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## Long-term consequences of adolescent parenthood among African American urban youth: A propensity matching approach

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### Abstract

**Purpose**—To improve understanding of long-term socioeconomic consequences of teen parenting for men and women.

**Methods**—Analysis is based on the Woodlawn Study, a longitudinal study of an African American cohort from a socially disadvantaged community in Chicago; data were collected at childhood (N=1,242), adolescence (N=705), young adulthood (age 32, N=952), and midlife (age 42, N=833). This analysis focused on the 1050 individuals with data on teen parenting. We used propensity score matching to account for differences in background characteristics between teenage parents and their peers and multiple imputation to account for differential attrition.

**Results**—The regression models on matched samples showed that at age 32, in comparison to non-teen mothers, teenage mothers were more likely to be unemployed, live in poverty, depend on welfare, and have earned a GED or completed high school compared to finishing college. At age 32, teen fathers were more likely to be without a job compared to non-teen fathers. At age 42, the effect of teen parenting for women remained statistically significant for education and income. There were no significant associations between teen parenting and outcomes for men at age 42.

**Conclusions**—Socioeconomic consequences of teenage parenting among African Americans from disadvantaged background seem to be primarily concentrated in women and persist throughout adulthood. In addition to promoting the delay of parenting after the teenage years, it is critical to provide programs at early stages in the life course to mitigate the negative socioeconomic consequences of teenage motherhood as effects for women are broad.

### Keywords

Teenage Pregnancy; Socioeconomic Consequences; Longitudinal Study; Teen Mothers, Teen Fathers

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Although teen pregnancy rates in the U.S. have decreased 51% from 1990 to 2010 [1], teenage parenthood remains a major public health concern, particularly among youth from disadvantaged backgrounds [2]. Even though the short-term socioeconomic consequences of teen motherhood are well examined, studies rarely have compared effects for men and women [3-5] nor have examined consequences extending into midlife [4,6,7] to understand long-term effects.

Previous work has established early life differences between teenage parents and non-teenage parents. Compared to those who postpone childbearing, teenage mothers are more likely to come from families with low income and low educational attainment [8,6], to live in a household with none or one biological parent [8], and to be raised by a single mom [6] who was a teenage mother herself [9]. With regards to adolescent fathers, they are more likely to use illicit drugs and be exposed to family violence in childhood [10] and to have prior grade failure, high aggression, and low academic skills [11].

While studies have consistently shown associations between teenage parenting and negative outcomes [9,12,13], risk factors for teenage pregnancy overlap with risk factors for reduced life opportunities, which makes it difficult to tease out consequences from selection effects. Cumulative disadvantage theory proposes that individuals' lives interact with structural realities that shape their trajectories over time [14]. In the context of socioeconomically disadvantaged teenagers, early parenting is thought to function as a significant major life event that perpetuates trajectories of disadvantage [15,16]. Thus compared to their peers, teenage parents from disadvantaged backgrounds have even fewer opportunities and greater stress and barrier that make it difficult to achieve socioeconomic success over the life course [17].

In line with this perspective, studies controlling for teen pregnancy risk factors found that early childbearing accounts partially for the disadvantaged outcomes that teenage mothers face later in life [5,12,18], generally finding the strength of association is reduced after adjusting for selection factors [4,5,7,19]. After taking confounders into account, studies have found persistent socioeconomic differences between teenage parents and non-teen parents by young adulthood. For example, teenage mothers achieve lower educational attainment [3,5,7], are less likely to be employed [3,19], and more likely to depend on welfare [4,6] compared to non-teenage mothers in models adjusting for earlier disadvantage. However, since most studies on consequences of teenage parenting have examined the socioeconomic consequences of teenage motherhood in the early to mid-twenties only, it is less known whether these consequences persist into the 30s and 40s.

Compared to teenage mothers, fewer studies have examined the socioeconomic consequences of parenting for teenage fathers. In a study of teenage fathers conducted in England, researchers found evidence that selection factors partially explained negative consequences [20]. Results show that by the age of 30, teenage fathers are more likely to use subsidized housing, receive government benefits, and report poorer mental health compared to older fathers or childless men [20]. Similarly, Nock found that unmarried teenage fathers completed less education and were less likely to work year round by their early to mid thirties compared to older unmarried fathers [21]. In contrast, there is also some limited

evidence of positive effects in the short-term for fathers. Fletcher and Wolfe report that teen fathers were more likely to have full time employment and be in the military by age 22 than non-teen fathers, though no effects were found for income or wages [22]. Further analysis is necessary to explore the role of selection factors, socioeconomic consequences extending into midlife and any potential positive effects of teenage fatherhood.

## Current study and hypotheses

The aim of this study is to identify long-term socioeconomic consequences of teenage parenthood for women and for men. While most studies have focused on short-term outcomes (e.g. into the early twenties) [4,6,7], this study examines socioeconomic outcomes at two points further into adulthood (ages 32 and 42) to identify the persistence of effects. Analyses of longterm consequences among teenage fathers are rare [20,22,23], and this work allows for an identification of effects for men and women separately. With longitudinal data spanning over 35 years, we are able to apply propensity score matching, an advanced analytic technique for estimating causal effects in observational data, to attempt to better isolate consequences from selection effects than many previous studies. Based on cumulative disadvantage theory, we hypothesize that teenage parenting perpetuates early disadvantages by adding responsibilities associated with childrearing among those already with limited financial and social support. Specifically, we hypothesize that compared to non-teen parents from similar backgrounds, teenage parents achieve lower education and income and have poorer employment outcomes over the long-term. We expect consequences for both men and women over the life course but assume more consequences for women because of their greater role in childrearing [24] and thus the greater disadvantage conveyed to them.

## Methods

### Sample

This analysis is based on the Woodlawn Study, a longitudinal study of African American cohort from a socially disadvantaged community in Chicago. All first graders in the nine public and three parochial schools in the Woodlawn community were invited to participate and only 13 families declined [25]. In this study, data were collected at four time points. In first grade (1966–1967, age 6), teachers and mothers (or mother surrogates) were interviewed (N=1,242). When these children were teenagers (1975–1976, age 16), their mothers or surrogates provided information (N=939), as well as the teens themselves (N=705). Interview data were collected when participants were 32 years of age (1992–1993, N=952), and 42 years of age (2002–2003, N=833). The current analysis involves 1050 individuals, which includes those who have at least one adult interview and complete data on teen parenting. Of the 1050 individuals included in this analysis, 731 completed both adult assessments, 218 only completed the young adulthood interview, and 101 only completed the midlife interview.

Further details of the Woodlawn Study population are described elsewhere [25]. Data collection and analyses were approved by the Committee on Human Research at the Johns Hopkins Bloomberg School of Public Health. The University of Maryland Institutional

Review Board also approved these analyses. Complete disclosure of the study has been made to participants, and data have been kept confidential.

## Measures

**Teenage parent**—During the young adult (age 32) and midlife interviews (age 42), participants were asked their age at the birth of their first child. Anyone reporting an age less than 20 years was coded as being a teen parent.

**Educational outcomes**—At age 32 and 42 participants reported their highest educational degree earned in the following categories: No high school diploma, GED, high school diploma, some college, and college degree.

**Economic outcomes**—Current unemployment at ages 32 and 42 was based on questions on employment status in the previous week. Individuals employed full time and part-time were coded as employed. Any unemployment since young adulthood was also assessed at the age 42 interview representing any period of unemployment in the past 10 years (between ages 32 and 42). Poverty was based on federal guidelines for poverty considering household composition and household income for the previous year. Current welfare at ages 32 and 42 was self-reported welfare receipt at the time of assessment. Age 32 household income before taxes was self-reported on a 23-point scale (1=under \$1,000 and 23=\$75,000 or more). Age 42 household income was measured on an 18-point scale (1=under \$1,000 and 18=\$100,000 or more).

**Covariates**—Poverty status was calculated from mothers' reports during the childhood interview on household size and income for the previous year. Welfare at childhood was self-reported by mothers during the childhood interview. Mothers provided childhood family type; this information was dichotomized to examine single female/mother headed household compared to other household types. Having a teenage mother was based on mothers' reports of her age at the first birth of her first child.

Parental supervision was reported by adolescents. Low parental supervision was defined as leaving school decisions mostly or entirely up to the children and high parental supervision as some to very definite rules. Parental curfew was reported by adolescents and was defined "weak" if having no weeknight curfew or curfew after 10:00 pm, and "strong" if having to be at home by 10pm or not being able to go out at all. Mother's years of education indicated the numbers of years of schooling completed by the childhood interview (range 0–18). Maternal school aspiration was based on mothers' reports of how far they would like their child to go in school (1=some high school, 2=finish high school, 3=some college, 4=finish college, 5=beyond college). Family conflict was based on a 6-point, 5-item scale ( $\alpha=0.82$ ), with adolescents indicating how often they and adults in the family have arguments, say mean things, let out hurt and angry feelings, slam doors in anger, and yell or shout to let off steam.

Both aggressive behavior and underachievement were based on first grade ratings of classroom behavior by teachers using the Teacher's Observation of Classroom Adaptation scale (0=adapting to 3=severely maladapting) [25]. IQ was measured in 1st grade (range 67–

129). School bonds were assessed during the adolescence assessment with 5 items indicating school importance, aspirations, expectations, teacher opinions, and satisfaction with teachers' opinion ( $\alpha=0.67$ ). For cigarette smoking, adolescents self-reported how often he or she smoked cigarette in his/her lifetime (1=never to 5=pack a day or more). Beer/wine use was assessed by adolescents self-reporting their lifetime frequency of use of beer and/or wine (1=never to 6=40 times or more). Marijuana use was measured with adolescents' self-reporting their lifetime frequency of marijuana or hashish use (1=never to 6=40 times or more). Adolescent delinquent behavior was measured by the overall sum of the frequency of engaging in 18 non-drug related crimes (range 0–69). Items were combined into an index score, in which higher values indicate greater number and more frequent commission of offenses [26].

### Attrition

When we compared those with at least one adult interview (84.8% of the original cohort) to those lost to follow-up in adulthood, either because of death (6.8%), loss of cognitive capabilities (0.6%) or not interviewed (7.8%), no differences were found on several variables, among them: gender, mother's years of education, welfare use in childhood, having a mother who was a teenage mother, adolescent drug use, problem behavior and self-reported delinquency, percentage unemployed and percentage below federal poverty [26]. When we compared those who completed the assessment in adolescence to those who did not, no differences were found in regards to several variables including gender, poverty status in childhood, and family type. Participants' mothers who were not interviewed in adolescence were more likely to have been teenage mothers and to have greater mobility before the child was in first grade [27].

### Data Analysis

The analysis comprised of four steps, as recommended by Stuart [28]. First, to better isolate the impact of teenage parenting on socioeconomic outcomes and adequately take into account early context, a propensity score was estimated based on observed background characteristics expected to confound the association between teen parenting and adult socioeconomic status [29]. Specifically, we created a propensity score model with teen parenting as the outcome and the 17 variables described in the *Covariates* section as predictors. Missingness on matching variables was handled using a missing data indicator and simple imputation [28]. The propensity score, which ranged from 0 to 1, represented the probability of a participant to become a teen parent. In the second step, teen parents were matched to non-teen parents based on these propensity scores. Non-teen parents included those who had children after age 20 as well as those who reporting having no children at the adult interview(s). Full matching was employed [30] in which a series of matched sets were created based on the propensity score in which each set contained at least one teen parent and one non-teen parent allowing us to retain all 1050 in the analyses. Propensity score matching was conducted in MatchIt [28].

In the third step, to account for differential attrition and other missing data, we used multiple imputation in Stata/SE 11.2 imputing 40 datasets [31]. We imputed data both for those missing an entire wave, as well as missingness on individual variables in order to reduce

bias due to attrition and maintain the strengths of the community cohort design. Finally, regression analyses on the matched sample were used to identify consequences of teenage parenting for men and women separately. We employed logistic regression for unemployment, poverty, and welfare; multinomial logistic regression for educational degree; and linear regression for income. These models incorporated the propensity score weights as well as all matching variables to ensure double robustness.

## Results

Women were statistically significantly more likely than men to have a child as a teenager with 37.3% of women and 19.3% of men becoming teen parents (see Table 1). Also shown in Table 1, participants were relatively disadvantaged in adulthood, particularly as young adults. Overall, women were more educated than men at both young adulthood and midlife, but had higher rates of welfare receipt in young adulthood.

As shown in Table 2, compared to non-teenage mothers, teenage mothers were more likely to be poor, live in a family dependent on welfare, live in a female-headed household during childhood, and have a mother who was a teen mother herself. Teenage mothers were also more likely to report adolescent smoking and substance use, as well as more delinquent behavior and less parental supervision. After propensity score matching, non-teen mothers were more similar to teen mothers on background variables. All standardized differences were 0.10 or less, which represents excellent balance and demonstrates the success of the full matching employed in equating teen mothers and non-teen mothers on observed characteristics [32].

As shown in Table 3, compared to non-teen fathers, teenage fathers were more likely to have lived in a female-headed household, had a mother who was a teenage mother, and had low parental supervision. Teenage fathers had higher first grade aggressive behavior and underachievement and more delinquent behavior. The standardized differences, which represents the covariance balance achieved with propensity score matching, showed acceptable balance; 13 standardized differences were less than 0.10, which represents excellent balance, and the remaining 4 were 0.125 or less, which is considered acceptable [32].

In the propensity score adjusted model, we found that teen motherhood had a significant effect on several age 32 outcomes (see Table 4). Compared to non-teen mothers, those who became mothers during adolescence were more likely to be unemployed (OR=1.83,  $p<0.001$ ), live in poverty (OR=1.85,  $p<0.001$ ), and be dependent on welfare (OR=2.07,  $p<0.001$ ). Teen mothers were significantly more likely to drop out of high school (OR=5.02,  $p<0.001$ ) and to have earned a GED (OR=3.01,  $p=0.021$ ) compared to finishing college. Further, teen mothers had a significantly lower family income compared with non-teenage mothers ( $b=-2.72$ ,  $p<0.001$ ).

At age 42, the effect of being a teen mother persisted for several outcomes (Table 4). Teen mothers were 4.11 times as likely as non-teen mothers to dropout out of high school compared to earning a college degree ( $p<0.001$ ). They were over three and one half times as

likely to have earned a GED ( $p=0.012$ ) and twice as likely to have completed high school ( $p=0.015$ ) compared to having a college degree. In addition, compared to non-teen moms, teenage mothers continued to have a lower family income at age 42 ( $b=-1.06$ ,  $p=0.037$ ).

As shown in Table 5, we only found one statistically significant effect for teenage fathers after employing the propensity score matching. Results from the matched sample showed that at age 32, teen fathers were 1.70 times as likely as non-teen fathers to be unemployed ( $p=0.033$ ).

## Discussion

This study identified the socioeconomic consequences in the 30s and 40s of teenage parenthood among a cohort of urban African American men and women from disadvantaged backgrounds. We hypothesized that teenage parenting perpetuates early disadvantage so that teen parents lag behind in adult educational and economic outcomes when compared to peers with similar background characteristics. A key finding is the difference in the breadth of socioeconomic consequences of teenage parenting we observed for women and the limited effects for men. Women experienced most of the negative socioeconomic consequences considered – both in young adulthood and in midlife. In contrast, few consequences were found for men. These results underscore the disproportionate burden that women historically have faced with the responsibilities and expectations of childrearing, especially when the child is born to unmarried parents. This was especially true in the 1970s when no strict child support laws were enacted in the US, leaving mothers and the government financially responsible for children born out of wedlock [33], and findings should be considered in this context as this longitudinal cohort was born around 1960.

One of the most recent studies that examined the socioeconomic consequences of teenage fatherhood found that teenage fathers were more likely to have received a GED and have fewer years of schooling when compared to non-teen fathers [22], while we found no educational differences between teen and non-teen fathers after propensity score matching. This study by Fletcher and Wolfe also found some evidence that teen fathers were more likely to have full employment in their 20s, while we found no employment effects. The discrepancies between our findings might relate to the fact that these authors examined socioeconomic consequences among a sample in their 20s while we considered educational attainment in the 30s and 40s. This might account for the smaller differences in educational attainment between teenage fathers and nonteen fathers as fathers may have had a chance to go back to school to make-up for initial differences. In addition, in our sample individuals became parents in the late 1970s, and in Fletcher and Wolfe's [22] participants' experienced teenage fatherhood in the 1990s. Changes in social norms, gender roles and the stronger enforcement of child support laws between the years of 1975 to 1996 [34] may explain greater employment in the 20s among Fletcher and Wolfe's teen fathers.

We observed a reduction in the strength of association between teenage parenting and adulthood socioeconomic outcomes from unadjusted models to propensity matched samples. The differences between the two models support the importance of carefully considering selection factors. By observing the drop in the strength of association between the

unadjusted and matched models, our results support the evidence that teenage childbearing may not be as devastating an event as it once was believed to be [12,13,35–38]. However, after careful consideration of background characteristics, most results remained statistically significant for women, aligning with other studies showing that the differences in background characteristics between teenage mothers and non-teen mothers do not fully account for the differences in socioeconomic outcomes between these two groups [5,7,19,39]. Thus having a child at an early age does seem to impact later socioeconomic outcomes among girls from impoverished neighborhoods.

Most young adult socioeconomic consequences of teenage motherhood identified for this population of low income women persisted into midlife, highlighting the uniqueness of this study, since prospective analyses into the 40s are scarce [17]. However, results should be interpreted within the social context experienced by the study's participants as those from more advantaged background may fair better [18,36,40]. In a study that analyzed the narratives of families from 16 teenage mothers for 16 years, SmithBattle [36] found that those from middle class backgrounds completed high school on time and had adequate academic records. However, the teenage mothers from impoverished backgrounds lagged behind in educational attainment and were still poor in their 30's [36]. Thus the extent that teenage mothers are able to advance in their education and achieve employment may depend on the availability of social resources and support in the transition to adulthood [36,40].

The use of a community cohort in a well-defined geographic area for our study may impact our ability to generalize the findings to a broader population of teenage parents. Furthermore, our findings might not be fully generalizable across time because social norms, stigma and parental support laws may differ between those who were teenage parents in the 1970s and those who had this experience in more recent years. An additional limitation worth mentioning is that despite matching on a wealth of background variables to take early context into account, propensity score matching does not eliminate unobserved differences. Therefore, causal inferences regarding the effects of teenage parenting on adverse outcomes need to be taken with caution.

The strengths of this study relate to the design: a prospective cohort of African Americans men and women over 35 years from a well-defined community, which allowed for comparisons among teenage parents and non-teen parents of both genders and careful consideration of selection effects. This research contributes to the body of existing research on the consequences of teenage birth by extending findings to midlife, showing that consequences are concentrated among women and likely persist for at least 20 years. Future research investigating the mechanisms explaining the long-term effects and factors that buffer negative outcomes is needed. By identifying contextual and protective factors, interventions can be designed to help teenage parents achieve better outcomes across the life course.

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## References

1. Kost K, Henshaw S. U.S. Teenage Pregnancies, Birth and Abortions, 2010: National and State Trends by Age, Race and Ethnicity. 2014
2. Upadhyia KK, Ellen JM. Social disadvantage as a risk for first pregnancy among adolescent females in the United States. *Journal of Adolescent Health*. 2011; 49(5):538–541. [PubMed: 22018570]
3. Lee C, Gramotnev H. Predictors and outcomes of early motherhood in the Australian Longitudinal Study on Women's Health. *Psychology, Health & Medicine*. 2006; 11(1):29–47.
4. Duncan GJ, Hoffman SD. Teenage welfare receipt and subsequent dependence among black adolescent mothers. *Family Planning Perspectives*. 1990; 22(1):16. [PubMed: 2182339]
5. Fergusson DM, Woodward LJ. Teenage pregnancy and female educational underachievement: A prospective study of a New Zealand birth cohort. *Journal of Marriage and the Family*. 2000; 62(1): 147–161.
6. Lee D. The early socioeconomic effects of teenage childbearing: A propensity score matching approach. *Demographic Research*. 2010; 23(25):697–736.
7. Levine DI, Painter G. The Schooling Costs of Teenage Out-of-Wedlock Childbearing: Analysis with a Within-School Propensity-Score-Matching Estimator. *Review of Economics and Statistics*. 2003; 85(4):884–900.
8. Booth A, Rustenbach E, McHale S. Early Family Transitions and Depressive Symptom Changes From Adolescence to Early Adulthood. *Journal of Marriage & Family*. 2008; 70(1):3–14.
9. Woodward L, Fergusson DM, Horwood LJ. Risk factors and life processes associated with teenage pregnancy: Results of a prospective study from birth to 20 years. *Journal of Marriage and Family*. 2001; 63(4):1170–1184.
10. Tan LH, Quinlivan JA. Domestic violence, single parenthood, and fathers in the setting of teenage pregnancy. *Journal of Adolescent Health*. 2006; 38(3):201–207. [PubMed: 16488816]
11. Gest SD, Mahoney JL, Cairns RB. A developmental approach to prevention research: configural antecedents of early parenthood. *American Journal of Community Psychology*. 1999; 27(4):543–565. [PubMed: 10573834]
12. Geronimus AT, Korenman S. The socioeconomic consequences of teen childbearing reconsidered. *Quarterly Journal of Economics*. 1992; 107(4):1187–1214.
13. Hoffman, SD.; Maynard, RA. *Kids Having Kids: Economic costs and social consequences of teen pregnancy*. Washington, D.C.: Urban Institute Press; 2008. Vol 2nd.
14. Dannefer D. Cumulative advantage/disadvantage and the life course: Cross-fertilizing age and social science theory. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*. 2003; 58B(6):S327–S337.
15. Elder GH. The life course as developmental theory. *Child Development*. 1998; 69(1):1. [PubMed: 9499552]
16. Umberson D, Pudrovska T, Reczek C. Parenthood, childlessness, and well-being: A life course perspective. *Journal of Marriage and Family*. 2010; 72(3):612–629. [PubMed: 21869847]
17. Taylor JL. Midlife impacts of adolescent parenthood. *Journal of Family Issues*. 2009; 30(4):484–510. [PubMed: 20216917]
18. Kane JB, Morgan SP, Harris KM, Guilkey DK. The educational consequences of teen childbearing. *Demography*. 2013; 50(6):2129–2150. [PubMed: 24078155]
19. Jaffee SR. Pathways to adversity in young adulthood among early childbearers. *Journal of Family Psychology*. 2002; 16(1):38–49. [PubMed: 11915409]
20. Sigle-Rushton W. Young fatherhood and subsequent disadvantage in the United Kingdom. *Journal of Marriage & Family*. 2005; 67(3):735–753.
21. Nock SL. The consequences of premarital fatherhood. *American Sociological Review*. 1998:250–263.

22. Fletcher JM, Wolfe BL. The effects of teenage fatherhood on young adult outcomes. *Economic Inquiry*. 2012; 50(1):182–201. [PubMed: 22329053]
23. Dariotis J, Pleck J, Astone N, Sonenstein F. Pathways of early fatherhood, marriage, and employment: A latent class growth analysis. *Demography*. 2011; 48(2):593–623. [PubMed: 21499850]
24. Bunting L, McAuley C. Research review: teenage pregnancy and parenthood: the role of fathers. *Child & Family Social Work*. 2004; 9(3):295–303.
25. Kellam, SG.; Branch, JD.; Agrawal, KC.; Ensminger, ME. *Mental Health and Going to School: The Woodlawn Program of Assessment, Early Intervention, and Evaluation*. Chicago, IL: University of Chicago Press; 1975.
26. Doherty EE, Green KM, Ensminger ME. Investigating the long-term influence of adolescent delinquency on drug use initiation. *Drug & Alcohol Dependence*. 2008; 93(1/2):72–84. [PubMed: 17980514]
27. Green KM, Zbrak KA, Fothergill KE, Robertson JA, Ensminger ME. Childhood and adolescent risk factors for comorbid depression and substance use disorders in adulthood. *Addictive Behaviors*. 2012; 37(11):1240–1247. [PubMed: 22762959]
28. Stuart EA. Matching methods for causal inference: A review and a look forward. *Statistical Science: A Review Journal Of The Institute Of Mathematical Statistics*. 2010; 25(1):1–21. [PubMed: 20871802]
29. Rosenbaum PR, Rubin DB. The central role of the propensity score in observational studies for causal effects. *Biometrika*. 1983; 70:41–55.
30. Stuart EA, Green KM. Using full matching to estimate causal effects in nonexperimental studies: Examining the relationship between adolescent marijuana use and adult outcomes. *Developmental Psychology*. 2008; 44(2):395–406. [PubMed: 18331131]
31. Graham JW, Olchowski AE, Gilreath TD. How many imputations are really needed? some practical clarifications of multiple imputation theory. *Prevention Science*. 2007; 8:206–213. [PubMed: 17549635]
32. Austin PC. Balance diagnostics for comparing the distribution of baseline covariates between treatment groups in propensity-score matched samples. *Statistics in Medicine*. 2009; 28:3083–3107. [PubMed: 19757444]
33. Beller, AH.; Graham, JW. *Small Change: The Economics of Child Support*. New Haven, CT: Yale University Press; 1993.
34. Garfinkel I, Chien-Chung H, McLanahan SS, Gaylin DS. The roles of child support enforcement and welfare in non-marital childbearing. *Journal of Population Economics*. 2003; 16(1):55.
35. Hoffman SD. Teenage Childbearing Is Not So Bad After All...Or Is It? A Review of the New Literature. *Family Planning Perspectives*. 1998; 30(5):236–243. [PubMed: 9782047]
36. Smithbattle L. Legacies of advantage and disadvantage: the case of teen mothers. *Public Health Nursing*. 2007; 24(5):409–420. [PubMed: 17714225]
37. Hotz VJ, McElroy SW, Sanders SG. Teenage childbearing and its life cycle consequences exploiting a natural experiment. *Journal of Human Resources*. 2005; 40(3):683–715.
38. Barr AB, Simons RL. College aspirations and expectations among new African-American mothers in late adolescence. *Gender & Education*. 2012; 24(7):745–763. [PubMed: 23226923]
39. Hofferth SL, Reid L, Mott FL. The Effects of Early Childbearing On Schooling over Time. *Family Planning Perspectives*. 2001; 33(6):259. [PubMed: 11804435]
40. SmithBattle L, Leonard V. Inequities compounded: explaining variations in the transition to adulthood for teen mothers' offspring. *Journal of Family Nursing*. 2012; 18(3):409–431. [PubMed: 22538448]

**Implications and contributions**

For women in particular, parenting at an early age can perpetuate socioeconomic disadvantages experienced in childhood. Programs to prevent teenage pregnancy and support young mothers and families are critical to helping young women achieve better educational, employment, and economic outcomes throughout their lives.

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**Table 1**

Characteristics of Woodlawn Participants in Young Adulthood (Age 32) and Midlife (Age 42)

	<b>Women n=547</b>	<b>Men n=503</b>	<b>Total n=1050</b>
Teenage Parents (%)	37.3	19.3	28.7
<b>Age 32 Variables</b>			
<b>Educational Attainment</b>			
Dropout (%)	19.1	23.8	21.4
GED (%)	5.3	9.3	7.2
High School Graduate (%)	18.8	21.8	19.7
Some College (%)	39.6	33.1	36.5
College Degree (%)	18.2	12.0	15.3
Poverty status (%)	42.0	41.6	41.8
Currently receiving welfare (%)	28.4	11.1	20.1
Currently unemployed (%)	39.8	36.7	38.3
Family income (mean)	11.4	11.2	11.3
<b>Age 42 Variables</b>			
<b>Educational Attainment</b>			
Dropout (%)	16.0	21.7	18.6
GED (%)	5.2	8.4	6.7
High School Graduate (%)	29.4	35.4	32.3
Some College (%)	25.4	19.9	22.8
College Degree (%)	24.0	14.6	19.5
Poverty status (%)	30.3	26.6	28.5
Currently receiving welfare (%)	7.2	6.6	6.9
Currently unemployed (%)	28.5	27.6	28.1
Unemployed past 10 years (%)	57.5	60.4	58.8
Family income (mean)	9.6	9.6	9.6

**Table 2**

Means and percentages on matching variables by teenage motherhood before and after propensity score matching (n=547)

	Teen Mothers Before Matching (n=204)	Non-Teen Mothers Before Matching (n=343)	Non-Teen Mothers After Matching (n=343)	Standardized Difference After Matching
<b>SES</b>				
Poverty status	57.84%	45.05%	57.92%	0.002
Welfare use at childhood	34.94%	28.27%	35.92%	0.021
Mother's years of education	10.35	10.91	10.58	0.100
<b>Family Characteristics</b>				
Female headed household	36.27%	33.82%	34.35%	0.040
Mother a teen mother	48.79%	44.12%	49.21%	0.009
Low parental supervision	41.20%	31.66%	38.64%	0.068
Weak parental curfew	59.96%	51.40%	61.12%	0.031
Family conflict	3.83	3.70	3.81	0.013
<b>School/Academic Factors</b>				
Aggressive behavior	0.44	0.45	0.39	0.058
Underachievement	0.69	0.54	0.62	0.070
IQ	97.92	99.68	97.95	0.003
School bonds	21.09	21.23	20.97	0.042
Maternal school aspiration for child	3.72	3.86	3.70	0.018
<b>Substance Use/Delinquency</b>				
Smoked cigarettes	2.76	2.53	2.81	0.053
Beer/wine use	3.11	2.91	3.16	0.044
Marijuana use	2.75	2.51	2.76	0.008
Delinquent behavior	11.58	10.07	11.79	0.036

**Table 3**

Means and percentages on matching variables by teenage fatherhood before and after propensity score matching (n=503)

	<b>Teen Father Before Matching (n=97)</b>	<b>Non-Teen Father Before Matching (n=406)</b>	<b>Non-Teen Father After Matching (n=406)</b>	<b>Standardized Difference After Matching</b>
<b>SES</b>				
Poverty status	57.73%	52.59%	63.92%	0.125
Welfare use at childhood	38.80%	32.09%	43.84%	0.104
Mother's years of education	10.29	10.60	10.59	0.110
<b>Family Characteristics</b>				
Female headed household	42.27%	35.47%	48.35%	0.123
Mother a teen mother	55.36%	46.59%	55.29%	0.002
Low parental supervision	46.02%	38.69%	44.79%	0.030
Weak parental curfew	73.20%	67.48%	71.18%	0.058
Family conflict	3.36	3.59	3.27	0.070
<b>School/Academic Factors</b>				
Aggressive behavior	0.95	0.63	0.91	0.034
Underachievement	0.89	0.73	0.86	0.033
IQ	97.30	98.19	98.01	0.083
School bonds	20.39	20.68	20.43	0.012
Maternal school aspiration for child	3.74	3.78	3.75	0.015
<b>Substance Use/Delinquency</b>				
Smoked cigarettes	2.85	2.62	2.86	0.010
Beer/wine use	3.47	3.41	3.60	0.079
Marijuana use	3.71	3.03	3.76	0.028
Delinquent behavior	15.37	13.72	13.79	0.050

**Table 4**  
 Estimates of the effects of teenage parenting on adult outcomes at ages 32 and 42 for women (n=547)

	Unadjusted			Matched Sample		
	OR	95% CI	p-value	OR	95% CI	p-value
<b>Age 32 Variables</b>						
<b>Educational Attainment</b>						
Dropout vs college degree	7.73	4.08–14.62	0.001	5.02	2.69–9.37	0.001
GED vs college degree	3.85	1.50–9.90	0.005	3.01	1.18–7.67	0.021
HS grad vs college degree	1.95	0.98–3.87	0.057	1.70	0.85–3.41	0.135
Some college vs college degree	1.84	1.02–3.32	0.043	1.61	0.89–2.93	0.118
Poverty status	2.50	1.72–3.65	0.001	1.85	1.27–2.70	0.001
Currently receiving welfare	2.43	1.63–3.62	0.001	2.07	1.40–3.06	0.001
Currently unemployed	2.34	1.61–3.41	0.001	1.83	1.26–2.66	0.001
<b>Age 42 Variables</b>						
<b>Educational Attainment</b>						
Dropout vs college degree	7.50	3.92–14.32	0.001	4.11	2.15–7.89	0.001
GED vs college degree	4.28	1.73–10.55	0.002	3.77	1.34–10.55	0.012
HS grad vs college degree	2.64	1.53–4.53	0.001	2.04	1.15–3.64	0.015
Some college vs college degree	1.30	0.71–2.36	0.392	1.19	0.60–2.34	0.621
Poverty status	1.88	1.24–2.84	0.003	1.53	0.97–2.42	0.065
Currently receiving welfare	1.92	1.28–2.89	0.002	1.86	0.69–5.02	0.221
Currently unemployed	1.64	1.11–2.41	0.012	1.49	0.97–2.28	0.070
Unemployed past 10 years	1.77	1.18–2.67	0.006	1.49	0.95–2.34	0.084
<b>Linear Regression</b>						
	Coef.	95% CI	p-value	Coef.	95% CI	p-value
Family income age 32	-2.94	-3.97 to -1.90	0.001	-2.19	-3.23 to -1.14	0.001
Family income age 42	-1.40	-2.28 to -0.53	0.002	-1.06	-2.06 to -0.07	0.037

Note: Statistically significant (p<0.05) associations are bolded.

**Table 5** Estimates of the effects of teenage parenting on adult outcomes at ages 32 and 42 among men (n=503)

	Unadjusted			Matched Sample		
	OR	95% CI	p-value	OR	95% CI	p-value
<b>Age 32 Variables</b>						
<b>Educational Attainment</b>						
Dropout vs college degree	2.20	0.92–5.27	0.076	2.00	0.82–4.84	0.124
GED vs college degree	2.08	0.73–5.92	0.172	1.41	0.50–4.01	0.517
HS grad vs college degree	1.32	0.51–3.38	0.563	1.12	0.43–2.89	0.814
Some college vs college degree	1.63	0.68–3.92	0.277	1.22	0.50–2.96	0.653
Poverty status	1.20	0.75–1.94	0.441	0.95	0.57–1.58	0.851
Currently receiving welfare	0.62	0.26–1.49	0.288	0.73	0.30–1.76	0.485
Currently unemployed	1.51	0.93–2.45	0.095	<b>1.70</b>	<b>1.04–2.78</b>	<b>0.033</b>
<b>Age 42 Variables</b>						
<b>Educational Attainment</b>						
Dropout vs college degree	2.04	0.89–4.68	0.090	2.10	0.89–4.91	0.087
GED vs college degree	1.57	0.54–4.54	0.404	1.40	0.48–4.10	0.538
HS grad vs college degree	1.18	0.52–2.67	0.688	1.01	0.44–2.33	0.983
Some college vs college degree	1.37	0.57–3.32	0.481	1.45	0.56–3.77	0.442
Poverty status	1.30	0.73–2.30	0.370	1.35	0.70–2.61	0.365
Currently receiving welfare	0.94	0.50–1.76	0.845	1.03	0.21–5.04	0.967
Currently unemployed	1.11	0.65–1.88	0.701	1.12	0.63–2.00	0.698
Unemployed past 10 years	0.67	0.36–1.25	0.208	0.69	0.36–1.32	0.264
<b>Linear Regression</b>						
	<i>Coef.</i>	95% CI	p-value	<i>Coef.</i>	95% CI	p-value
Family income age 32	-0.93	-2.35 to 0.49	0.197	-0.52	-2.00 to 0.96	0.491
Family income age 42	-0.61	-1.79 to 0.57	0.311	-0.40	-1.66 to 0.86	0.531

Note: Statistically significant (p<0.05) associations are bolded.