					
1	Adjusted Difference: age and race/ethnicity	-0.013** (0.007)	-0.007 (0.016)	0.029* (0.016)	-0.069** (0.011)	-0.081** (0.020)
2	Adjusted Difference: age, race/ethnicity, unemployment, and AFDC/TANF benefit level	-0.014 (0.010)	-0.027 (0.022)	0.029* (0.016)	-0.092** (0.011)	-0.127** (0.022)
3	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and state	0.002 (0.016)	0.023 (0.032)	0.077** (0.027)	-0.104** (0.017)	-0.102** (0.041)
	Effect of Years Since Time Limit					
4	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and cohort	-0.004 (0.004)	-0.000 (0.008)	0.018** (0.005)	-0.025** (0.005)	-0.026** (0.011)
5	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, cohort, and state	0.001 (0.003)	0.013 (0.007)	0.028** (0.005)	-0.020** (0.006)	-0.009 (0.013)
	Low Risk 97 – Low Risk 79					
1	Adjusted Difference: age and race/ethnicity	-0.001 (0.003)	0.008 (0.010)	0.017* (0.009)	-0.011** (0.006)	0.011 (0.017)
2	Adjusted Difference: age, race/ethnicity, unemployment, and AFDC/TANF benefit level	0.002 (0.002)	0.025 (0.017)	0.030** (0.015)	-0.015* (0.008)	0.021 (0.021)
3	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and state	0.005 (0.005)	0.009 (0.016)	0.018 (0.016)	-0.022 (0.014)	0.064** (0.029)
	Effect of Years Since Time Limit					
4	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and cohort	0.000 (0.001)	0.010 (0.007)	0.012* (0.006)	-0.005* (0.003)	0.012 (0.008)
5	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, state, and cohort	0.000 (0.001)	0.006 (0.006)	0.007 (0.005)	0.000 (0.005)	0.017* (0.011)

Notes:

1. Model 1 includes controls for age (age in months) and race/ethnicity (3 categories).
2. Model 2 includes model 1 controls plus: contemporaneous state unemployment rate, three lags of state unemployment rate, contemporaneous state AFDC/TANF maximum benefit level for a family of 3, and three lags of state AFDC/TANF benefit level.
3. Model 3 includes model 2 controls plus: state dummy variables.
4. Model 4 includes model 3 controls plus: a variable measuring the number of years since state implemented time limited benefits for welfare receipt. The effect of this variable is derived from a comparison between members of the 1979 cohort and members of the 1997 cohort who live in states with time limited benefits. A dummy variable is included to identify members of the 1997 cohort who live in states without time-limited benefits.
5. Robust (cluster on state) standard errors are in parentheses. ** $p \leq 0.05$, * $0.05 < p \leq 0.10$

Table 8
Difference-in-Differences Estimates
Cohort Differences in Welfare Receipt, Fertility, Marriage and Education of Young Women Age 17
By Relative Risk Status

Model	Difference-in-Differences (DD)	Ever AFDC/TANF	Ever Had a Birth	Ever Nonmarital Birth	Ever Married	Current Drop Out
2	Adjusted DD: age, race/ethnicity, unemployment, and AFDC benefit level	-0.016* (0.010)	-0.052* (0.028)	-0.001 (0.022)	-0.077** (0.014)	-0.148** (0.030)
3	Adjusted DD: age, race/ethnicity, unemployment, AFDC benefit level, and state	-0.003 (0.017)	0.014 (0.036)	0.059** (0.031)	-0.082** (0.022)	-0.166** (0.050)
	Effect of Years Since Time Limit					
4	Adjusted DD: age, race/ethnicity, unemployment, AFDC benefit level, and cohort	-0.004 (0.004)	-0.010 (0.011)	0.006 (0.008)	-0.020** (0.006)	-0.038** (0.014)
5	Adjusted DD: age, race/ethnicity, unemployment, AFDC benefit level, cohort, and state	0.001 (0.003)	0.007 (0.009)	0.021** (0.009)	-0.020** (0.008)	-0.026 (0.017)

Notes:

1. Model numbers refer to those in Table 7
2. Standard errors of estimates in Table 8 are calculated assuming no covariance between the estimates in the top and bottom panels of Table 7
3. ** $p \leq 0.05$, * $0.05 < p \leq 0.10$

Table 9
Cohort Differences in Welfare Receipt, Fertility, Marriage and Education of Young Women Age 19 by Relative Risk Status

Model	Cohort Difference	Ever AFDC/TANF	Ever Had a Birth	Ever Nonmarital Birth	Ever Married	Current Drop Out
	High Risk 97 – High Risk 79					
1	Adjusted Difference: age and race/ethnicity	-0.036** (0.017)	-0.091** (0.022)	0.011 (0.023)	-0.186** (0.020)	-0.103** (0.024)
2	Adjusted Difference: age, race/ethnicity, unemployment, and AFDC/TANF benefit level	-0.030 (0.021)	-0.112** (0.022)	0.024 (0.025)	-0.259** (0.034)	-0.135** (0.029)
3	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and state	0.030 (0.049)	0.007 (0.044)	0.094** (0.042)	-0.167** (0.043)	-0.074* (0.052)
	Effect of Years Since Time Limit					
4	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and cohort	-0.008 (0.007)	-0.033** (0.006)	0.009 (0.007)	-0.081** (0.011)	-0.041** (0.010)
5	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, cohort, and state	0.007 (0.014)	-0.007 (0.014)	0.024* (0.013)	-0.053** (0.013)	-0.017 (0.014)
	Low Risk 97 – Low Risk 79					
1	Adjusted Difference: age and race/ethnicity	0.004 (0.009)	0.036 (0.022)	0.066** (0.019)	-0.058** (0.023)	-0.018 (0.015)
2	Adjusted Difference: age, race/ethnicity, unemployment, and AFDC/TANF benefit level	0.019 (0.014)	0.040 (0.026)	0.084** (0.023)	-0.120** (0.022)	-0.031 (0.019)
3	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and state	0.009 (0.019)	0.105** (0.050)	0.119** (0.040)	-0.088* (0.047)	-0.015 (0.048)
	Effect of Years Since Time Limit					
4	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and cohort	0.003 (0.003)	0.013 (0.009)	0.024** (0.008)	-0.038** (0.006)	-0.006 (0.006)
5	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, cohort, and state	0.003 (0.004)	0.034** (0.015)	0.032** (0.012)	-0.022 (0.014)	-0.005 (0.013)

Notes: (see notes following Table 7)
1. For the outcome "ever AFDC/TANF", the 1979 cohort is restricted to young women age 17 or less at baseline.

Table 10
Difference-in-Differences Estimates
Cohort Differences in Welfare Receipt, Fertility, Marriage and Education of Young women Age 19
By Relative Risk Status

Model	Difference-in-Differences (DD)	Ever AFDC/TANF	Ever Had a Birth	Ever Nonmarital Birth	Ever Married	Current Drop Out
2	Adjusted DD: age, race/ethnicity, unemployment, and AFDC/TANF benefit level	-0.049* (0.025)	-0.152** (0.034)	-0.060* (0.034)	-0.139** (0.041)	-0.104** (0.035)
3	Adjusted DD: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and state	0.021 (0.053)	-0.098 (0.067)	-0.025 (0.058)	-0.079 (0.064)	-0.059 (0.071)
	Effect of Years Since Time Limit					
4	Adjusted DD: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and cohort	-0.011 (0.008)	-0.046** (0.011)	-0.015 (0.011)	-0.043** (0.013)	-0.035** (0.012)
5	Adjusted DD: age, race/ethnicity, unemployment, AFDC/TANF benefit level, cohort, and state	0.004 (0.015)	-0.041* (0.021)	-0.008 (0.018)	-0.031 (0.019)	-0.012 (0.019)

Notes:

1. Model numbers refer to those in Table 9.
2. Standard errors of estimates in Table 10 are calculated assuming no covariance between the estimates in the top and bottom panels of Table 9.
3. ** $p \leq 0.05$, * $0.05 < p \leq 0.10$

Table 11
Cohort Differences in Welfare Receipt and Living Arrangements, Mothers Age 17, By Relative Risk Status

Coefficients (robust SEs) From Linear Probability Models

Model	Cohort Difference	Ever AFDC/TANF	Current AFDC/TANF	No Current AFDC, Live w/ Parent	No Current AFDC, Live w/ Spouse
	High Risk 97 – High Risk 79				
1	Adjusted Difference: age and race/ethnicity	-0.121* (0.063)	-0.166** (0.070)	0.318** (0.064)	-0.220** (0.054)
2	Adjusted Difference: age, race/ethnicity, unemployment, and AFDC/TANF benefit level	-0.110 (0.076)	-0.098 (0.073)	0.320** (0.092)	-0.268** (0.052)
3	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and state	-0.006 (0.117)	-0.028 (0.123)	0.472** (0.233)	-0.370** (0.104)
	Effect of Years Since Time Limit				
4	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and cohort	-0.038 (0.027)	-0.033 (0.024)	0.135** (0.027)	-0.082** (0.024)
5	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, cohort, and state	-0.003 (0.030)	-0.011 (0.034)	0.147** (0.047)	-0.108** (0.040)

Notes:

1. Sample is limited to teenage young women who have had a child.
2. Model 1 includes controls for age (age in months) and race/ethnicity (3 categories).
3. Model 2 includes model 1 controls plus: contemporaneous state unemployment rate, three lags of state unemployment rate, contemporaneous state AFDC/TANF benefit level for a family of three, and three lags of state AFDC/TANF benefit level.
4. Model 3 includes model 2 controls plus: state dummy variables.
5. Model 4 includes model 3 controls plus: a variable measuring the number of years since state implemented time limited benefits for welfare receipt. The effect of this variable is derived from a comparison between members of the 1979 cohort and members of the 1997 cohort who live in states with time limited benefits. A dummy variable is included to identify members of the 1997 cohort who live in states without time-limited benefits.
6. Robust (cluster on state) standard errors are in parentheses. ** $p \leq 0.05$, * $0.05 < p \leq 0.10$

Table 12
Cohort Differences in Welfare Receipt and Living Arrangements, Mothers Age 19 By Relative Risk Status

Coefficients (robust SEs) From Linear Probability Models

Model	Cohort Difference	Ever AFDC/TANF	Current AFDC/TANF	No Current AFDC, Live w/ Parent	No Current AFDC, Live w/ Spouse
	High Risk 97 – High Risk 79				
1	Adjusted Difference: age and race/ethnicity	-0.038 (0.066)	-0.161** (0.041)	0.214** (0.056)	-0.317** (0.048)
2	Adjusted Difference: age, race/ethnicity, unemployment, and AFDC/TANF benefit level	0.007 (0.074)	-0.070 (0.044)	0.188** (0.054)	-0.405** (0.061)
3	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and state	0.096 (0.147)	0.028 (0.074)	-0.011 (0.118)	-0.416** (0.098)
	Effect of Years Since Time Limit				
4	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, and cohort	0.004 (0.026)	-0.021 (0.015)	0.064** (0.018)	-0.129** (0.021)
5	Adjusted Difference: age, race/ethnicity, unemployment, AFDC/TANF benefit level, cohort, and state	0.020 (0.039)	0.003 (0.019)	0.023 (0.027)	-0.116** (0.024)

Notes:

1. Sample is limited to teenage young women who have had a child. For the outcome "ever received AFDC", the 1979 cohort is limited to young women age 17 or less at baseline.