The Timing of Teenage Births and the Economic Returns to Education

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Abstract

Teenage mothers tend to have poor economic outcomes later in life. However, the girls who become teenage mothers come from less advantaged backgrounds than those who delay childbearing until later in life, making causality difficult to establish. This paper examines the effect of having a child during high school versus becoming a young mother, but one who has already finished high school. I compare the outcomes of girls who have a child in the end of their senior year of high school to a control group comprised of girls who give birth a few months later. I find that girls who give birth during the school year are 9 percentage points less likely to graduate from high school; however, this has little effect on their eventual labor market outcomes. Despite being much more likely to obtain a High School degree, the control group does not enjoy higher earnings later in life, and is not any more likely to be working.

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1 Introduction

There is an extensive body of literature establishing a strong correlation between teenage childbearing and poor economic outcomes later in life. Teenage mothers are less likely to complete high school, less likely to be working, have lower earnings and are less likely to be married than those women who did not become teenage mothers (Card & Wise 1978, Trussell 1988, Ellwood 1989). While teen pregnancy rates in the U.S. are currently at record lows,[1] the rate is still considerably higher than in most developed countries.[2] This has led the CDC to name teen pregnancy prevention as one of its "top six priorities, a 'winnable battle' in public health, and of paramount importance to health and quality of life for our youth."[3]

However, there is also evidence that the girls who have children as teenagers come from less advantaged backgrounds than those who delay childbearing until later in life. This makes it very difficult to establish causality, as previous studies tend to compare those girls who have a child as a teenager with those who do not. It may be that even if the teenage moms had delayed childbearing until later in life, their disadvantaged background would have made them worse off anyway. In fact, the few papers that have not simply compared teenage mothers with those who delayed childbearing have found strikingly different results. Geronimus & Korenman (1992) control for family background by comparing pairs of sisters, where one has a child as a teen and the other does not. While noting that heterogeneity in endowments and parental investment exists even within families, they find that studies that do not control for family background overstate the causal consequences of teenage childbearing.

More recent papers have used teenagers who become pregnant, but suffer miscarriages as an instrument for becoming a teenage mother (Hotz et al. 2005), and as a control group (Ashcraft & Lang 2006). Hotz et al. (2005) find very small, short lived negative effects for most examined

[1] http://www.cdc.gov/TeenPregnancy/AboutTeenPreg.htm

[2] United Nations Demographic Yearbook 2007,
http://unstats.un.org/unsd/demographic/products/dyb/dyb2007/Table10.pdf

[3] http://www.cdc.gov/TeenPregnancy/AboutTeenPreg.htm#_edn3

outcomes. And, for annual hours of work and earnings, they find that the teenage mothers are actually doing better at older ages than they would have been if they had delayed childbearing. Ashcraft & Lang (2006) show that IV underestimates the negative effect of childbearing, but that OLS overestimates it. Using both estimates, they find that if there is a negative effect of teenage childbearing, it is quite small.

One clear difference between women who have their first child as teenagers, and women who do not, is that teenage mothers' high school experience is more likely to be interrupted by the arrival of their child. This paper examines the effect of that interruption on a number of later life outcomes. I look at the effect of having a child during high school versus becoming a young mother, but one who has already finished high school, by comparing the outcomes of women who had a child near the end of their senior year of high school to those who have one just after the end of high school.[4]

I find that women whose high school education was interrupted are 9 percentage points less likely to graduate from high school than those who had their first child a few months later. However, this difference in educational attainment has no effect on income (personal or family), her probability of working, or the likelihood that she is married. What it does change is her average number of children, and as a result, her family's chance of falling below the poverty line.

2 Previous Literature

There is an extensive body of work documenting the consequences of becoming a teenage mother. Card & Wise (1978) use a nationally representative survey called Project TALENT to assess the differences for women who had their first child as a teen compared to those who delayed childbearing. The survey allows them to control for a number of pre-pregnancy

[4]In classifying women into groups, I assume normal school progress. "Just after the end of high school" means just just after they would have graduated, whether they did or not. This will be discussed in more detail in Section 3.

variables: socioeconomic status, race, academic achievement and aptitude, and educational expectations at age 15. They find that when examined 11 years after the end of high school, the teenage mothers are doing significantly worse on a range of outcomes. They are less educated, have less prestigious jobs, have lower incomes, and are less satisfied with their jobs. They also tend to marry younger and to choose spouses who have less education than the spouses of their counterparts. They also find that the teenage mothers have more children, on average, and that they report having more children than they would prefer.

While Card & Wise (1978) present the most convincing evidence among the early papers, there are still considerable concerns that their estimates are driven by omitted variables. Geronimus & Korenman (1992) examine three samples of sisters drawn from the National Longitudinal Survey Young Women's Sample (NLSYW), the National Longitudinal Survey of Youth Sample (NLSY), and the Panel Study of Income Dynamics (PSID). They find that even when they control for observables–race, age, and urban/rural status– like much of the earlier work does, they find sizable differences between teenage mothers and older mothers in later life outcomes. For the two NLS samples, these differences narrow once they add additional controls for parental education, family size and parental family arrangement. In the PSID, the differences remain just as large as they were without the additional family controls. Geronimus & Korenman (1992) examine three samples of sisters drawn from the National Longitudinal Survey Young Women's Sample (NLSYW), the National Longitudinal Survey of Youth Sample (NLSY), and the Panel Study of Income Dynamics (PSID). They find that even when they control for observables–race, age, and urban/rural status– like much of the earlier work does, they find sizable differences between teenage mothers and older mothers in later life outcomes. For the two NLS samples, these differences narrow once they add additional controls for parental education, family size and parental family arrangement. In the PSID, the differences remain just as large as they were without the additional family controls.

Their main estimates compare outcomes for pairs of sisters who have children at different ages. By using within family estimates, they are able to control for differences between families that are not observable in the data. In the NLS samples, this dramatically reduces the size of the estimated effects; however, the estimates in the PSID remain quite large. On net, the results suggest that there are economic consequences to becoming a teenage mother, but that those consequences are likely smaller than was suggested by earlier work.

Still, it is likely that even the within family estimates are missing unobservable differences between sisters. It is likely that the same differences that lead one sister to become a teenage mother and the other to delay childbearing might lead to differences in later life measures even if they had both become mothers at the same age. Hotz et al. (2005) examines a sample of women who all became pregnant as teenagers. They compare outcomes for women who gave birth as teenagers to those who became pregnant, but subsequently suffered a miscarriage. They argue that after conditioning on observables, miscarriages are random events. Using the occurrence of a miscarriage as an instrument, they find very small, short lived negative effects for most examined outcomes. And, for annual hours of work and earnings, they find that the teenage mothers are actually doing better at older ages than they would have been if they had delayed childbearing.

Ashcraft & Lang (2006) argue that using miscarriages as an instrumental variable underestimates the negative effect of teenage childbearing. They point out that women who choose to have an abortion are less likely to suffer a miscarriage. Once they abort, they can no longer have a miscarriage. Because of this, and the fact that more affluent teenagers are more likely to choose to have an abortion, the group that suffers miscarriages is less advantaged, on average. They show that this leads to an underestimate of the negative effects when using instrumental variables, but an overestimate when using OLS. Using both estimates as bounds on the true effect, they find that if there is a negative effect of teenage childbearing, it is quite small.

This paper adds to the growing literature that suggests that, at least for the mothers, the long term economic consequences of teenage childbearing are relatively small. While I find large differences in high school completion rates, these differences do not translate into differences in earnings or family income.

3 Data

This paper takes advantage of the fact that the timing of birth within the teenage years might matter for future outcomes. In particular, I look at a tight band of time around high school graduation. The main comparison examines the differences in outcomes for women who had their first child in January through June of their senior year of high school, and women who had their first child shortly after the end of their senior year: between July and December. The main identifying assumption is that by comparing two groups of teenage mothers, who differ in the timing of their births by only a few months, there are no differences between the two groups prior to childbearing. Section 5 will provide evidence that this is the case.

The main analysis uses a sample of 20-40 year old mothers from the the 1980 Census 5% sample.[5] The publicly available sample includes age (on the survey date: April 1, 1980) and quarter of birth for both the mother and child.[6] Using this information, and the age of a mother's oldest "own child" living with her at survey date,[7] I calculate each mother's age when she gave birth to her first child.

Figure 1 shows how women are assigned to groups. In assigning women to the treatment and control groups, I assume that the cutoff for starting school is October 1st (the first day of the third quarter of the calendar year) and that everyone makes normal school progress. I also assume that if the mother and child are born in the same quarter, the mother's birthday is first.

[5]Put reference for from the Integrated Public Use Microdata Series here.

[6]Because year of birth is not available, survey date is important for calculating each mother's age when she gave birth. For example, imagine a mother who was born on April 15th, 1950 (Q2) and has a child who was born on May 1, 1965 (Q3). On survey day, the mother is 29, and her child is 14 (neither one has had their birthday yet). Here, it is easy to see that the mother was 15 years old when her child was born. Now, imagine that the mother was born on March 1st, 1950 (Q1). In this example, the mother has already turned 30 by April 1st, but the child is still 14. Knowing that April 1 falls between their birthdays allows me to accurately calculate that the mother was 15 years old when her child was born, not 16.

[7]I only include children who are 18 or younger at survey date.

The shaded rows in the first two columns represent the treated group, while the shaded rows in the 3rd and 4th columns represent the control group. Each cell displays the school year at ages 17, 18 and 19 for someone who has made normal progress in school. For example, if a woman was born in Q1, had her first child in Q1, and was 18 years old when she had the child, she became a mother during January-March of her senior year of high school. She is assigned to the treatment group. However, if a woman was born in Q1, had her first child in Q3, and was 18 when she had the child, she became a mother during the summer after her senior year of high school and is assigned to the control group.

Table 1 displays the summary statistics for the treatment and control groups, as well as for a sample of women who delayed childbearing until they were between 23-25 years old.[8] Recent research has found evidence of seasonality in the types of women giving birth over the year(Buckles & Hungerman 2008), so these women will be used to difference out any seasonality. Women who had their first child between Jan-June are "Treated" and women who had their first child between July-December are the "Control" group. Among the teen mothers, we can see that the treatment group is slightly younger at survey date, and a higher percentage of the group is black. This highlights the importance of including controls for age and race in the main specification.

The table also gives a first look at the main outcome variables of interest. The stars in the second column indicate a statistical difference between means for the treatment and control groups in the teenage cohort.[9] The treated group has fewer years of completed education and is less likely to have completed high school.[10] They are also less likely to be married, have more children, earn slightly less, and are more likely to fall below the poverty line.

[8] I pick 23-25 because most women will have completed their education by this age.

[9] These are simple differences without controls or clustered standard errors.

[10] "HS Degree" is defined as having completed at least 12 years of education, or having obtained a General Educational Development Test (GED).

4 Estimation Strategy

In order to estimate the effect of an interruption in high school education on a number of outcomes, I estimate the following equation, first for the full sample and then separately for white and black mothers:

$$
\begin{aligned}
\text{Outcome}_{isa} &= \alpha + \beta_1 \text{Treat}_{isa} \times \text{Teen}_{isa} + \beta_2 \text{Treat}_{isa} + \beta_3 \text{Teen}_{isa} \\
&\quad + \Phi_s + \Phi_a + \Phi_r + \varepsilon_{isa}
\end{aligned} \tag{1}
$$

where Treat_{isa} is an indicator variable equal to one if individual i's child was born January through June, and Teen_{isa} is an indicator variable equal to one if the mother had her first child as a teen. The coefficient of interest is β_1, which measures the difference in differences for the outcome variable. It gives the effect of giving birth just before the end of high school, rather than just after the end of high school, with seasonality differenced out by the sample of older mothers. Additionally, all regressions include a full set of fixed effects for state Φ_s, mother's age at survey Φ_a, and mother's race Φ_r. Standard errors are clustered by state.

I examine a number of outcome variables. First, I look at whether there is a difference in years of education (Years Ed) or in the probability that the mother has completed at least 12 years of school (HS Degree).[11] Then, I look at whether there are any differences in family structure at survey date. Does she have more children (# Children), and is she more or less likely to be married (Married)? Finally, I estimate whether the interruption in education has detrimental effects on income or on the probability that her family falls below 100% or 200% of the poverty line (100% Pov and 200% Pov, respectively).

[11] This also includes women who have obtained a General Educational Development Test (GED).

5 Validity of the Identification Assumption

For this design, it is very important to argue that prior to their pregnancy, the girls in the two groups of teenage mothers, who differ in the timing of their births by only a few months, are not different from each other. In addition, I must argue that within this small window, the timing of the birth is exogenous. As most teenage pregnancies are unplanned, this is likely a reasonable assumption. However, there might be some concern that the girls in my control group were planning to have a child just after graduation. Then, I would be concerned that much of my result is driven by wanting/not wanting to have a child. The following analysis attempts to rule out any pre-birth differences and any differences in planning.

5.1 Natality Data

I use Natality Data from the National Vital Statistics System of the National Center for Health Statistics from the years 1969-1975 to look at seasonality in the types of women giving birth over the year. The files contain a mix of either a 50% or 100% sample of births (depending on state and year). Among other things, the records contain data on the mother's age, race, and number of prenatal visits.

The first check looks at the pattern of birthrates over the year for 17, 18 and 19 year olds as well as a sample of older women: 23, 24 and 25 year olds. While the pattern of births is largely cyclical for both age groups (more in the summer, fewer in the winter), the older women should be less likely to time their births specifically around the end of a school year. If there was a larger spike during the summer months for the high school girls than for the older ones, I might be concerned that the teens were consciously timing their pregnancies to have their first child after graduation. However, as illustrated in Figure 2, this does not appear to be a major concern. Furthermore, it shows that the older cohort should do a good job of differencing out seasonality in the regressions. I show the graph in two ways. Panel A shows the pattern in birth rates over the year on the same scale for both the teen moms and the older moms. It is clear that while the birthrates are significantly higher for the older mothers, the pattern is very similar over the year. Panel B shows the same graphs, but the teenage cohort is shown on the left axis, and the older cohort is on the right axis. This gives a better illustration of patterns over the year. Still, it is apparent that the seasonality in birthrates is very similar for both age groups.

It is also useful to look at changes in the composition of mothers over the year. Figure 3, displays changes in the racial composition of mothers over the year and Figure 4 shows changes in the average number of pre-natal visits over the year. Although there is seasonality in the racial composition of mothers, the pattern is very similar for the two cohorts. While the older cohort has more prenatal visits, on average, when compared to teenage cohort, there does not appear to be strong seasonality for this measure for either group.

5.2 National Survey of Family Growth

The next check utilizes data from the National Survey of Family Growth. While this dataset is not ideal for the main analysis because of its small size and imprecise income data, it offers a number of interesting survey questions. The survey includes questions regarding sexual activity, sexual education and family background. The variables I use are defined in Table 2. I use these data to examine whether the treatment and control groups really are similar on a number of measures, many of them determined pre-pregnancy. For each variable, I estimate the difference-in-differences, again using a sample of 23-25 year olds to difference out seasonality. As displayed in Table 3, the difference-in-differences is not statistically significant for any of the control variables tested. These results lend credibility to my assumption that these are comparable groups.

6 Results

6.1 Main Results

The outcome variable that is most likely to be affected by the disruption in high school is education itself. Table 4 displays the results from estimating equation 1 for two measures of education. As expected there are fairly large and statistically significant differences in educational attainment between the treatment and control groups. The first three columns display the results for the mothers' years of education. Row one of column (1) shows that, on average, the treated teenagers complete nearly 1/5 of a year less than the control group. The second row shows that, as expected, the teenage mothers have much lower educational attainment than their older counterparts. The third row, which shows the difference in education among the older cohort suggests that either there is seasonality in the types of mothers giving birth over the year, or that even the older mothers are experiencing an interruption in their education. At ages 23-25, it is possible that some of these mothers have interrupted their college education. Columns (2) and (3) show the results stratified by race. While the patterns are the same, the magnitudes are slightly larger for white mothers.

Columns (5)-(6) show the effect on an indicator variable equal to one if the mother has completed at least 12 years of education. Here, the results are even more striking. The treated teens are 9 percentage points less likely to have finished high school than the control group. Again, the magnitude of the estimated effect is larger for white mothers than for black mothers.

Next, I look at whether these large differences in educational attainment translate into differences in the labor market. Table 5 shows that there are not any statistically significant differences in total family income, mother's wage income or her probability of reporting that she worked during the prior year. The one exception is the coefficient on total family income for white mothers, which is significant at the 10% level. This suggests that, if anything, the treated teenagers earn slightly more. Perhaps surprisingly, the significantly better educated control group does not benefit financially. While there does not appear to be any difference in mean income, it is possible that there are differences over the distribution of incomes, particularly at lower levels. Tables 6 and 7 examine this possibility. Table 6 displays the results of running the main specification for a set of income thresholds. Each cell displays the difference in differences for the probablility that a mother's own wage income falls below the income threshold listed. Table 7 shows the same resuluts, but for total family income. Both tables show that there does not appear to be any differences in the probability of falling below these thresholds.

Table 8 shows that while there does not appear to be any sizable impact on earnings, income, or work behavior, the treated teenagers are significantly more likely to fall below 100% and 200% of the poverty line. While this seems unexpected given the results for income, columns (1)-(3) of Table 9 show that the treated teenagers have more children, on average, than the control group. The fact that they have similar incomes, but larger families means that they are less able to meet their family's needs. Columns (4)-(6) show that there are no differences in the likelihood of being married.

6.2 Differences Over the Lifecycle

Table 10 displays the β_1 coefficients from the same regressions as in Tables 4 - 9, with the outcome variable listed in the first column. However, the regressions in this table are stratified by age at survey. The first three columns show the results for women who were younger than 30 when surveyed, and the last three columns show the results for women who were 30 and older. The teenage mothers included in the first three columns all have middle school aged children at home when they are surveyed, while the teenage mothers included in the last three columns are less likely to have young children at home. It could be that when the children are young, the better educated control group is unable to take advantage of their education, but once their children are older, they can finally make use of their high school degrees.

However, the evidence for this is weak, at best. In column (1), we can see that the treatment group, when measured under age 30, enjoys slightly higher family income and earnings. This, in combination with column (4), which shows the opposite relationship for women surveyed after age 30, lends some support to the hypothesis that it takes some time for the control group to make use of their degrees. However, the results for the older women are not statistically significant. The most noticeable difference between the two sets of regressions is that after age 30, the treatment group is not any more likely to fall below 100% of the poverty line than the control group, though they are at younger ages. This supports an opposite story – that the two groups look more like eachother as time goes on.

6.3 Robustness Checks

Section 5 argues that the treatment and control groups are very similar to each other before becoming mothers, particularly after controlling for seasonality with the older cohort. However, even though I have chosen a fairly tight band around the end of high school–approximately six months on either side–the data allow me to test an even tighter band. This should do even more to alleviate concerns that the control group is not a good comparison. Columns (1)-(3) of Table 11 show the results of running the same regressions as the main specification, but for the new treatment and control groups. The treatment group only includes those mothers who gave birth during March-June of their senior years, and the control group only includes mothers who gave birth during July-September following their senior years. For the older cohort, mothers who have birth during the 2nd quarter are classified as "treated" and those who gave birth during the 3rd quarter are classified as "control." In most respects, these results look very similar to the main results. In terms of statistical significance, the same patterns emerge. The one exception is that differences in the probability of falling below 100% of the poverty line are no longer significant.

I also check whether my decision to use women who gave birth between ages 23-25, rather than another age group is important. I chose ages 23-25 in an attempt to still use relatively young mothers, but ones who are far less likely to experience an interruption in school due to their pregnancy. Columns (4)-(6) show the results using a sample of women who became mothers between ages 20-22. This group is much closer in age to the teen mothers. The coefficients in these columns look very similar to the main results.

7 Conclusions

Lowering teenage pregnancy rates is one of the top priorities for public health officials in the United States. Its correlation with poor economic outcomes for both the teenage mothers and her children makes it an easy target. However, given the disadvantaged backgrounds of teenage mothers when compared to women who delayed childbearing, it is difficult to establish causality. The most convincing previous literature finds that the true causal effect is much lower than correlations would suggest, even when those correlations control for observable measures of family background.

This paper finds that while having a child during high school significantly lowers educational attainment, this does not hurt earnings. I find that having a child during the last six months of high school causes a 9 percentage point decrease in the probability of obtaining a high school degree, when compared to women who had a child just after the end of high school. However, this does not have any effect on earnings or on total family income. This suggests that the returns (or signaling value) of a high school degree are non-existent for this group. From a policy perspective, this suggests simply helping a teenage mother finish high school will not help improve her earnings potential.

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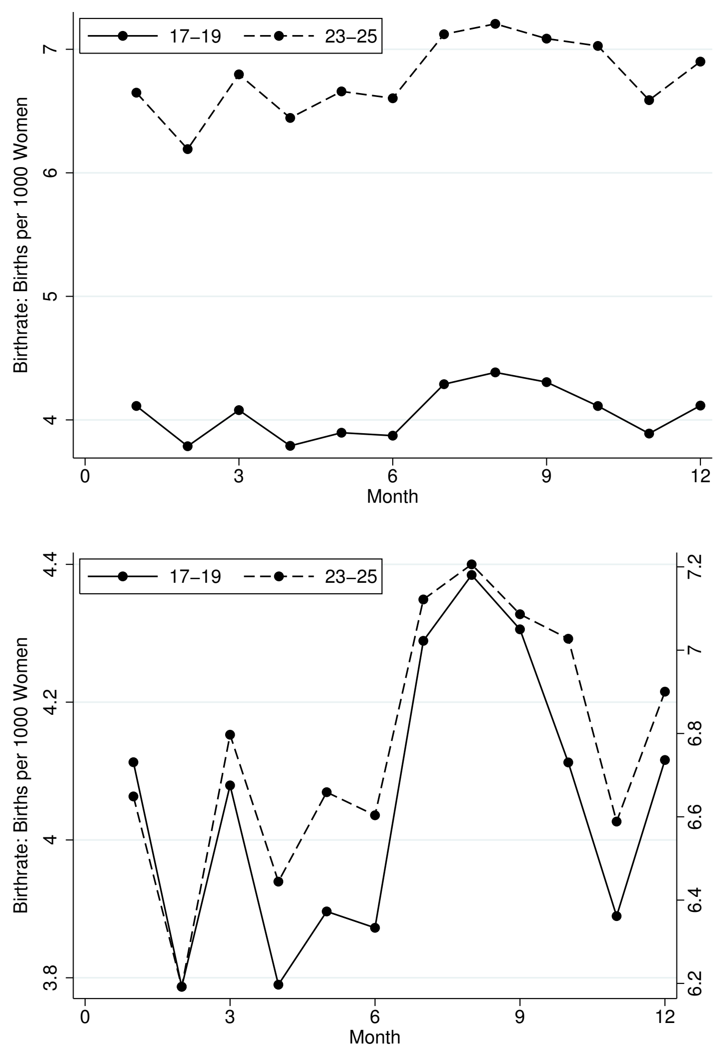
Figure 1: Assignment to Treatment and Control Groups

	Child's Quarter of Birth			
	Treat		Control	
Mom's Quarter of Birth	1	2	3	4
1	17: Junior	17: Junior	17: Summer J/S	17: Senior
	18: Senior	18: Senior	18: Summer S/C	18: College1
	19: College1	19: College1	19: Summer C1/C2	19: College2
2	17: Senior	17: Junior	17: Summer J/S	17: Senior
	18: College1	18: Senior	18: Summer S/C1	18: College1
	19: College2	19: College1	19: Summer C1/C2	19: College2
3	17: Senior	17: Senior	17: Summer J/S	17: Senior
	18: College1	18: College1	18: Summer S/C1	18: College1
	19: College2	19: College2	19: Summer C1/C2	19: College2
4	17: Junior	17: Junior	17: Summer J/S	17: Junior
	18: Senior	18: Senior	18: Summer S/C1	18: Senior
	19: College1	19: College1	19: Summer C1/C2	19: College1

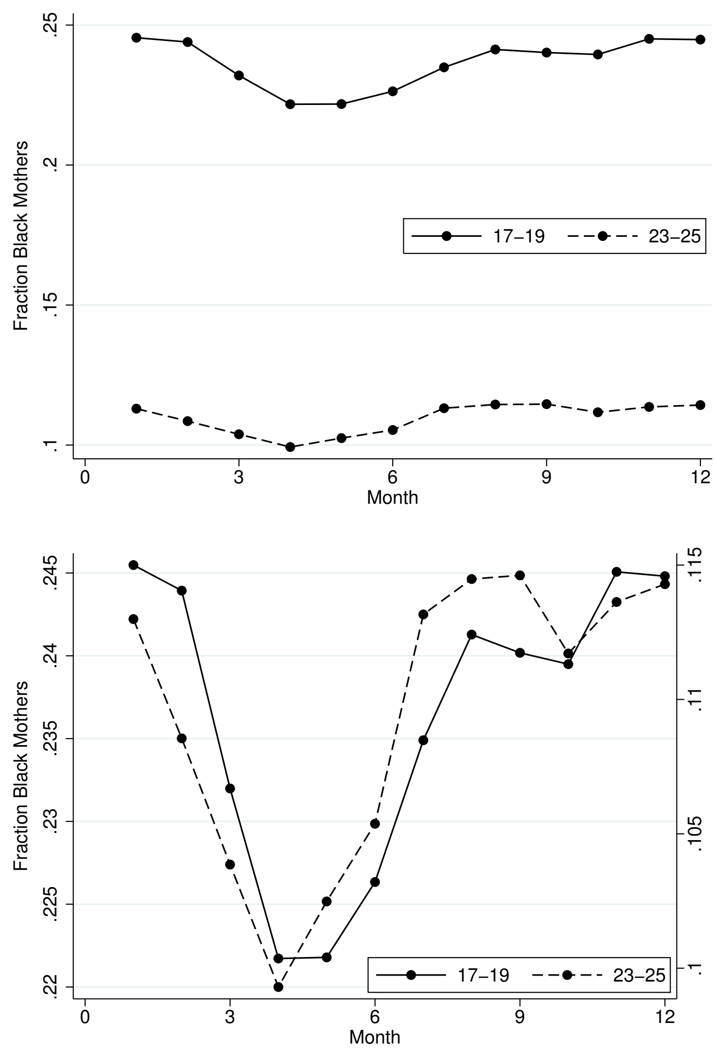
Notes: The shaded rows in the first two columns represent the treated group, while the shaded rows in the 3rd and 4th columns represent the control group. Each cell displays the school year at ages 17, 18 and 19 for someone who has made normal progress in school.

Figure 2: Birthrates Over the year



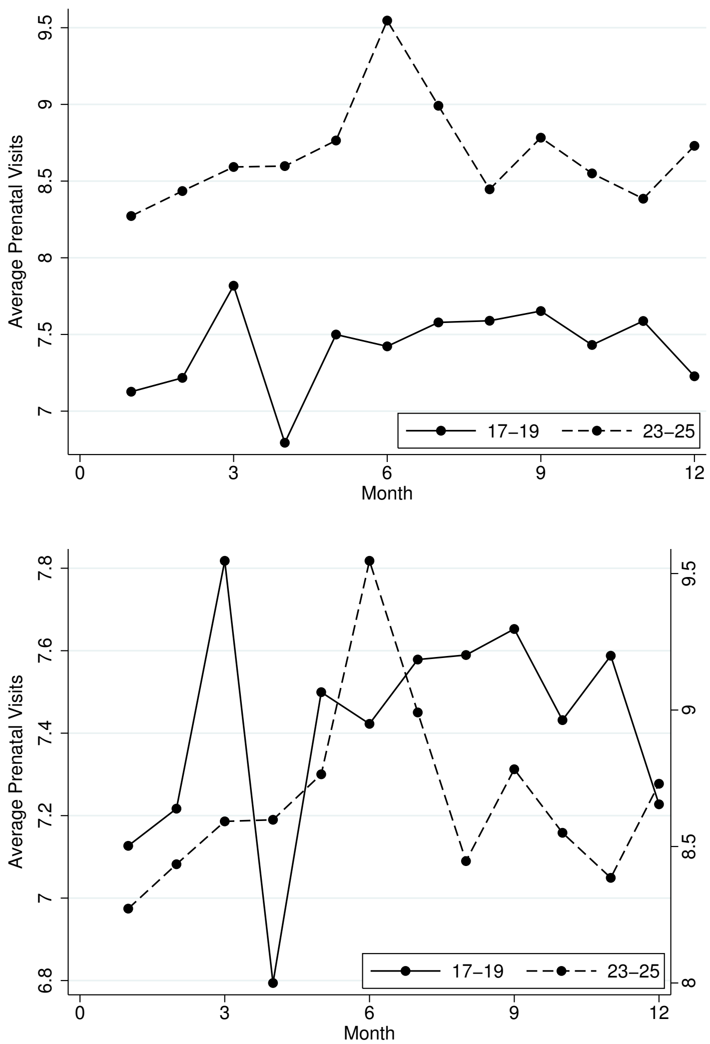
Notes: Figures compiled using the 1969-1975 Natality Data from the National Vital Statistics System of the National Center for Health Statistics. The solid line shows birthrates by month of (child's) birth for 17-19 year old mothers. The dashed line shows birthrates for 23-25 year mothers.

Figure 3: Percent Black Mothers



Notes: Figures compiled using the 1969-1975 Natality Data from the National Vital Statistics System of the National Center for Health Statistics. The solid line shows the fraction of births to black mothers by month of (child's) birth for 17-19 year old mothers. The dashed line shows the fraction of births to black mothers for 23-25 year old mothers.

Figure 4: Number of Prenatal Visits



Notes: Figures compiled using the 1969-1975 Natality Data from the National Vital Statistics System of the National Center for Health Statistics. The solid line shows the average number of prenatal visits by month of (child's) birth for 17-19 year old mothers. The dashed line shows the average number of prenatal visits for 23-25 year old mothers.

Table 1: Summary Statistics

	Teen		Older	
	Treat	Control	Treat	Control
Age	28.624	29.110***	32.029	32.114***
Black	0.218	0.193***	0.074	0.078***
Years Ed.	11.086	11.301***	13.011	13.050***
HS Degree	0.537	0.624***	0.907	0.906
Working	0.607	0.612	0.584	0.583
Married	0.728	0.746***	0.870	0.872
# children	2.406	2.368***	1.953	1.954
Wage Income (1980$)	3744.0	3829.2**	3986.4	4037.5**
$<$100% Poverty Line	0.210	0.190***	0.080	0.079
$<$200% Poverty Line	0.485	0.455***	0.236	0.237
N	29002	38871	98335	102983

Notes: Data compiled from the 1980 5% Census sample. The first two columns show the averages for the treatment and control groups of a cohort teenage mothers. The last two columns show the averages for a cohort of women who had their first child between ages 23-25. The stars represent statistically significant differences between the treatment and control groups, within cohort.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: NSFG Variables

Variable	Description	Coding
Sexual Activity/Education		
FirstInt	Age at First Intercourse	Age in Months
SexEdNo	Sexual Education: Saying No	1=yes, 0=no
SexEdBC	Sexual Education: Using Birth Control	1=yes, 0=no
VirPledge	Ever took a virginity pledge	1=yes, 0=no
Family Variables		
MomTeenMom	Mother was a Teen Mom	1=yes, 0=no
Intact	Lived in "intact" family: with both parents	1=yes, 0=no
MomHS	Mom has high school degree	1=yes, 0=no
DadHS	Dad has high school degree	1=yes, 0=no
MomWork	Whether mom worked for pay most of the time while she was between ages 5-15	1=yes, 0=no
MomChild	Mom's number of children	Number of Children
Other		
RelServ	Ever attended religious services	1=yes, 0=no
RelServOft	Attended religious services often: >=once a week	1=yes, 0=no
Want	Feelings about timing of pregnancy	1 if too overdue or right time, 0 otherwise
Black	Race	1=black, 0=white

Notes: This table describes the coding for variables from the National Survey of Family Growth.

Table 3: NSFG - Difference-in-Differences

	FirstInt	SexEdNo	SexEdBC	VirPledge	MomTeenMom	Intact	MomHS
Treat × Teen	**-0.146**	**0.0767**	**-0.0537**	**-0.0460**	**0.0187**	**-0.0593**	**0.0025**
	(0.267)	(0.142)	(0.153)	(0.117)	(0.0556)	(0.0522)	(0.0514)
Treat	-0.0010	-	-	-	-0.0454	0.0378	0.0134
	(0.185)	-	-	-	(0.0385)	(0.0362)	(0.0356)
Teen	-2.613***	-	-	-	0.114***	-0.155***	-0.0448
	(0.195)	-	-	-	(0.0407)	(0.0381)	(0.0375)
Mean	17.136	0.684	0.636	0.110	0.396	0.635	0.712
N	1356	40	40	40	1280	1356	1356

	DadHS	MomWork	MomChild	RelServ	RelServOft	Want	Black
Treat × Teen	**-0.0222**	**0.0294**	**-0.112**	**0.0298**	**0.0345**	**-0.0430**	**-0.0003**
	(0.0493)	(0.0522)	(0.181)	(0.162)	(0.202)	(0.0487)	(0.0492)
Treat	0.0317	-0.0582	0.0388	-0.0571	0.0286	0.0263	-0.0283
	(0.0342)	(0.0361)	(0.125)	(0.150)	(0.187)	(0.0338)	(0.0342)
Teen	-0.0431	0.0199	0.169	-0.0463	-0.0985	-0.388***	0.138***
	(0.0359)	(0.0380)	(0.132)	(0.118)	(0.147)	(0.0355)	(0.0358)
Mean	0.729	0.671	3.638	0.829	0.535	0.430	0.165
N	1356	1345	1355	200	200	1356	1255

Notes: The variable listed at the top of each column is the outcome variable used when estimating the following equation:
$\text{Outcome}_i = \alpha + \beta_1 \text{Treat}_i \times \text{Teen}_i + \beta_2 \text{Treat}_i + \beta_3 \text{Teen}_i + \varepsilon_i$
The coefficient highlighted in bold is β_1, which gives the difference in differences for the group of teenagers who gave birth right before the end of high school relative to those who gave birth shortly after. Data come from the National Survey of Family Growth, and the outcome variables are defined in Table 2.
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 4: Results: Educational Attainment

	Years of Ed.			HS Degree		
	All	White	Black	All	White	Black
Treat × Teen	-0.171***	-0.181***	-0.143**	-0.0872***	-0.0960***	-0.0554***
	(0.0169)	(0.0200)	(0.0593)	(0.00548)	(0.00610)	(0.0107)
Teen	-1.735***	-1.799***	-1.351***	-0.281***	-0.291***	-0.216***
	(0.0415)	(0.0439)	(0.0598)	(0.00827)	(0.00892)	(0.00943)
Treat	-0.0394***	-0.0374***	-0.0769**	0.000736	0.00123	-0.00783
	(0.00936)	(0.00975)	(0.0380)	(0.00124)	(0.00118)	(0.00515)
Black	0.0592			-0.000315		
	(0.0663)			(0.0105)		
Constant	12.97***	13.40***	13.57***	0.821***	0.905***	1.098***
	(0.0827)	(0.0531)	(0.0875)	(0.0183)	(0.0160)	(0.0240)
mean	12.571	12.620	12.169	0.826	0.836	0.744
N	269191	240042	29149	269191	240042	29149

Notes: The variable listed at the top of each set of 3 columns is the outcome variable used when estimating the following equation:

$$\text{Outcome}_{isa} = \alpha + \beta_1 \text{Treat}_{isa} \times \text{Teen}_{isa} + \beta_2 \text{Treat}_{isa} + \beta_3 \text{Teen}_{isa} + \Phi_s + \Phi_a + \Phi_r + \varepsilon_{isa}$$

Within each set of columns, the first one includes all women, the second includes only white women, and the third includes only black women. The coefficient in the first row is β_1, which gives the difference in differences for the group of teenagers who gave birth right before the end of high school relative to those who gave birth shortly after. Standard errors are shown in parentheses and are clustered by state.

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 5: Results: Labor Market Outcomes

	Total Family Income			Mother's Wage Income			Working		
	All	White	Black	All	White	Black	All	White	Black
Treat × Teen	25.00	97.12*	-195.7	-26.58	26.64	-113.6	-0.00476	-0.00192	-0.00494
	(48.08)	(55.82)	(163.1)	(43.80)	(51.12)	(174.8)	(0.00506)	(0.00538)	(0.0106)
Teen	214.7**	307.2***	-540.4***	-14.36	123.1*	-1015.9***	0.0250***	0.0358***	-0.0473***
	(83.08)	(85.40)	(113.6)	(71.25)	(72.94)	(107.9)	(0.00489)	(0.00546)	(0.00748)
Treat	-31.15	-33.06	0.617	-37.62	-33.63	-67.80	-0.000142	0.000452	-0.00487
	(24.28)	(25.10)	(104.5)	(24.87)	(23.56)	(125.4)	(0.00186)	(0.00180)	(0.00887)
Black	1987.5***			1690.8***			0.0808***		
	(199.0)			(159.7)			(0.00955)		
Constant	4231.5***	2117.9***	4445.5***	3791.6***	1434.4***	2966.9***	0.551***	0.461***	0.530***
	(261.7)	(120.0)	(212.4)	(237.3)	(132.5)	(242.5)	(0.0142)	(0.0117)	(0.0245)
mean	4610.562	4399.878	6345.544	3957.136	3778.806	5425.684	0.616	0.607	0.689
N	269191	240042	29149	269191	240042	29149	269191	240042	29149

Notes: The variable listed at the top of each set of 3 columns is the outcome variable used when estimating the following equation:
$\text{Outcome}_{isa} = \alpha + \beta_1 \text{Treat}_{isa} \times \text{Teen}_{isa} + \beta_2 \text{Treat}_{isa} + \beta_3 \text{Teen}_{isa} + \Phi_s + \Phi_a + \Phi_r + \varepsilon_{isa}$
Within each set of columns, the first one includes all women, the second includes only white women, and the third includes only black women. The coefficient in the first row is β_1, which gives the difference in differences for the group of teenagers who gave birth right before the end of high school relative to those who gave birth shortly after. Standard errors are shown in parentheses and are clustered by state.
$^{*}\ p < .1$, $^{**}\ p < .05$, $^{***}\ p < .01$

Table 6: Results: Probability of Falling Below Wage Income Thresholds

Threshold (<=)	$1000	$2000	$3000	$4000	$5000	$6000	$7000
Treat × Teen	0.007*	0.004	0.001	0.002	0.001	0.002	0.004
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)
Mean	0.48	0.53	0.58	0.62	0.66	0.70	0.75
Threshold (<=)	$8000	$9000	$10000	$11000	$12000	$13000	$14000
Treat × Teen	0.003	0.004	0.002	0.004	0.001	0.001	0.000
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)
Mean	0.78	0.82	0.85	0.88	0.91	0.93	0.94
Threshold (<=)	$15000	$16000	$17000	$18000	$19000	$20000	
Treat × Teen	-0.001	-0.001	-0.001	-0.002*	-0.000	-0.001	
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
Mean	0.96	0.97	0.97	0.98	0.98	0.99	

Notes: Each cell displays the β_1 from a separate estimation of the following equation:
$\text{Outcome}_{isa} = \alpha + \beta_1 \text{Treat}_{isa} \times \text{Teen}_{isa} + \beta_2 \text{Treat}_{isa} + \beta_3 \text{Teen}_{isa} + \Phi_s + \Phi_a + \Phi_r + \varepsilon_{isa}$
The outcome variable for all regressions in this table is an indicator variable equal to one if "Own Wage Income" falls below that column's threshold. Standard errors are shown in parentheses and are clustered by state.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Results: Probability of Falling Below Family Income Thresholds

Threshold (<=)	\$1000	\$2000	\$3000	\$4000	\$5000	\$6000	\$7000
Treat × Teen	-0.003	-0.005	-0.005	-0.003	-0.004	-0.004	0.000
	(0.004)	(0.005)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)
Mean	0.40	0.46	0.52	0.57	0.62	0.67	0.72
Threshold (<=)	\$8000	\$9000	\$10000	\$11000	\$12000	\$13000	\$14000
Treat × Teen	0.002	0.002	0.000	0.003	0.001	0.001	0.000
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.002)	(0.002)
Mean	0.76	0.80	0.83	0.87	0.89	0.91	0.93
Threshold (<=)	\$15000	\$16000	\$17000	\$18000	\$19000	\$20000	
Treat × Teen	0.000	-0.001	-0.001	-0.002*	-0.000	-0.001	
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	
Mean	0.94	0.96	0.97	0.97	0.98	0.98	

Notes: Each cell displays the β_1 from a separate estimation of the following equation:
$\text{Outcome}_{isa} = \alpha + \beta_1 \text{Treat}_{isa} \times \text{Teen}_{isa} + \beta_2 \text{Treat}_{isa} + \beta_3 \text{Teen}_{isa} + \Phi_s + \Phi_a + \Phi_r + \varepsilon_{isa}$
The outcome variable for all regressions in this table is an indicator variable equal to one if "Total Family Income" falls below that column's threshold. Standard errors are shown in parentheses and are clustered by state.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Results: Living in Poverty

	Below 100% Poverty			Below 200% Poverty		
	All	White	Black	All	White	Black
Treat × Teen	0.0116***	0.00706**	0.0207	0.0196***	0.0148***	0.0331**
	(0.00339)	(0.00321)	(0.0124)	(0.00395)	(0.00491)	(0.0128)
Teen	0.0754***	0.0663***	0.135***	0.160***	0.155***	0.194***
	(0.00361)	(0.00388)	(0.00665)	(0.00492)	(0.00536)	(0.00914)
Treat	0.00112	0.000579	0.00559	-0.000607	-0.000889	0.00190
	(0.00131)	(0.00111)	(0.00739)	(0.00173)	(0.00177)	(0.00846)
Black	0.183***			0.243***		
	(0.00845)			(0.00945)		
Constant	0.0661***	0.153***	0.251***	0.295***	0.521***	0.498***
	(0.0139)	(0.0103)	(0.0269)	(0.0169)	(0.0116)	(0.0191)
mean	0.110	0.087	0.292	0.295	0.263	0.554
N	269191	240042	29149	269191	240042	29149

Notes: The variable listed at the top of each set of 3 columns is the outcome variable used when estimating the following equation:

$\text{Outcome}_{isa} = \alpha + \beta_1 \text{Treat}_{isa} \times \text{Teen}_{isa} + \beta_2 \text{Treat}_{isa} + \beta_3 \text{Teen}_{isa} + \Phi_s + \Phi_a + \Phi_r + \varepsilon_{isa}$

Within each set of columns, the first one includes all women, the second includes only white women, and the third includes only black women. The coefficient in the first row is β_1, which gives the difference in differences for the group of teenagers who gave birth right before the end of high school relative to those who gave birth shortly after. Standard errors are shown in parentheses and are clustered by state.

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 9: Results: Family Structure

	Number of Children			Married		
	All	White	Black	All	White	Black
Treat × Teen	0.0785***	0.0689***	0.102***	-0.00623	-0.00610	0.00840
	(0.00614)	(0.00798)	(0.0262)	(0.00388)	(0.00378)	(0.00957)
Teen	0.698***	0.651***	0.982***	-0.0853***	-0.0750***	-0.149***
	(0.0124)	(0.0112)	(0.0272)	(0.00574)	(0.00648)	(0.00712)
Treat	0.00815***	0.00772**	0.00694	-0.00234	-0.00112	-0.0148***
	(0.00300)	(0.00361)	(0.0156)	(0.00156)	(0.00149)	(0.00548)
Black	0.0829**			-0.315***		
	(0.0358)			(0.0112)		
Constant	0.347***	0.626***	0.0212	0.709***	0.808***	0.433***
	(0.0364)	(0.0207)	(0.0591)	(0.0145)	(0.00986)	(0.0212)
mean	2.062	2.047	2.184	0.837	0.874	0.539
N	269191	240042	29149	269191	240042	29149

Notes: The variable listed at the top of each set of 3 columns is the outcome variable used when estimating the following equation:

$\text{Outcome}_{isa} = \alpha + \beta_1 \text{Treat}_{isa} \times \text{Teen}_{isa} + \beta_2 \text{Treat}_{isa} + \beta_3 \text{Teen}_{isa} + \Phi_s + \Phi_a + \Phi_r + \varepsilon_{isa}$

Within each set of columns, the first one includes all women, the second includes only white women, and the third includes only black women. The coefficient in the first row is β_1, which gives the difference in differences for the group of teenagers who gave birth right before the end of high school relative to those who gave birth shortly after.

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 10: Results: Differences Over the Lifecycle

	Age 20 - 29			Age 30-40		
	All	White	Black	All	White	Black
Years of Ed.	-0.199***	-0.215***	-0.146**	-0.163***	-0.165***	-0.160*
	(0.0204)	(0.0242)	(0.0691)	(0.0233)	(0.0242)	(0.0906)
Mean	12.38	12.41	12.19	12.69	12.75	12.15
HS Degree	-0.0930***	-0.102***	-0.0597***	-0.0818***	-0.0890***	-0.0520***
	(0.00623)	(0.00703)	(0.0143)	(0.00732)	(0.00732)	(0.0138)
Mean	0.81	0.82	0.77	0.83	0.85	0.72
Tot. Fam. Inc.	90.89*	160.5**	-171.8	-57.22	25.62	-245.9
	(52.31)	(60.25)	(133.7)	(89.36)	(87.92)	(318.8)
Mean	3913.78	3712.89	5288.60	5062.02	4829.40	7256.46
Wage Inc.	40.61	88.84	-75.08	-96.00	-29.54	-161.4
	(51.56)	(57.40)	(131.6)	(75.45)	(76.13)	(326.7)
Mean	3414.84	3274.74	4373.61	4308.50	4093.96	6332.41
Worked	-0.0038	-0.0015	0.0024	-0.0056	-0.0021	-0.0094
	(0.0077)	(0.0079)	(0.0144)	(0.0054)	(0.0063)	(0.0161)
Mean	0.61	0.60	0.66	0.62	0.61	0.72
Married	-0.0082*	-0.0083**	0.0078	-0.0005	0.0000	0.0123
	(0.0043)	(0.0038)	(0.0143)	(0.0054)	(0.0058)	(0.0134)
Mean	0.83	0.87	0.50	0.84	0.87	0.57
# Children	0.0641***	0.0600***	0.0908***	0.0916***	0.0701***	0.129***
	(0.0080)	(0.0090)	(0.0253)	(0.0121)	(0.0139)	(0.0456)
Mean	1.62	1.60	1.74	2.35	2.33	2.57
<100% Pov.	0.0147***	0.00960**	0.0297**	0.00482	0.000678	0.00874
	(0.0041)	(0.0037)	(0.0126)	(0.0050)	(0.0051)	(0.0182)
Mean	0.13	0.11	0.32	0.09	0.08	0.26
<200% Pov.	0.0128**	0.0051	0.0472***	0.0231***	0.0196***	0.0208
	(0.0062)	(0.0077)	(0.0119)	(0.0047)	(0.0061)	(0.0198)
Mean	0.35	0.31	0.60	0.26	0.23	0.52
N	105838	92345	13493	163353	147697	15656

Notes: Each cell displays the β_1 from a separate estimation of the following equation:
$\text{Outcome}_{isa} = \alpha + \beta_1 \text{Treat}_{isa} \times \text{Teen}_{isa} + \beta_2 \text{Treat}_{isa} + \beta_3 \text{Teen}_{isa} + \Phi_s + \Phi_a + \Phi_r + \varepsilon_{isa}$
The variable listed in the first column is the outcome variable. The first three columns of results include women who were between ages 20 and 29 when surveyed, and the last three columns include women who were between ages 30 and 40 when surveyed. Standard errors are shown in parentheses and are clustered by state.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Robustness Checks

	2nd vs. 3rd Quarter			20-22 year old control		
	All	White	Black	All	White	Black
Years of Ed.	-0.0924***	-0.0946***	-0.110	-0.195***	-0.196***	-0.227***
	(0.0213)	(0.0261)	(0.0796)	(0.0157)	(0.0187)	(0.0477)
Mean	12.57	12.62	12.17	11.97	11.97	11.98
HS Degree	-0.0623***	-0.0707***	-0.0352**	-0.0861***	-0.0942***	-0.0657***
	(0.0060)	(0.0068)	(0.0168)	(0.0053)	(0.0060)	(0.0105)
Mean	0.83	0.84	0.74	0.80	0.80	0.76
Tot. Fam. Inc.	51.71	102.4	-280.8	19.34	92.36*	-206.3*
	(71.73)	(72.01)	(253.8)	(48.19)	(54.76)	(110.1)
Mean	4610.56	4399.88	6345.54	4570.87	4357.45	6038.78
Wage Inc.	57.14	85.62	-159.5	-17.99	40.12	-170.4
	(64.28)	(62.08)	(259.8)	(42.12)	(49.31)	(109.4)
Mean	3957.14	3778.81	5425.68	3899.71	3728.92	5074.46
Worked	0.0000	0.0008	-0.0000	-0.0051	-0.0018	-0.0113
	(0.0076)	(0.0086)	(0.0134)	(0.0055)	(0.0053)	(0.0107)
Mean	0.62	0.61	0.69	0.63	0.62	0.68
Married	-0.0010	-0.0040	0.0265*	-0.0056	-0.0046	-0.0046
	(0.0050)	(0.0054)	(0.0149)	(0.0034)	(0.0036)	(0.0088)
Mean	0.84	0.87	0.54	0.81	0.85	0.52
# Children	0.0414***	0.0295***	0.0958***	0.0728***	0.0616***	0.113***
	(0.0104)	(0.0109)	(0.0347)	(0.0065)	(0.0085)	(0.0202)
Mean	2.06	2.05	2.18	2.22	2.21	2.29
<100% Pov.	0.0055	0.0011	0.0233	0.0133***	0.0086**	0.0266***
	(0.0051)	(0.0050)	(0.0149)	(0.0034)	(0.0035)	(0.0092)
Mean	0.11	0.09	0.29	0.13	0.11	0.31
<200% Pov.	0.0150**	0.0120*	0.0289*	0.0151***	0.0099**	0.0340***
	(0.0057)	(0.0064)	(0.0156)	(0.0037)	(0.0046)	(0.0108)
Mean	0.29	0.26	0.55	0.36	0.32	0.59
N	135430	120904	14526	378833	330747	48086

Notes: Each coefficient is the β_1 from a separate estimation of the following equation:
$\text{Outcome}_{isa} = \alpha + \beta_1 \text{Treat}_{isa} \times \text{Teen}_{isa} + \beta_2 \text{Treat}_{isa} + \beta_3 \text{Teen}_{isa} + \Phi_s + \Phi_a + \Phi_r + \varepsilon_{isa}$
The variable listed in the first column is the outcome variable. The first three columns show the results from a comparison of women who gave birth in the 2nd quarter compared to those who gave birth in the 3rd quarter. The last three columns show the results for a set of regressions where the "older" control group is comprised of women ages 20-22. Standard errors are shown in parentheses and are clustered by state.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$