Heterogeneous Consequences of Teenage Childbearing

Devon Gorry [1]

Abstract

This study finds heterogeneous effects of teen childbearing on education and labor market outcomes across socioeconomic status and race. Using miscarriages to put bounds on the causal effects of teen childbearing, results show that teen childbearing leads to lower educational attainment, lower income, and greater use of welfare for individuals who come from counties with better socioeconomic conditions. However, there are no significant adverse effects for individuals who come from counties with worse socioeconomic conditions. Across race, teen childbearing leads to negative consequences for white teens but no significant negative effects for black or Hispanic and Latino teens.

Keywords Teenage childbearing · Education · Labor market · Socioeconomic status · Race

Introduction

The teen birth rate in the United States is the highest of any developed country (Kearney and Levine 2012; Sedgh et al. 2015). These births are concentrated among minority groups and those with low socioeconomic status[1] and are often cited as one cause of the poor education and labor market outcomes that these groups obtain. In turn, nationwide efforts and resources are directed at reducing teen pregnancy as a means to improve outcomes for young disadvantaged women. Although early literature

---

[1] Among the population analyzed herein, 14 % of white women, 28 % of black women, and 23 % of Hispanic or Latino women in the sample reported teen births. Among those who reported teen births, approximately 68 % come from families at or below the median reported income.

✉ Devon Gorry
devongorry@gmail.com

[1] Department of Economics, Clemson University, Clemson, SC 29634, USA

Springer

has found large associations between teen births and negative outcomes (Card and Wise 1978; Furstenberg 1976; Waite and Moore 1978), more recent studies using miscarriages to evaluate the causal impact of teen childbearing have found that teen childbearing is associated with modest if any adverse consequences (Ashcraft and Lang 2006; Ashcraft et al. 2013; Fletcher and Wolfe 2009; Hoffman and Maynard 2008; Hotz et al. 2005). This line of research brings into question whether policies aimed at reducing teen pregnancy improve outcomes for young women.

However, estimating the average effect of teen childbearing may obscure differential effects across groups. Groups of women likely have different opportunity costs of childbearing. For example, having children at an early age is unlikely to hamper outcomes for women without strong education and employment prospects. In fact, Edin and Kefalas (2005) documented several narratives of poor young mothers citing childbearing as improving their lives because motherhood gave them more motivation to complete schooling or find employment. However, if women are planning to go to college and obtain high-paying jobs with long hours, having children as a teen would make such a trajectory more difficult. Diaz and Fiel (2016) suggested that differential costs may also arise from differences in social stigma and social support. That is, if a woman becomes a teen mother in a community where teen motherhood is common, she may experience more social support and less stigma. Conversely, in a community where teen motherhood is rare, social stigma attached to teen motherhood may make it difficult to return to school or find success in the workplace.

Economic theory suggests that women who have lower costs associated with teen childbearing are more likely to become pregnant as teens. In support of this idea, Kearney and Levine (2014) documented that the highest rates of teen childbearing among poor women occur in areas with high income inequality, reflecting low opportunity cost of early childbearing for those at the bottom of the income distribution. In addition, Lang and Weinstein (2015) showed that more advantaged teens who faced higher opportunity costs of motherhood increasingly avoided pregnancy in the 1960s. Given that teen childbearing rates vary dramatically across socioeconomic status and race, one may expect that the effects of early motherhood differ along these lines as well. Thus, the high teen birth rate among low-socioeconomic and minority groups may not be the cause of poor outcomes but instead reflect the fact that these individuals simply face lower costs of early childbearing. In contrast, low teen birth rates among other groups may reflect high costs of teen childbearing. It is important to understand whether and how the effects of teen childbearing vary in order to assess whether policies focused on reducing teen pregnancies are actually helping the populations they intend to serve.

To obtain a more complete picture of the causal effects of teen childbearing, this study analyzes how effects differ across socioeconomic status and race. I employ recent techniques, using miscarriages as a natural experiment to put bounds on the causal effects of teen childbearing (Ashcraft and Lang 2006; Ashcraft et al. 2013; Fletcher and Wolfe 2009; Hotz et al. 2005), but I extend the analyses to examine effects separately across socioeconomic status and race. The results indicate that teen pregnancy prevention policies could have large payoffs for some populations but may not help the populations most in need. In particular, teen childbearing is

detrimental to educational attainment and labor market outcomes for those from counties with an above-average median income. However, teen childbearing has no negative effects for those from less advantaged counties. The detrimental effects on educational outcomes are long-lasting, and the labor market effects are largest in the short run and fade in the longer run. In addition, results across race and Hispanic and Latino origin show that teen childbearing has significant negative consequences for white teens but no significant negative consequences for black or Hispanic and Latino teens.

These results indicate that policies to reduce teen pregnancy—to improve the outcomes for the most disadvantaged—may not help the targeted population. On the other hand, such policies could have much greater impacts than suggested by the recent literature among relatively advantaged populations. The heterogeneous effects of teen childbearing uncovered herein should be carefully considered when assessing the value of teen pregnancy prevention programs.

Background

A large body of literature has estimated the average effects of teen childbearing. Early studies that looked at the correlation between teen childbearing and outcomes found that childbearing is correlated with poor education and labor market outcomes (Card and Wise 1978; Furstenberg 1976; Waite and Moore 1978). However, those who become pregnant are very different on observable and unobservable characteristics. Typically, women who become pregnant as teens come from worse backgrounds (Ashcraft et al. 2013; Diaz and Fiel 2016; Hotz et al. 2005), and failing to control for this will produce a negative bias on teen childbearing. Moreover, the differences between women who become pregnant as teens and those who do not are not always observable in data.

Many studies have tried to account for unobserved endogeneity. Early studies tried to identify causal effects through comparing sisters (Geronimus and Korenman 1992; Hoffman et al. 1993) or by instrumenting with age at menarche, ob-gyn availability, and abortion rates (Ribar 1994): they found smaller impacts of teen childbearing. Kane et al. (2013) provided a summary of the broader literature that tried to estimate the effect of teen childbearing for the population as a whole, finding that some of the different estimates in the literature can be attributed to different estimation strategies. The current study focuses on one particular identification strategy, which uses miscarriages to estimate the effect of teen childbearing among those who become pregnant. This strategy cannot estimate the average effect among all teens in the United States. However, the effect among those who become pregnant is more policy-relevant given that any effort to curb teen pregnancy would have effects among these teens. Therefore, estimating heterogeneous effects of childbearing among pregnant teens informs policy-makers of the benefits of teen pregnancy-prevention across groups.

Moreover, identifying the effect of teen childbearing off of miscarriages has strong theoretical support. Hotz et al. (1997, 2005) instrumented with miscarriages in an instrumental variable (IV) analysis of the effect of teen childbearing. They provided evidence that miscarriages are random after controlling for factors such as drinking, smoking, and early contraception. Ashcraft and Lang (2006) also provided evidence

that miscarriages are not correlated with factors that predict later outcomes.[2] If abortion were not an option, miscarriage serves as a good instrument for no childbearing. However, subsequent research has shown that teens who abort come from more advantaged backgrounds (Ashcraft and Lang 2006; Ashcraft et al. 2013). Because teens who miscarry are less likely to be the type who abort relative to teens who do not miscarry, they represent more disadvantaged backgrounds. Therefore, the IV estimates are biased upward toward finding no harmful effects of teen childbearing.

Ashcraft and Lang (2006) extended the IV approach by using an ordinary least squares (OLS) estimator on the sample of teens who give birth or miscarry. Because some women will miscarry before they can have an abortion, the miscarriage group is now more likely to contain abortion types than the group that gives birth and thus represents more advantaged backgrounds. The OLS estimates on the birth and miscarriage sample are therefore downwardly biased toward finding harmful effects of teen childbearing. Together, the IV and OLS estimates create bounds for the impact of teen childbearing on those who become pregnant as a teen.[3]

The literature that has advanced using miscarriages for identification has largely examined average effects and has not analyzed whether there are heterogeneous impacts of teen childbearing across socioeconomic status or race. Several studies found heterogeneous effects but used estimation strategies that fail to fully account for endogeneity. Diaz and Fiel (2016) used a propensity score method to estimate the impact of teen pregnancy on educational outcomes and early career wages. They found the largest adverse consequences of teen pregnancy among those with the smallest propensity to experience a teen pregnancy. Levine and Painter (2003) also used a propensity score method to estimate the impacts of teen childbearing on education and earnings, finding larger negative effects among those with the lowest likelihood of having teen births. Although these studies are suggestive of heterogeneous effects, the propensity score matching does not fully eliminate selection bias if relevant variables are omitted from the propensity score.[4] Nonetheless, these studies highlight the need for further investigation into heterogeneous effects.

Of the studies that addressed endogeneity using miscarriages to identify causal effects, only two explored heterogeneous effects, and these concentrated on early cohorts of women. Lang and Weinstein (2015) estimated the effects of teen motherhood for women in the 1940s–1960s and examined heterogeneity across marital status, predicted education levels, and period. For these early cohorts, they found larger negative education effects for mothers who had premarital conceptions from more advantaged backgrounds and larger marriage effects among teens with premarital conceptions from disadvantaged backgrounds. These results align with the findings of this study, where education and labor market consequences are worse

---

[2] In addition, Hotz et al. (1997) showed that even when a proportion of miscarriages is assumed to be nonrandom, the estimated bounds reach similar conclusions to those from studies assuming that all miscarriages are random.

[3] Lang and Nuevo-Chiquero (2012) also showed that reported miscarriages may be drawn from a more advantaged population because advantaged types are more aware when an early pregnancy has taken place. This would diminish the upward bias of IV estimates and increase the downward bias on the OLS estimates.

[4] See Kane et al. (2013) for a detailed discussion of the limits of propensity score matching in the context of estimating the effects of teen childbearing.

for those from high-income counties. Hotz et al. (1997) divided results by black and nonblack populations using an earlier cohort of women from the NLSY 1979 and did not find stark differences in effects across race. For the more recent cohort examined here, results show significantly different consequences across race. However, the differences arise largely in short-run effects and are driven by differences in years of education. Hotz et al. (1997) did not look at years of schooling but found no differences in high school diploma receipt, GED receipt, hours of work, and earnings at ages in the late 20s. With the exception of GED receipt, this is consistent with the longer-run estimates in this study. I look at heterogeneity across both socioeconomic status and race. These two factors are predictive of teenage pregnancy and could influence the costs of teenage pregnancy through differences in opportunity costs and social support. Moreover, this study looks at a more recent cohort to explore heterogeneity, which is important because the education and labor market landscape has changed significantly for women since the 1940s–1970s. Moreover, evidence suggests that effects of teen pregnancy may also be changing over time (Hoffman and Maynard 2008).

Data and Estimation

This study uses data from the National Longitudinal Study of Adolescent Health (Add Health), which is a nationally representative survey of individuals in the United States in grades 7–12 during the 1994–1995 school year (Harris 2009; Harris et al. 2009). The survey collects a range of health and fertility data as well as information on family background, contextual variables, and education and economic outcomes. Wave 1 interviews were conducted in 1994–1995, with follow-up waves in 1996, 2001–2002, and 2008. Waves 3 and 4 asked respondents about the outcomes of each reported pregnancy.

The sample for this study is limited to women from Waves 3 and 4 who end first pregnancies by the age of 18 years and 9 months.[5] Individuals reporting miscarriages, ectopic pregnancies, or stillbirths are coded as miscarrying. The sample for Wave 3 consists of 1,024 women, with 61 % of these women reporting their pregnancy ending in a birth, 16 % reporting a miscarriage, and 23 % reporting an abortion. Similarly, the sample for Wave 4 consists of 1,171 women, with 67 % reporting births, 14 % reporting a miscarriage, and 19 % reporting an abortion.[6] These numbers are similar to national statistics as reported in Fletcher and Wolfe (2009).

Table 1 reports statistics on outcome variables, individual characteristics, and family background characteristics divided by pregnancy outcome for Waves 3 and 4. Educational outcomes are whether the respondent received a high school diploma, whether the respondent received a GED, and the respondent's years of completed schooling (or

---

[5] Other work defined teen pregnancy as pregnancies that begin by age 18 (Ashcraft and Lang 2006; Ashcraft et al. 2013; Hoffman and Maynard 2008; Hotz et al. 2005). Because Add Health reports only end dates, I use pregnancies that end by the age of 18 years and 9 months. This is the same way that Fletcher and Wolfe (2009) defined teen pregnancy using Add Health data. The pattern of results is robust to extending the sample to include pregnancies that end prior to age 20.

[6] The Wave 4 sample is bigger because of a higher response rate during this wave as well as a larger number of reported teen pregnancies.

schooling attainment). Labor market outcomes are labor income and welfare receipt.[7] Additional outcomes in Wave 4 are household income and reported assets.[8] Given the multiplicity of outcome variables, one must be cautious about statistical inference on any one particular result. Because the outcomes are highly correlated, a Bonferroni correction would be too conservative and reduce statistical power. Following Kling et al. (2007), Anderson (2008), and Hoynes et al. (2016), I create indices to aggregate the outcomes for each wave. The index for each wave is the average z score over all outcomes, with each score oriented such that more beneficial outcomes have higher values (e.g., "on welfare" is converted to "not on welfare"). I calculate the z scores by subtracting the mean of the outcome for the untreated group (those that do not give birth) and dividing by the standard deviation. A higher index value represents better education and labor market outcomes. These indices are robust to including multiple outcomes and can improve statistical power in some cases (Anderson 2008).

Controls are included for whether a respondent reports smoking during pregnancy, drinking during pregnancy, and whether the respondent conceived before age 15, all of which are known risk factors for miscarriage (see Ashcraft and Lang 2006; Hotz et al. 2005). In addition, Wave 3 results control for drug use during pregnancy.[9] Ashcraft and Lang (2006) explained that including other controls (such as race or parental education) that correlate with abortion outcomes could make the bias worse or change the direction of bias and thus distort the bounds on the estimates. For example, if abortion is negatively selected after parental background is controlled for, the direction of the bias in the IV estimates would change. Following the literature, I do not include controls outside of the risk factors for miscarriage (Ashcraft and Lang 2006; Ashcraft et al. 2013; Fletcher and Wolfe 2009). However, robustness checks that include no controls at all or additional controls for birth year and month, parental education, race, region, and urbanicity do not change the overall pattern of results presented here.

The background data presented in Table 1 confirm that teens who have abortions are positively selected. Those who have abortions come from families with higher parental education and income, and they score higher on the Wave 1 Add Health Picture Vocabulary Test (AH PVT), a version of the Peabody Picture Vocabulary test that measures scholastic aptitude. Given the positive selection into abortion, an IV estimate of the effect of teen childbearing is upwardly biased and an OLS estimate using the birth and miscarriage subsample is downwardly biased. If abortions were negatively selected among some groups, these bounds would reverse. The IV estimate would be downwardly biased toward finding negative effects, and the OLS estimates on the birth and miscarriage sample would be upwardly biased toward finding benign effects. However, even when background data are examined separately across racial and socioeconomic subgroups, teens who have abortions continue to look advantaged relative to teens who do not abort across all subgroups.

---

[7] Labor income is reported earnings from wages, salaries, tips, bonuses, overtime, and self-employment. If earnings were unknown, respondents were asked to select a range of income that represented their best guess. The middle of these ranges and the bottom of the top range are used in these cases.
[8] Respondents selected a range of values for household income and reported assets. The midpoint of these ranges or the bottom of the top range is used for the values of these variables.
[9] Using certain drugs has also been linked to miscarriages, but this variable is not available for Wave 4. The Wave 3 results are not sensitive to excluding the control for drug use.

Table 1 Summary statistics: Weighted means

	Wave 3				Wave 4			
	All	Live Births	Miscarriage	Abortions	All	Live Births	Miscarriage	Abortions
Outcomes								
Index	−0.23	−0.35	−0.18	0.06	−0.24	−0.34	−0.23	0.10
	(0.54)	(0.55)	(0.52)	(0.38)	(0.56)	(0.56)	(0.50)	(0.48)
High school diploma	0.64	0.59	0.60	0.82	0.61	0.53	0.68	0.85
GED	0.14	0.13	0.19	0.11	0.19	0.21	0.21	0.11
Years of schooling	11.97	11.64	11.95	12.83	12.54	12.23	12.69	13.48
	(1.85)	(1.75)	(1.77)	(1.89)	(1.85)	(1.79)	(1.57)	(1.89)
Labor income	8,691	7,653	8,934	11,290	21,049	19,476	19,359	27,636
	(10,578)	(8,582)	(14,946)	(11,196)	(32,811)	(36,677)	(26,918)	(19,106)
Welfare receipt	0.17	0.23	0.13	0.05	0.54	0.60	0.58	0.30
Household income					45,881	41,560	42,050	63,303
					(34,880)	(31,961)	(31,171)	(41,087)
ln (assets)					9.55	9.41	9.55	10.02
					(1.64)	(1.59)	(1.65)	(1.73)
Individual Variables								
Age	22.03	22.13	21.80	21.93	28.60	28.61	28.64	28.52
	(1.66)	(1.65)	(1.60)	(1.73)	(1.67)	(1.64)	(1.61)	(1.81)
White	0.55	0.52	0.60	0.59	0.54	0.52	0.69	0.53
Black	0.26	0.30	0.20	0.21	0.27	0.29	0.15	0.26
Hispanic	0.15	0.15	0.17	0.12	0.14	0.15	0.14	0.12
AH PVT	96.80	94.96	97.39	101.17	96.07	94.59	97.72	99.97
	(12.73)	(12.43)	(12.96)	(12.28)	(12.77)	(12.58)	(12.99)	(12.33)
Family Background								
Mother's education	12.29	12.02	12.44	12.88	12.12	11.87	12.06	12.95
	(2.13)	(1.88)	(2.28)	(2.47)	(2.08)	(1.99)	(2.08)	(2.18)
Father's education	12.30	11.88	12.33	13.10	12.14	11.70	12.27	13.44
	(2.15)	(2.06)	(1.94)	(2.26)	(2.24)	(2.12)	(2.01)	(2.26)
Family income (Wave 1)	35,345	30,295	38,382	45,290	33,356	29,539	33,973	45,666
	(30,130)	(26,071)	(35,137)	(32,908)	(27,192)	(23,826)	(28,424)	(32,792)
Birth Outcomes								
Live birth	0.61	1	0	0	0.67	1	0	0
Miscarriage	0.16	0	1	0	0.14	0	1	0
Abortion	0.23	0	0	1	0.19	0	0	1

Notes: Wave 3 sample includes 1,024 pregnant teens. Wave 4 sample includes 1,171 pregnant teens. Standard deviations are shown in parentheses.

Add Health provides contextual data from the 2000 census linked to respondents in Wave 3. The 2000 census variables reflect conditions in 1999 because respondents are asked about conditions in the previous year. Most of the pregnancies took place between 1994 and 1999, so the Wave 3 census variable therefore reflects conditions around the time of pregnancy, which is when teens are making their education or labor market decisions.[10] Median family income by county is the census variable used to divide the sample by socioeconomic status. However, results are similar if groups are divided by individuals who come from relatively high-educated counties and relatively low-educated counties. In addition, results are similar if groups are divided by high and low parental education or income; however, census data were used because they are more likely to reflect the overall economic opportunities where one lives.[11] Individuals are defined to be from low- or high-income counties based on whether they are above or below the median levels within the sample of pregnant teens.[12] Data are also divided by self-reported race and Hispanic or Latino origin from Wave 1.[13]

This study estimates the impact of teen childbearing on those who become pregnant as teens. This is the effect that one should measure in order to understand the benefit of policies aimed at preventing teen births. Following Ashcraft and Lang (2006) and Ashcraft et al. (2013), this study uses miscarriages to put bounds on the causal effects of teen childbearing.[14]

In particular, IV specifications are estimated on the sample of all pregnant teens to create the upper bound for the effect of childbearing. The first stage is

$$Birth_i = \alpha_0 + \alpha_1 Miscarriage_i + \alpha_2 \mathbf{X}_i + e_i,$$

where *Miscarriage* acts as the instrument for teen childbearing; and $\mathbf{X}$ includes controls for drinking, smoking, and early conception for all waves, as well as drug use for Wave 3. The second stage is

$$Y_i = \beta_0 + \beta_1 \widehat{Birth}_i + \beta_2 \mathbf{X}_i + \varepsilon_i,$$

where Y is an outcome variable of interest. Because some abortions occur prior to miscarriage, this specification includes more teens who abort in the nonmiscarriage group. Given that teens who abort are relatively advantaged, the effect of having a teen birth will be upwardly biased in this specification. Therefore, the estimated $\hat{\beta}_1$ represents the upper bound for the effect of teen childbearing on Y.

---

[10] Wave 1 also provides contextual variables, but these come from the 1990 census and reflect conditions in 1989, prior to most pregnancies and less relevant to the time during which women are making schooling and labor market decisions. However, the results are similar when socioeconomic status is defined based on these earlier contextual variables instead of the Wave 3 variables.

[11] Results using other socioeconomic divisions can be provided upon request.

[12] Results are similar if the whole sample is used to define the median level instead of just the pregnant teen sample.

[13] Categories are defined as Hispanic or Latino; black with no report of Hispanic or Latino; and white with no report of black, Hispanic, or Latino. Results are robust to using categories as reported by the interviewer as well.

[14] Ashcraft and Lang (2006) and Ashcraft et al. (2013) showed that the average treatment effect (ATE) is a weighted average of these bounds.

To obtain the lower bound, the following OLS specification is estimated on only the sample of pregnant teens who either miscarry or give birth:

$$Y_i = \gamma_0 + \gamma_1 Birth_i + \gamma_2 \mathbf{X}_i + \mu_i.$$

In this case, the miscarriage group now contains some abortion types (who did not actually abort because the miscarriage came first) and will be relatively advantaged compared with the group that gives birth and contains no abortion types. This will create a downward bias on the effect of giving birth. Therefore, the estimated $\hat{\gamma}_1$ represents the lower bound for the effect of teen childbearing on Y.

These bounds assume that miscarriage does not have any direct effect on one's outcomes. If the experience of miscarriage impacts outcomes directly, that would also impose a bias on both $\hat{\beta}_1$ and $\hat{\gamma}_1$. In particular, if miscarriage negatively (positively) affects outcomes, there would be an upward (downward) bias on both estimates.

This study extends previous analyses by separating the results across socioeconomic status and race, as defined earlier, to better understand how effects vary by a teen's background. In particular, the preceding regressions are run separately across individuals from low- and high-income counties. The regressions are also run separately across race and Hispanic and Latino origin.

All estimation accounts for the Add Health sampling design, which has unequal probability of selection and clustered observations within schools. Regressions use cross-sectional sample weights corresponding to the wave of the outcome variable and Eicker-Huber-White standard errors robust to clustering within schools. The sample weights are designed to make estimates nationally representative of students in grades 7–12 in 1994–1995.

Results

Impacts of Teen Childbearing Across Socioeconomic Conditions

Table 2 reports Wave 3 results across socioeconomic conditions. Wave 3 respondents range from age 18 to 25, averaging 22 years old. Thus, these results can be interpreted as the short-run effects of teen childbearing. The first two columns in the table present results for all teens, the middle two columns present results for teens from low-income counties, and the final two columns present results for teens from high-income counties. For each group, the first column presents OLS results on the sample of pregnant teens who give birth or miscarry, which represents the lower bound of the effect of teen childbearing on outcomes. The second column within each income group presents the IV estimates on the sample of all pregnant teens using miscarriage as an instrument, which represents the upper bound.

The first row in Table 2 reports the effect of teen childbearing on the Wave 3 index, and the remaining rows show the effects of teen childbearing on each element of the index. The Wave 3 index represents an average of all the Wave 3 outcomes, and a higher coefficient indicates improved education and labor market outcomes. For all women combined, results show that teen childbearing has a negative impact on the

Table 2 Short-run effects of teen childbearing across socioeconomic status (Wave 3 results)

	All		Low-Income Counties		High-Income Counties	
	OLS	IV	OLS	IV	OLS	IV
	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies
Wave 3 Index	−0.200*	−0.101	0.022	0.134	−0.405**	−0.373**
	(0.080)	(0.107)	(0.084)	(0.108)	(0.092)	(0.127)
n	749	1,004	401	498	335	487
High School Diploma	−0.055	0.047	0.027	0.142	−0.152†	−0.089
	(0.060)	(0.080)	(0.096)	(0.120)	(0.079)	(0.114)
n	747	1,002	401	498	333	485
GED	−0.037	−0.080	−0.044	−0.123	−0.020	−0.040
	(0.048)	(0.065)	(0.080)	(0.097)	(0.066)	(0.098)
n	748	1,003	400	497	335	487
Years of Schooling	−0.463*	−0.069	0.000	0.460	−0.838**	−0.604†
	(0.209)	(0.288)	(0.314)	(0.406)	(0.238)	(0.355)
n	749	1,004	401	498	335	487
Labor Income	−1,557	−648	1,708	3,162*	−4,950*	−5,313†
	(1,530)	(2,256)	(1,097)	(1,499)	(1,900)	(3,046)
n	715	961	384	478	321	467
Welfare Receipt	0.108*	0.075	−0.015	−0.069	0.221**	0.225**
	(0.045)	(0.057)	(0.064)	(0.082)	(0.058)	(0.071)
n	745	1,000	400	497	333	485

Notes: Controls are smoking, drinking, and drug use during pregnancy; and conception before age 15. Each cell represents a separate regression. Standard errors robust to clustering at the school level are shown in parentheses, and sample sizes are presented below the estimates. Add Health cross-sectional sample weights are used.

†$p < .10$; *$p < .05$; **$p < .01$

Wave 3 index, with the bounds of the effect ranging from an OLS lower-bound estimate of –0.200 to an IV upper-bound estimate of –0.101 units, or about a 0.4 to 0.2 standard deviation decrease in the index; only the lower bound of the effect is significantly different from 0.

The negative results are driven by teens from high-income counties. The middle columns of Table 2 show that teens from low-income counties do not experience any negative overall effects of childbearing. In fact, the bounds of the Wave 3 index for these teens indicate slightly improved outcomes, with bounds ranging from 0.022 to 0.134. This represents a 0.04 to 0.25 standard deviation improvement in the index, but these estimates are statistically insignificant. However, teens from high-income counties who give birth experience statistically significant and large decreases in overall education and labor market outcomes. The effect of teen childbearing for these women is a decrease in the Wave 3 index, with bounds ranging from –0.405 to –0.373. Both bounds are statistically significant at the 1 % level and represent a decrease in the index of about 0.75 of a standard deviation. The difference in effects across women

from low- and high-income counties is also significant at less than the 1 % significance level.[15] Overall, the short-run effects of teen childbearing differ dramatically depending on the socioeconomic conditions in which the teen lives around the time of childbearing.[16]

Results for each element of the Wave 3 index portray similar differences across socioeconomic groups. Estimates for teens from low-income counties are mostly insignificant but indicate large increases in schooling and labor market outcomes. Upper-bound IV estimates indicate increases in high school diploma receipt of up to 14 percentage points and increased schooling attainment of almost half a year. The OLS and IV estimates indicate labor income increases of $1,708 to $3,162 and reductions in welfare receipt of 1.5 to 6.9 percentage points, respectively. However, with the exception of the IV upper-bound estimate on labor income, none of the coefficients are statistically significant, and the standard errors on these estimates are large. Thus, although positive effects cannot be ruled out, there may also be no effects or even small negative effects. Overall, results indicate that teen childbearing does not have large negative short-run consequences for teens from low-income counties.

For individuals from high-income counties, the negative overall effect of teen childbearing is driven by decreases in schooling attainment and labor income and increases in welfare use. The lower- and upper-bound estimates of teen childbearing for these teens range from –0.838 to –0.604 for years of completed schooling, from –$5,313 to –$4,950 for lost income, and from 22.1 to 22.5 percentage points for increased welfare use, with all estimates statistically significant at the 10 % level or less. These are large effects given that pregnant teens have an average schooling attainment of about 12 years, labor income of $8,691, and welfare use of 33 %. In addition, the point estimates for years of completed schooling, labor income, and welfare use are all significantly different across high-income and low-income counties at the 5 % level or less. High school diploma and GED receipt also decrease, but only the lower bound for high school diploma is marginally statistically significant.

Table 3 reports Wave 4 results across socioeconomic conditions. Wave 4 respondents range in age from 24 to 33, averaging almost 29 years old. Thus, the effects represent longer-run effects, about 10 years after teen childbearing. The first row in Table 3 presents the effect of teen childbearing on the Wave 4 index, and the remaining rows show the effects for each element of the index. The first two columns present the bounds for the whole population. Results show that the effect of childbearing on the Wave 4 index is negative but only marginally significant for the lower-bound OLS estimate. This is consistent with recent research finding small overall effects of teen childbearing using miscarriages to identify the causal effect (Ashcraft and Lang 2006; Ashcraft et al. 2013; Fletcher and Wolfe 2009; Hotz et al. 2005). The remaining columns show that the pattern of results across income is similar to Wave 3. For teens from low-income counties, teen childbearing improves the Wave 4 index from the OLS lower-bound estimate of 0.102 to the IV upper-bound estimate of 0.215, or almost 0.2

---

[15] This result is obtained by running the low-income and high-income observations in one regression and testing the significance of the interaction terms.

[16] When results are broken into quartiles of income, similar results hold. Even though the consequences of teen childbearing generally worsen as socioeconomic status improves, in some cases, the effects are not strictly monotonic across quartile. For instance, teens from the highest quartile of income experience less detrimental effects than those from the next highest quartile.

to 0.4 standard deviations. This is slightly larger than the magnitude for Wave 3, but only the upper bound of this effect is marginally significant. For teens from high-income counties, teen childbearing reduces the Wave 4 index from –0.192 to –.124, or about 0.2 to 0.3 standard deviations. Thus, the detrimental effect is smaller in Wave 4 for those from high-income counties.[17] The smaller detrimental effects for Wave 4 outcomes are consistent with findings by Hotz et al. (2005) that the effects of teen childbearing become more positive over time. The differences in effects between low- and high-income counties remain statistically significant for the lower- and upper-bound estimates, with p values of .032 and .052, respectively.

Elements of the Wave 4 index indicate that the positive effects for teens from low-income counties are driven by improvements in labor market outcomes, and the negative effects for teens from high-income counties are driven by lower schooling attainment. For those from low-income counties, the effects of teen childbearing on labor income, household income, welfare, and assets are large in magnitude—and in the case of household income, both bounds are statistically significant at the 10 % level or less. In particular, teen childbearing increases labor income from a lower bound of $8,446 to an upper bound of $12,752, increases household income from $9,529 to $14,204, decreases welfare from –0.074 to –0.195, and increases assets from 49 % to 79 %. One must be cautious in interpreting these results because the standard errors are large and most of the estimates are insignificant. However, the large estimates are in line with findings by Hotz et al. (2005) that teen mothers in their sample would have 56 % to 62 % lower income at age 28 if they had delayed childbearing. Overall, teen childbearing may lead to a better long-term financial situation for teens from low-income counties, and there is no evidence of large negative impacts.

For teens from high-income counties, teen childbearing decreases schooling attainment by 0.731 to 0.832 years, with both bounds statistically significant at the 5 % level or less. In addition, teen childbearing leads to a large reduction in the probability of receiving a high school diploma, with bounds ranging from –0.172 to –0.128. However, the standard errors are large, and only the lower bound is marginally statistically significant. The effects of teen childbearing on labor market outcomes for those from higher-income areas are not as large in magnitude as the Wave 3 effects, and none of the effects are statistically significant. Overall, the Wave 4 results for teens from high-income counties suggest that large negative effects on educational attainment persist, but there are minimal negative consequences for labor market outcomes in the longer run.

Impacts of Teen Childbearing Across Race

Tables 4 and 5 report results separated by race and Hispanic and Latino origin for Waves 3 and 4, respectively. Each pair of columns presents the effects of teen childbearing for white, black, and Hispanic and Latino teens, respectively. The first column for each group displays the OLS specification, which gives the lower bound of the effect of teen childbearing; the second column for each group displays the IV

---

[17] One may worry that the sample of women differs between waves and could drive this effect. However, the same pattern is true even when the sample is limited to observations that appear in both waves of the data.

Table 3 Longer-run effects of teen childbearing across socioeconomic status (Wave 4 results)

	All		Low-Income Counties		High-Income Counties	
	OLS	IV	OLS	IV	OLS	IV
	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies
Wave 4 Index	−0.113†	−0.031	0.102	0.215†	−0.192*	−0.124
	(0.059)	(0.075)	(0.100)	(0.125)	(0.081)	(0.108)
n	899	1,169	393	482	338	479
High School Diploma	−0.170*	−0.133†	−0.076	−0.035	−0.172†	−0.128
	(0.066)	(0.079)	(0.094)	(0.112)	(0.101)	(0.127)
n	899	1,169	393	482	338	479
GED	0.020	−0.008	0.007	−0.016	0.009	−0.032
	(0.046)	(0.057)	(0.070)	(0.085)	(0.070)	(0.093)
n	899	1,169	393	482	338	479
Years of Schooling	−0.461*	−0.302	−0.108	0.094	−0.832**	−0.731*
	(0.204)	(0.258)	(0.348)	(0.430)	(0.278)	(0.367)
n	899	1,169	393	482	338	479
Labor Income	236	2,709	8,446	12,752	−2,133	153
	(3,241)	(3,959)	(8,429)	(9,468)	(2,256)	(3,227)
n	874	1,141	381	467	334	475
Household Income	−340	5,117	9,529†	14,204*	−3,634	1,979
	(3,549)	(4,736)	(5,320)	(6,565)	(4,842)	(7,094)
n	841	1,102	368	455	317	452
Welfare Receipt	0.034	−0.045	−0.075	−0.195†	0.077	0.020
	(0.056)	(0.072)	(0.078)	(0.099)	(0.079)	(0.109)
n	899	1,169	393	482	338	479
ln(Assets)	−0.137	−0.025	0.398	0.581	−0.215	−0.107
	(0.208)	(0.263)	(0.297)	(0.362)	(0.362)	(0.479)
n	813	1,066	359	442	303	433

Notes: Controls are smoking and drinking during pregnancy, and conception before age 15. Each cell represents a separate regression. Standard errors robust to clustering at the school level are shown in parentheses, and sample sizes are presented below the estimates. Add Health cross-sectional sample weights are used.

†$p < .10$; * $p < .05$; **$p < .01$

specification, which gives the upper bound of the effect. Overall, these results suggest that the effects of teen childbearing are not uniform across race.

Table 4 reports the Wave 3, short-run effects of teen childbearing on education and labor market outcomes. The first row illustrates the overall impact on the Wave 3 index, and the remaining rows show the effects of teen childbearing on each element of the index. As shown in the table, the negative effect for the population as a whole is driven by the white population, for whom teen childbearing decreases the Wave 3 index from the lower-bound estimate of −0.323 to the upper-bound estimate of −0.254 units, or a

Table 4 Short-run effects of teen childbearing across race (Wave 3 results)

	White		Black		Hispanic/Latino	
	OLS	IV	OLS	IV	OLS	IV
	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies
Wave 3 Index	−0.323**	−0.254*	−0.045	0.047	0.014	0.127
	(0.092)	(0.123)	(0.148)	(0.188)	(0.125)	(0.155)
n	329	441	255	335	139	179
High School Diploma	−0.131	−0.044	−0.138	−0.094	0.243*	0.404**
	(0.081)	(0.105)	(0.084)	(0.108)	(0.109)	(0.140)
n	328	440	255	335	138	178
GED	−0.029	−0.066	0.043	0.025	−0.124	−0.193
	(0.072)	(0.096)	(0.026)	(0.033)	(0.141)	(0.169)
n	329	441	254	334	139	179
Years of Schooling	−0.836**	−0.572	−0.267	0.119	0.345	0.736
	(0.256)	(0.353)	(0.357)	(0.504)	(0.360)	(0.491)
n	329	441	255	335	139	179
Labor Income	−3,299	−2,501	−1,174	−711	4,330*	5,442**
	(2,177)	(3,251)	(1,984)	(2,480)	(1,611)	(2,036)
n	320	428	238	313	133	173
Welfare Receipt	0.152**	0.133*	−0.046	−0.094	0.135[†]	0.095
	(0.049)	(0.060)	(0.114)	(0.138)	(0.072)	(0.094)
n	327	439	254	334	138	178

Notes: Controls are smoking, drinking, and drug use during pregnancy; and conception before age 15. Each cell represents a separate regression. Standard errors robust to clustering at the school level are shown in parentheses, and sample sizes are presented below the estimates. Add Health cross-sectional sample weights are used.

[†]$p < .10$; *$p < .05$; **$p < .01$

0.6 to 0.5 standard deviation decrease. Both estimates are significantly different from 0 at the 5 % level or less, indicating detrimental overall effects of teen childbearing for the white population. However, the overall effects of teen childbearing are smaller and insignificant for the black and Hispanic and Latino populations. In an F test of whether the coefficients across race are equal, I can reject the null hypothesis for both the lower and upper bounds, with p values of .008 and .074, respectively.[18]

The components of the index show that teen childbearing reduces years of schooling and labor income and increases welfare use for white teens. The lower- and upper-bound estimates range from −0.836 to −0.572 for years of schooling, −$3,299 to

---

[18] The F test is obtained by estimating the results in one regression, allowing interactions with race and Hispanic and Latino origin, and testing whether the interactions are both 0. In pairwise t tests, the coefficients for the Hispanic and Latino group are significantly different from the coefficients for the white group, with p values of .032 and .054 for the lower and upper bounds, respectively. The lower bound for the black group is significantly different from the lower bound for the white group, with a p value of .093. The differences between the black and Hispanic and Latino group are not significantly different at conventional levels.

Table 5 Longer-run effects of teen childbearing across race (Wave 4 results)

	White		Black		Hispanic/Latino	
	OLS	IV	OLS	IV	OLS	IV
	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies
Wave 4 Index	−0.151*	−0.083	0.043	0.152	0.006	0.147
	(0.075)	(0.094)	(0.118)	(0.156)	(0.129)	(0.154)
n	417	524	302	399	153	199
High School Diploma	−0.195*	−0.146	−0.181	−0.159	−0.008	0.067
	(0.086)	(0.100)	(0.133)	(0.167)	(0.151)	(0.184)
n	417	524	302	399	153	199
GED	0.012	−0.030	0.162**	0.173**	−0.072	−0.132
	(0.067)	(0.080)	(0.043)	(0.044)	(0.115)	(0.149)
n	417	524	302	399	153	199
Years of Schooling	−0.624*	−0.525†	0.124	0.452	−0.036	0.263
	(0.240)	(0.299)	(0.416)	(0.563)	(0.362)	(0.450)
n	417	524	302	399	153	199
Labor Income	762	3,733	1,895	4,720	−5,764	−4,368
	(4,591)	(5,646)	(3,083)	(3,823)	(4,684)	(5,795)
n	411	517	285	380	151	197
Household Income	−2,089	1,964	5,806	11,983*	6,055	19,764†
	(5,173)	(6,763)	(4,237)	(5,448)	(7,095)	(10,034)
n	397	499	277	373	140	185
Welfare Receipt	0.021	−0.057	0.051	0.009	−0.073	−0.178
	(0.082)	(0.105)	(0.100)	(0.125)	(0.111)	(0.144)
n	417	524	302	399	153	199
ln (assets)	−0.343	−0.297	0.119	0.334	0.555	0.996†
	(0.278)	(0.348)	(0.289)	(0.360)	(0.379)	(0.512)
n	386	484	269	361	132	177

Notes: Controls are smoking and drinking during pregnancy, and conception before age 15. Each cell represents a separate regression. Standard errors robust to clustering at the school level are shown in parentheses, and sample sizes are presented below the estimates. Add Health cross-sectional sample weights are used.

†$p < .10$; *$p < .05$; **$p < .01$

−$2,501 for labor income, and 15.2 to 13.3 percentage points for welfare use. The impacts for black teens are all insignificant and smaller in magnitude relative to estimates for white teens, with some of the estimates indicating small positive effects. For Hispanic and Latino teens, teen childbearing significantly increases high school diploma receipt and labor market income, with the bounds ranging from 24.3 to 40.4 percentage points for high school diploma receipt and from $4,330 to $5,442 for income. These estimates are large, but the large standard errors mean that smaller effects cannot be ruled out. Although estimates on years of schooling for Hispanic and Latino teens are insignificant, the magnitudes are positive and range from 0.345 to

0.736 years. In an *F* test of whether the coefficients across race are equal, I can reject the null hypothesis at the 5 % level or less for the lower and upper bounds of high school diploma receipt and the lower bounds of years of schooling and earnings. I can reject the null hypothesis at the 10 % level for the upper bounds of years of schooling and earnings and the lower bound of welfare receipt.[19]

As shown in Table 5, a similar pattern continues to hold for the longer-run outcomes (Wave 4). However, the effects are smaller, and the overall differences are no longer significant. Once again, the negative bounds on the Wave 4 index for the whole population are driven by negative effects of teen childbearing for the white population with bounds ranging from –0.151 to –0.083 units, or about –0.27 to –0.151 standard deviations. For white women, the negative longer-run effects of teen childbearing are largely driven by detrimental effects on education, with bounds on high school diploma receipt ranging from reductions of –0.195 to –0.146 percentage points, and bounds on years of schooling indicating significant reductions of more than half a year. The longer-run effects of teen childbearing on labor market outcomes for white teens are all insignificant and no longer appear to be detrimental overall. The only large detrimental labor market effect for white teens is a 26 % to 29 % reduction in assets, but the estimates are not statistically significant.

Teen childbearing has a positive but insignificant effect on the Wave 4 index for both the black and Hispanic and Latino populations, with the bounds ranging from about 0 to 0.152 units, or up to about 0.27 standard deviations. For black teens, receipt of GED increases significantly, although the magnitude of the increase is similar to the magnitude of the decrease in receiving a high school diploma, suggesting that black teen mothers may substitute GED receipt for high school diploma receipt.[20] Teen childbearing increases labor and household income as well as assets for black women, but the estimates are insignificant with the exception of a significant but noisy upper bound on household income of $11,983. Finally, the positive effects of teen childbearing on high school diploma receipt and years of schooling seen in Wave 3 for Hispanic and Latino teens largely disappear, but there are no longer-run negative impacts. Teen childbearing no longer increases labor income for this group, but it increases household income with bounds from $6,055 to $19,764 and increases assets with bounds from 74 % to 171 %, with upper bounds being marginally significant.[21] Thus, Hispanic and Latino teen mothers may be in better longer-run financial situations relative to those who do not give birth as teens. However, because the individual estimates are noisy and the impact on the Wave 4 index is insignificant, I cannot conclude that teen childbearing has positive effects for this group. Overall, white teens experience detrimental effects of teen childbearing, but neither black nor Hispanic and Latino teens experience detrimental effects. In addition, these differences across race do not drive all the differences across socioeconomic status. Even within race categories, differences across

---

[19] The estimates on high school diploma receipt and earnings for Hispanic and Latino teens are significantly different from the estimates for white or black teens at the 5 % level or less, and the estimates on years of schooling for Hispanic and Latino teens are significantly different from the estimates for white teens at the 5 % level. The other individual estimates are not significantly different across race at conventional levels.

[20] The increase in GED receipt is significantly different from the coefficient for white teens, with *p* values of .059 and .027 for the lower and upper bounds, respectively.

[21] The increase in assets is significantly different from the coefficient on assets for white teens, with *p* values of .055 and .035 for the lower and upper bounds, respectively.

socioeconomic backgrounds seen for the whole population remain (results not shown but available upon request).

Extensions

One may worry that the heterogeneous results are driven by differences in the timing of subsequent fertility for those who have miscarriages. If the comparison groups for women from low-income counties or minority groups go on to have second pregnancies and births soon after their miscarriages but the comparison groups for women from high-income counties or white populations are able to delay future births more effectively, the differential timing of subsequent births in the comparison groups may be driving some of the heterogeneous effects. For example, I may be comparing women having teen births with women having births in their late teens or early 20s in low-income counties but comparing women having teen births with women having births in their late 20s or early 30s in high-income counties. In this case, the difference in relative comparison group could drive differential effects of teen childbearing across low- and high-income counties or across race instead of differences reflecting different costs.

To explore whether such a phenomenon exists, Tables 6 and 7 illustrate the effect of teen childbearing on Wave 3 birth outcomes across socioeconomic status and race, respectively. These tables show some differences in timing of births across groups. For example, Table 6 illustrates that within high-income counties, the coefficients on teen childbearing are larger for the outcomes of ever given birth, age at first birth, and total births relative to coefficients on teen childbearing within low-income counties. In addition, differences in both bounds for the effects on ever given birth and total births are significant at the 5 % and 10 % level, respectively. This indicates that within high-income counties, those with teen pregnancies who do not give birth delay future births longer than those with teen pregnancies who do not give birth in low-income counties.

Table 7 illustrates some differences in the effects of teen childbearing on birth outcomes across race as well. However, none of the pairwise comparisons of coefficients across race are statistically significant at the 5 % level, with the exception of the lower bound of total births for the Hispanic and Latino subgroup relative to the white subgroup.

To examine whether the heterogeneous results are being driven by the observed differential timing of the next birth for pregnant teens who miscarry, I carry out two extensions. First, I restrict the sample to exclude teens whose first pregnancies do not result in a birth but go on to have teen childbirths from subsequent pregnancies. Second, I restrict the sample to exclude teens whose first pregnancies do not result in a birth but who go on to have births within the next two years. In both cases, omitting these groups leads to more similar effects of childbearing on birth outcomes across socioeconomic status and race. In particular, there are no longer significant differences at the 10 % level or less in Wave 3 birth outcomes across income for either restricted sample. However, the heterogeneous effects of teen childbearing seen in the full sample remain for these subsamples. (These results are provided in Tables A1 and A2 in the online appendix.) I also conduct these exercises for Wave 4 results, and the heterogeneous patterns found in the full sample remain in these subsamples. Thus, despite some differential timing of future

Table 6 Teen childbearing effects on birth outcomes by socioeconomic status (Wave 3)

	All		Low Income		High Income	
	OLS	IV	OLS	IV	OLS	IV
	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies
Ever Given Birth	0.529**	0.464**	0.387**	0.295**	0.623**	0.593**
	(0.054)	(0.073)	(0.076)	(0.089)	(0.062)	(0.091)
n	749	1,004	401	498	335	487
Age at First Birth	−2.036**	−1.892**	−1.854**	−1.766**	−2.318**	−2.188**
	(0.182)	(0.213)	(0.225)	(0.248)	(0.230)	(0.253)
n	670	751	367	406	292	333
Total Births	1.093**	0.967**	0.922**	0.740**	1.218**	1.157**
	(0.095)	(0.126)	(0.130)	(0.167)	(0.115)	(0.151)
n	749	1,004	401	498	335	487

Notes: Controls are smoking, drinking, and drug use during pregnancy; and conception before age 15. Each cell represents a separate regression. Standard errors robust to clustering at the school level are shown in parentheses, and sample sizes are presented below the estimates. Add Health cross-sectional sample weights are used.

**p < .01

Table 7 Teen childbearing effects on birth outcomes by race (Wave 3)

	White		Black		Hispanic/Latino	
	OLS	IV	OLS	IV	OLS	IV
	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies	Births and Miscarriages	All Teen Pregnancies
Ever Given Birth	0.553**	0.482**	0.517**	0.505**	0.494**	0.471**
	(0.068)	(0.099)	(0.119)	(0.154)	(0.113)	(0.150)
n	329	441	255	335	139	179
Age at First Birth	−2.188**	−2.031**	−1.771**	−1.645**	−1.686**	−1.643**
	(0.215)	(0.260)	(0.220)	(0.257)	(0.333)	(0.410)
n	293	327	232	261	122	135
Total Births	1.140**	1.009**	1.178**	1.122**	0.748**	0.655**
	(0.112)	(0.151)	(0.235)	(0.293)	(0.169)	(0.214)
n	329	441	255	335	139	179

Note: Controls are smoking, drinking, and drug use during pregnancy; and conception before age 15. Each cell represents a separate regression. Standard errors robust to clustering at the school level are shown in parentheses, and sample sizes are presented below the estimates. Add Health cross-sectional sample weights are used.

**p < .01

births across socioeconomic status and race, this differential timing does not drive the heterogeneous results.

As a further extension, Add Health provides useful data to test whether teens from lower socioeconomic areas or minorities have more acceptance, support, or resources for teen births. Given that teen births are more common within these groups, perhaps acceptance and support are also more common, which may drive more benign effects of teen childbearing. Wave 1 asks students about their attitudes toward teen pregnancy. Questions include stating agreement about whether a pregnancy would embarrass one's family, whether a pregnancy would embarrass the teen, whether a pregnancy would require one to quit school, and whether a pregnancy would lead to marrying the wrong person. In addition, Add Health provides administrative information on the number of pregnant teens in one's school and a school survey that reports on school resources provided to pregnant teens and teen moms, such as family planning, prenatal or postnatal care, day care, separate school or home tutor options, and parent courses. Table 8 looks at all these variables across teens who experience a teen pregnancy, divided by socioeconomic status and race.

The top panel of Table 8 shows that overall attitudes toward teen pregnancy appear slightly less negative for those from lower-income counties. Teens from lower-income counties are less likely to report that a pregnancy would be embarrassing and result in quitting school. These teens also have more pregnant peers in their schools. However, few of these differences are large or statistically significant across income group. Differences in attitudes vary some across race. White and Hispanic and Latino women are more likely to report that a teen pregnancy would be embarrassing to one's family and result in marrying the wrong person. However, only white women are more likely to report that a pregnancy would be embarrassing to themselves. There are no significant differences across race in reporting that a pregnancy would require quitting school or in the number of pregnant peers at one's school.

The bottom panel of the table shows no consistent differences in school resources provided to teens across income status or race. On the whole, those from higher-income counties often have greater resources, but the differences are small and insignificant. The resources vary some across race, but most differences are statistically insignificant. The significant differences are that upon becoming pregnant, white women are less likely to have access to a home tutor or separate school, Hispanic and Latino women are more likely to have access to a home tutor or separate school, and black women are less likely to have access to parent courses. Overall, there are no consistent patterns that would suggest that access to resources are driving the heterogeneous effects of teen childbearing.

Discussion

For teens from lower-income counties and teens in minority groups, poor education and labor market outcomes are not the result of teen childbearing. Instead, teen childbearing is likely complementary with poor education and labor market prospects. In addition, teen childbearing may encourage some young women in poor circumstances to obtain

Table 8 Attitudes and resources across socioeconomic status and race

	Socioeconomic Status			Race			
	Low-Income	High-Income		White	Black	Hispanic/Latino	
Pregnancy Would Embarrass Family	0.405	0.480		0.490	0.309	0.576	**
	(0.492)	(0.500)		(0.501)	(0.463)	(0.496)	
Pregnancy Would Embarrass Teen	0.362	0.480	*	0.488	0.342	0.358	**
	(0.481)	(0.500)		(0.501)	(0.475)	(0.482)	
Quit School if Pregnant	0.095	0.133		0.129	0.095	0.097	
	(0.294)	(0.340)		(0.336)	(0.294)	(0.297)	
Marry Wrong Person	0.229	0.238		0.268	0.138	0.284	*
	(0.421)	(0.426)		(0.444)	(0.346)	(0.453)	
Number Pregnant at School	16.75	12.42		10.21	22.86	14.22	
	(30.37)	(15.57)		(13.58)	(37.51)	(19.25)	
Family Planning Counseling	0.061	0.115		0.102	0.036	0.124	
	(0.240)	(0.319)		(0.303)	(0.185)	(0.331)	
Prenatal/Postnatal Care	0.115	0.118		0.100	0.104	0.171	
	(0.319)	(0.323)		(0.301)	(0.305)	(0.377)	
Day Care	0.197	0.164		0.154	0.200	0.241	
	(0.398)	(0.370)		(0.361)	(0.401)	(0.429)	
Separate School/Home Tutor	0.249	0.312		0.205	0.326	0.516	**
	(0.433)	(0.464)		(0.404)	(0.469)	(0.501)	
Parent Courses	0.211	0.335		0.300	0.156	0.342	†
	(0.409)	(0.473)		(0.459)	(0.363)	(0.476)	

Notes: Symbols in the middle column indicate significant differences between low- and high-income groups; symbols in the last column indicate significant differences across race as measured with an F test.

$†p < .10$; $*p < .05$; $**p < .01$

more education and attain better labor market outcomes than they otherwise would have, but the positive effects are noisy and largely insignificant. However, for teens from higher-income counties, as well as white teens, teen childbearing has large negative impacts on education and labor market outcomes. These negative effects can be obscured if analyses are not separated across socioeconomic background and race.

It is important to understand this heterogeneity when targeting policy mechanisms directed at reducing teen fertility. Although recent work has found that such policies may have only modest beneficial effects on teen outcomes, the results presented here suggest that there could be large beneficial effects of reducing teen childbearing concentrated among relatively more advantaged or white teens. However, teen pregnancy prevention policies may not help teens who come from less advantaged backgrounds. Thus, broad pregnancy prevention programs targeting all teens may not help the populations that they intend to serve. Instead of focusing on reducing childbearing of poor and minority teens directly, results of this study suggest that policy-makers

would be better off to first target the socioeconomic conditions that make teen childbearing a more prevalent outcome among these groups.

References

Anderson, M. L. (2008). Multiple inference and gender differences in the effects of early intervention: A reevaluation of the Abecedarian, Perry Preschool, and Early Training projects. *Journal of the American Statistical Association, 103,* 1481–1495.

Ashcraft, A., Fernandez-Val, I., & Lang, K. (2013). The consequences of teenage childbearing: Consistent estimates when abortion makes miscarriage non-random. *Economic Journal, 123,* 875–905.

Ashcraft, A., & Lang, K. (2006). *The consequences of teenage childbearing* (NBER Working Paper No. 12485). Cambridge, MA: National Bureau of Economic Research.

Card, J. J., & Wise, L. L. (1978). Teenage mothers and teenage fathers: The impact of early childbearing on the parents' personal and professional lives. *Family Planning Perspectives, 10,* 199–205. https://doi.org/10.2307/2134267

Diaz, C. J., & Fiel, J. E. (2016). The effect(s) of teen pregnancy: Reconciling theory, methods, and findings. *Demography, 53,* 85–116.

Edin, K., & Kefalas, M. (2005). *Promises I can keep: Why poor women put motherhood before marriage.* Berkeley: University of California Press.

Fletcher, J. M., & Wolfe, B. L. (2009). Education and labor market consequences of teenage childbearing: Evidence using the timing of pregnancy outcomes and community fixed effects. *Journal of Human Resources, 44,* 303–325.

Furstenberg, F. F., Jr. (1976). The social consequences of teenage parenthood. *Family Planning Perspectives, 8,* 148–164. https://doi.org/10.2307/2134201

Geronimus, A. T., & Korenman, S. (1992). The socioeconomic consequences of teen childbearing reconsidered. *Quarterly Journal of Economics, 107,* 1187–1214.

Harris, K. M. (2009). *The National Longitudinal Study of Adolescent Health (AddHealth), Waves I & II, 1994–1996; Wave III, 2001–2002; Wave IV, 2007–2009* [Machine-readable data file and documentation]. Chapel Hill: Carolina Population Center, University of North Carolina at Chapel Hill.

Harris, K. M., Halpern, C. T., Whitsel, E., Hussey, J., Tabor, J., Entzel, P., & Udry, J. R. (2009). *The National Longitudinal Study of Adolescent Health: Research design.* Retrieved from http://www.cpc.unc.edu/projects/addhealth/design

Hoffman, S. D., Foster, E. M., & Furstenberg, F. F., Jr. (1993). Reevaluating the costs of teenage childbearing. *Demography, 30,* 1–13.

Hoffman, S. D., & Maynard, R. A. (Eds.). (2008). *Kids having kids: Economic costs and social consequences of teen pregnancy* (2nd ed.). Washington, DC: Urban Institute Press.

Hotz, V. J., McElroy, S. W., & Sanders, S. G. (2005). Teenage childbearing and its life cycle consequences: Exploiting a natural experiment. *Journal of Human Resources, 40,* 683–715.

Hotz, V. J., Mullin, C. H., & Sanders, S. G. (1997). Bounding causal effects using data from a contaminated natural experiment: Analyzing the effects of teenage childbearing. *Review of Economic Studies, 64,* 575–603.

Hoynes, H., Schanzenbach, D. W., & Almond, D. (2016). Long-run impacts of childhood access to the safety net. *American Economic Review, 106,* 903–934.

Kane, J. B., Morgan, S. P., Harris, K. M., & Guilkey, D. K. (2013). The educational consequences of teen childbearing. *Demography, 50,* 2129–2150.

Kearney, M. S., & Levine, P. B. (2012). Why is the teen birth rate in the United States so high and why does it matter? *Journal of Economics Perspectives, 26*(2), 141–166.

Kearney, M. S., & Levine, P. B. (2014). Income inequality and early nonmarital childbearing. *Journal of Human Resources, 49,* 1–31.

Kling, J. R., Liebman, J. B., & Katz, L. F. (2007). Experimental analysis of neighborhood effects. *Econometrica, 75,* 83–119.

Lang, K., & Nuevo-Chiquero, A. (2012). Trends in self-reported spontaneous abortions: 1970–2000. *Demography, 49,* 989–1009.

Lang, K., & Weinstein, R. (2015). The consequences of teenage childbearing before *Roe v. Wade. American Economic Journal: Applied Economics, 7*(4), 169–197.

Levine, D. I., & Painter, G. (2003). The schooling costs of teenage out-of-wedlock childbearing: Analysis with a within-school propensity-score-matching estimator. *Review of Economics and Statistics, 85,* 884–900.

Ribar, D. C. (1994). Teenage fertility and high school completion. *Review of Economics and Statistics, 76,* 413–424.

Sedgh, G., Finer, L. B., Bankole, A., Eilers, M. A., & Singh, S. (2015). Adolescent pregnancy, birth, and abortion rates across countries: Levels and recent trends. *Journal of Adolescent Health, 56,* 223–230.

Waite, L. J., & Moore, K. A. (1978). The impact of an early first birth on young women's educational attainment. *Social Forces, 56,* 845–865.