I DID WHAT LAST NIGHT?!!!
ADOLESCENT RISKY SEXUAL BEHAVIORS AND SUBSTANCE USE

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ABSTRACT

This purpose of this paper is to examine the causal impact of substance use on risky sexual behaviors by teenagers. Risky sexual behaviors, which include unprotected sex and multiple partners, are highly correlated with alcohol and illicit drug use, although the nature of the causal relationship is in question. This study uses two-stage least squares and reduced form models to examine the relationship between substance use and sexual behaviors by gender. Data come from the Youth Risk Behavior Surveys. Result show that alcohol use does not increase the likelihood of having sex or of having multiple partners, although alcohol use does lower the probability of using birth control and condoms among sexually active teens.

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1. <u>INTRODUCTION</u>

Recent years have seen a widespread public concern with the practice of safe sex. While this concern has been brought on mainly by the AIDS epidemic, the benefits of safe sex include protection against other sexually transmitted diseases (STDs) and unwanted pregnancies. In particular, sexual risk taking behavior, or unsafe sex, is a prevalent problem among teenagers. Broadly defined, sexual risk taking behaviors include unprotected sex, unfamiliarity with the partner, and multiple partners. While the last two outcomes are not necessarily risky behaviors, they are included under the rubric of risky sexual behavior because when the partner is not well known and when there are multiple partners, it is more likely that the infection status of the partner is unknown. Knowledge of the infection status can lead to practices such as condom use or abstinence, which compensate for the risk of contracting a STD (Laumann et al. 1994).

Studying the sexual behavior of teenagers is important because when compared to older adults, teenagers and young adults are particularly at risk for contracting a STD or having an unwanted pregnancy. For example, young adult women between the ages of 20 and 24 have the highest rate of unintended pregnancy, and teenage women between the ages of 15 and 19 have the second highest rate (Henshaw 1998). Incidence rates of chlamydia and gonorrhea--the two most common STDs-- are also high among teenagers and young adults. In 2000, the chlamydia incidence rate was 258 per 100,000 population for persons of all ages, 1,373 for teenagers, and 1,404 for young adults (CDC 2000). The corresponding gonorrhea incidence rates were 132, 516, and 623, respectively. Approximately one-quarter of all new human immunodeficiency virus (HIV) infections occur among teenagers and young adults (CDC 1997). Thus, the focus on teenagers is significant since the health

and development of teens are particularly affected by their sexual behavior.

An important question for policy purposes is to identify what causes teens to engage in unsafe sex. Two of the most commonly cited correlates of risky sexual behavior are alcohol and drug use. Numerous studies have shown a positive association between substance use and risky sexual practices (see Leigh and Stall, 1993 and Donovan and McEwan, 1995 for reviews of this literature). Recent studies, such as Graves and Leigh (1995), show that young adults who drink heavily or use marijuana are more likely to be sexually active and to have multiple partners, and those who are heavy drinkers are also less likely to use condoms. Evidence also comes from Strunin and Hingson (1992) and Fergusson and Lynskey (1996) who show that alcohol use by teenagers is associated with unprotected intercourse. Rosenbaum and Kandel (1990) show that prior use of alcohol or illegal drugs increases the risk of initiating intercourse prior to age sixteen.

It is important to note that none of these studies establish a causal relationship from drugs and alcohol use to risky sex, rather, these studies highlight an association. There are several competing explanations of the observed association, each with different implications for the direction of causality between substance use and sexual behaviors. Laumann et al. (1994) propose that alcohol and drugs may enhance sexual desire, and that substance use may also result in impaired judgment and increase the likelihood that condoms and other birth control methods are not be used. These theories imply that alcohol and drug use cause risky sexual practices. By contrast, according to Jessor and Jessor's (1977) "problem behavior theory" the two outcomes are manifestations of a common personality trait. This suggests that risky sex and substance use are associated because both are related to an unmeasured third variable such as a thrill-seeking personality. Leigh and Stall (1993) find support for this

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theory by citing many studies which show that cigarette smoking is also highly correlated with risky sex. It is hard to argue that smoking is an indicator of temporary lapses in judgment, which is one argument for why alcohol use may cause risky sex. Finally, Cooper et al. (1990) point out that a teenager who chooses to have many sexual partners may use drugs and alcohol to cope with society's negative view of such behavior. In effect, the teenager consumes these substances to lower the psychic costs of risky sex. In this scenario, risky sex causes, but is not caused by, substance use. Reverse causality also occurs when a youth is introduced to or obtains drugs and alcohol from a sex partner. This is more likely the earlier the youth begins to have sex and the more sexual partners that he or she has.

2. RELATED RESEARCH

The studies discussed above which show a relationship between substance use and risky sexual behaviors fail to establish a direction of causality. Insights from the literature of economics may provide information on the direction of causality, if any. One important paper from the economics literature is by Kaestner and Joyce (2001) who examine the effects of substance use on the probability of unintended pregnancy and contraception use. Using the 1984 and 1988 waves of the National Longitudinal Survey of Youth (NLSY), the authors try to establish causality from substance use to unintended pregnancy using instrumental variable and fixed effect techniques. They estimate the equations separately by race and find that when the unmeasured individual traits are controlled for in the fixed effects models, alcohol use increases the likelihood of unintended pregnancy and contraception use for whites, while drug use has no statistically significant effects. By contrast, substance use is statistically unrelated to unintended

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pregnancy for blacks and Hispanics. Estimates using instrumental variables were found to be unreliable because of lack of powerful instruments in predicting drug and alcohol use.

Chesson et al. (2000) use state-level beer and liquor taxes to help establish the direction of causality between alcohol consumption and sexually transmitted diseases. The authors find that an increase in the beer tax or the liquor tax will reduce the rates of gonorrhea and syphilis. Since the only way the alcohol taxes should affect STD rates is through reduced consumption, the authors conclude that this is evidence of a causal relationship from alcohol use to risky sexual behaviors which in turn lead to the contraction of a STD.

Rees et al. (2001) examine the effects of marijuana and alcohol use on the sexual practices of high school age teenagers. Using bivariate probit and two-stage least square estimation to control for unobserved heterogeneity, they find little evidence to suggest that substance use has a causal impact on probability of being sexually active and the probability of having sex without contraception. Specifically, they show that for females, neither drunkenness nor marijuana use impacts the probability of having sex and using condoms. For males, drunkenness has no impact on the probability of having sex, but it may lead to a lower probability of using condoms. Marijuana use has no impact on sexual behaviors by males.

Liang et al. (2002) use a survey of college students to examine the causal relationship between drinking and risky sex. These authors use four different indicators of sexual behavior in the past thirty days: having sex, sex with multiple partners, sex without a condom, and sex without any birth control. Alcohol control policies are used as instruments to help establish causality. Using bivariate probits and splitting the sample by gender, the authors find that drinking increases the probabilities of having sex, sex with multiple partners, sex without condoms, but has no impact on sex without any birth control. These results often do not hold

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when two-stage least squares is used to estimate the models making it difficult to draw any firm conclusions. The most trustworthy results appear for females. In particular, females who drink are more likely to have sex without a condom.

The studies by Rees et al. and Liang et al. are similar in design to this paper. Both use instrumental variables to explore the nature of the relationship between substance use and risky youth sexual behaviors although neither estimates the reduced form equation to confirm their results. Additionally, these two studies are flawed in their examination of impact of substance use on the use of condoms or birth control. They both treat the decision to use birth control use as independent from the decision to have sex. That is, respondents who have sex and do not use birth control are compared against both abstainers and sexually active youth who consistently use birth control. The resulting coefficient on substance use reflects both the decision to engage in sex and the decision to use protection, making the distinct impact of consumption on birth control use unknown. In this paper, we correct for this problem by examining condom and birth control use only for the sexually active sample of teenagers.

3. <u>METHODOLOGY</u>

The above discussion on the possible ways drugs and alcohol might be related to sexual behaviors can be summarized in three ways: 1) drug and alcohol use causes unsafe sex; 2) unsafe sex causes drug and alcohol use; 3) drug and alcohol use and unsafe sex are both caused by an unobserved third factor, such as a thrill-seeking personality. Taking into account these three cases gives the following equations:

$$S_{it} = \alpha_0 + \alpha_1 A_{it} + \alpha_2 D_{it} + \alpha_3 X_{it} + \alpha_4 u_i + \varepsilon_{it,} \tag{1}$$

$$A_{it} = \beta_0 + \beta_1 S_{it} + \beta_2 Pd_{it} + \beta_3 Pa_{jt} + \beta_4 Y_{it} + \beta_5 u_i + \omega_{it,} \tag{2}$$

$$D_{it} = \delta_0 + \delta_1 S_{it} + \delta_2 Pa_{it} + \delta_3 Pd_{jt} + \delta_4 Y_{it} + \delta_5 u_i + \eta_{it,} \qquad (3)$$

where S represents a measure of risky sexual behavior, A is a measure of alcohol use, D is a measure of drug use, Pa is the price of alcohol, Pd is the price of drugs, and X and Y represent observed individual characteristics which may affect sexual behavior (X) and drug and alcohol use (Y). The vectors X and Y may have many of the same elements in common. Unobserved, individual traits which do not vary over time are represented by u_i. The subscripts i, j, and t, refer to individuals, geographic area, and time, respectively. The prices of drugs and alcohol appear in equations 2 and 3 because of evidence that drugs and alcohol are complement goods (Saffer and Chaloupka, 1999).

Many of the studies discussed in the introduction have used ordinary least squares (OLS) to estimate equation 1. However, estimating equation 1 by OLS can lead to biased and inconsistent coefficients if there is reverse causality present ($\beta_1 \neq 0$ and $\delta_1 \neq 0$) or the unmeasured individual-level factor is correlated with sexual behaviors and substance use ($\alpha_4 \neq 0$, $\beta_5 \neq 0$, and $\delta_5 \neq 0$). In either case, drug and alcohol use will be correlated with the error term in equation 1 ($\alpha_4 u_i + \varepsilon_t$), thus estimates by OLS violate the requirement that the right-hand side variables be orthogonal to the error term.

In order to avoid the problems presented by OLS estimation, two stage least squares (TSLS) is used to estimate equation 1. The TSLS technique requires at least one exogenous variable (instrument) that will predict drug and alcohol use but which is not correlated with the error term in the sexual behavior equation. When estimating equation 1 by TSLS, drug or alcohol consumption is first predicted by using the instruments and then the predicted value is used as a regressor in equation 1. The predicted value of consumption is purged of its correlation with the error term in the sexual behavior

equation, leading to unbiased estimates of drug or alcohol use on risky sex.

A reduced form equation can be derived by substituting equations 2 or 3 into equation 1:

$$S_{it} = \gamma_0 + \gamma_1 Pa_{jt} + \gamma_2 Pd_{jt} + \gamma_3 Y_{it} + \gamma_4 X_{it} + \gamma_5 u_i + \upsilon_{it}. \tag{4}$$

Estimating the reduced form equation shows the direct effect of changes in the prices of drugs and alcohol in reducing risky sexual behaviors. A statistically significant price coefficient implies that risky sex is a result of consumption since there is no intuitive reason to believe that the prices of drugs and alcohol are determinants of risky sex holding consumption constant. Thus, the reduced form estimation will serve as a check on the validity of the results from the instrumental variable estimation.

4. DATA

Data on sexual risk taking behaviors and related outcomes come from the 1991, 1993, 1995, 1997 and 1999 National School-Based Youth Risk Behavior Surveys. These surveys contain nationally representative samples of high school students in grades 9-12. Four measures of sexual behaviors are considered, all of which refer to sexual practices in the past three months. This time period is chosen because it corresponds most closely to the available illegal drug and alcohol use questions. The first indicator refers to all respondents and is a dichotomous indicator for whether the respondent has had sex in the past three months. The other dependent variables are all limited to the sample of respondents reporting having sex in the past three months, and include the number of partners, a dichotomous indicator of whether a condom was used at last encounter, and a dichotomous indicator of whether any form of birth control was used to prevent pregnancy at last encounter. Respondents are assigned a value of "1" for the birth control

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question if condoms or birth control pills are used. In 1999, use of Depo-Provera (an injected hormonal birth control) is also include as a method of birth control.

Table 1 shows the means and standard deviations for the four dependent variables and all of the independent variables. Thirty-four percent of males and 37 percent of females report having sex in the past 3 months. Conditional on having sex, the average number of partners is 1.79 for males and 1.29 for females. Sixty-nine percent of males and 64 percent of females who have had a sexual encounter in the past three months report using some form of birth control, while 61 percent of sexually active males and 47 percent of sexually active females report condom use.

Three measures of alcohol and drug consumption are used. The first is the number of days in the past thirty days on which the respondent had five or more drinks of alcohol in a row within a couple of hours (termed binge drinking); the second is the number of days in the past thirty days on which the respondent had at least one drink of alcohol; and the third is the number of times in the past thirty days the respondent used marijuana.

The socio-economic and demographic characteristics of the respondents are very limited in that only age, gender, and race are consistently reported in all surveys. These variables are included in each model along with a dichotomous indicator for whether the respondent has been educated about AIDS at school. Next, two variables are included that indicate whether or not the respondent's age is greater than that of the majority of the class and whether or not the respondent's age is less than that of the majority of the class. The former will help identify students who have repeated grades while the later will identify students who have skipped grades.

Some additional measures which may help control for the respondent's personality or

propensity towards risk are included in all models. The first is how often the respondent usually

wears a seat belt when he or she is a passenger in a car (1=never, 5=always). Second, we include

the number of sports teams on which the respondent plays, which may reflect the respondent's

attachment to and involvement in school and the community. The number of days in the past

thirty days on which the respondent smoked is also included to represent unmeasured personality

traits since there is no reason to believe that smoking is directly correlated with risky sexual

practices. Next, when condom use and birth control use are considered, we include an indicator

for whether or not the sexual encounter in question is the respondent's first time. This indicator

is takes on a value of "1" if the respondent's current age is equal to the reported age at first

encounter, the respondent has had only one lifetime partner, and has had only one partner in the

past three months.

Finally, all models include dummy variables for the survey year, variables representing

the religious composition of the state, state real per capita income, state unemployment rate, and

dummy variables indicating the region in which the respondent resides. The survey year dummy

variables are included to capture secular trends in the outcomes, while the state and region

variables are intended to proxy unobserved attitudes towards risky behaviors that may be shared

by respondents living in the same state.

4.1. Instruments

Variables measuring the full price of alcohol and marijuana serve as instruments

which are used to predict consumption but not sexual behavior. The full price includes the

monetary price of purchasing the good plus factors that may increase the total costs of

obtaining the substance such as time and travel costs, or expected penalties for illegal

possession. The prices are theoretically valid instruments because there is no reason to believe that the prices of drugs and alcohol are predictors of risky sexual behaviors, holding consumption constant. Prices should, however, predict consumption. Previous research has show that consumption of these goods is negatively related to their prices. (Leung and Phelps, 1993, Grossman, et al. 1998, and Grossman and Chaloupka, 1998, Saffer and Chaloupka, 1999).

Five variables will be used as instruments: The real state-level excise tax on a gallon of beer, the real price of a pound of marijuana, the per capita number of outlets licensed to sell alcohol in each state, and the midpoint of the minimum and maximum statutory fine and jail terms (in years) for possession of small amounts of marijuana. Beer taxes come from the Beer Association's *Brewer's Almanac*, the number of outlets licensed to sell alcohol come from Jobson's *Liquor Handbook*, marijuana prices come from the Drug Enforcement Agency, and fines and jail terms are provided by the ImpacTeen Illicit Drug Team.

5. ESTIMATION AND RESULTS

Table 2 shows means of substance use by sexual behavior status. In all cases, respondents who engage in sex and in risky sexual practices have higher rates of drinking and drug use. For example, 39 percent of males who have had sex in the past three months also binge drink, while only 15 percent of sexually inactive males binge drink. The corresponding numbers for females are 23 percent and 10 percent. For sexually active respondents, Table 2 shows that compared to males who have had only one partner in the past three months, males who have had more than one partner binge more frequently (3.86 days vs. 2.16), drink on more days (7.52 vs. 4.34 days), and use marijuana more frequently (9.40 vs. 4.60).   Similar trends

hold for sexually active females. Teens of both genders who do not use condoms or birth control also drink and use marijuana more than those who do use protection. It is important to note that these results establish a correlation between substance use and risky sexual behaviors, but do not address the issue of causality.

Table 3 shows the impact of binge drinking on the likelihood of having sex in a multivariate analysis. In this table and the tables that follow, the results are presented separately by gender. The t-ratios in brackets are based on standard errors which are take account of the correlation among individuals living in the same state and year (Huber 1967).

The OLS results in column 1 of Table 3 shows that for males, binge drinking is positively associated with having sex. However, the results of the TSLS and the reduced form provide no evidence that this result is causal. First, the TSLS coefficient on binge drinking is negative and statistically insignificant (column 2). A number of tests point to the efficacy of the TSLS procedure. First, an overidentification test indicates that the exclusion restrictions are valid. Second, the instruments in the first stage (column 3) are statistically significant predictors of binge drinking and demonstrate the expected sign. Here, higher beer taxes will lower binge drinking, and more outlets licensed to sell alcohol will raise binge drinking. The coefficient on the price of marijuana is negative and significant providing some evidence that marijuana and alcohol are complement goods. The partial F-statistic associated with the excluded instruments is 2.56, which is low, but is statistically significant. Note that Bound et al. (1995) show that as the F-statistic on the instruments gets smaller, the bias in the TSLS estimates approaches that of OLS casting some doubt on the TSLS estimate. Indeed, the Hausman test for the consistency of OLS confirms that the TSLS estimate is no different from the OLS estimate, thus drawing into question the reliability of the TSLS estimate.[1] Therefore, the coefficients in the reduced form

model in column 4 become important as they provide an alternative test of causality. Here, none of the coefficients on the instruments predict the likelihood of having sex, providing further evidence that for males, binge drinking is not a causal determinant of having sex.

The results for females are presented in columns 5-8 of Table 3. The OLS coefficient is positive and statistically significant while the TSLS coefficient is negative and insignificant. The reliability of the TSLS estimate is questionable as the F-statistic on the instruments is low, and the Hausman test is rejected only at the 10 percent level. However, the coefficients on the beer tax and alcohol outlets in the reduced form confirm the finding of no impact of binge drinking on the probability of having sex in the TSLS model. Note that the coefficient on the price of marijuana is negative and significant in the first stage regression, and positive and significant in the reduced form. Thus, there is some evidence that marijuana and alcohol are complement goods, and that lowering the price of marijuana will raise consumption of alcohol or marijuana and lower the probability of females having sex. One possible explanation for this result is that for females, excessive drug and alcohol consumption may inhibit sexual desire rather than promote it. Alternatively, males may be unwilling to "take advantage" of a female who is under the influence.

Table 4 shows the impact of binge drinking on the number of partners conditional on having sex in the past three months. For both genders, the OLS results show that binge drinking is associated with having more partners, while the TSLS and reduced form estimates do not uphold this result. The insignificant TSLS coefficients suggest that binge drinking does not have a causal impact on the number of partners. For males, the low F-statistics on the instruments makes the validity of the TSLS estimate questionable, however, the overidentification restrictions are valid and the Hausman test rejects the consistency of OLS. For females, the F-

statistic is low, but is statistically significant, whereas the overidentification restrictions may not be valid and the Hausman test cannot reject OLS. Despite these questionable TSLS results, the reduced form tells a similar story. Here, neither higher beer taxes nor fewer alcohol outlets will lower the number of partners for either gender. Raising the marijuana price will have no impact on lowering the number of partners, although longer jail terms for marijuana possession may lower the number of partners for females.

Tables 5 and 6 contain the results of the impact of binge drinking on birth control use and condom use, respectively. Unlike with the probability of having sex or the number of partners, binge drinking does appear to causally impact the use of birth control and condoms. For both genders, the TSLS coefficients on binge drinking are negative and statistically significant. As seen previously, the TSLS models suffer from low F-statistics on the instruments in the first stage, although the overidentification restrictions are valid, and the Hausman test is rejected in all cases except for condom use by males. In the reduced form, higher beer taxes will raise the probability of using any birth control and condoms for males. Higher marijuana prices will also increase the use of birth control among sexually active males. For females, higher beer taxes have no impact, although higher marijuana prices will lead to more use of birth control and condoms.

Table 7 shows the results when the number of days in the past thirty days on which the respondent had at least one drink of alcohol is the measure of substance use. Coefficients from the OLS, TSLS and first stage regressions are shown. The reduced form estimates do not change from those in Tables 3-6 and are therefore not repeated. The results for drinking any positive quantities are very similar to those for binge drinking. In the OLS models, drinking is positively related to the probability of having sex and having multiple partners for both males and females,

and is negatively related to birth control use by both genders and condom use by males. As with binge drinking, the TSLS coefficients show that drinking lowers birth control use for both genders and condom use as reported by females.

Table 8 shows the OLS and TSLS coefficients when the number of times in the past thirty days the respondent used marijuana is considered. Not surprisingly, the OLS results show that marijuana use is positively related to the probability of having sex and having multiple partners for both males and females. Marijuana use is negatively related to condom use and birth control for males, but is not related to birth control use for females. Unfortunately, conclusions about the causal nature of these relationships cannot be made from the TSLS estimates. None of the instrument in the first stage are statistically significant predictors of marijuana use, thus the TSLS estimates are unreliable. Recall however, that the reduced form estimates in Table 3-6 do provide alternative evidence of the causal relationship. As previously discussed, a higher marijuana price will raise the probability of a female engaging in sex, but will lower the number of partners for females. Higher prices will also raise the probability of birth control use by both genders and condom use as reported by females. One caveat is that it is difficult to attribute the impact of higher marijuana prices in the reduced form directly to marijuana consumption given that the first stage binge drinking and drinking regressions show that marijuana and alcohol are complement goods.

5.1. Other variables

Estimates of the impact of the other included independent variables are shown in Tables 3-6. Results are unaltered when the other substances are included, and there is little difference between the OLS and 2SLS estimation. Beginning with the decision to have sex, the regressions

show that older teens, blacks teens, and male teens of races other than white or black are more likely to have recently had sex. Smoking is associated with a higher probability of having sex, as is playing sports for males. Wearing seat belts and having been taught about AIDS (for males only) are both associated with a lower likelihood of engaging in sex.

Similar character traits predict the number of partners. Teens who are black or of races other than white or black have multiple partners. For females, age increases the number of partners. Males who smoke or play sports have more partners, and those males who wear seat belts or have been taught about AIDS have fewer partners. For both genders, a higher state unemployment rate is associated with higher numbers of partners.

In regards to condom and birth control use, teenagers of races other than black or white are less likely to use condoms or birth control, black females are less likely to use birth control, and older teens of both genders are less likely to use condoms. Teens who play on sports teams are more likely to use protection. Lastly, the indicator for first sexual encounter is negative for males in the birth control equations and positive for females in the condom use equations.

6. <u>CONCLUSION</u>

Previous studies have shown a strong statistical correlation between drug and alcohol consumption and teenage sexual behaviors. Models estimated by OLS confirm the findings of previous studies, however, we show that for certain behaviors, this correlation does not translate into causality. Through the use of instrumental variables and a reduced form equation, this paper provides evidence against the theory that alcohol consumption causes teens to engage in sex or have multiple partners, while providing evidence for the theory that alcohol consumption leads to a lower use of birth control and condoms by sexually active teens. The impact of marijuana

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consumption on teenage sexual behaviors remains unclear.

For males, the TSLS and reduced form results consistently show no impact of alcohol consumption, or the exogenous determinants of consumption, on the probability of having sex or having multiple partners. However, the TSLS models do show evidence that among sexually active males, drinking will lower the probability of using condoms or birth control. The reduced form results for these behaviors confirm the TSLS estimates and show that higher beer taxes and marijuana prices will raise the probability of using birth control.

For females, the TSLS and reduced form results show that alcohol consumption does not increase the likelihood of having sex. Also, there is no evidence of a causal impact of drinking on the number of partners. As with males, the TSLS estimates for females do show evidence that among sexually active respondents, drinking will lower the probability of using condoms or birth control. In the reduced form models, however, higher beer taxes and fewer alcohol outlets have no direct impact on the use of these forms of birth control, although higher marijuana prices, which may impact both alcohol and marijuana consumption, will lead to the increased use of birth control and condoms.

[1] Adjusting the standard errors according to Huber (1967) have an large impact on the value of the tests of the TSLS coefficient. The partial F-statistic based on unadjusted standard errors is much higher at 7.48, and the Hausman test of the consistency of OLS is rejected at the 5 percent level.

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Table 1
Weighted Means, Standard Deviations

	Males, Full Sample (N=27,567)	Males, Sexually Active (N=10,944)	Females, Full Sample (N=30,096)	Females, Sexually Active (N=11,675)
Had sex	0.34, 0.48		0.37, 0.48	
Number of partners		1.79, 1.40		1.29, 0.77
Use birth control		0.69, 0.46		0.64, 0.48
Use condom		0.61, 0.49		0.47, 0.50
Number of days drink	3.34, 5.75	5.85, 7.34	2.34, 4.36	3.72, 5.43
Number of days binge	1.68, 3.62	3.10, 4.79	0.99, 2.52	1.72, 3.33
Number of times use marijuana	3.62, 9.59	7.06, 12.83	1.84, 6.38	3.55, 8.78
Beer tax	0.55, 0.15	0.56, 0.16	0.55, 0.15	0.56, 0.16
Alcohol Outlets	2.23, 0.89	2.26, 0.94	2.22, 0.89	2.22, 0.96
Marijuana price	945.78, 281.70	942.6, 268.5	930.2, 280.2	935.69, 274.04
Jail	0.19, 0.22	0.21, 0.22	0.19, 0.22	0.2, 0.2
Fine (in 1,000s)	1.09, 6.34	1.02, 6.00	1.06, 6.22	0.92, 5.55
Black	0.10, 0.3	0.20, 0.40	0.14, 0.35	0.19, 0.39
Other race	0.19, 0.39	0.18, 0.39	0.20, 0.40	0.18, 0.38
Age	16.19, 1.21	16.54, 1.14	16.10, 1.21	16.49, 1.11
Age greater than grade	0.06, 0.25	0.09, 0.29	0.04, 0.19	0.05, 0.22
Age less than grade	0.003, 0.05	0.002, 0.04	0.003, 0.05	0.003, 0.05
Seat belt	3.58, 1.28	3.18, 1.33	3.86, 1.13	3.59, 1.20
Sports	1.60, 1.55	1.65, 1.60	1.01, 1.31	0.84, 1.21
Number of days smoked	5.30, 10.34	9.10, 12.54	5.17, 10.15	9.07, 12.50
Aids education	0.93, 0.26	0.91, 0.28	0.93, 0.26	0.92, 0.27
State real income	156.53, 19.21	155.03, 19.35	156.48, 19.16	154.84, 18.89
State unemployment	5.71, 1.60	5.75, 1.64	5.69, 1.60	5.70, 1.60
Protestant	21.89, 9.52	22.37, 9.50	22.06, 9.85	22.78, 9.95
Catholic	19.96, 12.03	19.27, 12.17	19.77, 12.14	18.81, 12.31
Southern Baptist	5.46, 7.67	6.34, 8.27	5.70, 7.93	6.69, 8.63
Mormon	0.88, 0.94	0.80, 0.86	0.88, 0.92	0.83, 0.87
1993	0.23, 0.42	0.25, 0.43	0.24, 0.42	0.23, 0.42
1995	0.15, 0.36	0.15, 0.36	0.15, 0.36	0.16, 0.37
1997	0.24, 0.43	0.23, 0.42	0.22, 0.41	0.21, 0.41
1999	0.20, 0.40	0.20, 0.40	0.22, 0.41	0.21, 0.41
North East	0.22, 0.41	0.21, 0.41	0.22, 0.41	0.20, 0.40
Midwest	0.27, 0.45	0.28, 0.45	0.26, 0.44	0.26, 0.44
South	0.28, 0.45	0.33, 0.47	0.28, 0.45	0.33, 0.47
First time		0.10, 0.30		0.13, 0.34

Table 2
Sexual Behaviors and Substance Use

	All Respondents		Sexually Active Respondents					
	Did not have sex in past 3 months	Had sex in past 3 months	1 partner in past 3 months	More than 1 partner in past 3 months	Used birth control	Did not use birth control	Used a condom	Did not use a condom
MALES								
Proportion binge	0.15	0.39	0.35	0.46	0.37	0.44	0.36	0.45
Proportion drink	0.40	0.69	0.64	0.75	0.68	0.71	0.67	0.72
Proportion use marijuana	0.14	0.39	0.32	0.49	0.38	0.42	0.37	0.42
Number of days binge	0.87	2.85	2.16	3.86	2.53	3.50	2.45	3.48
Number of days drink	1.98	5.63	4.34	7.52	5.13	6.61	5.03	6.59
Number of times used marijuana	1.59	6.55	4.60	9.40	5.93	7.59	5.84	7.54
FEMALES								
Proportion binge	0.10	0.23	0.19	0.38	0.22	0.24	0.20	0.25
Proportion drink	0.36	0.59	0.55	0.76	0.59	0.60	0.57	0.61
Proportion use marijuana	0.09	0.27	0.23	0.45	0.26	0.29	0.25	0.29
Number of days binge	0.51	1.34	1.07	2.53	1.23	1.49	1.15	1.50
Number of days drink	1.47	3.26	2.74	5.54	3.10	3.49	2.97	3.51
Number of times used marijuana	0.71	2.94	2.36	5.52	2.71	3.23	2.54	3.28

Note: All means and proportions are statistically different with the exception of birth control use by the proportion of females who drink.

Table 3
Had Sex in the Past 3 Months

	MALES (N=27,567)				FEMALES (N=30,096)			
	OLS	TSLS	First Stage	Reduced Form	OLS	TSLS	First Stage	Reduced Form
Binge	0.023 (24.71)	-0.022 (-0.71)			0.020 (14.09)	-0.139 (-1.47)		
Beer tax			-0.647 (-2.04)	0.037 (1.16)			0.001 (0.01)	0.057 (1.49)
Alcohol Outlets			0.087 (1.81)	-0.0001 (-0.03)			0.042 (1.96)	-0.002 (-0.36)
Marijuana price			-0.0004 (-2.42)	3.7E-06 (0.14)			-0.0002 (-1.99)	0.0001 (2.10)
Jail			0.274 (1.20)	-0.001 (-0.04)			0.043 (0.40)	-0.015 (-0.46)
Fine			-0.005 (-1.12)	0.001 (1.12)			0.0004 (0.14)	0.0004 (0.56)
Black	0.304 (29.76)	0.271 (11.27)	-0.678 (-8.81)	0.285 (26.85)	0.182 (17.07)	0.119 (2.94)	-0.387 (-8.71)	0.169 (15.47)
Other race	0.060 (5.76)	0.065 (5.35)	0.033 (0.43)	0.064 (5.64)	0.003 (0.26)	-0.009 (-0.62)	-0.095 (-1.93)	0.008 (0.75)
Age	0.071 (30.65)	0.085 (8.35)	0.300 (14.05)	0.078 (33.01)	0.089 (35.60)	0.101 (13.32)	0.075 (6.88)	0.091 (36.55)
Age greater than grade	0.002 (0.21)	-0.004 (-0.33)	-0.119 (-1.28)	-0.001 (-0.09)	-0.041 (-3.32)	-0.045 (-2.41)	-0.025 (-0.31)	-0.040 (-3.25)
Age less than grade	0.132 (3.08)	0.143 (3.07)	0.246 (0.85)	0.138 (3.10)	0.064 (1.74)	0.111 (1.71)	0.293 (1.15)	0.071 (1.91)
Seat belt	-0.041 (-13.96)	-0.061 (-4.32)	-0.443 (-16.15)	-0.051 (-16.06)	-0.036 (-11.22)	-0.064 (-3.87)	-0.178 (-10.84)	-0.040 (-12.08)
Sports	0.029 (14.25)	0.035 (7.28)	0.143 (9.09)	0.032 (15.95)	-0.006 (-2.67)	0.008 (0.96)	0.088 (7.24)	-0.004 (-1.79)
Number of days smoked	0.009 (25.28)	0.015 (3.39)	0.136 (22.21)	0.012 (33.96)	0.011 (28.46)	0.027 (2.84)	0.099 (25.27)	0.013 (32.44)
Aids education	-0.020 (-1.92)	-0.037 (-2.41)	-0.364 (-4.43)	-0.029 (-2.77)	0.005 (0.46)	-0.003 (-0.24)	-0.048 (-0.85)	0.004 (0.38)
State real income	0.0002 (0.79)	0.00004 (0.11)	-0.004 (-1.14)	0.0001 (0.43)	0.0004 (0.91)	-0.00002 (-0.05)	-0.002 (-1.43)	0.0002 (0.65)
State unemployment	0.004 (1.09)	0.006 (1.44)	0.028 (0.78)	0.006 (1.58)	0.006 (1.28)	0.008 (1.28)	0.008 (0.35)	0.008 (1.80)
Protestant	-0.001 (-3.94)	-0.002 (-3.47)	-0.006 (-1.58)	-0.001 (-3.05)	-0.001 (-1.21)	-0.001 (-1.01)	0.0001 (0.03)	-0.0003 (-0.80)
Catholic	-0.002 (-2.55)	-0.001 (-0.92)	0.012 (1.43)	-0.001 (-1.25)	-0.003 (-4.50)	-0.002 (-1.10)	0.011 (2.71)	-0.002 (-3.07)
Southern Baptist	0.003 (3.60)	0.004 (3.07)	0.026 (2.76)	0.003 (3.42)	0.001 (0.55)	0.003 (1.46)	0.015 (3.47)	0.001 (0.54)
Mormon	-0.011 (-1.53)	-0.014 (-1.67)	-0.127 (-1.46)	-0.016 (-1.59)	-0.012 (-1.01)	-0.007 (-0.54)	0.001 (0.02)	-0.005 (-0.32)
1993	0.002 (0.10)	-0.0001 (-0.01)	0.028 (0.25)	-0.0004 (-0.03)	-0.005 (-0.30)	-0.013 (-0.60)	-0.020 (-0.35)	-0.012 (-0.74)
1995	-0.023 (-1.29)	-0.026 (-1.49)	-0.065 (-0.46)	-0.022 (-1.27)	0.014 (0.77)	0.024 (1.02)	0.079 (1.10)	0.017 (0.91)
1997	-0.031 (-1.72)	-0.026 (-1.35)	0.078 (0.49)	-0.026 (-1.47)	-0.007 (-0.34)	-0.005 (-0.17)	0.015 (0.19)	0.000 (-0.02)

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1999	-0.009	0.005	0.114	0.003	-0.010	0.020	0.129	0.016
	(-0.43)	(0.19)	(0.57)	(0.15)	(-0.47)	(0.62)	(1.48)	(0.68)
North East	0.030	-0.005	-0.683	0.003	0.058	-0.019	-0.451	0.026
	(1.63)	(-0.14)	(-2.94)	(0.10)	(1.83)	(-0.30)	(-3.91)	(0.70)
Midwest	-0.001	-0.018	-0.439	-0.013	0.002	-0.023	-0.161	-0.006
	(-0.07)	(-0.69)	(-1.84)	(-0.46)	(0.07)	(-0.53)	(-1.43)	(-0.17)
South	-0.030	-0.041	-0.494	-0.038	-0.014	-0.056	-0.355	-0.005
	(-1.47)	(-1.60)	(-2.09)	(-1.57)	(-0.53)	(-1.28)	(-3.17)	(-0.18)
R-squared	0.22	0.12	0.20	0.19	0.16	0.11	0.17	0.15
F on instruments			2.560				2.150	
			[0.031]				[0.064]	
Overidentification test			3.268				9.651	
			[0.514]				[0.047]	
Hausman test			2.038				2.844	
			[0.153]				[0.092]	

Notes: T-statistics in parentheses, P-values in brackets, and intercept not shown. Standard errors are adjusted for clustering by state and year.

Table 4
Number of Partners in Past 3 Months
Sexually Active Respondents

	MALES (N=10,944)				FEMALES (N=11,675)			
	OLS	TSLS	First Stage	Reduced Form	OLS	TSLS	First Stage	Reduced Form
Binge	0.078 (18.20)	-0.120 (-1.23)			0.050 (10.45)	0.068 (0.89)		
Beer tax			-0.978 (-1.76)	0.220 (1.82)			-0.239 (-0.95)	0.061 (1.00)
Alcohol Outlets			0.157 (2.09)	-0.025 (-1.37)			0.096 (2.66)	0.005 (0.48)
Marijuana price			-0.0005 (-1.40)	-0.00001 (-0.18)			-0.0003 (-1.86)	-0.0001 (-1.47)
Jail			0.560 (1.51)	-0.056 (-0.49)			0.278 (1.53)	-0.098 (-1.82)
Fine			-0.010 (-1.03)	-0.001 (-0.43)			-0.004 (-0.74)	-0.0003 (-0.18)
Black	1.001 (25.97)	0.705 (4.67)	-1.433 (-10.53)	0.880 (20.58)	0.202 (9.32)	0.215 (3.84)	-0.704 (-8.27)	0.169 (8.01)
Other race	0.297 (6.74)	0.325 (6.58)	0.062 (0.42)	0.317 (7.43)	0.056 (2.11)	0.059 (2.25)	-0.236 (-2.46)	0.042 (1.49)
Age	-0.045 (-3.21)	-0.008 (-0.33)	0.185 (4.32)	-0.030 (-2.06)	-0.025 (-3.64)	-0.024 (-3.66)	-0.014 (-0.64)	-0.026 (-3.69)
Age greater than grade	0.262 (4.96)	0.252 (3.90)	-0.047 (-0.31)	0.257 (4.59)	0.017 (0.54)	0.016 (0.49)	0.058 (0.38)	0.019 (0.60)
Age less than grade	0.588 (1.98)	0.669 (2.19)	0.369 (0.51)	0.621 (2.10)	-0.045 (-0.25)	-0.061 (-0.32)	0.906 (1.08)	-0.002 (-0.01)
Seat belt	-0.079 (-6.29)	-0.187 (-3.53)	-0.554 (-11.05)	-0.121 (-9.16)	-0.021 (-3.97)	-0.018 (-1.04)	-0.218 (-7.45)	-0.033 (-5.67)
Sports	0.047 (4.23)	0.078 (4.08)	0.156 (4.98)	0.059 (5.07)	0.003 (0.38)	0.00003 (0.00)	0.144 (5.06)	0.010 (1.43)
Number of days smoked	0.012 (7.26)	0.037 (2.92)	0.129 (18.85)	0.022 (12.92)	0.007 (8.11)	0.005 (0.72)	0.091 (18.80)	0.011 (12.02)
Aids education	-0.241 (-4.53)	-0.376 (-3.77)	-0.659 (-3.90)	-0.298 (-5.07)	-0.018 (-0.82)	-0.015 (-0.53)	-0.163 (-1.52)	-0.028 (-1.19)
State real income	0.003 (2.90)	0.002 (1.12)	-0.006 (-1.20)	0.002 (1.87)	0.0003 (0.59)	0.0004 (0.66)	-0.004 (-1.51)	0.001 (0.89)
State unemployment	0.037 (2.61)	0.046 (2.23)	0.007 (0.10)	0.045 (2.78)	0.014 (1.92)	0.014 (1.82)	-0.008 (-0.20)	0.013 (1.66)
Protestant	-0.001 (-0.71)	-0.002 (-0.75)	-0.006 (-0.85)	-0.001 (-0.44)	-0.001 (-1.67)	-0.001 (-1.70)	0.001 (0.26)	-0.001 (-1.50)
Catholic	-0.004 (-1.64)	0.001 (0.37)	0.021 (1.60)	-0.001 (-0.46)	-0.003 (-2.99)	-0.004 (-2.31)	0.017 (2.53)	-0.003 (-2.32)
Southern Baptist	0.001 (0.25)	0.005 (1.07)	0.034 (1.87)	-0.001 (-0.27)	-0.001 (-0.90)	-0.002 (-0.83)	0.021 (2.80)	-0.001 (-0.48)
Mormon	0.020 (0.60)	0.005 (0.11)	-0.184 (-0.91)	0.045 (0.82)	0.024 (1.32)	0.025 (1.35)	-0.080 (-0.74)	0.036 (1.71)
1993	-0.058 (-1.01)	-0.035 (-0.62)	0.197 (1.16)	-0.052 (-1.06)	-0.018 (-0.68)	-0.017 (-0.65)	0.007 (0.07)	-0.013 (-0.47)
1995	-0.024 (-0.47)	-0.049 (-0.83)	-0.163 (-0.74)	-0.018 (-0.38)	0.022 (0.81)	0.020 (0.71)	0.120 (1.05)	0.039 (1.35)

1997	-0.116	-0.074	0.147	-0.082	-0.021	-0.022	0.052	-0.011
	(-1.95)	(-0.91)	(0.56)	(-1.36)	(-0.68)	(-0.68)	(0.37)	(-0.38)
1999	-0.095	-0.023	0.139	-0.043	0.009	0.004	0.152	0.0001
	(-1.45)	(-0.25)	(0.46)	(-0.61)	(0.28)	(0.11)	(1.03)	(0.00)
North East	0.109	-0.166	-1.359	0.049	0.047	0.066	-1.060	0.044
	(1.46)	(-0.91)	(-2.78)	(0.42)	(1.15)	(0.76)	(-4.32)	(0.93)
Midwest	0.094	-0.025	-0.864	0.125	0.063	0.072	-0.618	0.107
	(1.02)	(-0.17)	(-1.81)	(0.89)	(1.40)	(1.37)	(-2.61)	(1.84)
South	0.013	-0.070	-0.889	0.059	0.038	0.049	-0.862	0.045
	(0.15)	(-0.53)	(-1.88)	(0.46)	(0.90)	(0.81)	(-3.56)	(0.87)
R-squared	0.15	0.09	0.18	0.10	0.07	0.07	0.16	0.04
F on instruments			1.800				2.710	
			[0.119]				[0.023]	
Overidentification test			1.247				9.545	
			[0.870]				[0.049]	
Hausman test			4.126				0.055	
			[0.042]				[0.815]	

Notes: T-statistics in parentheses, P-values in brackets, and intercept not shown. Standard errors are adjusted for clustering by state and year.

Table 5
Birth Control Use
Sexually Active Respondents

	MALES (N=10,645)				FEMALES (N=11,434)			
	OLS	TSLS	First Stage	Reduced Form	OLS	TSLS	First Stage	Reduced Form
Binge	-0.006 (-5.09)	-0.102 (-2.77)			-0.005 (-3.06)	-0.139 (-2.63)		
Beer tax			-0.964 (-1.71)	0.125 (2.91)			-0.244 (-0.99)	0.053 (1.48)
Alcohol Outlets			0.147 (1.90)	-0.008 (-1.24)			0.095 (2.68)	-0.006 (-1.13)
Marijuana price			-0.001 (-1.49)	0.0001 (2.77)			-0.0004 (-2.15)	0.0001 (3.23)
Jail			0.552 (1.46)	-0.042 (-1.40)			0.328 (1.84)	-0.028 (-1.03)
Fine			-0.013 (-1.36)	0.0004 (0.48)			-0.005 (-1.10)	0.001 (1.47)
Black	-0.016 (-1.15)	-0.173 (-2.86)	-1.578 (-11.33)	-0.012 (-0.90)	-0.035 (-3.05)	-0.140 (-3.16)	-0.752 (-8.84)	-0.037 (-3.12)
Other race	-0.120 (-7.94)	-0.112 (-5.50)	0.006 (0.04)	-0.109 (-6.96)	-0.169 (-12.25)	-0.195 (-9.49)	-0.243 (-2.65)	-0.158 (-11.70)
Age	-0.009 (-2.13)	0.005 (0.60)	0.142 (3.37)	-0.010 (-2.32)	0.003 (0.64)	-0.004 (-0.65)	-0.050 (-2.15)	0.004 (0.81)
Age greater than grade	-0.005 (-0.38)	-0.012 (-0.58)	-0.064 (-0.40)	-0.005 (-0.39)	-0.015 (-0.85)	-0.009 (-0.33)	0.044 (0.31)	-0.015 (-0.82)
Age less than grade	-0.194 (-2.65)	-0.159 (-1.62)	0.322 (0.45)	-0.192 (-2.63)	0.216 (2.45)	0.249 (2.98)	0.252 (0.48)	0.220 (2.43)
Seat belt	0.026 (6.05)	-0.024 (-1.21)	-0.531 (-10.68)	0.030 (7.11)	0.036 (8.46)	0.008 (0.65)	-0.213 (-7.33)	0.038 (8.85)
Sports	0.016 (5.94)	0.031 (4.34)	0.156 (4.86)	0.015 (5.65)	0.020 (4.83)	0.039 (3.71)	0.143 (5.11)	0.019 (4.76)
Number of days smoked	-0.001 (-3.35)	0.011 (2.35)	0.128 (19.02)	-0.002 (-5.15)	-0.001 (-2.21)	0.011 (2.26)	0.089 (18.30)	-0.002 (-3.49)
Aids education	0.065 (3.97)	0.002 (0.04)	-0.634 (-3.70)	0.067 (4.12)	0.054 (3.52)	0.031 (1.60)	-0.159 (-1.56)	0.055 (3.62)
State real income	-0.001 (-1.25)	-0.001 (-1.91)	-0.007 (-1.35)	-0.001 (-1.35)	-0.0002 (-0.33)	-0.001 (-0.95)	-0.004 (-1.43)	-0.0002 (-0.47)
State unemployment	-0.001 (-0.12)	0.003 (0.36)	-0.002 (-0.03)	0.004 (0.72)	-0.012 (-2.63)	-0.011 (-1.67)	-0.010 (-0.25)	-0.009 (-2.10)
Protestant	0.001 (1.27)	0.001 (0.97)	-0.005 (-0.73)	0.001 (2.20)	0.001 (1.59)	0.001 (1.31)	0.001 (0.27)	0.001 (2.08)
Catholic	-0.001 (-0.87)	0.002 (1.16)	0.021 (1.60)	0.0002 (0.15)	-0.002 (-1.79)	0.001 (0.31)	0.018 (2.72)	-0.001 (-0.93)
Southern Baptist	-0.001 (-1.20)	0.0003 (0.18)	0.030 (1.64)	-0.003 (-1.82)	-0.001 (-0.80)	0.002 (0.89)	0.022 (2.82)	-0.001 (-1.09)
Mormon	-0.021 (-1.85)	-0.030 (-1.64)	-0.175 (-0.85)	-0.002 (-0.17)	-0.039 (-4.28)	-0.041 (-2.88)	-0.068 (-0.62)	-0.032 (-2.75)
1993	0.047 (2.91)	0.061 (2.47)	0.232 (1.34)	0.036 (2.15)	0.044 (2.60)	0.041 (2.01)	0.018 (0.18)	0.035 (2.03)
1995	0.038 (2.04)	0.027 (1.08)	-0.144 (-0.64)	0.044 (2.63)	0.015 (0.81)	0.029 (1.13)	0.112 (0.97)	0.014 (0.82)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1997	0.062	0.084	0.173	0.073	0.026	0.033	0.037	0.032
	(3.24)	(2.59)	(0.64)	(3.63)	(1.80)	(1.44)	(0.26)	(2.21)
1999	0.100	0.134	0.123	0.133	0.060	0.090	0.115	0.091
	(4.64)	(3.72)	(0.40)	(5.74)	(3.40)	(3.32)	(0.76)	(4.68)
North East	-0.012	-0.149	-1.347	-0.017	-0.011	-0.154	-1.035	-0.041
	(-0.32)	(-1.94)	(-2.68)	(-0.39)	(-0.33)	(-2.20)	(-4.25)	(-1.05)
Midwest	-0.005	-0.064	-0.831	0.016	-0.028	-0.093	-0.606	-0.036
	(-0.16)	(-1.12)	(-1.71)	(0.42)	(-0.95)	(-2.01)	(-2.56)	(-1.05)
South	-0.060	-0.100	-0.851	-0.014	-0.101	-0.178	-0.836	-0.076
	(-1.85)	(-1.82)	(-1.76)	(-0.40)	(-3.85)	(-3.85)	(-3.42)	(-3.02)
First time	-0.033	-0.161	-1.340	-0.024	0.052	-0.007	-0.452	0.055
	(-2.01)	(-3.07)	(-11.61)	(-1.44)	(3.49)	(-0.25)	(-6.84)	(3.64)
R-squared	0.04	0.02	0.19	0.04	0.05	0.03	0.17	0.05
F on instruments			1.730				3.28	
			[0.134]				[0.008]	
Overidentification test			2.854				3.255	
			[0.583]				[0.516]	
Hausman test			6.783				6.431	
			[0.009]				[0.011]	

Notes: T-statistics in parentheses, P-values in brackets, and intercept not shown. Standard errors are adjusted for clustering by state and year.

Table 6
Condom Use
Sexually Active Respondents

	MALES (N=10,760)				FEMALES (N=11,553)			
	OLS	TSLS	First Stage	Reduced Form	OLS	TSLS	First Stage	Reduced Form
Binge	-0.006 (-5.66)	-0.053 (-1.63)			-0.003 (-2.11)	-0.133 (-2.54)		
Beer tax			-0.994 (-1.76)	0.076 (1.70)			-0.241 (-0.98)	0.049 (1.42)
Alcohol Outlets			0.145 (1.89)	0.0002 (0.03)			0.096 (2.69)	-0.009 (-1.45)
Marijuana price			-0.001 (-1.55)	0.00005 (1.53)			-0.0004 (-2.06)	0.0001 (2.43)
Jail			0.547 (1.44)	-0.015 (-0.45)			0.321 (1.79)	-0.014 (-0.49)
Fine			-0.012 (-1.21)	0.001 (0.92)			-0.006 (-1.16)	0.002 (1.79)
Black	0.049 (3.23)	-0.030 (-0.56)	-1.603 (-11.64)	0.055 (3.76)	0.076 (5.91)	-0.025 (-0.56)	-0.745 (-8.73)	0.072 (5.64)
Other race	-0.059 (-3.99)	-0.056 (-3.81)	-0.010 (-0.07)	-0.053 (-3.48)	-0.058 (-4.47)	-0.084 (-3.97)	-0.238 (-2.49)	-0.050 (-3.87)
Age	-0.034 (-8.64)	-0.028 (-4.47)	0.141 (3.40)	-0.035 (-8.86)	-0.034 (-8.31)	-0.040 (-6.98)	-0.046 (-2.08)	-0.033 (-8.17)
Age greater than grade	0.005 (0.41)	0.002 (0.10)	-0.079 (-0.49)	0.006 (0.42)	0.013 (0.68)	0.019 (0.70)	0.049 (0.35)	0.013 (0.73)
Age less than grade	-0.244 (-3.17)	-0.224 (-2.68)	0.392 (0.54)	-0.243 (-3.16)	0.181 (1.78)	0.297 (1.92)	0.909 (1.08)	0.181 (1.77)
Seat belt	0.028 (6.91)	0.003 (0.16)	-0.540 (-10.75)	0.032 (7.89)	0.037 (8.88)	0.010 (0.78)	-0.213 (-7.36)	0.038 (9.41)
Sports	0.018 (6.93)	0.026 (4.06)	0.155 (4.82)	0.018 (6.53)	0.031 (6.97)	0.051 (4.80)	0.150 (5.13)	0.031 (6.88)
Number of days smoked	-0.001 (-3.39)	0.004 (1.11)	0.126 (18.74)	-0.002 (-5.10)	-0.002 (-3.79)	0.010 (2.09)	0.089 (18.33)	-0.002 (-4.57)
Aids education	0.052 (2.97)	0.023 (0.79)	-0.598 (-3.52)	0.056 (3.20)	0.041 (2.60)	0.021 (0.93)	-0.149 (-1.47)	0.042 (2.67)
State real income	-0.00002 (-0.04)	-0.0003 (-0.62)	-0.006 (-1.13)	-0.00004 (-0.07)	-0.00002 (-0.04)	-0.0004 (-0.83)	-0.003 (-1.33)	-0.0001 (-0.25)
State unemployment	0.007 (1.21)	0.009 (1.60)	0.010 (0.14)	0.009 (1.61)	-0.005 (-1.01)	-0.004 (-0.67)	-0.013 (-0.32)	-0.002 (-0.36)
Protestant	0.001 (1.05)	0.0005 (0.86)	-0.006 (-0.86)	0.001 (1.72)	-0.00004 (-0.09)	0.00003 (0.06)	0.001 (0.22)	0.0001 (0.29)
Catholic	0.001 (0.57)	0.002 (1.44)	0.020 (1.51)	0.001 (1.10)	-0.002 (-1.75)	0.001 (0.55)	0.017 (2.59)	-0.001 (-0.76)
Southern Baptist	-0.0002 (-0.16)	0.001 (0.56)	0.033 (1.82)	-0.001 (-0.41)	-0.001 (-0.59)	0.002 (0.96)	0.022 (2.95)	-0.001 (-0.91)
Mormon	-0.010 (-0.81)	-0.013 (-0.91)	-0.152 (-0.74)	-0.005 (-0.32)	-0.019 (-1.66)	-0.023 (-1.44)	-0.082 (-0.75)	-0.020 (-1.34)
1993	0.066 (3.30)	0.073 (3.06)	0.223 (1.29)	0.059 (2.80)	0.079 (5.68)	0.074 (3.66)	0.003 (0.03)	0.071 (4.52)
1995	0.074 (3.52)	0.068 (2.84)	-0.156 (-0.69)	0.078 (3.61)	0.086 (5.23)	0.098 (4.05)	0.100 (0.86)	0.085 (5.34)

1997	0.105	0.116	0.176	0.110	0.110	0.116	0.029	0.113
	(4.19)	(3.72)	(0.66)	(4.20)	(6.56)	(4.66)	(0.21)	(6.32)
1999	0.132	0.151	0.145	0.152	0.108	0.136	0.102	0.135
	(5.05)	(4.60)	(0.46)	(5.19)	(4.80)	(4.28)	(0.69)	(5.64)
North East	-0.009	-0.072	-1.263	-0.024	0.052	-0.091	-1.069	0.019
	(-0.20)	(-1.11)	(-2.54)	(-0.48)	(1.63)	(-1.37)	(-4.34)	(0.45)
Midwest	0.030	0.003	-0.787	0.029	0.049	-0.016	-0.623	0.036
	(0.89)	(0.07)	(-1.63)	(0.69)	(2.00)	(-0.41)	(-2.60)	(0.98)
South	-0.009	-0.027	-0.818	0.004	-0.020	-0.100	-0.871	-0.005
	(-0.25)	(-0.64)	(-1.70)	(0.09)	(-0.84)	(-2.16)	(-3.56)	(-0.17)
First time	-0.018	-0.082	-1.343	-0.009	0.115	0.062	-0.450	0.116
	(-1.05)	(-1.71)	(-11.76)	(-0.53)	(7.66)	(2.01)	(-6.95)	(7.69)
R-squared	0.05	0.04	0.19	0.04	0.06	0.04	0.17	0.06
F on instruments			1.750				3.190	
			[0.129]				[0.010]	
Overidentification test			3.095				2.685	
			[0.542]				[0.612]	
Hausman test			2.093				6.148	
			[0.148]				[0.013]	

Notes: T-statistics in parentheses, P-values in brackets, and intercept not shown. Standard errors are adjusted for clustering by state and year.

Table 7
Drinking and Sexual Behaviors

	MALES			FEMALES		
	OLS	TSLS	First Stage	OLS	TSLS	First Stage
HAD SEX						
Drink	0.016	-0.008		0.014	-0.078	
	(28.06)	(-0.41)		(18.49)	(-1.79)	
Beer tax			-0.817			-0.167
			(-1.69)			(-0.59)
Alcohol outlets			0.157			0.072
			(2.13)			(1.58)
Marijuana price			-0.001			0.000
			(-2.49)			(-1.75)
Jail			0.470			0.275
			(1.28)			(1.20)
Fine			-4.4E-03			4.8E-03
			(-0.56)			(0.84)
F on instruments			3.420			2.130
			[0.006]			[0.066]
Overidentification test		4.091			8.512	
		[0.394]			[0.075]	
Hausman test		1.631			4.496	
		[0.202]			[0.034]	
NUMBER OF PARTNERS						
Drink	0.054	-0.072		0.031	0.010	
	(20.93)	(-1.08)		(12.28)	(0.24)	
Beer tax			-1.002			-0.469
			(-1.22)			(-1.02)
Alcohol outlets			0.256			0.128
			(2.26)			(1.70)
Marijuana price			-0.001			-0.001
			(-1.39)			(-2.15)
Jail			0.818			0.643
			(1.35)			(1.62)
Fine			-1.1E-02			2.0E-03
			(-0.75)			(0.18)
F on instruments			1.720			2.150
			[0.135]			[0.064]
Overidentification test		1.719			10.440	
		[0.787]			[0.034]	
Hausman test		3.611			0.224	
		[0.057]			[0.636]	

Table 7 (Continued)

	MALES			FEMALES		
	OLS	TSLS	First Stage	OLS	TSLS	First Stage
BIRTH CONTROL USE						
Drink	-0.004	-0.063		-0.002	-0.074	
	(-4.84)	(-2.48)		(-1.97)	(-2.44)	
Beer tax			-1.067			-0.410
			(-1.28)			(-0.89)
Alcohol outlets			0.239			0.136
			(2.08)			(1.87)
Marijuana price			-0.001			-0.001
			(-1.53)			(-2.41)
Jail			0.824			0.712
			(1.32)			(1.84)
Fine			-1.7E-02			-8.1E-04
			(-1.09)			(-0.07)
F on instruments			1.620			2.580
			[0.160]			[0.030]
Overidentification test		4.460			3.309	
		[0.347]			[0.508]	
Hausman test		5.463			5.668	
		[0.019]			[0.017]	
CONDOM USE						
Drink	-0.004	-0.030		-0.001	-0.062	
	(-5.99)	(-1.27)		(-1.11)	(-2.10)	
Beer tax			-1.054			-0.447
			(-1.26)			(-0.97)
Alcohol outlets			0.232			0.131
			(2.02)			(1.75)
Marijuana price			-0.001			-0.001
			(-1.54)			(-2.33)
Jail			0.832			0.699
			(1.33)			(1.79)
Fine			-1.5E-02			-7.1E-04
			(-0.97)			(-0.06)
F on instruments			1.570			2.430
			[0.174]			[0.039]
Overidentification test		4.632			4.841	
		[0.327]			[0.304]	
Hausman test		1.220			4.272	
		[0.269]			[0.039]	

Notes: T-statistics in parentheses, P-values in brackets, and intercept not shown. Standard errors are adjusted for clustering by state and year. All models include age, race, age greater than grade, age less than grade, seat belt, sports teams, smoking, AIDS education, real income, unemployment, religion variables, year indicators and region indicators.

Table 8
Marijuana and Sexual Behaviors

	MALES		FEMALES	
	OLS	TSLS	OLS	TSLS
HAD SEX				
Marijuana	0.008	-0.003	0.008	-0.040
	(19.34)	(-0.19)	(12.79)	(-0.56)
F on instruments		1.050		0.360
		[0.391]		[0.872]
Overidentification test		4.437		16.474
		[0.350]		[0.002]
Hausman test		0.386		0.449
		[0.534]		[0.503]
NUMBER OF PARTNERS				
Marijuana	0.026	-0.051	0.013	-0.025
	(16.35)	(-0.81)	(8.66)	(-0.48)
F on instruments		0.730		0.760
		[0.604]		[0.579]
Overidentification test		1.738		8.783
		[0.784]		[0.067]
Hausman test		1.498		0.519
		[0.221]		[0.471]
BIRTH CONTROL USE				
Marijuana	-0.002	-0.043	-0.001	-0.043
	(-3.39)	(-1.71)	(-1.30)	(-1.27)
F on instruments		0.880		0.670
		[0.495]		[0.648]
Overidentification test		4.526		9.855
		[0.340]		[0.043]
Hausman test		2.712		1.537
		[0.100]		[0.215]
CONDOM USE				
Marijuana	-0.002	-0.025	-0.001	-0.043
	(-4.26)	(-1.51)	(-1.80)	(-1.13)
F on instruments		0.890		0.710
		[0.490]		[0.617]
Overidentification test		2.805		8.204
		[0.591]		[0.084]
Hausman test		1.969		1.200
		[0.161]		[0.273]

Notes: T-statistics in parentheses, P-values in brackets, and intercept not shown. Standard errors are adjusted for clustering by state and year. All models include age, race, age greater than grade, age less than grade, seat belt, sports teams, smoking, AIDS education, real income, unemployment, religion variables, year indicators and region indicators.