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Examining the Relationship of Substance Use and Sexual Orientation

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In this article we examine the effects of self-reported sexual orientation on substance abuse. Using data on a random sample of 6,713 individuals in Washington State, this study examines causes and correlates of substance use by sexual minorities, an at-risk and treatment underserved population. Logistic regression results indicate homosexual orientation is a significant positive predictor of past year marijuana use, past year hard drug use, past year binge drinking, and lifetime alcohol addiction. Bisexual orientation is a significant predictor of past year marijuana use, past year hard drug use, and past year binge drinking. Potential causal mechanisms for these elevated patterns of substance use are discussed.

Lesbian, gay, and bisexual (LGB) populations¹ display rates of substance use that are substantially higher than the general population (Cochran et al. 2004; McCabe et al. 2009). While this correlation is well established in the literature, the causal mechanism for elevated substance use in sexual minorities is complicated, manifold, and uncertain (GLMA 2001). Patterns and correlates of drug use by this population are poorly understood in part because the drug-using LGB population is difficult to access, yielding insufficient samples for generalizable findings. Improved measures of prevalence and patterns of substance use in sexual minority populations are critical for a variety of reasons: First, a variety of recreational substances increase the risk of HIV transmission, a critical concern in the community (GLMA 2000). Second, accurate knowledge of use patterns is necessary for directing effective treatment programs toward this at-risk population, which may be underserved by existing treatment options (Cochran et al. 2007; Merighi et al. 2011). Third, sexual minorities are disproportionately likely to commit suicide

¹The current article, due to data constraints specified below, focuses on LGB along with heterosexuals. Our data do not enable us to examine individuals identifying as transgendered or queer or questioning (respectively, the “T” and “Q” in LGBTQ) or other sexual minority identities. Although LGBTQ populations are often combined and presented as a single entity for either research or advocacy purposes, these are distinct groups with distinct concerns (IOM 2011). Furthermore, it is important to acknowledge that the experiences of these sexual minority populations “are not uniform and are shaped by factors of race, ethnicity, socioeconomic status, geographical location, and age, any of which can have an effect on health-related concerns and needs” (IOM 2011:1).

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(Bolton and Sareen 2011) and be the victims of violent crime and child abuse (Hughes et al. 2010), and enhanced knowledge of the role of substance use in these relationships may help improve the health and safety of this population. This study seeks to improve our understanding of substance use of sexual minorities with generalizable findings drawn from data from a detailed large-scale survey of a Northwest United States sample.

BACKGROUND

Sampling is the first issue to address in establishing this study's place in the existing literature. Sampling and population access are significant barriers to analyzing drug use by any hard to reach group, such as sexual minority populations. The majority of research on this topic has been conducted using either convenience samples or targeted samples that may not represent the general population, such as club drug studies, or high school and college samples that suffer from well-established limitations (GLMA 2001; Mosher and Akins 2007). Consequently, our understanding of drug use among adolescent sexual minorities is clearer than that of adult sexual minorities. As the majority of individuals in the general population age out of drug use (Hirschi and Gottfredson 1983; Mosher and Akins 2007), along with other forms of criminal behavior, it is critical that we analyze drug use in the entire age range of the LGB community.

Additionally, as we hope to inform public health and drug policy efforts, it is critical that findings be generalizable. While research based on convenience samples, case studies, and adolescent surveys provide valuable insight on this hard to study topic, the results of such studies cannot be generalized to the broader population. Additionally, the most reliable and commonly used nationwide surveys that account for substance abuse, such as Monitoring the Future and the National Survey on Drug Use & Health, do not record respondent self-identified sexual orientation. Consequently some past large sample studies have relied on inferred sexual orientation measures such as gender of past sexual partners that appear to under-report LGB sexual orientation and produce uncertain results (Cochran et al. 2004). While this study does not utilize a nationwide sample, the data were obtained from the relatively large-scale ($N = 6,713$) 2003 Washington State Needs Assessment Household Survey (WANAHS), which was specifically designed to measure the prevalence of substance use and the need for substance abuse treatment, (WSDSHS 2010) with oversampling of young adults, minorities populations living in poverty, and other hard to reach groups. As a result, we have a unique opportunity to view substance use patterns of a statistically robust quantity of sexual minority individuals.

Identification of a clear causal mechanism for elevated substance use by sexual minorities has proven challenging. Though by no means exhaustive, a variety of potential mechanisms have been identified including psychological factors, social learning, and social bonds. The marginalization and stigmatization of sexual minorities results in magnification of the psychological risk factors for substance use; LGB individuals report higher levels of stress, discrimination, abuse, depression, and other mental health-related predictors of substance abuse (Bolton and Sareen 2011; McCabe et al. 2010). Reported high levels of polydrug and club drug use in the LGB community may indicate greater social acceptance of substance use (Halkitis and Palamar 2008; Parsons et al. 2006). In line with social control theories, LGB individuals often experience broken bonds with family (Padilla et al. 2010) and higher school dropout rates (Callahan 2001). These are established predictors of substance abuse and other forms of deviance (Hirschi 1969; Mosher and Akins 2007), and respondents in past surveys of sexual minority health have

indicated weak community ties as a risk factor for drug use (GLMA 2000). Studies that include controls for these important psychosocial factors still reveal elevated substance use levels by sexual minorities as compared to the general population.

Psychological Factors

The association between psychological issues and sexual minority identification is well established (Bolton and Sareen 2011; Cochran et al. 2003; Ueno 2005). LGB individuals are more likely to experience prejudice, discrimination, and abuse of all kinds (McCabe et al. 2010). As a result, the LGB population displays higher rates of diagnosed mental disorders (Bolton and Sareen 2011) as well as self-reports of depression, anxiety, difficulties with intimacy, and suicidal thoughts (GLMA 2000). Research on the LGB community has identified correlations between these psychological issues and risk-taking behavior such as drug use (Saewyc et al. 2006; Shoptaw and Reback 2007). Increased levels of drug use in the sexual minority population may be predicted by psychological theories of drug use such as problem behavior theory, which is based on the manifestation of risk-seeking urges, and self-derogation theory, where substance use is considered an attempt to mitigate low self-esteem (Jessor and Jessor 1975; Kaplan 1980). Research has indicated that in some cases drugs, methamphetamine in particular, are taken primarily to overcome low self-esteem and psychosexual issues believed to be more common in sexual minority populations (Halkitis et al. 2005, 2007).

Most forms of drug use are positively correlated with psychological issues, particularly depression, anxiety, and suicidal thoughts (SAMHSA 2009). Research has found that individuals subject to abuse and neglect in childhood, particularly sexual minorities, have higher rates of substance abuse (Hughes et al. 2010). Similarly, a recent study by McCabe and colleagues (2010) found that exposure to discrimination significantly increased risks of substance use disorders. Many, but not all, studies of substance abuse in the LGB community take into account psychological factors, and the analyses presented in this study include a scale capturing emotional health.

Social Learning/Norms

Social norms may play a significant role in increased LGB substance use as researchers have indicated elevated acceptance of substance use in particular LGB communities (Halkitis et al. 2007). A contributing factor to this is that illicit drug use may be considered normative in bars and clubs catering to LGB individuals (Parsons et al. 2006). The subcultural learning theory of drug use states that individuals are socialized into substance use in subcultures where such behavior is valued and accepted (Goode 1970). This is empirically supported by case studies on club drug use, including recent research on the progression of club drug initiation (Halkitis and Palamar 2008). Similarly, some evidence suggests that lesbian and bisexual women have drug use patterns that are distinct from heterosexual women, as well as from homo- and heterosexual men. These findings may be indicative of differing underlying causal relationships or a weaker protective effect of female gender for sexual minorities (McCabe et al. 2009; Parsons et al. 2006). The 2003 WANAHS does not contain measures of community norms or social learning, so we are unable to estimate the impact of these factors in our models. More research is warranted into the effects of social learning on sexual minority substance use in representative samples.

Social Bonding

Social bonding theory proposes that substance use is inversely related to the strength of conventional social bonds, such as those to family, work, conforming peers, and school (Hirschi 1969). As compared to those of heterosexual orientation, sexual minorities may be more likely to experience weak social bonds as adolescents for a variety of reasons. For instance, research by Ueno has indicated that sexual minority adolescents experience weaker emotional bonds to family, peers, and teachers, and that their social networks are weaker than the social networks of other minority populations (2005). There is also some evidence correlating sexual minority status with reduced adolescent school performance (Russell et al. 2001). Consistent with bonding theory, some evidence has been found correlating parental acceptance of child sexual minority status with lower rates of substance use in adolescence (Padilla et al. 2010). Additionally, sexual minorities are more likely to be the victims of abuse as children (Hughes et al. 2010) and at school (Smith and Smith 2005) and this may contribute to weakening of these important social bonds. Marriage, considered one of the primary social bonds correlated with reduced deviant and criminal behavior of all kinds, including drug use, is also completely unavailable to sexual minorities in most of the United States, although research has indicated long-term cohabitation may have effects similar to marriage on other measures of wellbeing (Musick and Bumpass 2012). Whether these findings are replicated among sexual minorities is unclear but would be expected theoretically.

Although correlations between sexual minority identification and social bonds to work and school after adolescence are poorly understood, both of these variables have been found to exercise a preventative effect on substance use in the broader population (Chilcoat et al. 1995; Menard et al. 1993; Oxford et al. 2001). Accordingly, controls for marriage/cohabitation, employment, and education are included in this analysis.

The Present Study

To reiterate, the primary contribution of this study is to examine the patterns and correlates of drug use by adult sexual minorities. This topic is poorly understood largely because it is difficult to obtain samples of sufficient size to enable statistically meaningful analyses of deviant behavior by any hard to reach group, such as sexual minority populations. The few existing large sample studies of this topic are based on data that do not capture a respondent's self-identified sexual orientation, but infer it from measures such as the gender of the respondent's past sexual partners, leading to potentially faulty conclusions. Consequently, the vast majority of research on the relationship of sexual orientation and substance use has been based on either convenience samples or targeted samples that may not represent the general population (e.g., club drug studies, high school and college samples), yielding a clearer picture of the relationship among adolescent as compared to adult subjects. Because people in the general population typically age out of drug use and other forms of deviant and criminal behavior in the late teens and twenties, it is critical that we analyze drug use in the entire age range of the LGB community. Our data capture self-identified sexual orientation and provide a substantial gay/bisexual adult subsample, enabling statistically meaningful analyses of substance use by sexual minorities while controlling for a number of factors known to influence drug use.

METHODS

The data used in this study were acquired from the 2003 WANAHS, a survey of 6,713 adults in Washington State using sampling frames to provide significant quantities of hard to reach populations. The survey was constructed and implemented to measure substance use prevalence and to help the state assess the need for state-funded substance abuse treatment services.

Dependent Variables

We employ four measures of substance use and abuse in this study and all dependent variables are binary in nature. "Past year marijuana use" is coded 1 if the respondent reported the use of marijuana in the year prior to completing the survey. "Past year hard drug use" is coded 1 if the respondent reported the use of illicit use of cocaine, methamphetamine, other stimulants, heroin, pain relievers or other opiates, hallucinogens, tranquilizers, sedatives, or inhalants in the year prior to completing the survey. "Past-Year Binge Drinking" is coded 1 if the respondent reported consuming more than 4 drinks in a day if female, or 5 drinks in a day if male, at any point in the past 12 months.² "Ever addicted to alcohol" is coded 1 if a respondent reported ever being addicted to alcohol. It is notable that this question had a lower number of valid cases, 4,982, than the other dependent variables. This is because the relevant question was only asked of the 4,999 respondents who reported any lifetime alcohol use and 17 of these respondents did not provide an answer to the question on lifetime addiction to alcohol.

Independent Variables

Sexual orientation was established by asking respondents to identify as heterosexual or straight, homosexual or gay/lesbian, or bisexual. As can be seen in Table 1, 6,435 respondents (95.9% of the total sample) provided information on sexual orientation, 103 (1.6%) of which reported homosexual orientation and 98 (1.5%) reported bisexual orientation. At 3.1% combined LGB orientation, this is very close, within .5 percentage points, to estimated national means in existing literature on U.S. sexual minority demographics (Gates 2011).

"Education" is measured using a 1 to 8 scale ranging from 1 = no education completed to 8 = advanced degree. "Married or cohabitating" is coded 1 if respondents report being "unmarried but living with partner" or if they report being "married." Those reporting "never married," "divorced/separated," and "widowed" are coded 0. "Emotional/psychological health" is derived from a question asking respondents to assess their emotional/psychological health during the previous 12 months. Responses are coded from 1 (poor) to 5 (excellent). The variables "female," "urban," and "unemployed" are coded 1 if the respondent reported these statuses and "age" is a continuous variable. Descriptive statistics for all the independent variables can be seen in Table 1.

²As our data contain measures of past 30 day marijuana and hard drug use, but only past year binge drinking, we chose to utilize past year measures both for uniformity and for statistical power. Regressions of past 30 day marijuana and hard drug use were run and were substantively identical to past year results in both magnitude and direction of all coefficients, though the rarity of hard drug use, combined with the relatively small number of gay and bisexual respondents, reduces statistical significance to above .05 but below .10 in that case only.

TABLE 1
Means and Standard Deviations for Independent Variables

<i>Variable</i>	<i>Mean</i>	<i>SD</i>
Gay	.016	.13
Bisexual	.015	.12
Age	39.39	16.59
Female (0/1)	.61	.48
Married or Cohabiting (0/1)	.55	.49
Urban (0/1)	.62	.48
Unemployed (0/1)	.06	.25
Education (1–8)	4.86	1.70
Emotional/Psy. Health (1–5)	3.39	1.14

Analysis

Data analysis was conducted using logistic regression. Hc1 robust standard errors were used as a precaution to adjust for potential heteroskedasticity in age, emotional health, and education, and no multicollinearity issues were detected (see variance inflation factors in Appendix 1).³ We examine the effect of sexual orientation on drug use with measures of (1) gay/lesbian and (2) bisexual to isolate unique relationships. Age, sex, marriage/cohabitation, urban residence, employment status, education, and emotional/psychological health were included as control variables in all analyses.⁴

RESULTS

Table 2 presents reported substance use and addiction of survey respondents by sexual orientation. All reported levels of use and addiction are higher, and in most cases much higher, in the gay and bisexual categories as compared to heterosexual. Bisexual respondents display higher values than gay respondents for marijuana use and binge drinking, but similar values for hard drug use. Reported levels of addiction to alcohol for bisexuals were closer to heterosexuals than homosexuals.

Table 3 presents results of logistic regression on past year marijuana use and past year hard drug use controlling for a number of factors known to predict substance use. Those identifying as gay or bisexual are approximately 3 to 3.5 times as likely to have used marijuana in the past year as compared to heterosexuals. Similarly, with respect to hard drug use, those identifying as gay or bisexual are approximately 3 to 3.5 times as likely to report this behavior during the past year. The coefficients for the control variables in these models are in the expected directions and the majority of the coefficients are statistically significant. Marriage/cohabitation strongly predicts reduced marijuana and hard drug use, findings that are supportive of social bonding theory. Unemployment is significant only for hard drug use, predicting higher rates and possibly indicating a weaker protective influence of conventional bonds on marijuana as compared to hard drug

³Use of Hc1 robust standard errors did not significantly alter standard error values.

⁴The ordinal measures for education and emotional health sufficiently conform to linear interval variable behavior and therefore do not violate assumptions of logistic regression.

TABLE 2
Percent Reporting Drug/Alcohol Use and Abuse by Sexual Orientation

<i>Variable</i>	<i>Gay</i>	<i>Bi</i>	<i>Heterosexual</i>
Past Month Marijuana Use	12.6	20.0	4.2
Past Year Marijuana Use	21.4	27.4	7.3
Past Month Hard Drug Use	6.8	6.1	2.0
Past Year Hard Drug Use	16.5	17.3	4.6
Past Year Binge Drinking	35.0	40.8	22.2
Past Year Drinking Problem or Addicted to Alcohol	16.1	11.8	9.3
<i>n</i>	103	98	6,234

use. Education is positively correlated with past-year marijuana use, but not hard drug use, which may be indicative of grater normative acceptance and use in the college population. Urban residence also has a notable positive relationship with marijuana use, potentially due to increased availability and greater exposure to deviant peers, though it is uncertain why it is not a significant predictor of hard drug use. In line with theories of psychological risk factors, poor emotional health is a strong predictor of both marijuana and hard drug use in this model, independent of the strong impacts of bisexual and gay/lesbian self-identification; it is clear emotional health alone does not account for the considerable disparity between LGB and heterosexual individuals in this study. The substantial positive influence of sexual minority identification on drug use, in this case, combines with their greater propensity for reduced emotional health to produce the particularly high rates of substance use depicted in the bivariate prevalence figures in Table 2. Controls for age and sex were significant and in the expected direction for both measures of illegal drug use, with females substantially less likely to report use and use decreasing as people aged.

Table 4 presents results of logistic regressions on past year binge drinking and lifetime addiction to alcohol. Both gay and bisexual orientation display significantly higher results for past year binge drinking while controlling for a number of correlates of drug use; these groups are

TABLE 3
Logistic Regression Results: Odds Ratios for Past Year Marijuana Use and Past Year Hard Drug Use

<i>Variable</i>	<i>Past year marijuana use</i>	<i>Past year hard drug use</i>
Gay	2.98***	3.51***
Bisexual	3.48***	3.18***
Age	.93***	.95***
Female (0/1)	.54***	.54***
Married or Cohabiting (0/1)	.60***	.70**
Urban (0/1)	1.41***	1.18
Unemployed (0/1)	1.18	1.55*
Education (1–8)	1.14***	1.06
Emotional/Psy. Health (1–5)	.76***	.68***
<i>N</i>	6,411	6,411
Wald Chi-Square	381.45***	226.16***
Nagelkerke R2	.166	.115

* $p < .05$, ** $p < .01$, *** $p < .001$.

TABLE 4
Logistic Regression Results: Odds Ratios for Past Year Binge Drinking and Lifetime
Addiction to Alcohol

<i>Variable</i>	<i>Past year binge drinking</i>	<i>Lifetime alcohol addiction</i>
Gay	1.54*	1.88*
Bisexual	2.09***	1.17
Age	.96***	1.01***
Female (0/1)	.46***	.67**
Married or Cohabiting (0/1)	.75***	.70***
Urban (0/1)	.91**	.92
Unemployed (0/1)	.92	1.33
Education (1–8)	1.12***	.90***
Emotional/Psy. Health (1–5)	.94*	.69***
<i>N</i>	6,411	4,982
Model Chi-Square	512.31***	165.69***
Nagelkerke R ²	.140	.070

* $p < .05$, ** $p < .01$, *** $p < .001$.

approximately 1.5 and 2 times, respectively, as likely to report binge drinking as heterosexuals. For alcohol addiction, only homosexual orientation was found to be significantly higher than the baseline heterosexual category, at nearly twice as likely to report lifetime alcohol addiction. Again, the coefficients for the control variables are in the expected direction (given the fact that this measure captures lifetime presence, not past year) and most of the coefficients are statistically significant. Age negatively predicts past-year binge drinking, indicating aging out effects, but, while statistically significant, is not a meaningful predictor of lifetime alcohol addiction due the lifetime nature of the measure. Again consistent with social bonding perspectives, marriage/cohabitation is a relatively strong negative predictor of both binge drinking and alcohol addiction, though regarding the latter it is uncertain to what degree past or current alcohol addiction may negatively impact the formation of marriages or cohabitation. As seen for marijuana use, educational attainment is positively correlated with binge drinking but negatively associated with lifetime alcohol addiction. Similar to our findings for marijuana use, this may be explained by tolerant or favorable normative attitudes toward heavy substance use (in this case “party drinking”) in college. Although the direction of causality cannot be established with these cross-sectional analyses, these findings are consistent with research indicating that college students often engage in very high patterns of alcohol use during college, often belonging to groups in which heavy alcohol consumption is the norm (e.g., fraternities and sororities), but that these individuals often age out of this behavior and experience limited negative consequences from their substance abuse provided they graduate (see, e.g., Hagan 1991). Urban residence is negatively correlated only with past-year binge drinking, which may be indicative of greater acceptance of alcohol use in rural areas or reduced availability of substitute substances. Emotional health, lastly, is again a predictor of both forms of use, supporting theories based on psychological risk factors. Emotional health is a weak negative predictor of past-year binge-drinking, but more strongly predicts lifetime alcohol addiction. In both cases, reciprocal causal relationships are likely at work, particularly in the latter measure where lifetime alcohol addiction may severely impact emotional health.

CONCLUSION

Our study confirms past findings indicating that sexual minorities display rates of substance use that are higher than heterosexuals, while controlling for a variety of common correlates of substance abuse. While the majority of studies in this area have been conducted with focused samples, our findings are based on a large (albeit regionally) representative sample and are thus able to inform work on this topic by yielding generalizable findings. In general, our results indicate that elevated rates of substance use in the LGB population appear to be due to factors related to sexual minority identification that are independent of, or interact uniquely with, most common predictors of substance abuse in the general population, rather than due to variation in these factors particular to LGB individuals. In particular, while they confirm a strong negative relationship between emotional and psychological health and marijuana use, hard drug use, and alcohol addiction, and a weak but significant negative relationship with binge drinking, these factors alone do not account for the large disparity between heterosexual and sexual minority substance use. Nonetheless, given the elevated levels of mental disorders and psychological stress experienced by LGB individuals (Bolton and Sareen 2011; Halkitis et al. 2007) and that extensive research has found people with psychological problems to “self-medicate” with illicit substances (Khantzian 1985), a continued focus on the intersection of sexual identity, mental health, and substance use may contribute to reducing drug use and associated problems in this at-risk population. The impacts of social learning and social bonding factors on LGB substance use are less clear, as observed variation in employment, educational attainment, marriage/cohabitation, and other factors also do not eliminate the positive association of sexual minority self-identification on use.

While our results are informative and statistically robust, our analyses were impacted by a variety of data limitations that may present opportunities for future research. Firstly, while we examine a significant number of lesbian, gay, and bisexual individuals, the 2003 WANAHS did not record transgender, queer, questioning, or any other gender identity aside from heterosexual or LGB. Consequently we are unable to analyze the substance use behaviors of these unique populations. Future large scale studies on substance use might benefit from including broader measures of self-identified sexual orientation. Secondly, our dichotomous past year measures of substance abuse, while commonly employed in the literature, are not ideal in terms of capturing the forms of substance use most likely to result in harm to the individual and society. Past month analyses were run where possible and results were not substantively different (see footnote 9), but ideally, substance use measures that capture “heavy use” (high frequency in the past month, the past week) would be preferable. Unfortunately, capturing statistically meaningful data on sexual minority substance use frequency, particularly of hard drugs, would require a much larger sample than presented by the 2003 WANAHS due to the rarity of hard drug use and relatively small number of sexual minority individuals.

Lastly, our analyses and discussion of theoretical explanations for elevated sexual minority substance use are limited by the availability and nature of particular independent variables. Self-reported emotional health is utilized as our measure of psychological factors that may impact substance use. While it has been established that sexual minority identification may negatively impact emotional health, the relationship between hard drug use and emotional health is reciprocal and mutually reinforcing (GLMA 2001; SAMHSA 2008); while poor emotional health may result in self-medication with hard drugs, long-term use of hard drugs may also result

in poor emotional health through both direct psychological impact and indirectly through effects on socioeconomic factors such as employment and social status. Consequently, emotional health is used as a control primarily to isolate its effects from unknown factors otherwise associated with LGB self-identification. The study from which our data were acquired did not directly measure social learning related factors related to substance use, though urban residence may absorb some of the effect of social learning from bar and club attendance. We suspect omitted social learning factors could be responsible for much of the elevated substance use captured by the gay/lesbian and bisexual variables in our analyses. A variety of factors associated with social control are accounted for, both directly in the form of marriage/cohabitation and unemployment and indirectly in the form of age as a proxy for unaccounted-for social bonds that accrue over the lifecourse. Our measure of educational attainment also serves as an imprecise proxy for both social learning and social bonding, as education represents both a social bond likely to reduce deviance such as hard drug use and as an environment in which social pressures encourage the use of substances, particularly alcohol. All of these limitations in precise theoretical predictors present opportunities for future research, particularly for large-scale studies specifically investigating the causes of sexual minority substance use.

Despite these limitations, this study represents a significant contribution to the literature by analyzing substance use of a statistically meaningful number of adult LGB individuals in a representative sample. Accurate knowledge of the prevalence and correlates of substance use by members of the LGB community is necessary for directing effective prevention and treatment efforts toward this at-risk and under-served population (Cochran et al. 2007; Merighi et al. 2011). The higher rates of substance use observed in other convenience, adolescent, or inferred sexual orientation studies are replicated here, and a variety of theoretically supported correlates are examined that, while significantly associated with substance use, do not explain the substantial difference in use observed between the heterosexual and LGB groups. These findings affirm the need both for treatment programs specifically targeted at these populations and additional research to explore the hidden causes of high rates of sexual minority substance use.

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APPENDIX 1

Variance Inflation Factors

<i>Variable</i>	<i>VIF</i>
Gay	1.01
Bisexual	1.01
Age	1.02
Female	1.01
Married/Cohabiting	1.02
Urban	1.04
Unemployed	1.03
Education	1.10
Emotional/Psy. Health	1.07