# Sexual Orientation, Gender, and Racial Differences in Illicit Drug Use in a Sample of US High School Students

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Illicit drug use profoundly affects individual and societal health and places a heavy burden on the nation's healthcare systems.[1-3] Lesbian, gay, bisexual, and other sexual minority youths are at higher risk for illicit drug use and for drug use disorders than are heterosexuals.[4-11] Because of numerous chronic, socially based stressors[12] resulting from having a minority sexual orientation, sexual minority youths may develop deficits in healthy emotion regulation, which promotes negative affect,[13] and these youths may turn to maladaptive coping behaviors such as drug use.

Relatively little attention has been paid to subgroup differences in drug use within sexual minority populations (i.e., sexual orientation, gender, and racial subgroups) using large random samples with heterosexual comparison groups, although several studies have documented racial differences in drug use in community samples of young men who have sex with men (MSM).[14-20] Understanding these differences is critical for many reasons. First, identifying heterogeneity in drug use in sexual minorities will allow future research to more accurately delineate predictors of drug use within these subgroups. Additionally, this information will aid in the development and targeting of policies and programs for adolescent drug use. Finally, the identification of subgroup differences will inform the tailoring of interventions that aim to reduce drug use in sexual minority youths.

Evidence suggests that bisexual youths report the highest prevalence of illicit drug use compared with heterosexual and gay or lesbian youths.[5,21,22] However, most previous investigations have relied on measuring a single aspect of sexual orientation, such as identity labels or sexual behavior. Because self-adopted identity labels do not always correspond with sexual behavior, particularly in youths,[23-25] single-measure studies are not sufficient to understand potential differential effects of identity and behavior on drug use.

*Objectives*. We evaluated drug use differences between sexual minority and heterosexual students, including interactions with gender and race/ethnicity.

*Methods*. We used 2005 and 2007 Youth Risk Behavior Survey data pooled from Boston, Massachusetts; Chicago, Illinois; Delaware; Maine; Massachusetts; New York City, New York; Rhode Island; and Vermont to evaluate drug use (marijuana, cocaine, inhalants, heroin, methamphetamine, and MDMA [Ecstasy]) using 2 aspects of sexual orientation (identity and sex of sexual partners).

*Results*. Sexual minority students had higher prevalence of drug use than did heterosexuals on both sexual orientation dimensions, and differences were particularly pronounced among bisexual students on both dimensions. Differences between sexual minority and heterosexual male students in prevalence were generally larger than were differences between sexual minority and heterosexual female students. Racial minority students generally reported lower prevalence of drug use. However, the protective effect of African American race was less pronounced for some sexual minorities.

*Conclusions*. Sexual minority youths are at increased risk for drug use. Intervention is needed at the institutional and individual levels to address these disparities. (*Am J Public Health.* 2014;104:304–310. doi:10.2105/AJPH. 2013.301702)

Male youths and male adults have been found to use drugs at higher rates than do female youths and adults in the general population.[26-30] However, when comparing the drug use of sexual minorities to that of heterosexuals, differences between sexual minorities and heterosexuals are typically larger in female than in male respondents.[4,29] Some evidence even suggests that sexual minority female adolescents report higher prevalence of drug use than do sexual minority male adolescents.[4,10]

In terms of racial differences, White youths and White adults tend to report the highest prevalence of drug use, followed by Hispanics and Latinos, African Americans, and Asians.[26-32] Several studies of community samples of young MSM have found that African American young MSM (and to a lesser degree Hispanic or Latino young MSM) report lower prevalence and frequency of illicit drug use than do White young MSM.[14-19] However, random samples provide more generalizable estimates of the prevalence of substance use, and utilization of heterosexual

comparison groups allows the opportunity to investigate whether the magnitude and direction of these racial disparities differ in sexual minority youth populations from those of heterosexuals. Because of the dearth of research on drug use in sexual minority youths from random samples with heterosexual comparison groups, our study is a critical contribution to the literature related to the potential heterogeneity of drug use in sexual minority youths.

Using representative data from the 2005 and 2007 Youth Risk Behavior Survey pooled from multiple jurisdictions, we evaluated differences between sexual minority and heterosexual students in the prevalence of reporting lifetime marijuana, cocaine, inhalant, methamphetamine, heroin, and MDMA (Ecstasy) use using 2 measures of sexual orientation (identity and sex of sexual partners). We examined whether the magnitude and direction of gender and racial differences in drug use found in general populations differ in sexual minority students (i.e., interactions between gender, race/ethnicity, and sexual orientation).

On the basis of existing research, we hypothesized that sexual minority students would be more likely than would heterosexual students to report lifetime use of all substances examined,[4–11] and we expected that bisexual students would report the highest prevalence of use,[5,21,22] as measured on both dimensions of sexual orientation. We hypothesized that male students would report the highest prevalence of drug use,[26–30] but we anticipated an interaction between gender and sexual orientation in which female sexual minorities would have the highest overall prevalence of drug use.[4,10] Finally, we hypothesized that all racial minority groups would have lower prevalence of drug use than would White students[26–32] and that these differences would remain intact among sexual minority students.[14–19]

## METHODS

We analyzed a data set that pooled 2005 and 2007 Youth Risk Behavior Surveys from 14 jurisdictions that included 1 or more measures of sexual orientation. The approach to pooling the data and analysis, along with characteristics of the sample by jurisdiction, are described in detail elsewhere.[33] We analyzed data from the 8 jurisdictions that measured both sexual orientation identity and sex of sexual partners (behavior), including Boston, Massachusetts; Chicago, Illinois; Delaware; Maine; Massachusetts; New York City, New York; Rhode Island; and Vermont. The maximum unweighted sample size for the 8 jurisdictions included in these analyses was 49 307. The actual sample size for each analysis varied because of differences among survey items included by jurisdictions as well as differences in random missingness.

### Measures

We assessed all measures via self-report. We evaluated respondent gender as either male or female. We determined race/ethnicity with the following categories: White, Black or African American, Hispanic or Latino, Asian, American Indian or Alaskan Native, Native Hawaiian or other Pacific Islander, multiple Hispanic, and multiple non-Hispanic. We categorized respondents into White, African American, Hispanic or Latino, Asian, and other race/ethnicity (i.e., all other groups combined).

We used 2 sexual orientation measures. We evaluated self-reported sexual orientation identity with the following categories: gay or lesbian, bisexual, heterosexual, and not sure. We evaluated sexual orientation on the basis of the sex of respondents' sexual partners (behavior) with the following categories: same-sex sexual partners only, opposite-sex sexual partners only, both same- and opposite-sex sexual partners, and no sexual partners or virgin.

We assessed lifetime prevalence of drug use for each drug examined (marijuana, cocaine, inhalants, methamphetamine, heroin, and MDMA) using the following question: "During your life, how many times have you used [insert drug type]?" Alternative street names were provided for each drug assessed. Response options included 0 = 0 times, 1 = 1 to 2 times, 2 = 3 to 9 times, 3 = 10 to 19 times, 4 = 20 to 39 times, and 5 = 40 or more times (note that the marijuana item utilized a 7-point Likert scale). For all analyses, we used dichotomous drug use variables to examine lifetime use of each of the 6 drugs. We excluded those who did not respond to the sexual orientation items or who had missing data on covariates and variables of interest from our analyses.

### Statistical Analysis

We accounted for the complex sampling design of the Youth Risk Behavior Survey in analyses by adjusting the relative weights and altering the effective sample size for each jurisdiction. We conducted analyses with HLM version 7 (Scientific Software International, Lincolnwood, IL), which accounted for clustering of data by entering jurisdiction at level 2 in each model. We ran multivariate models for all 6 drug use outcome variables in HLM, examining the influence of age, gender (dummy-coded), race/ethnicity (dummy-coded), and sexual orientation (both sexual orientation identity dummy-coded and sex of sexual partners dummy-coded) on each dichotomous drug variable. Next, we entered interaction terms into each of the 6 models examining the interaction effects of gender, African American race (vs White), and Hispanic or Latino ethnicity (vs White) with sexual orientation (both identity and sex of sexual partners). We were not able to examine interactions between other racial groups and sexual orientation because of low

numbers of students in each of the sexual orientation categories from these racial/ethnic groups.

## RESULTS

Table 1 shows the lifetime prevalence of drug use for all 6 drugs split by respondent sexual orientation and gender. Note than we have reported overall prevalence and not statistically significant differences. Among male students on the sexual orientation identity dimension, bisexual male students reported the highest prevalence of use of all drugs except marijuana, for which gay male students reported the highest prevalence. Among female students, bisexuals reported the highest prevalence of marijuana, cocaine, and inhalant use, whereas lesbians reported the highest prevalence of methamphetamine and heroin use. There were negligible differences between lesbian and bisexual female students in MDMA use. Across genders, bisexual male students reported the highest prevalence of use of all drugs except marijuana, for which bisexual female students reported the highest prevalence.

In terms of sexual behavior, both male and female students who had partners of both sexes reported the highest prevalence of drug use across all drugs. Overall, male students with partners of both sexes reported the highest prevalence of use of all drugs except marijuana, for which female students with partners of both sexes reported the highest prevalence. Students with no lifetime sexual partners reported the lowest prevalence of drug use.

### Age, Gender, Race/Ethnicity, and Sexual Orientation Differences

Table 2 summarizes age, gender, race/ethnicity, and sexual orientation (identity and behavior) differences in each of the 6 drug outcomes after adjusting for all other variables in the model. Note that Table 2 presents odds ratios (ORs) as opposed to prevalence of drug use and that the relative odds of drug use change depending on which covariates are included in multivariate models. In this model, age was associated with increased odds of marijuana, cocaine, and MDMA use but decreased odds of inhalant and heroin use. Age was not associated with methamphetamine

TABLE 1—Prevalence of Lifetime Drug Use, Split by Sexual Orientation Groups and Gender: Youth Risk Behavior Survey, United States, 2005 and 2007

| Variable | Marijuana (n = 35 185), % (SE) | Cocaine (n = 37 142), % (SE) | Inhalants (n = 28 468), % (SE) | Methamphetamine (n = 49 222), % (SE) | Heroin (n = 49 307), % (SE) | MDMA (n = 36 801), % (SE) |
|---|---|---|---|---|---|---|
| **Male students** | | | | | | |
| Sexual identity | | | | | | |
| Gay or lesbian | 58.1 (4.8) | 24.7 (3.9) | 18.8 (3.9) | 18.7 (3.9) | 16.6 (3.3) | 20.8 (4.5) |
| Bisexual | 49.6 (5.5) | 26.4 (4.6) | 32.2 (6.4) | 30.5 (5.9) | 27.9 (5.8) | 32.7 (5.8) |
| Unsure | 28.9 (4.0) | 16.7 (3.3) | 19.0 (3.9) | 14.0 (2.7) | 15.6 (2.9) | 17.1 (3.1) |
| Heterosexual | 39.2 (0.9) | 6.0 (0.4) | 8.0 (0.5) | 3.3 (0.2) | 2.1 (0.1) | 4.8 (0.3) |
| Sexual orientation behavior | | | | | | |
| Same-sex partners only | 60.4 (4.2) | 15.3 (2.6) | 22.4 (3.7) | 12.9 (2.6) | 11.1 (2.2) | 13.3 (2.4) |
| Both-sex partners | 63.5 (5.3) | 42.3 (4.1) | 34.9 (5.1) | 36.4 (4.7) | 31.5 (5.0) | 39.6 (4.6) |
| No sex | 16.5 (0.8) | 1.5 (0.2) | 5.7 (0.4) | 0.9 (0.2) | 0.6 (0.1) | 0.9 (0.2) |
| Opposite-sex partners only | 53.0 (0.9) | 8.5 (0.5) | 10.3 (0.7) | 4.9 (0.3) | 3.2 (0.2) | 7.1 (0.5) |
| Total male students | 39.5 (0.8) | 7.0 (0.3) | 9.6 (0.5) | 4.5 (0.2) | 3.2 (0.2) | 5.9 (0.3) |
| **Female students** | | | | | | |
| Sexual identity | | | | | | |
| Gay or lesbian | 59.3 (5.6) | 12.3 (3.2) | 10.9 (3.2) | 10.1 (3.0) | 12.1 (3.6) | 15.9 (3.5) |
| Bisexual | 64.3 (2.6) | 16.4 (1.9) | 23.2 (2.3) | 7.2 (1.2) | 4.6 (0.9) | 15.3 (2.0) |
| Unsure | 31.9 (3.3) | 7.8 (2.0) | 20.6 (3.3) | 3.6 (1.0) | 3.6 (1.1) | 5.9 (1.6) |
| Heterosexual | 33.0 (0.9) | 3.6 (0.3) | 8.1 (0.5) | 1.8 (0.2) | 0.8 (0.1) | 3.4 (0.3) |
| Sexual orientation behavior | | | | | | |
| Same-sex partners only | 50.7 (4.8) | 10.4 (2.1) | 12.4 (3.4) | 6.1 (1.8) | 7.3 (1.7) | 10.5 (1.9) |
| Both-sex partners | 70.7 (2.5) | 21.7 (2.3) | 27.3 (2.4) | 12.8 (1.7) | 7.7 (1.3) | 20.8 (2.0) |
| No sex | 13.5 (0.8) | 0.9 (0.2) | 7.0 (0.9) | 0.5 (0.1) | 0.2 (0.1) | 0.5 (0.1) |
| Opposite-sex partners only | 50.0 (1.1) | 5.6 (0.4) | 10.0 (0.6) | 2.6 (0.2) | 1.2 (0.2) | 5.5 (0.4) |
| Total female students | 34.8 (0.9) | 4.5 (0.3) | 9.6 (0.4) | 2.3 (0.2) | 1.3 (0.1) | 4.2 (0.3) |
| Total students | 37.1 (0.7) | 5.8 (0.2) | 9.6 (0.4) | 3.3 (0.2) | 2.2 (0.1) | 5.1 (0.2) |

*Note.* MDMA = Ecstasy. Data were weighted to account for the complex sampling design of the Youth Risk Behavior Survey. The total number varies by the substance category because of differences among survey items included by jurisdictions and random absence.

use. Male students had higher odds of marijuana, cocaine, methamphetamine, heroin, and MDMA use than did female students, but there was no gender difference in odds of inhalant use. Compared with White students, African American, Hispanic or Latino, Asian, and other race/ethnicity students had significantly lower odds of marijuana, cocaine, and MDMA use. Asian students did not differ significantly from White students in odds of heroin use, and other race/ethnicity students did not differ from White students in odds of inhalant, methamphetamine, and heroin use.

In terms of sexual orientation identity, all sexual minority identities (i.e., gay or lesbian, bisexual, and unsure) had significantly higher odds of cocaine, inhalant, methamphetamine, heroin, and MDMA use than did heterosexually identified students. Only bisexual students

had higher odds of marijuana use than did heterosexuals. With regard to sexual behavior, students with partners of both sexes had significantly higher odds of use of all drugs than did those with opposite-sex partners only. Students with same-sex partners only had significantly higher odds of use of all drugs except marijuana and inhalants, for which they did not significantly differ from students with opposite-sex partners only. Students with no sex behavior had lower odds of use of all drugs than did students with opposite-sex partners only.

### Interactions Between Gender, Race/Ethnicity, and Sexual Orientation

There was a significant interaction between gender and bisexual identity in describing odds of inhalant ($P < .05$), methamphetamine

($P < .001$), heroin ($P < .001$), and MDMA ($P < .001$) use (Figure 1). For each association, differences between bisexual male students and heterosexual male students in odds of use were larger than were differences between bisexual and heterosexual female students; bisexual male students had the highest prevalence of use. We found a similar pattern for the interaction between gender and gay or lesbian identity in describing odds of cocaine use ($P < .05$), the interaction between gender and unsure identity in describing odds of methamphetamine ($P < .05$) and heroin ($P < .05$) use, and the interaction between gender and having partners of both sexes in describing odds of cocaine ($P < .01$), inhalant ($P < .01$), methamphetamine ($P < .001$), heroin ($P < .001$), and MDMA ($P < .01$) use.

TABLE 2—Summary of Multivariate Analyses of Demographic Differences in Drug Use: Youth Risk Behavior Survey, United States, 2005 and 2007

| Main Effect | Marijuana (n = 35 185), OR (95% CI) | Cocaine (n = 37 142), OR (95% CI) | Inhalants (n = 28 468), OR (95% CI) | Methamphetamine (n = 49 222), OR (95% CI) | Heroin (n = 49 307), OR (95% CI) | MDMA (n = 36 801), OR (95% CI) |
|---|---|---|---|---|---|---|
| Age | 1.18* (1.14, 1.22) | 1.09* (1.02, 1.17) | 0.80* (0.77, 0.84) | 1.03 (0.96, 1.11) | 0.89* (0.81, 0.98) | 1.12* (1.05, 1.19) |
| Birth sex is male | 1.14* (1.05, 1.23) | 1.67* (1.42, 1.96) | 0.97 (0.87, 1.08) | 2.18* (1.80, 2.65) | 3.24* (2.50, 4.22) | 1.60* (1.38, 1.85) |
| Race/ethnicity | | | | | | |
| White (Ref) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| African American | 0.68* (0.62, 0.75) | 0.26* (0.20, 0.34) | 0.47* (0.39, 0.56) | 0.38* (0.28, 0.51) | 0.58* (0.41, 0.81) | 0.31* (0.24, 0.40) |
| Hispanic or Latino | 0.56* (0.50, 0.63) | 0.41* (0.32, 0.53) | 0.66* (0.55, 0.80) | 0.35* (0.24, 0.50) | 0.47* (0.31, 0.73) | 0.40* (0.31, 0.52) |
| Asian | 0.26* (0.21, 0.32) | 0.43* (0.27, 0.69) | 0.62* (0.46, 0.84) | 0.49* (0.27, 0.87) | 0.96 (0.54, 1.73) | 0.54* (0.35, 0.84) |
| Other | 0.72* (0.64, 0.81) | 0.69* (0.55, 0.87) | 0.87 (0.74, 1.04) | 0.86 (0.66, 1.13) | 1.04 (0.76, 1.44) | 0.73* (0.59, 0.91) |
| Sexual orientation identity | | | | | | |
| Heterosexual (Ref) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Gay or lesbian | 1.40 (0.94, 2.07) | 1.84* (1.14, 2.97) | 1.86* (1.25, 2.76) | 2.11* (1.30, 3.42) | 2.69* (1.61, 4.50) | 1.73* (1.13, 2.65) |
| Bisexual | 1.73* (1.36, 2.20) | 2.01* (1.44, 2.80) | 2.07* (1.64, 2.62) | 2.49* (1.74, 3.57) | 2.78* (1.80, 4.29) | 2.08* (1.54, 2.79) |
| Unsure | 0.78 (0.58, 1.05) | 2.24* (1.45, 3.45) | 2.63* (2.00, 3.46) | 3.04* (1.97, 4.68) | 4.72* (2.98, 7.47) | 2.33* (1.60, 3.40) |
| Sexual orientation behavior | | | | | | |
| Opposite sex only (Ref) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Same sex only | 0.91 (0.69, 1.22) | 1.69* (1.11, 2.57) | 1.30 (0.91, 1.85) | 2.28* (1.48, 3.53) | 3.31* (2.06, 5.32) | 1.75* (1.19, 2.57) |
| Both sexes | 1.70* (1.33, 2.17) | 3.41* (2.52, 4.63) | 2.33* (1.83, 2.95) | 4.13* (2.98, 5.73) | 5.57* (3.79, 8.21) | 3.70* (2.82, 4.86) |
| No sex or virgin | 0.18* (0.16, 0.20) | 0.16* (0.12, 0.21) | 0.47* (0.42, 0.54) | 0.15* (0.11, 0.20) | 0.13* (0.09, 0.20) | 0.11* (0.08, 0.14) |

*Note.* CI = confidence interval; MDMA = Ecstasy; OR = odds ratio. The actual sample size for each analysis varies because of differences among survey items included by jurisdictions and differences in random absence.
*$P$ < .05.

For interactions between race/ethnicity and sexual orientation, there was a significant interaction between African American race and unsure identity in describing odds of cocaine ($P$<.01), heroin ($P$<.05), and MDMA ($P$<.01) use (Figure 2). For each association, drug use differences between African American and White students (i.e., lower odds among African Americans) were less pronounced among students with unsure identity: being African American was less protective among unsure students.

We found a similar pattern showing less pronounced drug use differences between African Americans and Whites for sexual minority students for the following interactions: African American race and bisexual identity in describing odds of heroin and MDMA use (both $P$<.05); African American race and having same-sex partners only in describing odds of cocaine use ($P$<.05); and African American race and having partners of both sexes in describing odds of heroin ($P$<.01) and MDMA ($P$<.001) use.

There was only 1 significant interaction between Hispanic or Latino ethnicity and sexual orientation: the interaction between Hispanic or Latino ethnicity and bisexual identity in describing odds of methamphetamine use ($P$<.05). The racial difference in odds of methamphetamine use (i.e., lower odds of use in Hispanic or Latinos than in Whites) was substantially larger among bisexuals. White bisexual students had the highest prevalence of methamphetamine use.

## DISCUSSION

Consistent with our hypotheses and with previous studies,[4–11] sexual minority students endorsed a higher lifetime prevalence of drug use than did heterosexuals for all drugs, including marijuana, cocaine, inhalants, methamphetamine, heroin, and MDMA. When considering differences by sexual orientation identity, all sexual minority identity groups (gay or lesbian, bisexual, and unsure) had significantly higher prevalence of use of all drugs than did heterosexuals except marijuana, for

which only bisexually identified students had significantly higher prevalence. Similarly, when measuring sexual orientation by sex of sexual partners, students with same-sex partners only or partners of both sexes had significantly higher prevalence of cocaine, methamphetamine, heroin, and MDMA use than did students with opposite-sex partners. In terms of marijuana and inhalant use, only students with partners of both sexes had significantly higher prevalence. Finally, in tests of interactions between gender, race/ethnicity, and sexual orientation we found several significant effects, indicating that the magnitude and direction of the drug use disparities between sexual minority and heterosexual students varied by gender and race/ethnicity.

Overall, male students reported higher prevalence of use of all drugs except inhalants, for which there were no gender differences. However, there were several significant interactions between gender and sexual orientation, indicating that differences between sexual minority and heterosexual students were generally larger in male than in female students
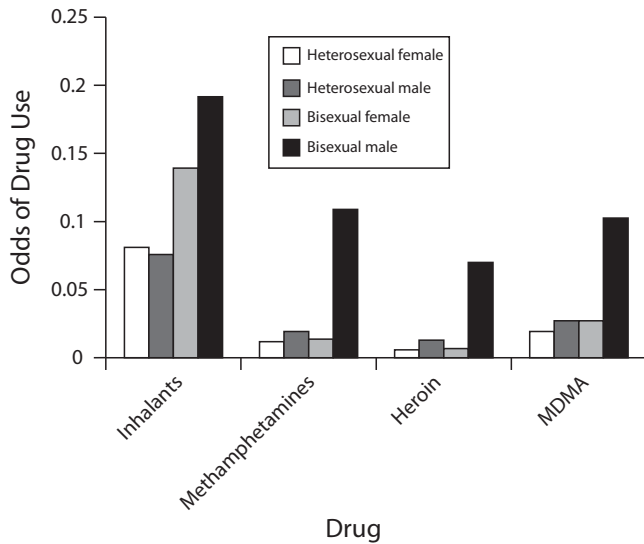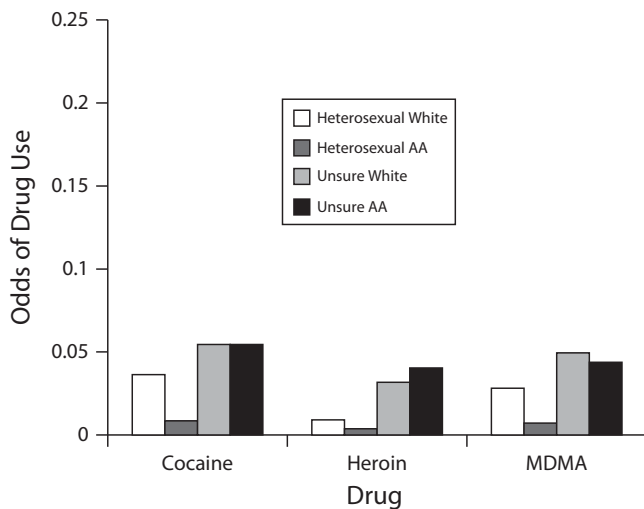
*Note.* MDMA = Ecstasy. All interactions presented are statistically significant at *P* < .05. Odds of drug use were generated by multivariate analyses.

**FIGURE 1—Interaction between gender and bisexual identity in describing odds of drug use: Youth Risk Behavior Survey, United States, 2005 and 2007.**

(although these interactions were only significant for bisexually identified and unsure students and for students with partners of both sexes). These groups of male sexual minorities reported the highest prevalence of use of all drugs except marijuana, which contradicts

previous findings that female sexual minority youths reported the highest prevalence of drug use.[4,10] There may be differences in the longitudinal growth of substance use between male and female sexual minorities so that female sexual minorities have lower initials rates of use

but faster acceleration over time.[34] The cross-sectional nature of our analyses did not allow us to observe growth. However, our analyses are unique in that we were able to observe drug use disparities in youths from multiple jurisdictions from across the United States, and these analyses had sufficient power for us to examine interactions between gender and multiple indicators of sexual orientation (both identity and behavior). Thus, these results may provide a more generalizable estimate of associations between gender, sexual orientation, and drug use in adolescents.

In terms of racial differences, African Americans and Hispanics or Latinos had lower odds of use of all drugs than did Whites for the sample as a whole, which is consistent with research in the general population.[26–32] Interestingly, there were several significant interactions between race/ethnicity and sexual orientation, indicating that some drug use differences between African American and White students (i.e., lower odds among African Americans) were less pronounced among bisexually identified and unsure students as well as students who reported sexual partners of both sexes. Of note, this reduced disparity was isolated to odds of cocaine, heroin, and MDMA use. These interactions indicate that having a bisexual or unsure identity and experiencing the various social stressors associated with being a sexual minority[12,13] may negate the protective effects of African American race on the risk of using some drugs.

Because of the dearth of research on racial differences in substance use in sexual minority youth populations, further research is needed to describe the mechanisms behind this interaction and to examine whether gay- or lesbian-identified African American youths do in fact retain the protective effect of their racial minority status (as we found). Finally, the vast majority of interactions between Hispanic or Latino ethnicity and sexual orientation were nonsignificant, suggesting that drug use differences between White and Hispanic or Latino students are similar in sexual minorities.

Also notable was the similar patterning of drug use disparities between sexual minority students and heterosexuals when examining 2 different aspects of sexual orientation: identity (gay or lesbian, bisexual, heterosexual, or



*Note.* AA = African American; MDMA = Ecstasy. All interactions presented are statistically significant at *P* < .05. Odds of drug use were generated by multivariate analyses.

**FIGURE 2—Interaction between African American race and unsure identity in describing odds of drug use: Youth Risk Behavior Survey, United States, 2005 and 2007.**

unsure) and sex of sexual partners (same sex only, opposite sex only, both same and opposite sex, or no sex). Students with a sexual minority identity reported a consistently higher prevalence of drug use, which was especially pronounced in bisexually identified students. Having a nonheterosexual identity may be associated with stressors that confer risk for drug use,[12,13] such as victimization and societal homophobia. Furthermore, bisexually identified students may experience different types of sexual minority stress from that of gays or lesbians, including discrimination and stigma from both heterosexuals and gays or lesbians (i.e., biphobia), which may contribute to their elevated odds of drug use.[35,36]

Interestingly, although unsure students generally had a lower lifetime prevalence of drug use than did gays or lesbians and bisexuals, unsure students had the highest odds of drug use (except marijuana) in multivariate analyses that adjusted for demographic differences and sexual behavior. Unsure students may experience exacerbated sexual minority stress or additional distress related to identity confusion that may confer greater risk of drug use. Longitudinal studies would help to determine whether identity resolution results in reduced odds of drug use over time in these youths, regardless of final orientation. Furthermore, this finding speaks to the importance of considering multiple dimensions of sexual orientation in analyses, as single-dimension analyses may mask important effects in subgroups of sexual minorities.

A somewhat parallel pattern was found for the sexual orientation behavior dimension; students with partners of both sexes had consistently higher prevalence of use of all drugs. Students with same-sex partners only had significantly higher prevalence of cocaine, methamphetamine, heroin, and MDMA use than did students with opposite-sex partners only, but they did not differ in prevalence of marijuana and inhalant use. Across both dimensions of sexual orientation (identity and behavior), the highest prevalence of drug use for all drugs was reported by students who had partners of both sexes. However, reporting sex with both male and female partners requires respondents to have had multiple sexual partners, which therefore confounds number of sexual partners with sexual orientation.

Sexually experienced youths are more likely to be disinhibited and impulsive,[37,38] both of which are associated with drug use in youths,[39–41] which may partially explain the elevated prevalence of drug use in behaviorally bisexual students. However, the convergent finding with bisexual identity suggests this may be an effect of bisexuality rather than an artifact of the measurement of sexual partners. Taken together, our findings indicate that it is important to consider multiple dimensions of sexual orientation when evaluating differences in drug use.

Further research is needed to examine the unique experiences of students that fall within varying sexual orientation subgroups, including how adopting an identity label or engaging in sexual behavior may predict or co-occur with drug use. It is possible that risk factors for drug use differ within these groups, and identification of these factors will help in the development of interventions that target drug use for those at highest risk.

## Limitations

Study results must be interpreted in the context of several limitations. Although a main asset of these analyses was the use of representative data from 8 jurisdictions, results are not generalizable beyond these jurisdictions. The surveys we used are cross-sectional, so we cannot rule out the possibility that uncontrolled confounding variables (e.g., personality traits, environmental or context factors) may have influenced our findings.

Additionally, although we tested many interactions between gender, race/ethnicity, and sexual orientation in multivariate analyses, there were limited numbers of sexual minority students who endorsed drug use in certain racial groups (e.g., Asian students), which precluded our ability to examine these effects. These power issues also precluded analyses of higher order (i.e., 3-way) interactions.

Finally, most variables we used were single items, and some items included in our analyses were inconsistent across state surveys. We were able to pool similar items to facilitate the use of all data, but more comprehensive and uniform approaches to assessing drug use and related constructs using community samples would be important supplements to these findings.

## Conclusions

We have provided novel, to our knowledge, information for future research and intervention development. Despite significant national progress both politically and socially in acceptance of sexual minorities over the past several decades, sexual minority youths continue to be at increased risk for drug use, likely because of the experience of socially based stressors.[12,13] Critical intervention work is needed at both the institutional and individual levels to address these disparities. Knowledge of subgroup differences in prevalence of drug use can help public health officials and policymakers develop targeted health campaigns, as well as prevention and treatment interventions, to at-risk groups.

Furthermore, evidence suggests that drug use does not occur in isolation, rather it is 1 of multiple overlapping risk behaviors that act synergistically to confer risk for multiple health concerns.[42] Therefore, addressing drug use through prevention interventions may also alleviate risk for other mental and physical health conditions, including (but not limited to) depression, suicide, interpersonal violence, and HIV/AIDS.[43] ■

### About the Authors

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## Human Participant Protection

Protocol approval was not necessary because de-identified data were obtained from secondary sources.

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