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Race Differences in Longitudinal Associations between Adolescent Personal and Peer Marijuana Use and Adulthood Sexually Transmitted Infection Risk

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Abstract

To assess whether adolescent marijuana exposure represents a modifiable predictor of adult STI risk, we used nationally-representative, longitudinal data from Waves I (1994–1995, adolescence) and III (2001–2002, adulthood) of the National Longitudinal Study of Adolescent Health (N=10,738) to examine racial/gender differences in associations between adolescent marijuana use, current use, and peer use and adulthood multiple partnerships, self-reported STI, and biologically-confirmed STI. Adulthood STI risk was predicted by adolescent marijuana use in all groups except Black females, and by peer marijuana use among Black males. Adolescents who use marijuana, or who have friends who use, constitute priority populations for STI prevention.

Keywords

Marijuana; Sexually Transmitted Infections; Race/Ethnicity; Adolescence; Young Adulthood

BACKGROUND

Sexually transmitted infections (STIs) represent a public health priority in the United States (US), with adolescents and young adults accounting for half of all cases.¹ With many of the risk behaviors for adulthood STI beginning in adolescence,² identifying adolescent indicators of STI risk represents a promising approach to targeted adult prevention. Further, given the clear race disparities in rates of infection – with Blacks being up to 20 times more likely to be infected with STIs such as Chlamydia, gonorrhea, and trichomoniasis than Whites¹ – identifying race-specific adolescent indicators of adult risk may prove to be a particularly effective way to reduce STI rates.

Adolescent use of marijuana, the most commonly used illicit substance in adolescence,³ may constitute an important risk factor for young adulthood STI. Adolescent marijuana use is a consistent correlate of adolescent STI risk^{4–12} and a marker of later adolescent and young adulthood elevations in STI risk.^{13–17} Moreover, though longitudinal research measuring the association between adolescent marijuana use and adulthood STI risk is limited, there is

evidence that marijuana use predicts adulthood STI risk independent of other STI determinants.^{18,19}

Adolescent marijuana use may influence adulthood STI risk by operating via a number of distinct risk pathways. First, it is likely that marijuana use (especially at very high levels) leads to neurological deficits,^{20,21} negative cognitive functioning,²² poor psychosocial functioning and delinquency,^{23–25} and even psychosis,^{26,27} all of which might lead to poor decision-making and increased risk taking. Second, given the link between adolescent marijuana use and adolescent STI risk, it is likely that risk behaviors that are initiated or established in adolescence will continue into adulthood. Third, marijuana use in adolescence often leads to continued marijuana use or even dependence in adulthood,²⁸ both of which are important correlates of elevated sexual risk-taking in adulthood. For example, one study of men and women in Baltimore emergency rooms found that adults who recently used marijuana (within the previous three months) had nearly two times the odds of biologically confirmed STI compared to non-users.²⁹ Fourth, it is possible that marijuana use is linked to involvement with high risk and high sensation-seeking peer networks,^{30,31} which might lead to greater levels of sexual risk, including increased likelihood of having infected sex partners.

Despite the fact that empirical evidence and theoretical models suggest that marijuana use in adolescence may represent a modifiable predictor of STI risk in adulthood, prior studies that have examined longitudinal effects have been limited by small sample size, convenience (e.g., treatment or clinic) samples,^{14,17} restricted geographical location,^{18–20} or racial composition of the study population.^{15,19} Further, few studies have used biologically-confirmed STI indicators in their assessment of risk.^{14,18} Additionally, no studies to the authors' knowledge have examined the influence of peer marijuana use on STI risk, independent of one's own use – a critical component to understanding the network effects of risky behavior and STI risk. This is an especially critical gap in literature, because, as mentioned above, involvement in drug networks where sexual risk taking is normative and STI levels are higher may lead one to engage in higher levels of risk taking and to do so with riskier partners who have elevated infection levels.

There is a clear need to examine the degree to which marijuana use - both personal and peer - predicts STI risk in a general population sample using longitudinal data and biologically-confirmed STI measures. Moreover, given the race disparities in STI, there is a need to examine population-specific associations between marijuana use and STI risk, an area of focus that has rarely been incorporated in the literature.¹⁷ This represents a clear gap in existing literature, since there is evidence that the effect of substance use on sexual risk outcomes differ for Blacks and Whites, most often in a way that suggests substance use is linked with sexual risk among Whites but not Blacks.^{32,33}

The purpose of this study was to use Waves I and III of the National Longitudinal Study of Adolescent Health (Add Health) to measure associations between personal and peer marijuana use in adolescence and STI risk (multiple partnerships, self-reported STI, and biologically-confirmed STI) in adulthood, by race (Black and White) and gender. This study contributes to the existing literature on marijuana use and sexual risk by using longitudinal, nationally-representative data; by including more than one measure of STI, including a biologically-confirmed measure; by considering the effect of peer marijuana use in addition to personal use in order to assess risky network effects; and by examining associations among racial subpopulations and significant gender differences within these groups. In sum, the guiding principle behind this study was that, by identifying whether exposure to marijuana (either via personal or peer use) represents a population-specific, modifiable

predictor of STI risk, it may be possible to better target at-risk populations for sexual risk prevention and intervention programs.

METHODS

Add Health is a longitudinal cohort study composed of a nationally-representative sample of more than 20,000 7th–12th graders in the US. Wave I (1994–1995) data were collected from parents and adolescents (range: 11–21 years) and include information concerning sociodemographic characteristics and psychosocial and health behaviors. Wave III (2001–2002) data were collected when the participants reached adulthood (range: 18–28 years) and, in addition to information on health and risk behaviors, include biological specimens used to determine infection with Chlamydia, gonorrhea, and trichomoniasis. The study design has been described in detail elsewhere.^{34–39} This study used Wave I and III data from individuals who self-identified at Wave III as Black or White. Ethical approval for this research was obtained from the University of Maryland at College Park Institutional Review Board.

Exposures: Adolescent Personal and Peer Marijuana Use

At Wave I, respondents were asked: “How old were you when you tried marijuana for the first time? During the past 30 days, how many times did you use marijuana? Of your 3 best friends, how many use marijuana at least once a month?” Three dichotomous indicators (yes versus no, the reference group) were defined: history of ever having used marijuana (“ever use”); marijuana use more than once in the 30 days before Wave I (“current use”); and peer marijuana use, defined as having at least one of three best friends who used marijuana at least once per month (“peer use”).

Outcomes: Adulthood Multiple Partnerships and STI

Multiple partnerships—At Wave III, respondents were asked: “Have you ever had vaginal intercourse? With how many different partners have you had vaginal intercourse in the past 12 months?” Respondents were coded as having multiple past year partnerships if they reported 2 or more partners in the year prior to Wave III versus 0–1 partner.

Self-reported STI—Additionally, respondents were asked: “In the past 12 months, have you been told by a doctor or nurse that you had the following sexually transmitted diseases?” Response options included Chlamydia, gonorrhea, trichomoniasis, syphilis, genital herpes, HPV, or HIV. Self-reported STI was defined as responding yes to any of these infections versus no on all 6.

Biologically-confirmed STI—Wave III biologically-confirmed STI was defined as having a positive test result for Chlamydia, gonorrhea, or trichomoniasis on the urine specimen versus a negative result for all 3.

Covariates

Several covariates were controlled in multivariable analyses: age; maternal education (based on Wave I self-report if the mother was interviewed, otherwise by adolescent’s report); low functional income status in the past year at Wave III (based on ability to pay for housing and utilities); age of sexual initiation (based on having sex before age 16 vs. 16 and older); adolescent delinquent behavior; and adolescent alcohol use. In models estimating adjusted associations between peer marijuana use and STI risk outcomes, personal marijuana use (ever having used marijuana in adolescence) was included as a covariate so as to determine the nature of the relationship between peer use when controlling for one’s own use.

Data Analysis

Weighted prevalences of Wave III sociodemographic characteristics, Wave I marijuana use, and Wave III STI risk were estimated and compared by race. Logistic regression was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for the associations between sociodemographic characteristics and Wave I marijuana use. ORs and 95% CIs also were estimated for the associations between Wave I marijuana indicators and Wave III STI risk outcomes, by race. The significance of gender by marijuana indicator interaction terms was tested in both unadjusted and unadjusted models, and, when significant, gender-specific associations were presented. Analyses were run using SAS Version 9.2. The complex survey design of the data set was accommodated by using survey commands to account for stratification, clustering, and unequal selection probabilities.

RESULTS

Of the 18,924 Wave I participants with valid weights, 14,322 (75.7%) participated in Wave III. Of those who participated in Wave III, 1,130 (7.9%) refused to provide urine specimens for the STI tests, 226 (1.6%) were unable to provide specimens, 421 (2.9%) provided specimens that could not be processed due to shipping or laboratory problems, and 951 (6.6%) did not have results for all three tests. STI testing procedures, participation, and results are described in detail elsewhere.^{40,41} 10,592 of the 10,783 White and Black participants provided valid responses for the multiple partnership variable, 10,582 provided responses to self-reported STI questions, and 8,794 had valid results for all three STI tests.

Sociodemographic Characteristics

The analytic sample had a mean age of 21.8 years, was approximately equal in gender, and was 80.9% White and 19.1% Black (Table 1). Comparing Whites and Blacks, there were no significant gender or age differences between groups, nor were there any differences in report of delinquent behaviors; however marked differences in risk behaviors and socio-economic characteristics were observed. Specifically, Whites were significantly more likely to report ever using alcohol in adolescence (75.0% vs. 67.2%; $p<0.0001$), but were less likely to have engaged in sexual intercourse before 16 years of age (32.7% vs. 44.2%; $p<0.0001$) (not shown). Whites were also more likely to have mothers who attained more than a high school education (55.9% vs. 45.4%; $p<0.0001$) and were significantly less likely to report low functional income status in the past year at Wave III (12.6% vs. 20.3%; $p<0.0001$).

Sociodemographic Characteristics and Marijuana Use

Ever using marijuana in adolescence was less common among females than males and more common among older respondents (Table 1). Marijuana use was also more common among those who reported a younger age at sexual initiation and among those who reported having a low-functional income status at Wave III.

Marijuana Exposure by Race

At Wave I, more than one-quarter of adolescents reported ever using marijuana (27.4%), about one-tenth reported current use (10.5%), and nearly one-third reported that at least one of their best friends used marijuana in the past month (32.6%) (not shown). There were no significant differences between Whites and Blacks in reports of ever having used marijuana (27.6% vs. 26.4%; $p=0.20$) or of current marijuana use (10.5% vs. 10.9%; $p=0.47$). However, Whites were less likely than Blacks to report peer marijuana use (31.7% vs. 36.4%; $p<0.0001$).

Multiple Partnerships and STI by Race

At Wave III, Whites were significantly less likely than Blacks to report multiple partnerships (two or more) in the year prior to Wave III (27.2% vs. 37.4%; $p < 0.001$). Whites were also significantly less likely to self-report STI (3.4% vs. 11.4%; $p < 0.001$) and to have a biologically-confirmed STI at Wave III (3.2% vs. 10.9%; $p < 0.001$).

Associations: Adulthood Multiple Partnerships

Whites

Personal Use: In unadjusted analyses, Whites who reported ever having used marijuana in adolescence were more likely to have two or more partners in the year prior to Wave III (OR: 1.42, 95% CI: 1.16–1.75) (Table 2). When adjusting for confounding factors, the association between marijuana use and having two or more partners weakened and lost significance (adjusted OR (AOR): 1.10; 95% CI: 0.90–1.35). Likewise, current use was marginally associated with an increased likelihood of multiple partnerships in unadjusted associations (OR 1.19, 95% CI: 0.97–1.46), but the association lost significance in adjusted analyses.

Peer Use: In unadjusted and adjusted analyses, peer marijuana use was not significantly associated with multiple partnerships.

Blacks

Personal Use: Among Blacks, unadjusted analyses suggested that ever having used marijuana in adolescence was associated with having multiple past year partnerships (OR: 1.74, 95% CI: 1.26–2.40), but in adjusted analyses, the associations between marijuana use weakened and lost significance. Similarly, in unadjusted analyses, current use was associated with having multiple partnerships (OR 1.77, 95% CI: 1.19–2.64), but was not associated with adulthood multiple partnerships in adjusted analyses. However, there was a significant difference in associations between Black men and women in adjusted analyses, and it appeared that current use of marijuana in adolescence was associated with adulthood multiple partnerships among Black men (AOR: 1.85, 95% CI: 01.02–3.37), whereas current use was not associated with adulthood multiple partnerships among Black women.

Peer Use: In unadjusted analyses among Blacks, peer marijuana use in adolescence was not associated with adulthood multiple partnerships. However, controlling for confounders, analyses indicated that peer marijuana use was associated with multiple partnerships (AOR: 1.50, 95% CI: 1.00–2.23). Moreover, there was a significant difference in associations between Black men and women in adjusted analyses (men AOR: 3.10, 95% CI: 1.59–6.03; women AOR: 0.77, 95% CI: 0.49–1.22). The latter findings indicated that Black men who had best friends who used marijuana in adolescence were at a significantly elevated risk of multiple past year partnerships, whereas Black women whose friends used marijuana in adolescence are no more likely to have adulthood multiple partnerships than those whose friends did not use marijuana.

Associations: Adulthood Self-Reported STI

Whites

Personal Use: Unadjusted analyses among Whites indicated that those who had ever used marijuana in adolescence were nearly twice as likely to report a past-year STI in adulthood (OR: 1.94, 95% CI: 1.51–2.49) (Table 3). In adjusted analyses, this association weakened yet remained (AOR: 1.55, 95% CI: 1.00–2.39). Current marijuana use was also associated

with self-reported STI in unadjusted associations (OR: 1.87, 95% CI: 1.29–2.73), but was not associated with an increased likelihood of self-reported STI in adjusted analyses.

Peer Use: Among Whites, peer marijuana use was significantly associated with having an adulthood self-reported STI in unadjusted analyses (OR: 1.46, 95% CI: 1.08–1.99), though this association lost significance in adjusted analyses.

Blacks

Personal Use: In unadjusted and adjusted analyses among Blacks, ever using marijuana and current use of marijuana in adolescence were both associated with self-reported STI in adulthood (ever use OR: 1.82, 95% CI: 1.24–2.47; current use OR: 2.61, 95% CI: 1.69–4.02). In adjusted analyses, however, both associations weakened and lost significance.

Peer Use: Controlling for personal use, peer marijuana use was associated with self-reported STI in both unadjusted and adjusted analyses (OR: 1.64, 95% CI: 1.17–2.29; AOR: 1.63, 95% CI: 1.01–2.63), and there was a significant difference in associations for Black men and women in adjusted analyses. Black men who had best friends who used marijuana in adolescence are nearly eight times more likely to self-report a past-year STI than those who did not (AOR: 7.90, 95% CI: 2.62–23.80), while a null association between peer marijuana use and self-reported STI seems to exist among Black women (AOR: 0.93, 95% CI: 0.52–1.65).

Associations: Adulthood Biologically-Confirmed STI

Whites

Personal Use: Among Whites, there was no association between ever using marijuana in adolescence and biologically-confirmed STI in adulthood (Table 4). In both unadjusted and adjusted analyses, however, current use was associated with approximately twice the likelihood of a STI in adulthood (OR: 2.31, 95% CI: 1.34–3.99; AOR: 1.92, 95% CI: 1.03–3.59)

Peer Use: Peer marijuana use was not associated with biologically-confirmed STI.

Blacks

Personal Use: In unadjusted and adjusted analyses among Blacks, there was no association between ever using or currently using marijuana in adolescence and biologically-confirmed STI in adulthood. However, there was a marginally significant difference ($p < 0.10$) in the effect of current use between Black men and women in adjusted analyses; Black men who were currently using marijuana in adolescence were significantly *less* likely to have a biologically-confirmed STI in adulthood (AOR: 0.37, 95% CI: 0.14–0.96), whereas Black women who were currently using marijuana seem to be more likely to have a biologically-confirmed STI (though this association was not significant) (AOR: 2.03, 95% CI: 0.68–6.05).

Peer Use: In adjusted analyses, peer marijuana use appeared to be associated with elevations in biologically-confirmed STI (AOR: 1.62, 95% CI: 0.96–2.72) though the association was not significant at the 0.05 level. Though this association was not significant, and though there was not a significant gender interaction term, there is a material reason to present these adjusted associations by gender, given the previous findings of significant differences in the effects of peer marijuana use between Black men and women. However, in this case, the results are contrary to the previous two findings: it appears that Black men who had friends who used marijuana were not at a statistically significantly elevated risk of

biologically-confirmed STI (AOR: 1.25, 95% CI: 0.67–2.34), whereas Black women with friends who used marijuana in adolescence were twice as likely to have an STI (AOR: 1.96, 95% CI: 1.01–3.81).

DISCUSSION

This study was the first, to the authors' knowledge, to measure the degree to which adolescent marijuana use is a marker for and potential driving factor of STI risk behaviors and infection in racially diverse sub-populations of a nationally-representative sample. Additionally, this study expanded research on marijuana use and STI risk by examining the degree to which peer marijuana use, controlling for personal use, may influence STI risk and by using multiple indicators of STI risk, including biologically-confirmed measures of STI. Results of this study indicate that White and Black adolescents who use marijuana or who have friends who use marijuana experience elevated levels of STI risk in adulthood. Thus, this study provides further evidence of the link between adolescent marijuana use and adult STI risk behaviors,^{16,17,20} and it provides support for the need to target adolescent marijuana users in STI prevention programs.

Among both Whites and Blacks, those who used had ever used marijuana in adolescence had elevated risk of engaging in multiple partnerships and reporting STI as adults. Adjusted analyses, however, indicated that a history of adolescent marijuana use is not a consistent predictor of adulthood STI, suggesting that other factors associated with adolescent marijuana use likely account for adulthood STI risk. Nonetheless, these findings indicate that adolescents who experiment with marijuana -- even if use is not frequent or ongoing -- may constitute a priority population for programs that aim to reduce sexual risk and prevent STI in young adulthood.

Given that ever using marijuana in adolescence is an indicator of adulthood STI risk, it follows, then, that current adolescent marijuana use is also an indicator of adulthood risk; thus current users of marijuana in adolescents also represent a priority population for sexual risk preventions. In fact, unlike the indicator of ever using marijuana, currently using marijuana appeared to represent a consistent predictor of STI risk among Whites. Whites who used marijuana more than once in the month prior to the Wave I survey were approximately twice as likely as those who had not to report or test positive for an STI at Wave III, and adjusted analysis suggested that for this subpopulation, current marijuana use predicted nearly two times the odds of having an STI in young adulthood, independent of important sociodemographic confounding factors. As such, these results suggest that among Whites, current adolescent marijuana use may constitute a modifiable adulthood STI risk factor.

While current marijuana use was predictive of STI risk among Whites, the same was not observed among Blacks. Black adolescents, as a whole, who were currently using marijuana at Wave I had higher levels of adulthood multiple partnerships and self-reported STI than those who had not, but adjusted analyses suggested that current marijuana use was not an independent predictor of these outcomes among Black females, and that current use was associated with mixed findings for Black males. Specifically, among Black males, current use was predictive of elevated risk behaviors (evidenced by reporting multiple sex partners), but, unexpectedly, was also predictive of lower odds of testing positive for an STI at the Wave III survey. It is possible, however, that those who are in this group represent individuals who knowingly engage in risky behaviors (evidenced by their ongoing substance use and multiple partnerships), and thus recognize their need to get treated for their infections (thereby leading to disproportionate under-diagnosis at the one-time Wave III urine specimen). Alternatively, it is possible that drug use is not associated (or not

consistently associated) with biologically confirmed infection among Blacks because Black non-drug users have comparable levels of STI as Black drug users. The results suggest that while Black adolescents who use marijuana should remain a target population of sexual risk reduction given their elevated levels of partnerships, preventing marijuana use in adolescence is not likely to contribute to reductions in STI in this population.

While the indicator of adolescent use of marijuana use was an independent predictor of STI risk among Whites but not Blacks, peer use was a stronger and more consistent predictor of STI risk among Blacks than Whites, with the most consistent associations observed among Black men. Among Black males, having friends who used marijuana in adolescence was associated with both multiple past year partnerships and self-reported STI even when controlling for other sociodemographic and risk characteristics and for one's own marijuana use, thereby indicating that being involved in a peer group that uses marijuana may be predictive of subsequent sexual risk. Further, among all Blacks, adjusted analyses suggested that adolescent peer marijuana use appeared to predict elevations in biologically confirmed STI independent of other factors, though this association did not reach significance at the 0.05 level. These findings have important implications for addressing the race disparity in rates of infections among this vulnerable population and also for understanding network effects. That is to say, Blacks may be at disproportionate risk for STI not because of their own risky behaviors (such as substance use) but because they are associating with networks of drug users that are characterized by high levels of sexual risk-taking and elevated infection levels and are, subsequently, engaging in sex with risky partners. Black adolescents – especially males – who are involved in risky peer networks should thus be identified and targeted for prevention efforts that include warning them of the risk associated with being involved in risky groups.

In addition to the aforementioned findings, this study illuminated some of the important differences in associations between marijuana exposures and STI risk between gender as well as race groups. While the effects of marijuana use did not differ comparing White males and females, it appeared that the various effects of marijuana exposure differed significantly by gender among Blacks. Specifically, it appears that, in most cases, adolescent marijuana exposure is more so an indicator of STI risk among men than women. In fact, the one group whose STI risk seemed to be unrelated to marijuana exposure was Black females. That is, the results suggest that while all Black adolescents who use marijuana should remain a target population of sexual risk reduction given the elevated levels of multiple partnerships among Blacks who had used marijuana as adolescents, preventing use of marijuana in adolescence is not likely to contribute to reductions in STI in this population. This highlights the need to target Black males who are currently using marijuana or who are members of marijuana-using peer networks when implementing substance use prevention and sexual health programs and interventions. Further, given that women are more vulnerable to and bear the disproportionate burden of STIs,⁴² targeting the male sex partners who may be exposing women to STIs can, in turn, reduce the incidence of STI among women as well. In particular, this may represent an important prevention strategies for Black females, given that Black adolescents and young adult women aged 15–24 have the highest rates of STIs such as Chlamydia and gonorrhea of any racial/ethnic, gender, and age groups,¹ regardless of their exposure to risk through marijuana use.

Though the findings of this study have important public health implications, they should be interpreted in the context of a number of limitations. First, unmeasured, uncontrolled sociodemographic characteristics, psychosocial factors, and personality factors, such as impulsivity, may drive both marijuana use and STI risk thereby confounding the measured associations. Though this study attempted to control for general risk-taking tendencies by including a measure of delinquency in adjusted analyses and for general substance using

behaviors by including a measure of adolescent alcohol use, it is possible that other factors may account for the observed associations. Second, this study did not examine whether any adulthood characteristics mediated the relationship between adolescent marijuana exposure and adulthood STI risk (including, for example, *adulthood* marijuana exposure). Regardless of whether a mediating mechanism accounts for the observed associations, though, this study provides the important contribution of identifying an early marker of sexual risk that may be used to identify groups that are at risk for STI. Third this study uses limited measures of STI risk. Future studies should explore the effects of marijuana use on additional indicators of STI risk, such as condom non-use,^{8–10, 16} age at sexual initiation,⁴³ and sex trade.⁴⁴ Fourth, underreporting of sensitive information regarding risk behaviors including marijuana use, sexual risk-taking, and infection may produce biased estimates. Finally, future studies should examine the potential influence of marijuana use on STI risk in additional racial and ethnic sub-populations to most effectively address STI in all groups in the US.

These findings of the current study suggest that adolescent marijuana exposure may represent a modifiable predictor of STI risk in young adulthoods, and that marijuana users and members of their peer networks constitute priority populations not only for drug treatment and prevention but also for STI testing and treatment and sexual risk reduction efforts. Of Drug prevention programs have evidenced success when prevention activities are maintained over several years and integrate different strategies of regulatory approaches with treatment practices, brief interventions, and harm reduction strategies.⁴⁵ There is also evidence that integration of multiple intervention strategies may increase positive health outcomes,⁴⁶ suggesting the potential importance of drug treatment programs as a base for STI risk prevention among at-risk youth. If adolescent marijuana use contributes to STI risk, preventing adolescent marijuana use may lead to reductions in STI transmission and – given the prevalence of marijuana use among youth³ – such interventions would have important population-level implications for STI control.

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Table 1

Associations between Respondent Characteristics^a and Marijuana Use (Wave I) among 7,741 White and 3,042 Black Youth in the United States.

	N	Weighted % [†]	Weighted % That Have Ever Used Marijuana [†]	Unadjusted Odds Ratios (95% Confidence Intervals)
Sociodemographics				
Race				
White	7,741	80.9	27.6	Reference
Black	3,042	19.1	26.4	0.94 (0.72–1.22)
Sex				
Male	4,984	50.4	28.8	Reference
Female	5,799	49.6	25.9	0.86 (0.76–0.98)
Age (Years)				
18–20	2,682	28.7	10.4	Reference
21	1,867	17.0	26.4	3.08 (2.49–3.81)
22	1,981	16.4	31	3.86 (3.02–4.94)
23	1,995	15.6	38.7	5.42 (4.29–6.85)
24–28	2,258	22.4	39.4	5.59 (4.36–7.18)
Socio-economic Background				
Maternal Education (Wave I) [*]				
<High School Graduate	1,019	12.1	27.8	Reference
High School Graduate	2,719	33.2	25.5	0.90 (0.71–1.15)
College	5,123	54.8	26.2	0.92 (0.72–1.18)
Could Not Afford Housing or Utilities, Past Year (Wave III) [*]				
No	9,098	89.9	25.4	Reference
Yes	1,554	14.1	40.2	1.98 (1.67–2.34)
Adolescent Risk-Taking Behaviors (Wave I)				
Age at First Sexual Intercourse [*]				
16 Years or Older	6,163	65.0	23.3	Reference
< 16 Years Old	3,183	35.0	43.5	2.53 (2.27–2.83)
Adolescent Alcohol Use [*]				
No	1,569	26.3	5.8	Reference
Yes	4,388	73.7	37.6	3.67 (3.02–4.46)
Adolescent Delinquent Behavior				
No	2,383	23.0	2.2	Reference
Yes	8,354	77.0	25.2	4.60 (3.74–5.67)

^aThe analytic sample was 80.9% White, 19.1% Black. Totals may not sum to 7,741 White, 3,042 Blacks due to missing values.

[†]Survey commands accounted for stratification, clustering, and unequal selection probabilities yielded nationally representative estimates of White and Black young adults

* Differences between racial group was statistically significant at the $p < 0.05$ level

Table 2

Associations between Wave I Marijuana Exposure and Wave III 2+ Past Year Sex Partnerships among 10,783 White and Black Young Adults Aged 18–28 Years in the U. S.[†]

		Weighted % with 2+ Partners	Unadjusted OR (95% CI) [‡]	Adjusted OR (95% CI) [‡]
Whites				
Ever Use of Marijuana	No	29.9	Reference	Reference
	Yes	34.0	1.21 (1.03–1.41)	1.10 (0.90–1.35)
Current Use of Marijuana	No	34.0	Reference	Reference
	Yes	34.6	1.19 (0.97–1.46)	1.18 (0.93–1.49)
Peer Use of Marijuana	No	30.3	Reference	Reference
	Yes	33.0	1.03 (0.89–1.20)	1.13 (0.95–1.34)
Blacks				
Ever Use of Marijuana	No	37.8	Reference	Reference
	Yes	51.3	1.74 (1.26–2.40)	1.26 (0.79–2.12)
Current Use of Marijuana [*]	No	49.4	Reference	Reference
	Yes	54.0	1.77 (1.19–2.64)	1.29 (0.82–2.04) <i>Male: 1.85 (1.02–3.37)</i> <i>Female: 0.67(0.32–1.40)</i>
Peer Use of Marijuana [*]	No	38.1	Reference	Reference
	Yes	47.6	1.22 (0.93–1.58)	1.50 (1.00–2.23) <i>Male: 3.10 (1.59–6.03)</i> <i>Female: 0.77 (0.49–1.22)</i>

[†]Survey commands accounted for stratification, clustering, and unequal selection probabilities yielded nationally representative estimates of White and Black young adults.

[‡]Personal use exposures (ever or current use) adjusted for age, maternal education, respondent's low functional income at Wave III, adolescent alcohol use, adolescent delinquency, and age at first sexual intercourse; peer use adjusted for covariates and for personal report of ever use; peer use associations were measured controlling for personal use.

^{*}Gender interaction significant at the p<0.05 level

Table 3

Associations between Wave I Marijuana Exposure and Wave III Self-Reported STIs among 10,783 White and Black Young Adults Aged 18–28 Years in the U. S.[†]

		Weighted % with an STI	Unadjusted OR (95% CI) ⁺	Adjusted OR (95% CI) [‡]
Whites				
Ever Use of Marijuana	No	3.0	Reference	Reference
	Yes	3.8	1.94 (1.51–2.49)	1.55 (1.00–2.39)
Current Use of Marijuana [*]	No	2.2	Reference	Reference
	Yes	6.3	1.87 (1.29–2.73)	1.23 (0.74–2.03)
Peer Use of Marijuana	No	2.9	Reference	Reference
	Yes	3.8	1.46 (1.08–1.99)	1.34 (0.89–2.02)
Blacks				
Ever Use of Marijuana	No	18.4	Reference	Reference
	Yes	19.0	1.82 (1.33–2.47)	1.34 (0.82–2.19)
Current Use of Marijuana	No	19.0	Reference	Reference
	Yes	19.0	2.61 (1.69–4.02)	1.74 (0.99–3.05)
Peer Use of Marijuana [*]	No	17.3	Reference	Reference
	Yes	20.4	1.64 (1.17–2.29)	1.63 (1.01–2.63)
				<i>Male: 7.90 (2.62–23.80)</i>
				<i>Female: 0.93 (0.52–1.65)</i>

^aChlamydia, gonorrhea, trichomoniasis, syphilis, herpes simplex virus-2, or HIV in the past year at Wave III.

[†]Survey commands accounted for stratification, clustering, and unequal selection probabilities yielded nationally representative estimates of White and Black young adults.

[‡]Personal use exposures (ever or current use) adjusted for age, maternal education, respondent's low functional income at Wave III, adolescent alcohol use, adolescent delinquency, and age at first sexual intercourse; peer use adjusted for covariates and for personal report of ever use; peer use associations were measured controlling for personal use.

^{*}Gender interaction significant at the p<0.05 level

Table 4

Associations between Wave I Marijuana Exposure and Wave III Biologically-Confirmed STIs among 10,783 White and Black Young Adults Aged 18–28 Years in the U. S.[‡]

		Weighted % with STI	Unadjusted OR (95% CI) ⁺	Adjusted OR (95% CI) [‡]
Whites				
Ever Use of Marijuana	No	3.0	Reference	Reference
	Yes	3.8	1.28 (0.82–2.02)	1.08 (0.60–1.94)
Current Use of Marijuana	No	2.2	Reference	Reference
	Yes	6.3	2.31 (1.34–3.99)	1.92 (1.03–3.59)
Peer Use of Marijuana	No	2.9	Reference	Reference
	Yes	3.8	1.26 (0.82–1.94)	1.53 (0.88–2.66)
Blacks				
Ever Use of Marijuana	No	18.4	Reference	Reference
	Yes	19.0	1.04 (0.75–1.45)	1.14 (0.66–1.99)
Current Use of Marijuana [‡]	No	19.0	Reference	Reference
	Yes	19.0	1.03 (0.63–1.69)	0.77 (0.35–1.75) <i>Male: 0.37(0.14–0.96)</i> <i>Female: 2.03 (0.68–6.05)</i>
Peer Use of Marijuana	No	17.3	Reference	Reference
	Yes	20.4	1.25 (0.85–1.84)	1.62 (0.96–2.72)

^aChlamydia, gonorrhea, and trichomoniasis were tested at Wave III.

[‡]Survey commands accounted for stratification, clustering, and unequal selection probabilities yielded nationally representative estimates of White and Black young adults.

[‡]Personal use exposures (ever or current use) adjusted for age, maternal education, respondent's low functional income at Wave III, adolescent alcohol use, adolescent delinquency, and age at first sexual intercourse; peer use adjusted for covariates and for personal report of ever use; peer use associations were measured controlling for personal use.

⁺Gender interaction significant at the p<0.10 level.