

Journal of Women, Politics, and Policy

Do jobs work? Risk and protective behaviors associated with employment among disadvantaged female teens in urban Atlanta

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July 6, 2012

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Acknowledgements

The authors thank Robert Cherry, Jeanne Brooks-Gunn, Jonathan Ellen, Charles Horn, Jonathan Joshua, Susan Kegeles, Carl Latkin, Willi McFarland, Clea McNeely, Katherine Newman, Dan Scharfstein, Daniel Liam Singer, Freya Sonenstein, Donna Strobino, Elizabeth Stuart, Mark Tisdahl, and Laurie Zabin for helpful conversations, as well as the participants at seminars at the Johns Hopkins Biostatistics Departments Causal Inference Working Group, Planned Parenthood of California, and the University of Massachusetts Statistics Department.

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Abstract

Adolescent employment predicts lower educational engagement and achievement and greater engagement with risk behaviors. Most research has studied middle class rather than disadvantaged adolescents. We identified risk and protective behaviors associated with employment using data from a 3 wave, 12-month study of 715 low-SES female African-American adolescents who were ages 15–21 at baseline. Adolescents who were employed at wave 2 (n=214) were matched with adolescents who were not employed at wave 2 (n=422) using nearest-neighbor matching on baseline factors within propensity score calipers on factors including marijuana use, sex while high, pregnancy risk, and socioeconomic status. We compared employed and non-employed teens on risk behaviors including marijuana use, sex while high or drunk, and a biomarker for semen exposure in the past 14 days. Employed teens were 44% as likely to say that their boyfriend is their primary spending money source and 43% as likely to be emotionally abused, but these benefits did not persist after employment ended. Six months after employment, employed respondents reported using marijuana 57% more often and had sex while drunk or high 2.7 times as frequently. Women who were employed at both waves 2 and 3 were 17% as likely to have their boyfriend as a primary source of spending money and 13% more likely to graduate high school, but they used marijuana twice as often, alcohol 1.6 times as often, had 1.6 times as many sexual partners, and had sex while high or drunk 2.3 times as often. Female teens who work may avoid potentially coercive romantic relationships, but they may buy drugs or alcohol with their earnings.

Introduction

Adolescents in the United States are more likely to work than adolescents in other industrialized countries (1). Most employed adolescents are middle class, and their wages do not contribute to family finances, so researchers consider much adolescent employment to be unnecessary (1). Research is divided about whether adolescent employment is positive character building (the character-building theory), a negative or neutral distraction from developmentally appropriate activities (the time trade-off theory), or simply adult (the adult roles theory). Research has more recently focused on special populations, including disadvantaged and female adolescents. We review the literature supporting each theory, and the theories about disadvantaged adolescents and female adolescents.

The character-building theory posits that adolescent employment is primarily positive by teaching skills and competencies necessary for adult roles (2). Most recently, former House Speaker Newt Gingrich advocated allowing disadvantaged children to work as school janitors to earn money, learn a work ethic, and establish employment records. One study using the National Longitudinal Study of Youth that found that adults who had been employed during adolescence 10 years before had better labor market outcomes than those who had not been employed during adolescence, although such adults had lower educational attainment (3). A Baltimore study found employed adolescents who held adult-type jobs at age 16 were less likely to drop out of school, and an orderly transition into work was protective against drop-out for students who had been held back in school (4). Youth who work in family businesses are less likely to engage in risk behaviors compared with youth who are not employed, which has been explained by parental monitoring in addition to character building (9)

Research has observed that employed adolescents are more likely to engage in risk behaviors such as substance use, delinquency, school truancy and drop-out, and are less involved in academic and extracurricular activities (2). Other studies found negative

outcomes only above a certain threshold: employed adolescents who worked more than 20 hours per week had lower school engagement and increases in substance use and delinquency, compared to adolescents who remained unemployed, but these studies found no benefits or risks to adolescents who worked less than 20 hours per week (6, 7). Employed youth may be less engaged in school even when they are not currently employed (8), but the Monahan study used propensity matching so its findings are unlikely to be explained by confounding and self-selection of disconnected youth into employment (7).

These negative outcomes for employed adolescents have been explained by two theories: time tradeoff and adult roles theories. The time-trade-off theory explains negative outcomes observed in past research by positing that employed adolescents have less time for education, sleep, and other developmentally necessary activities (2, 5).

The adult roles theory posits that employed adolescents become adults more quickly in both positive and negative respects because taking on one adult role accelerates the onset of other adult roles (13). This theory explains both positive and negative outcomes among employed adolescents. One study of 8th graders in the NELS data found that employment more than 4 hours per week predicted greater chances of sexual initiation in early adolescence compared with non-employed adolescents (14). Another study suggested that employed adolescents accelerate family formation, particularly if they have low-wage jobs (13).

Some researchers posited that employment may be positive for disadvantaged youth, even if it is neutral or negative for middle class youth (1, 3, 6). Katherine Newman's qualitative study of low-income youth suggested that part-time jobs provide mentorship, social networks, experiences, responsibilities, competencies, and earnings that improve both the employment and educational outcomes of disadvantaged youth (10). Newman described managers at fast food restaurants who encouraged their disadvantaged high school student employees to graduate from high school and help them select work schedules that do not conflict with school, although working youth were often tired. The managers facilitated high school completion because of public relations concerns: fast food restaurants have a widespread reputation of using their workers and jeopardizing their workers' futures, so even the low-skill, high-turnover fast food industry made an effort to counter this public perception. Working youth came to rely on their work as a source of income and avoided missing work to be dependable workers.

Quantitative research addressing the issues of employment for middle-class versus disadvantaged youth has found both positive and negative impacts. Using data from the Youth Development Study, Staff and Mortimer found that disadvantaged youth who adopt the steady work schedules typical of middle-class youth — steady work less than 20 hours per week, maintaining good grades — have higher educational attainment and better labor market outcomes (11). Conversely, advantaged youth who have the sporadic work schedules typical of disadvantaged youth (and youth with lower grades and educational aspirations) — many hours per week when employed with spells of non-employment — have lower levels of educational attainment and lower adult earnings (11). They hypothesized that consistent work teaches adult time-management skills that prevent time-trade-offs. A study using NELS data found that white middle class youth who worked were less likely to drop out of high school but that disadvantaged youth who worked steadily did not differ (12).

Employment may have particular impacts on female adolescents' family planning decisions. Demographic theory predicts that in populations where women have better employment

opportunities relative to men, women are less likely ever to marry; conversely, young women who come of age during high unemployment for women relative to men accelerate marriage and child-bearing (15). The current labor market offers greater opportunities for women, particularly among young African-Americans (16). In this population of young black women, we predict lower chances of marriage and greater chances of safer sex. Newman suggested that employment may reduce unplanned pregnancy by raising the opportunity cost of pregnancy, providing positive social influences such as peers and mentors who have similar orientations towards work and school, and encouraging high school graduation (10). Laurie Zabin posited that employment may increase young women's self-efficacy and desire to control their futures (18). Alternatively, following the theory that employment promotes "adult" behaviors, female youth who are employed may be less likely to have safe sex and more likely to pursue risk behaviors (13).

This paper tests the hypothesis that employed female youth are more likely to use contraception. Greater likelihood of contraception may be mediated by employed youth being less likely to depend on their boyfriends for spending money. Earlier research in this sample found that female adolescents whose boyfriend is their primary source of spending money were 50% more likely to have unprotected sex (17).

Methods and Descriptive Statistics

To provide context for the data, we will give facts about the population and setting. The city of Atlanta is 56% African-American (19). During the period of data collection, the youth unemployment rate in Georgia was approximately 15%, higher than the national average of 13%, (19) and the unemployment rate for the Atlanta metropolitan area during this period was 5.8% (20). Georgia also had a higher proportion of youth (ages 18–24) without a high school diploma or equivalency: 26% versus 21% for the country, and of teens ages 16–19 not working or attending school (11% versus 9% nationwide). (19) At this time in the state of Georgia, the birth rate was 9% and 12% per year, respectively, for 18–19 year old and 20–24 year old females, above the national averages of 7% and 10%. (19) Atlanta has a high unemployment rate for youth ages 20–24 (15.2%), high birth rates 9.7% of ages 18–19 year olds and 13% of 20–24 year olds), a high percentage of youth poverty among ages 18–24 (25%). (19) Georgia has rates of marijuana and alcohol use for youth (ages 18–25) below the national average: 13% for marijuana (17% is the national average), and 53% (61% was the national average.) (19)

We evaluated these hypotheses using data from a 12-month longitudinal study of 715 African-American adolescent women ages 15–21 who were sampled from 3 urban reproductive health clinics — a publicly funded STI clinic, a teen clinic based in a large public hospital, and a family planning clinic — in Atlanta, Georgia from March 2002 through August 2004 (21). Respondents answered surveys at baseline (n=715), 6 months (wave 2, n=607), and 12 months (wave 3, n=605).

The data were originally collected for a randomized control trial to evaluate Horizons, an HIV prevention program for African-American females. Unmarried African-American females were eligible to participate if they were sexually active in the past 60 days and neither pregnant nor attempting pregnancy: 847 participants were eligible, of whom 84% agreed to participate. Participants had mean age 17.6 years, and 25% had completed high school or high school equivalency; the rest were enrolled in school. Only 5 of the 715 reported living

with their children at baseline. Most sample members reported having a boyfriend — 83.6% at wave 1, 76.8% at wave 2, and 72.4% at wave 3 — and 24.0% of respondents said that their boyfriend was their primary source of spending money at baseline.

Emory University's Institutional Review Board approved the study protocol prior to implementation. A 40-minute interview was administered via audio computer-assisted subject interviewing (ACASI). Participants were paid \$50 upon completion.

Employment was measured with the questions, "Do you have a job for which you are paid?"; "How many hours per week do you usually work?"; and "How much do you make per hour?" Women's primary spending money source was assessed with "Where do you get most of your spending money?" which had the following answer choices: job, allowance from parents, TANF/public assistance, boyfriend, school/loans/work study, friends, other family, or other. The survey did not define the term "spending money." The survey defined a boyfriend as a committed sexual relationship partner and casual partners as non-committed sexual partners.

High school graduates were defined as those who have a high school diploma or equivalency (GED). Stop-outs were defined as respondents who have neither and were not currently enrolled in high school. Pregnancy risk was defined as 1 for respondents who do not take hormonal contraception and tested positive on a biomarker for semen exposure in the past 14 days, and 0 otherwise. The biomarker for semen exposure detected Y-chromosome DNA using a polymerase chain reaction (22–27). Y-chromosome is detectable for 14 days post-coitus even during menses (25, 26, 28).

The primary outcomes were pregnancy risk measured by a biomarker for semen exposure and self-reported contraception use; self-reported pregnancy; boyfriend physical and emotional abuse; boyfriend is the primary source of spending money; days sex while respondent or partner high/drunk; marijuana and alcohol use in the past 60 days (any and number of days used); tobacco smoking (any and number cigarettes per day); number of sexual partners in the past 60 days; usual number of alcoholic drinks at a time; high school graduation; and oral contraception use. The outcomes and their prevalences/means are listed in Table 1.

Among the respondents, 29%, 38%, and 43% had paying jobs at waves 1, 2, and 3, respectively. High school graduates were more likely to be employed than either high school students or high school stop-outs. High school graduates attending college (or other postsecondary education) worked fewer hours than graduates who didn't attend college, but they were not less likely to be employed (Figure 1.) Most employed students — both high school and post-secondary students — worked about 20 hours per week, whereas most employed stop-outs and non-students work about 40 hours per week (Figure 1.)

Employed students — both high school and post-secondary — seemed to work similar number of hours irrespective of season (Figure 2.) Some students may get jobs during the summer and quit their jobs for the school year, but students who stay employed seem not to reduce the number of hours that they work when school starts again in the fall. Students either did not ask for or were not granted accommodation for their school schedules. (This observation is limited by the fact that the individuals sampled in summer and non-summer are different individuals, rather than the same individuals sampled at different seasons.)

Employed respondents earned on average \$180 per week, or \$6.87 per hour, working for an

average of 26 hours per week. More than half of respondents (52.4%) worked more than 20 hours per week, but many worked 10–20 hours. Post-secondary school enrollment was more common among employed than non-employed high school graduates: 27% versus 11%. Post-secondary students did not report whether they were enrolled full-time or part-time.

Employment was more common among respondents who had been recruited from the Planned Parenthood site than the Grady site. Employed respondents gave higher ratings of neighborhood quality (absence of neighborhood decay) than non-employed. Employed respondents were less likely to come from households receiving any public assistance, TANF, and food stamps, and marginally less likely to come from households receiving WIC, but there was no significant difference in prevalence of Section 8 receipt, which was about 10% in both groups (8% among employed and 11% among non-employed.) Employed respondents were slightly older (18.3 years old vs. 17.6 years old), less likely to live with parent(s) or any family members, more likely to live alone and more likely to live with roommates, but there was no significant difference in the proportion who lived with a boyfriend.

Employed respondents reported higher self-esteem but lower mastery (self-efficacy). Employed respondents were less likely to have a boyfriend, but all respondents were sexually active in the past 60 days (a selection criterion for the study). Employed respondents were more likely to have boyfriends with cars, more likely to have employed boyfriends, reported slightly longer relationships, were less likely to report having had sex with others during a break-up, and gave higher ratings to their relationship futures. Employed versus non-employed respondents did not differ in boyfriend age, cohabitation with boyfriend, recent break-ups, concurrent casual partners, prevalence of emotional or physical abuse by the boyfriend, or time to sex with their current boyfriends.

Employed respondents were older on average on sexual debut, were more likely to have had oral sex, reported more pleasure from sex, more frequent sex, were more likely to have had abstinence-only sex education, and less likely to have ever had sex with two men at the same time. They did not differ in terms of contraception use.

Most substance use behaviors of employed and non-employed respondents did not differ, including for alcohol, smoking, or marijuana use both lifetime and in the past 60 days and in intensity of use.

Among women who began the study at baseline with their boyfriend as their primary source of spending money, women who had a job 6 months later at wave 2 were 52% more likely to discontinue having their boyfriend as their primary spending money source: that is, they had a relative risk of 1.52 with a 95% confidence interval of (1.34, 1.67). Among women who received money from their boyfriends at baseline and kept the same boyfriends at 6 months ($n=78$), 82.6% of women with a job at 6 months stopped receiving spending money from their boyfriends compared with 32.7% of women without a job (chi-squared $p < 0.001$), controlling for intervention status, wave 2 employment, school enrollment, future of relationship scale, recent break-ups, cohabitation, relationship continuity, months with boyfriend, and condom non-use in the past 60 days (relative risk 2.71 (2.26, 2.92), $p < 0.001$). Among women who kept the same boyfriends at wave 3 ($n=45$), 85.7% of women with a job at wave 3 discontinued receiving spending money from their boyfriends compared with 20.0% of women without a job (chi-squared $p=0.002$), controlling for intervention status, wave 2 employment, school enrollment, future of relationship scale, recent break-ups, cohabitation,

relationship continuity, months with boyfriend, and condom non-use in the past 60 days (relative risk 2.61 (2.39, 2.69), $p < 0.001$). Women who kept the same boyfriend, had a job, and stopped having their boyfriends as their primary spending money source earned at median \$245 and \$180 per week in waves 2 and 3, respectively, which do not differ by school enrollment (Mann-Whitney $p=0.5$, $p=0.3$).

Results

Differences in risk behaviors between employed and non-employed adolescents could be attributable to factors that preceded the employment. To avoid such confounded associations, we used a matched sampling method to identify non-employed respondents who were similar to employed respondents on potential confounders. This matched comparison group is the counterfactual for the “treatment” group and simulates what would happen if the employed group did not have jobs. The technical details for the matching method are described in the appendix.

Matched sampling eliminated baseline differences between respondents who were employed versus non-employed at wave 2 for the following variables: age, frequency of sex while drunk/high, marijuana use, eligibility for free STI care, whether they lived with their parents, high school graduation status, and clinic where they were recruited from (Figure 3, in appendix). The goal of matched sampling is to compare apples to apples by removing the “oranges,” the non-employed respondents who differ substantially from the employed respondents.

At wave 2, employed respondents were 43% as likely to report emotional abuse from a boyfriend, and 44% as likely to report that their boyfriend was their primary source of spending money (Table 1). Employed respondents reported smoking 66% as many cigarettes per day, were 80% as likely to have smoked marijuana in the past 60 days, and were 12% more likely to graduate high school.

At wave 3, we compared all those who were employed at 6 months, whether or not they were employed at 12 months, to those who were neither employed at 6 or 12 months. At wave 3, respondents who had been employed 6 months earlier were 73% as likely to be smokers and had sex while high or drunk 2.7 times as frequently.

We then compared women who were employed at both the 6 month and 12 month mark with those who were not employed at each time. Women who were employed at both waves were 17% as likely to have their boyfriend be their primary source of spending money and 13% more likely to graduate from high school. Women employed at both waves used marijuana 2.0 times as often, alcohol 1.63 times as often, had 1.56 times as many sexual partners, and had sex while high or drunk 2.31 times as often. Only 17% of the sample was over age 21 at the 12-month wave, so the alcohol was illegal for most respondents.

Discussion

As adolescents become adults, they take on greater levels of independence and risk-taking. Some adult roles are more positive, but others are negative. This study seems to support the theory that employment promotes adult roles. Employment may reduce one sexual risk — independence from abusive and potentially coercive romantic relationships — and increase other risks, such as having multiple sexual partners, using drugs and alcohol, and having sex

while high or drunk.

In this study, employed teens were less likely to cite their boyfriend as their primary spending money source and be emotionally abused, but these positive effects lasted only as long as the employment did. This finding gives a new dimension to earlier research that found that disadvantaged youth who work consistently have better educational outcomes, but no benefits accrued to youth who work only sporadically (11). Consistent employment may have more benefits for young women than sporadic employment, such as by helping them develop adult skills, mature social networks, and self-efficacy to leave manipulative boyfriends.

Teens who got jobs were likely to discontinue having their boyfriend be their primary source of spending money. Earlier research found that teens who depend on their boyfriends for spending money were more likely to have unsafe sex (17, 33–35). Teens who got jobs did not immediately increase condom use, which could be explained by reluctance to communicate distrust by beginning to use condoms after condom non-use (36.) Jobs programs may need to start early with both genders to increase condom use.

The increased sexual risk-taking is remarkable because all respondents were participants in HIV prevention interventions that discouraged sex under the influence: half in Horizons and half in a minimalist program. The impact of suddenly having enough money to buy alcohol and drugs may overcome the impact of HIV prevention programs.

This finding that employed teens had increased drug and alcohol use may suggest that young women may acquire drugs or alcohol on their own more than from boyfriends, even a boyfriends who are a spending money source.

This study found lower pregnancy incidence among employed teens, which contrasts with a nationally representative study that found employed teens were more likely to start forming families early (13).

Policy implications

In the Republican presidential primaries for the 2012 election, one candidate presented youth employment as a “character building” panacea for disadvantaged youth. As with any complex situation, there are no panaceas. Improvements in one area — independence from abusive or potentially coercive romantic relationships — do not yield improvements in all areas. This research suggests that young women may not make good spending decisions with the money that they earn from employment. Adult roles and skills promoted by employment do not automatically lead to good judgment.

A comparison of three theories about the benefits and risks of youth employment may be superfluous in the current employment climate. The United States has had high unemployment rates since 2008, particularly among adolescents and young adults, and especially among minorities. One report estimated that a third of youth’s time was spent economically inactive: unemployed and not in school, and 9% of youth (ages 16–24) were chronically economically inactive with almost no time spent in school or employment after age 16 (16). This unemployment poses risks to the health and economic well-being of the current generation of young adults, which Michael Marmot has called a public health emergency (37). Economically inactive young adults are at risk for clinical depression and other mental illness (38). Bouts of unemployment reduce future earnings and increase the likelihood of future unemployment (39). The high risks of non-employment may outweigh any

costs such as greater risk behaviors.

Strengths and limitations

These results cannot be attributable to the confounders used for the matched sampling, such as baseline marijuana use and frequency of sex while drunk/high. The groups were on average similar on these factors, so the differences are not due to systematic differences between employed and non-employed women. Employed respondents also seemed to be slightly higher SES than non-employed, but the matched sampling minimizes confounding on these factors by matching on clinic site, neighborhood decay, and eligibility for free STI care. This research used a biomarker for semen exposure to measure pregnancy risk. In most analyses, women who were employed were not more likely to be at risk for pregnancy, so it is unclear whether the greater number of partners and sexual risk-taking involved condoms.

This data was collected for an HIV prevention intervention. This study asks about a wide range of sexual and health behaviors not included in most educational studies, but the survey questions were less detailed than those in most employment/education studies. For example, the survey did not distinguish between GED and high school diplomas; distinguish between students enrolled in postsecondary programs fulltime versus part-time; or ask stop-outs for their reasons for stopping out, and whether they intend their absence from school to be permanent. The survey also did not ask about job quality, mentorship on the job, whether the respondent believed that their job had a future, or other factors that may influence how respondents respond to their jobs.

The individuals sampled in summer and non-summer may not be the same individuals, rather than the same individuals sampled at different seasons.

The respondents are ages 15–21, and at baseline 31% were high school graduates. The analysis attempted to consider employment separately for high school students and graduates, but the heterogeneity may have still biased the effects towards the null. Loss-to-follow-up between baseline and subsequent surveys may have changed the composition of the sample: of the 715 baseline respondents, 607 participated at wave 2 and 605 at wave 3. Respondents who were more busy, more deviant, or who had become pregnant in between waves may have been more likely to leave the sample. This loss-to-follow-up may reduce statistical power. The matching method balanced the baseline characteristics of employed and non-employed respondents, so the validity of the inference is unlikely to be impacted by the loss-to-follow-up.

This data were collected in 2002–04, which overlaps with an economic recession. The findings do not necessarily apply to subsequent recessions, particularly the recession that began in 2008.

Conclusions

Employment can help adolescent women to avoid becoming dependent on their boyfriends – and thus have lower risks of abuse and reproductive coercion – but only as long as the employment persists. When teens stop working, the positive effects from employment seem not to last. Employment isn't uniformly positive: employed teens had sex with more partners, used marijuana and alcohol more frequently, and had sex under the influence more frequently. Parents, guardians, teachers, and others can help young women find meaningful employment that facilitates both healthy romantic relationships and avoidance of risk

behaviors.

Figure 1: Hours worked by school enrollment status among respondents with jobs (all variables measured at baseline). The y-axis scale is chosen so that the total area under the curve is 1, so it is not labeled due to the arbitrary scale.

Hours worked by school enrollment status, wave 1 Smoothed kernel density plot

- High school students (n=82)
- Stop-outs (n=34)
- High school diploma or GED (n=38)
- Postsecondary program students (n=56)

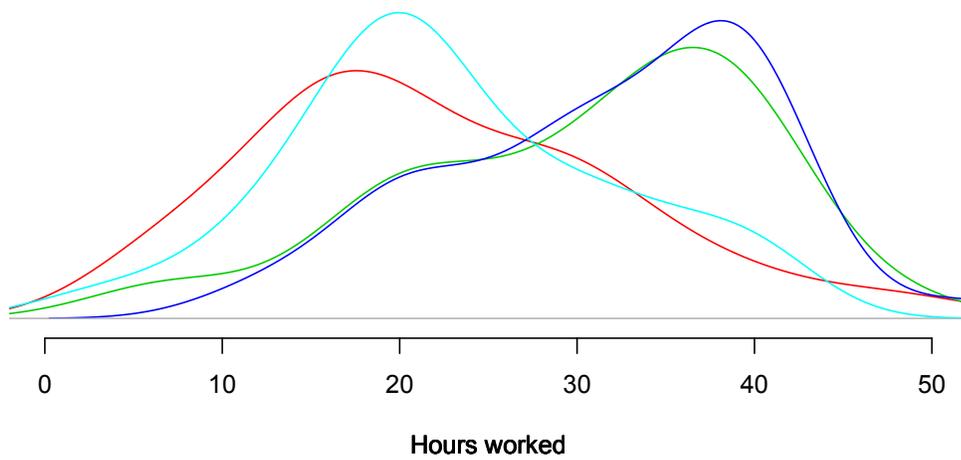


Figure 2: Seasonal variation in hours worked. Hours worked by current high school and post-secondary students in summer vs. not summer. The y-axis scale is chosen so that the total area under the curve is 1, so it is not labeled due to the arbitrary scale.

Hours worked by students by season, wave 1 Smoothed kernel density plot

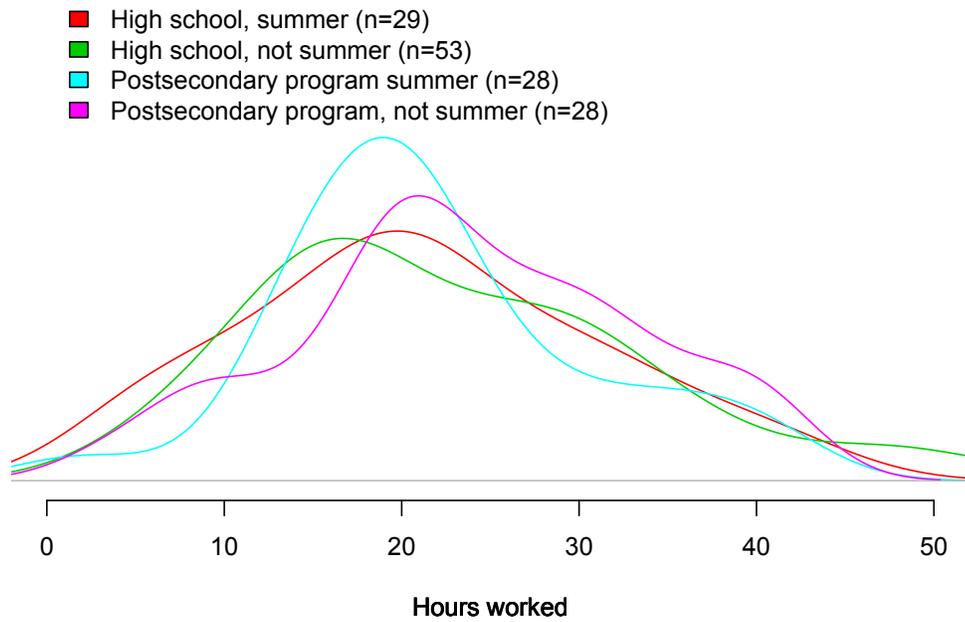


Table 1: Relative risk of each factor between employed and non-employed women within the matched sample, together with 95% confidence intervals (95% CI). In the matched sample of 350 respondents (matched sample 1), 214 are employed at 6 months. In the matched sample of 248 respondents (matched sample 2), 138 are employed at both 6 and 12 months.

	Matched sample 1 (n=350)			Matched sample 2 (n=248)		
	Outcomes at 6 mos Rel. risk (95% CI) P			Outcomes at 12 mos Rel. risk (95% CI) P		
Boyfriend emotional abuse	0.43 (0.23, 0.79)	**		0.78 (0.37, 1.61)		0.93 (0.43, 2.01)
Bf gives spending money	0.44 (0.28, 0.69)	***		0.91 (0.58, 1.44)		0.17 (0.08, 0.34)
Cigarettes per day	0.66 (0.40, 1.07)	+		0.85 (0.60, 1.19)		1.20 (0.77, 1.89)
Boyfriend physical abuse	0.66 (0.30, 1.46)			0.53 (0.22, 1.30)		0.54 (0.08, 3.72)
Days sex while partner high	0.74 (0.29, 1.89)			1.49 (0.82, 2.69)		1.83 (0.85, 3.96)
Pregnant	0.75 (0.39, 1.46)			1.52 (0.76, 3.02)		0.82 (0.38, 1.77)
Any marijuana past 60 days	0.80 (0.63, 1.03)	+		0.85 (0.62, 1.17)		1.08 (0.79, 1.49)
Marijuana uses past 60 days	0.87 (0.58, 1.31)			1.42 (0.91, 2.22)		2.00 (1.20, 3.35)
Alcohol uses past 60 days	0.94 (0.61, 1.45)			1.13 (0.80, 1.58)		1.63 (1.09, 2.43)
Partners past 60 days	0.95 (0.77, 1.17)			1.17 (0.96, 1.42)		1.56 (1.22, 2.00)
Smoke	0.96 (0.67, 1.36)			0.73 (0.54, 0.99)	*	1.18 (0.70, 1.98)
Num. alcoholic drinks	1.04 (0.80, 1.36)			1.05 (0.79, 1.38)		1.12 (0.85, 1.48)
High school grad	1.12 (1.00, 1.25)	+		1.10 (0.96, 1.26)		1.13 (0.98, 1.29)
Oral contraception	1.26 (0.66, 2.37)			1.26 (0.65, 2.41)		0.88 (0.46, 1.68)
Pregnancy risk	1.27 (0.76, 2.13)			0.69 (0.40, 1.19)		0.81 (0.37, 1.75)
Days sex while high	1.42 (0.84, 2.38)			2.66 (1.35, 5.25)	**	2.31 (1.02, 5.21)

+ $p \leq 0.1$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, **** $p \leq 0.0001$

Regressions used a Poisson working model and controlled for the following variables measured at baseline: intervention assignment status, years of education, age, clinic site, marijuana in the past 60 days, pregnancy risk, high school graduation status, parents are primary spending money source, boyfriend is primary spending money source, live with parent(s), eligible for free STI care, family emotional support, peers support risk behavior, neighborhood decay.

Appendix: Matched sampling methods

The goal of matched sampling is to eliminate significant differences between employed and non-employed adolescents so that all statistical comparisons are insignificant, judged either by p-score or by standardized difference. P-scores less than 0.05 are judged significant and standardized differences greater than 0.1 are judged significant.

Matched sampling attempts to create a group of non-employed adolescents with baseline characteristics similar to employed adolescents, as would be true in an experiment that randomized adolescents to employment versus non-employment (29, 40–42). Ideally, exact duplicates of every employed adolescent could be found among the non-employed (43). Instead, matching creates a comparison group with a similar distribution of baseline factors, which is thus the primary criterion for assessing match quality (29, 42, 44). There are not yet standardized guidelines for choosing a matching procedure (42, 45) and matching methods yield similar results in simulation (42), but nearest-neighbor caliper matching is generally recommended (42). A matching method's appropriateness is gauged post-facto by the balance achieved, so any method and choice of matching factors that result in balanced groups is considered appropriate (29, 42).

This study used 1:1 nearest-neighbor matching within propensity score calipers with replacement, using the R package MatchIt (46, 47). Propensity scores are the estimated probability of having a job at wave 2, estimated from logistic regression on clinic site, marijuana use, pregnancy risk, primary source of spending money (parents or boyfriend or other), high school graduation status, residence with at least one parent, eligibility for free STI care, family emotional support, peer risk behavior norms, and neighborhood decay. Nearest-neighbor matching within propensity score calipers locates the non-employed "closest" to each employed woman, preferentially within calipers of 0.25 standard deviations in propensity score. The Mahalanobis metric measured the correlation-adjusted distance between respondents based on respondents' values of continuous variables. In this case, the best match was obtained using only one continuous variable: age. The variables used in the distance measure are derived through trial and error by including and excluding variables until balance is achieved.

Match adequacy is determined by "balance," the similarity of the covariate distributions of employed and non-employed groups. This study assessed balance using the values of standardized differences. Standardized differences are independent of sample size: they are defined as the difference in means of the two groups divided by the average standard deviation of the two groups (not standard error). Standardized differences less than 0.1 are considered insignificant.

We compared respondents on pre-employment variables rather than variables contemporaneous with employment to ensure that the employment did not cause the factor. Employed respondents were older: on average 18.2 years old versus 17.4 years, but matching reduced this difference to 0. Employed respondents had sex less often when drunk or high, an average of 1.5 days in the past 60 days, versus 2.2 days for non-employed. Fewer employed respondents also used marijuana: 38% versus 48% among non-employed. Employed respondents were more likely to have been sampled at Planned Parenthood and less likely to have been sampled at the Grady clinic. Employed respondents were less likely to be eligible for free STI care: 56% were eligible versus 68% of the non-employed respondents. Employed respondents were less likely to live with their parents — 55% versus

69% of the non-employed — and were less likely to have their parents as a primary source of spending money — 23% versus 42% of the non-employed. Employed respondents were more likely to have graduated high school: 46% versus 19% of the non-employed. The summary measure, estimated propensity scores for the employed were much larger than for the unemployed. After matching, none of these differences were significant.

Once balance was achieved, we performed regression as usual within the matched sampling to predict each of the factors of interest. Regressions used a Poisson working model and controlled for the following variables measured at baseline: intervention assignment status, years of education, age, clinic site, marijuana in the past 60 days, pregnancy risk, high school graduation status, parents are primary spending money source, boyfriend is primary spending money source, live with parent(s), eligible for free STI care, family emotional support, peers support risk behavior, neighborhood decay.

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