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Differential Effects of State Policy Environments on Substance Use by Sexual Identity: Findings From the 2000–2015 National Alcohol Surveys

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Abstract

Introduction: This study explored whether structural stigma, defined by U.S. state policies related to sexual minority rights, moderated the relationship between sexual identity and heavy drinking, alcohol problems, and marijuana use among men and women.

Methods: Using combined data from the National Alcohol Survey (NAS) series (2000, 2005, 2010, and 2015), the sample included 11,115 men (421 sexual minority and 10,694 heterosexual) and 14,395 women (413 sexual minority and 13,982 heterosexual). State policy environment was assessed using a time-varying dichotomous indicator of comprehensive protections for sexual minorities (4–6 protections vs. limited or no protections). Gender-stratified logistic regression analyses examined the differential effect of the policy environment by sexual identity on three past-year substance use outcomes: high-intensity drinking (8+ drinks/day), any DSM-5 alcohol use disorder, and marijuana use.

Results: Among women, sexual minority status was associated with increased odds of all alcohol and marijuana use outcomes. Among men, sexual minority status was associated with decreased odds of high-intensity drinking but increased use of marijuana. Comprehensive policy protections were associated significantly decreased odds of high-intensity drinking among sexual minority men and marginally significant decreases among women.

Conclusions: Comprehensive policy protections appear to be protective for high-intensity drinking among sexual minority men and women. Findings underscore the importance of supportive policies in reducing risk of alcohol-related problems among sexual minorities.

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Keywords

hazardous drinking; marijuana use; sexual minority; structural stigma; policy

Structural stigma has been identified as an under-acknowledged driver of health disparities.^{1–3} Structural stigma refers to norms and policies within societal, institutional, and cultural levels that negatively impact the opportunities, access, and well-being of a particular group.⁴ Changes in structural stigma, such as extending rights of legal marriage to same-sex couples, appear to reduce disparities. In 2015, the U.S. Supreme Court extended same-sex marriage rights to all states, providing access to legal marriage for same-sex couples living in states that had not yet extended, or explicitly banned, equal marriage rights. Prior to this change, studies found evidence of less psychological distress and better self-reported health among sexual minorities living in states that had previously provided access to legal marriage for same-sex couples compared to those living in states that did not.^{2,5–11} Similarly, studies in the United States and Australia found sexual minorities living in regions where more residents support same-sex marriage reported better health outcomes (e.g., lower disparities in smoking, better overall self-rated health, and better mental health) than sexual minorities living in regions with lower support.^{12,13} Such supportive policy contexts have significant positive impacts on sexual minority health, but generally have no impact or only modest positive impacts on health outcomes among heterosexual individuals.^{2,12–14}

Cross-sectional, population-based research in the United States has documented greater risk for hazardous drinking and drug use among sexual minority adults compared to heterosexual adults.^{15–17} Differences in hazardous alcohol use (e.g., heavy episodic drinking, drinking at levels exceeding recommended guidelines, alcohol use disorders) are particularly pronounced and consistent among sexual minority women compared to heterosexual women,^{15,16,18} while differences in harmful use of alcohol by sexual identity are less consistent among men.^{19,20} Sexual minority women and sexual minority men have higher odds of using marijuana compared to heterosexual counterparts.^{15,21} Systematic reviews of sexual minority health inclusive of research from other countries have echoed these findings of elevated risk for hazardous drinking and drug use.^{22,23}

Although recent studies based on a large, national prospective cohort study of adolescents suggest that living in state and local contexts with protective policies for sexual minorities may reduce disparities by sexual identity for alcohol, tobacco, or other drug use among adolescents,^{24,25} few studies based on probability samples have examined the impact of the policy environment on hazardous drinking or other drug outcomes among sexual minority adults. One notable exception was a study using two waves of cross-sectional data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), which found that alcohol use disorders increased by 41.9% among sexual minority adults living in states that explicitly banned same-sex marriage compared to states without such bans.² This prior study used a dichotomous measure of institutional discrimination comparing states that voted on and passed constitutional amendments defining marriage as occurring only between a man and a woman to states that did not have such an amendment on the ballot. Documenting the harmful impact of institutional discrimination is important; however,

studies using different policy measures are also needed to investigate whether protections *against* discrimination are protective against hazardous drinking or other negative health outcomes. Furthermore, this prior study did not stratify analyses by gender, which is an important limitation in the context of research documenting that disparities in risks for hazardous drinking and drug use are more pronounced and consistent among sexual minority women than sexual minority men compared to their heterosexual counterparts.²⁶ The importance of disaggregating analyses by gender is demonstrated by a recent study of the impact of supportive policy environments on self-reported health among sexual minorities, which found that comprehensive policy protections were associated with better self-reported health for sexual minority men, but not sexual minority women.⁷

Research points to the value of using multiple indicators of social and political climates in examining the impact of structural stigma on minority health,^{7,24,27,28} particularly indicators that capture state-level anti-discrimination laws.²⁷ In the context of gaps in the literature with respect to the impact of policy environments on substance use outcomes among sexual minority adults stratified by gender, the current study aims to examine the differential effects of state policy environments, defined by state policies protecting the rights of sexual minorities, on the relationship between sexual identity and hazardous drinking and marijuana use, separately among women and men. We hypothesized that environments with comprehensive policy protections would be associated with reduced odds of hazardous drinking and marijuana use among sexual minority women and men, and these policies would have no impact on hazardous drinking and marijuana use among heterosexual women and men.

METHODS

Data and Sample Characteristics

Data are from four waves (2000, 2005, 2010, and 2015) of the NAS, a cross-sectional probability survey of adults ages 18 or older in the United States. Data were collected prior to the 2015 U.S. Supreme Court decision that extended the rights of same-sex couples to marry across all states. Survey data contained oversamples of racial/ethnic minorities, and they were weighted to be representative of the U.S. population. The combined dataset contained data from 29,571 respondents; sexual minority status could be determined for 25,510 respondents. Sample characteristics are presented in Table 1 by gender and sexual identity.

Measures

State Policy Environment.—We created an index of ten policies relevant to sexual minorities, which were adapted from the Movement Advancement Project (MAP).²⁹ The time-varying policy index included six potential policy protections enacted by states in the year of each survey: (1) legalized marriage for same-sex couples; (2) nondiscrimination protections in adoption or foster parenting for same-sex couples; (3) prohibition against discrimination by employers (both private and public/government); (4) housing nondiscrimination laws; (5) laws prohibiting discrimination in public accommodations (e.g., services or entry in public places); and (6) hate crimes laws that cover sexual minorities.

The index also included four potential negative policies: (1) bans that explicitly prohibit same-sex marriage, (2) policies that allow denial of adoption and/or foster care by same-sex couples, (3) state bans on cities/counties passing non-discrimination laws, and (4) religious exemption laws permitting discrimination based on religious or moral grounds. Each protective policy was assigned a value of 1 and each negative policy was assigned a value of -1. Partial points were assigned if states provided some form of legal recognition for same-sex couples other than marriage (0.5 for domestic partnerships or civil unions) or protection against employment discrimination for state employees (0.5). (See Table 1 for details of the definitions for each of the policy classifications.) Items on the index were summed by state for each year of the survey, resulting in a possible score ranging from -4 to 6 (see Table 2 for each state's score by year).

Because the study aim was to examine the potential protective effects of supportive policies on outcomes, a dichotomous variable was constructed to compare respondents living in states with four or more policy protections for sexual minorities (classified as comprehensive protections) compared to those living in states with limited or no protections. The construction of a comprehensive (4+) versus limited or no protective policies (-4 to 3) aligns with the designation of "high equality states" in the Movement Advancement Project's classification scheme. The construction of a dichotomous policy variable was also guided by other research focused on the impact of policy protections on sexual minority health outcomes.^{7,27,30} For example, other studies have examined health outcomes associated with any policy protections (such as states with hate crimes laws that specific sexual orientation and/or state policies banning sexual orientation employment discrimination in both public and private settings)³¹ or any state-level protections against discrimination in employment, housing, or public accommodations.²⁷ Other recent studies have used multiple policies to construct a policy environment variable, such as "comprehensive policy protections" defined as five out of five possible nondiscrimination policies⁷ or "high policy support" based on 11 policies relevant to sexual minorities.³⁰

Sexual minority participants were significantly more likely to live in states with comprehensive (4+) protections (36.6% and 40% respectively for women and men) than heterosexual participants (approximately 29% for both groups; see Table 1). In general, there was a trend toward increased protections for sexual minorities over the time frame represented in the study. In 2000, only eight states and the District of Columbia offered comprehensive protections. Although protections at the state level increased over the survey waves, as of 2015, 22 states and the District of Columbia offered comprehensive policy protections, which is still a minority of jurisdictions. There was some variability within states over time. For example, California and Wisconsin dropped from scores of 5.0–4.5 between 2005 and 2010 as a result state-level votes constitutional amendments that effectively banned same-sex marriage until 2013 and 2014 respectively.

Sexual Identity.—Sexual identity was assessed from a question that invited respondents to select the category that best identified their sexual identity. Given the small sample sizes for different sexual minority subgroups, lesbian/gay and bisexual respondents were combined using an indicator of sexual minority status. In the 2015 survey, response options included "something else"; based on prior research documenting higher risk for hazardous drinking

among individuals who identify as “something else” compared to those who identify as heterosexual,³² these respondents also were coded as sexual minorities.

Alcohol Use Disorder (DSM-5 AUD 2+).—Past year alcohol use disorder (AUD) was defined as endorsing symptoms in 2 or more of 11 domains (failure to fulfill role obligations; drinking despite social or interpersonal problems; drinking when physically hazardous; tolerance; with-drawal; using more than or for longer than intended; persistent desire to cut down/control use; giving up important activities; spending a lot of time getting alcohol, using or recovering from use; drinking despite physical or psychological problems; and craving) in the fifth edition of the American Psychiatric Association’s Diagnostic and Statistical Manual (DSM-5).³³ This 2+ measure includes respondents with at least mild AUD, encompassing those with moderate and severe AUD as well.

High-Intensity Drinking (HID 8+).—The NAS surveys assessed drinking quantity (e.g., “During the last 12 months, what is the largest number of drinks you had on any single day?”) and frequency of drinking various amounts (e.g., every day or nearly every day, 3–4 times a week, 1–2 times a week, 1–3 times a month, less than once a month, once in those 12 months, and never in those 12 months). We constructed a variable for consumption of eight or more drinks in a single day, one or more times in the past year (vs. none). This measure was based on prior research suggesting an association between alcohol-related problems and consuming larger amounts of alcohol per day³⁴ and documenting sexual orientation disparities in high-intensity binge drinking among adults in the United States.^{35,36} Although high-intensity drinking is associated with greater odds of past year AUD, quantity/frequency measures are not included in the DSM-5 criteria for AUD. Thus, HID measures are important to include in research designed to identify drinkers most at risk of potential harm.³⁷

Marijuana Use.—Past 12-month marijuana use was dichotomized as any use versus no use.

Demographics.—We included several demographic characteristics known to be associated with alcohol and marijuana use. These were age, race and ethnicity, highest year of education, employment status, marital/relationship status, and having children (ages 17 or under) living in the household (see Table 1). We also included state of residence to account for state-level fixed effects, as well as an indicator for survey year (2000, 2005, 2010, 2015) to adjust for changes over time.

Analysis

All analyses were conducted in Stata (version 16). To ensure that our estimates reflected survey sampling probabilities, we used sample-weighted logistic regression models to adjust point estimates for survey design features. In addition to using the sampling weights, we also adjusted the standard errors to reflect clustering of respondents at the state level and accounted for any number of unspecified differences between respondents in different states by including a categorical state indicator in our models. Studies examining the effects of

state-level policies on drinking using similarly weighted data from national surveys have used this approach.^{38–40}

We conducted multivariate, gender-stratified logistic regression analyses to test the independent effects of state policy environment and sexual minority status on measures of harmful drinking and marijuana use, controlling for demographics and other covariates. We then ran models to examine whether state policy environment moderated the relationship between sexual identity and hazardous drinking and marijuana use measures.

In addition to presenting model coefficients, we calculated marginal effects of the policy environment to test the effect of a protective policy context (policy score 4+ vs. < 4) on each outcome by sexual minority status. We then graphically displayed predictive margins for all models to present predicted probabilities of the alcohol and marijuana outcomes for each group (i.e., heterosexual and sexual minority respondents) by different levels of the policy score (i.e., < 4, 4+).

RESULTS

Independent Effects of Sexual Minority Status and Policy

Among women, sexual minority status was associated with increased odds of DSM-5 AUD (OR = 2.50, $p < .001$), high-intensity drinking (OR = 1.89, $p = .009$), and marijuana use (OR = 3.64, $p < .001$), but there was no association between a supportive policy environment and any of the outcomes. Among men, sexual minority status was associated with decreased odds of high-intensity drinking (OR = 0.57, $p = .011$) but increased odds of marijuana use (OR = 1.81, $p = .006$). (See Table 3).

Differential Effects of Policy Environment by Sexual Minority Status

Among women, there was a marginally significant interaction between protective policy environment and sexual minority status with respect to high-intensity drinking (OR = 0.39, $p = .063$), such that comprehensive policy protections were associated with a trend toward decreased odds of high-intensity drinking among sexual minority women only. Among men, there was a significant interaction between protective policy environment and sexual minority status with respect to high-intensity drinking (OR = 0.31, $p = .001$). As displayed in Table 4 and Figure 1, comprehensive policy protections were associated with decreased probability of HID 8+ among heterosexual and sexual minority men, but the difference was only statistically significant among sexual minority men (Pr = -0.02 , $p = .114$ vs. Pr = $-.11$, $p = .001$).

DISCUSSION

The current study examined whether supportive state policy environments—defined by policies protecting the rights of sexual minorities—moderated the relationship between sexual identity and two behavioral health measures: hazardous drinking and marijuana use. We found partial support for our hypotheses. Among men, we found strong evidence of differential effects of policy environment by sexual minority status with respect to high-intensity drinking. A protective policy environment was associated with decreased

odds of high-intensity drinking among both heterosexual and sexual minority men, but the magnitude of this protective effect was significant only among sexual minority men. Among women, policy environment was associated with trend toward decreased odds of high-intensity drinking among sexual minority women but not heterosexual women. Policy context was not significantly associated with AUD in any group.

The current study found a protective effect of comprehensive policy protections in relation to high-intensity drinking among sexual minorities. The trend toward a protective effect for sexual minority women in relation to high-intensity drinking is of interest, given the notably higher odds for this behavior relative to heterosexual women. These findings extend and confirm those of a growing body of literature documenting positive impacts of sexual minority policy protections on self-reported health,^{7,27} psychological well-being,^{31,41,42} AUD,² and drug use.²⁴ The findings of the current study are important given research documenting that high-intensity drinking, such as drinking eight or more drinks at one time (approximately twice the standard heavy-drinking threshold), is associated with greater risk for AUD³⁴ and other negative health consequences, such as driving while intoxicated and alcohol-related injuries.⁴³ Factors that may moderate negative impacts of excessive alcohol use are important for ongoing intervention efforts to address alcohol-related morbidity and mortality and to reduce disparities in health by sexual identity.

Our findings differed from Hatzenbuehler et al. (2010) in that we did not find a significant impact of the policy environment on AUD by sexual minority status. The divergence in findings may be due, at least in part, to differences in policy definitions. While our study explored the potential protective effects of multiple policy protections, Hatzenbuehler et al. examined the harmful impact of discriminatory state bans against same-sex marriage. They used two waves of data from a longitudinal, nationally representative sample to examine the impact of constitutional amendments that banned same-sex marriage and found that AUD (and other psychiatric disorders) increased between survey waves among sexual minority (but not heterosexual) adults living in states that adopted bans.² Comparable increases in AUD were not found in comparison states that had not enacted bans against same-sex marriage. The impact of exposure to stigmatizing messaging in campaign debates or referenda that devalue the rights of stigmatized minority groups may have uniquely harmful impacts on psychological health. For example, research on the psychological impact of debates about marriage bans in U.S. states showed exposure to stigmatizing campaign messages was associated with decreased positive affect, increased negative affect, more depressive symptoms and greater stress among sexual minorities.^{5,6} Policies that explicitly seek to limit the rights of sexual minorities, and messaging surrounding those detrimental policy initiatives, may differentially impinge upon the health of sexual minority residents in those areas.

There may be other reasons that AUD did not differ by policy context in the current study. Other sources of minority stress may persist despite policy protections. For example, same-sex couples still experience unequal treatment and stigma in interpersonal interactions despite marriage equality.^{11,44} Research has also found that community-level social climate (which was not assessed in the current study) is an important predictor of sexual minority health outcomes,^{12,27,45} and supportive policy environments are more protective of sexual

minority people's health in the context social climates that affirm their identities.²⁷ The health-promoting implications of concurrent improvements in policy *and* social climate may become more evident over time vis-à-vis shifts toward more affirming public attitudes and policies. For example, a study examining cross-sectional national data spanning 15 years in Sweden found disparities in psychological health among sexual minorities diminished as the political and social climate improved over time.⁴⁶ Furthermore, sexual minority experiences of structural stigma appear to be mediated by interpersonal and individual factors such as social support¹³ and rejection sensitivity^{47,48} that were not accounted for in the current study.

In independent effects models, sexual minority status was associated with increased odds of marijuana use by women and men. It may be that more permissive norms related to drug use in sexual minority communities identified in other studies⁴⁹ persist regardless of state policy context. Research has found support for sexual minority rights (e.g., legalization of marriage for same-sex couples) and public opinion favoring legalization of marijuana often occur in tandem.⁵⁰ Future studies might explore whether policy and social climate related to marijuana use differentially impacts sexual minorities. In our study, sexual minorities were significantly more likely than heterosexual respondents to live in states with policy protections, and these states may also be more likely to have greater availability of marijuana and a more permissive climate related to marijuana use. This deserves further study.

Limitations

Although this study has a number of strengths, including use of nationally-representative data, important limitations should be noted. Research using probability samples are often limited by relatively small numbers of sexual minority respondents.^{51,52} Consequently, it is possible these results may be influenced by the small sample size. Although the surveys oversampled Black/African American and Hispanic/Latinx individuals, we did not have a sufficient sample size to investigate how policy contexts may differentially impact sexual minority women and men of color in relation to White sexual minorities or heterosexual Black and Latinx counterparts. For example, some studies suggest differences in risk by race and ethnicity among sexual minority men.⁵³ Future research examining the impact of policies on sexual minority adults, stratified by race and ethnicity, would be informative to the design and implementation of potential social-structural and health promotion interventions. Our study did not include measures of perceived drug availability or norms, and our analyses also did not control for other state-level policies and measures of public opinion that may impact health behaviors or health outcomes, such as policies and public support for marijuana legalization. We also did not have a measure of cannabis use disorder in the survey data; our measure of any marijuana use may not adequately capture problem use. Furthermore, although data were collected at different time points, the NAS is a cross-sectional survey, and it is not possible to assess causal relationships.

Our sample size did not allow disaggregation of bisexual respondents from other sexual minority respondents, which is a limitation given studies suggesting hazardous drinking and drug use are particularly pronounced among bisexual individuals.^{15,19,26} However, in

post hoc analyses combining women and men, disaggregating respondents who identified as bisexual from those who identified as gay/lesbian showed no change in the overall findings. Specifically, living in a state with comprehensive policy protections was associated with a larger decrease in the probability of high-intensity drinking among both bisexual and gay/lesbian respondents compared to heterosexual respondents. There were no differences in high-intensity drinking between those identifying as bisexual and those identifying as gay/lesbian. We also ran post hoc analyses excluding marital/relationship status as a control and found no difference from the overall results. Finally, we also ran post hoc analyses with a higher weight (2 points) for legalized marriage (as debates and changes in these policies were highly visible and have been documented as impactful in prior research); in these analyses the protective effect for high-intensity drinking remained robust and were significant for both sexual minority women and sexual minority men. Future studies with larger samples of sexual minority respondents are needed to investigate how the impact of policies on hazardous drinking and marijuana use might vary by both sex and sexual identity or by relationship status.

In spite of these limitations, the findings from this study contribute to a growing body of literature suggesting protective policy and social contexts are associated with better psychological and physical health among sexual minorities.⁵⁴ It is interesting that our study found the policy environment was associated with a trend toward reduced high-intensity drinking among heterosexual men, although the protective effect of a living in a state with comprehensive policy protections was significant only for sexual minority men. A unique study by Solazzo et al. examined state-level anti-discrimination policies, sexual minority-friendly social climate, and the interaction between policy and climate and found no impact health status among individuals who identified as heterosexual.²⁷ By contrast, another study by Hatzenbuehler et al.¹² found higher levels of local approval of same-sex marriage lowered the probabilities of smoking and fair/poor self-rated health among both lesbian, gay, bisexual, and transgender (LGBT)-identified and heterosexual adults. Future research is needed to investigate potential positive impacts of protective policies among sexual identity groups across a larger range of outcomes.

In research concerning social and health outcomes of sexual and gender minorities, there has been increased focus on the influence of structural stigma, including its role in alcohol use disparities.^{1,55,56} As studies of structural stigma seek to unpack effects on health outcomes and disparities, better understanding the role of policy is paramount. For example, an increasing number of states in the United States are adopting laws that allow for discrimination against sexual and gender minorities, such as denial of health care to LGBT individuals or of services for same-sex couples, for reasons attributed to religious beliefs.⁵⁷ Emerging research suggests residence in states with discriminatory policies is associated with increased psychological distress among sexual minorities.⁴² In this changing context, studies are needed to further investigate the impact of anti-LGBT policies on alcohol and drug outcomes among sexual minorities. There also is a need for ongoing surveillance of laws prohibiting discrimination, as well as how these laws and their enforcement impact health outcomes.⁵⁸

Our findings underscore the value of reducing structural stigma as a strategy for addressing disparities in health by sexual identity. Findings from the current study are also compatible with calls to further investigate coping and resilience among sexual minorities in individual, interpersonal, and social realms.^{59–61} Resilience-based interventions^{62–64} may amplify effects of protective policies across the sexual minority spectrum and also may help buffer the negative impacts of living in regions without enforcement of such protections. There is a need for more research on specific strategies for advancing health equity and promoting health in diverse LGBT populations, particularly research grounded in frameworks that recognize the interactions between structural and individual stigma, use an intersectional stigma-informed lens,^{65,66} and focus on individual and community strengths.⁶⁷

Conclusions

The current study found that residence in states with comprehensive policy protections for sexual minorities was associated with decreased odds of high-intensity drinking among both sexual minority women and sexual minority men compared to sexual minority counterparts living in states with fewer or no protections; a difference that was statistically significant for sexual minority men. Findings underscore the importance of reducing structural stigma as a strategy for reducing health disparities by sexual identity. There is a need for further research designed to monitor the impact of policy on health given the U.S. context, in which policies that protect the rights of sexual and gender minorities, or that explicitly allow for denial of healthcare or other services on religious grounds, continue to evolve.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Statement of Public Health Significance:

Residence in states with comprehensive policy protections for sexual minority adults was associated with decreased odds of high-intensity drinking among both sexual minority women and sexual minority men compared to counterparts living in states with fewer or no protections. Findings underscore the importance of addressing structural stigma to reduce health disparities.

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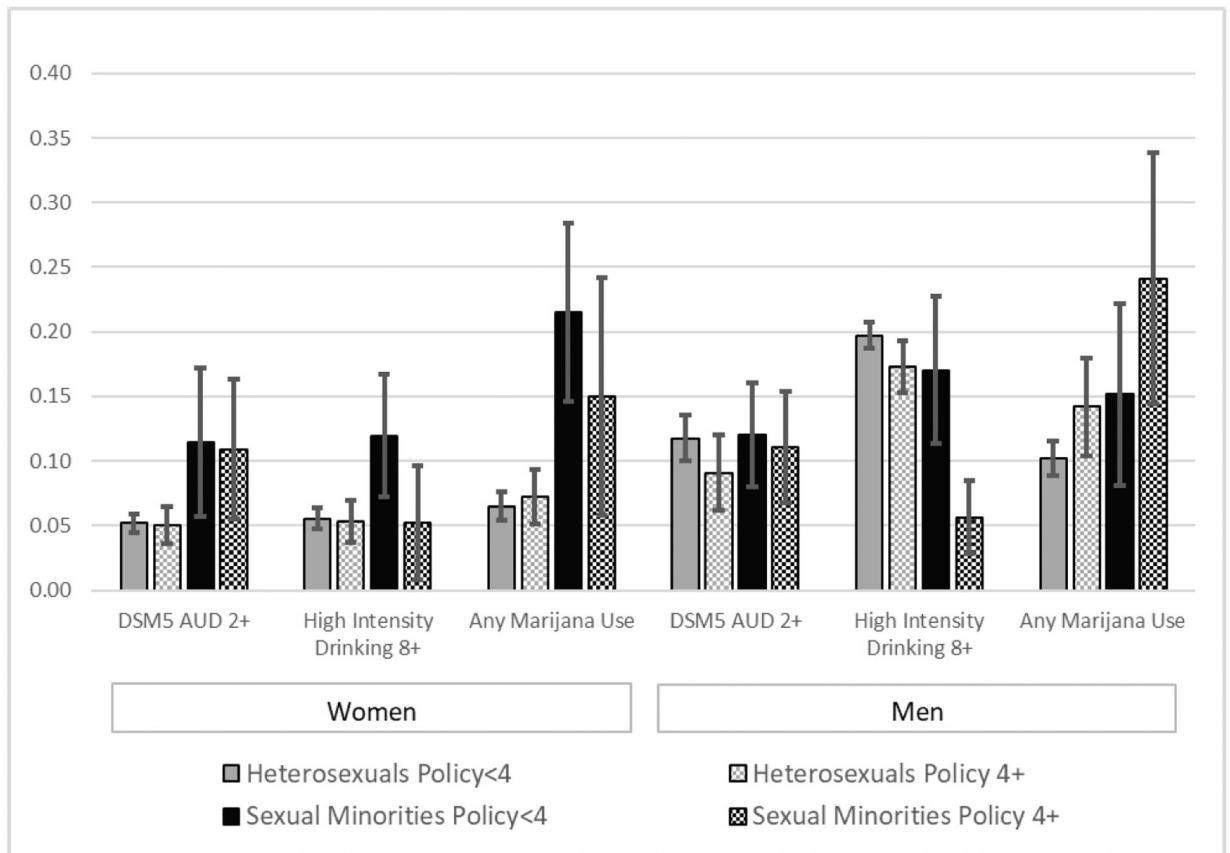


Figure 1. Predictive margins (with 95% CI) of comprehensive state policy protection environment by gender and sexual identity.

TABLE 1.

Sample Characteristics by Gender and Sexual Identity (N = 25,510)

	Women (N = 14,395)						Men (N = 11,115)					
	Heterosexual (N = 13,982)			SMW (N = 413)			Heterosexual (N = 10,694)			SMM (N = 421)		
	n	%	%	n	%	%	n	%	%	n	%	%
Marital/relationship status												
Single, divorced, widowed	6,742	39.4	55.8	258	62.5	3,788	32.2	296	62.8			
Married/living as a couple	7,197	60.6	44.3	155	37.5	6,879	67.8	125	37.2			
Age												
18-39	4,271	39.2	60.5	190	43.1	3,982	43.1	163	49.2			
40+	9,398	60.8	39.5	218	56.9	6,601	57.0	257	50.8			
Children in the household												
No	8,690	59.7	66.1	288	62.5	6,833	62.5	377	84.8			
Yes	5,264	40.3	33.9	124	37.5	3,838	37.5	44	15.2			
Race and ethnicity												
White/Caucasian	7,957	71.1	65.6	215	70.5	6,579	70.5	247	64.2			
Black/African American	2,930	11.7	13.5	101	10.4	1,631	10.4	77	16.4			
Hispanic	2,572	11.5	10.8	73	12.7	1,961	12.7	76	11.5			
Other	523	5.8	10.2	24	6.4	523	6.4	21	7.8			
Education												
High school or less	5,709	40.3	42.9	186	41.1	4,215	41.1	123	32.0			
College or more	8,217	59.7	57.1	227	58.9	6,427	58.9	298	68.0			
Employment												
Employed	7,259	55.7	63.3	228	70.1	7,203	70.1	272	69.1			
Unemployed	6,689	44.4	36.7	185	29.9	3,467	29.9	148	30.9			
Survey year												
2000	3,794	28.4	20.1	86	28.5	3,284	28.5	84	16.2			
2005	3,379	25.8	21.6	85	26.1	3,033	26.1	81	18.8			
2010	3,734	25.0	22.8	91	25.3	2,320	25.3	107	27.8			
2015	3,075	20.9	35.5	151	20.1	2,057	20.1	149	37.2			

State-level same-sex policy protections	Women (N = 14,395)			Men (N = 11,115)		
	Heterosexual (N = 13,982)	SMW (N = 413)	%	Heterosexual (N = 10,694)	SMM (N = 421)	%
Limited or none (-4 to 3)	n 9,797	n 268	71.0	n 7,633	n 246	60.0 ***
Comprehensive (4+)	n 4,170	n 145	29.0	n 3,054	n 175	40.0

Note. The combined dataset contained data from 29,571 respondents; sexual minority status could be categorized for 25,510 respondents. SMW, sexual minority women (bisexual and lesbian identities). SMM, sexual minority men (bisexual and gay identities). Ten policy protections were scored as negative (-1), absent (0), or protective (+1). Valid percentages are listed; missing data was generally minimal. Unweighted cell sizes are presented, but prevalence estimates are weighted. Pearson chi-squared statistics comparing across sexual identity are corrected for the survey design with the second-order Rao and Scott correction, converted into an F statistic.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

TABLE 2.

State Policy Index Score by State and Survey Year (−4 to 6)

State	2000	2005	2010	2015
AK	−1.0	−0.5	−0.5	1.5
AL	−2.0	−2.0	−2.0	−2.0
AR	−1.0	−1.0	−2.0	−2.0
AZ	−1.0	0.5	0.5	2.5
CA	4.0	5.0	4.5	6.0
CO	0.0	1.0	3.0	5.0
CT	4.0	4.5	5.0	5.0
DC	4.0	4.5	5.0	5.0
DE	1.0	1.0	4.0	5.0
FL	−1.0	−1.0	−1.0	0.0
GA	0.0	−1.0	−1.0	−1.0
HI	0.0	1.0	2.0	5.0
IA	1.0	1.0	5.0	5.0
ID	0.0	−1.0	−1.0	1.0
IL	0.0	0.0	3.0	5.0
IN	−1.0	−0.5	−0.5	0.5
KS	−1.0	0.0	0.0	0.5
KY	0.0	0.0	0.5	0.5
LA	0.0	0.5	0.0	0.0
MA	5.0	6.0	6.0	6.0
MD	−1.0	3.0	3.0	5.0
ME	0.0	3.0	3.0	5.0
MI	0.0	−1.0	−1.0	−1.0
MN	3.0	3.0	3.0	5.0
MO	1.0	0.0	0.0	0.0
MS	−2.0	−2.0	−2.0	−3.0
MT	−0.5	−0.5	−0.5	1.5
NC	−1.0	−1.0	−1.0	1.0
ND	−1.0	−1.0	−1.0	−1.0
NE	−1.0	−1.0	−1.0	−1.0
NH	4.0	4.0	5.0	5.0
NJ	4.0	4.5	5.5	6.0
NM	1.0	4.5	4.5	5.0
NV	2.0	2.0	3.5	6.0
NY	1.5	4.5	5.5	6.0
OH	0.0	−1.0	−1.0	−0.5
OK	−2.0	−2.0	−2.0	0.0
OR	1.0	0.0	4.5	6.0
PA	−0.5	0.5	−0.5	1.5

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State	2000	2005	2010	2015
RI	4.0	4.0	4.0	6.0
SC	-1.0	-1.0	-1.0	1.0
SD	0.0	0.0	-1.0	-1.0
TN	0.0	0.0	0.0	-1.0
TX	-1.0	0.0	0.0	0.0
UT	-1.0	-1.0	-1.0	3.0
VA	-1.0	-0.5	-1.0	1.5
VT	4.5	4.5	5.0	5.0
WA	0.5	0.5	3.5	5.0
WI	4.0	5.0	4.5	6.0
WV	-1.0	-1.0	-1.0	1.0
WY	-0.5	-0.5	-0.5	1.0

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TABLE 3.
 Weighted Logistic Regression Models Adjusting for Clustering of Respondents at the State Level

	DSM-5 AUD			HID 8+			Marijuana		
	OR	95% CI	P	OR	95% CI	P	OR	95% CI	P
Women									
Independent Effects Models									
Comprehensive policy protections (4+)	0.96	[0.61, 1.51]	0.875	0.88	[0.52, 1.48]	0.620	1.07	[0.61, 1.86]	0.816
Sexual minority status	2.50	[1.55, 4.03]	0.000	1.89	[1.17, 3.06]	0.009	3.64	[2.27, 5.85]	0.000
Differential Effects Models									
Comprehensive policy protections (4+)	0.97	[0.61, 1.53]	0.888	0.95	[0.57, 1.58]	0.849	1.14	[0.67, 1.92]	0.629
Sexual minority status	2.53	[1.33, 4.81]	0.005	2.53	[1.54, 4.16]	0.000	4.62	[2.96, 7.21]	0.000
Policy environment * sexual minority status	0.97	[0.40, 2.34]	0.950	0.39	[0.14, 1.05]	0.063	0.53	[0.23, 1.23]	0.141
Men									
Independent Effects Models									
Comprehensive policy protections (4+)	0.74	[0.42, 1.29]	0.287	0.80	[0.63, 1.02]	0.072	1.53	[0.93, 2.50]	0.095
Sexual minority status	1.12	[0.82, 1.54]	0.481	0.57	[0.37, 0.88]	0.011	1.81	[1.18, 2.77]	0.006
Differential Effects Models									
Comprehensive policy protections (4+)	0.73	[0.41, 1.30]	0.284	0.83	[0.66, 1.05]	0.122	1.50	[0.92, 2.46]	0.105
Sexual minority status	1.03	[0.68, 1.56]	0.890	0.82	[0.52, 1.28]	0.373	1.63	[0.88, 3.02]	0.120
Policy environment * sexual minority status	1.24	[0.61, 2.52]	0.558	0.31	[0.16, 0.63]	0.001	1.26	[0.64, 2.49]	0.501

Note. Weighted logistic regression models control for age, partner status, children in the household, race and ethnicity, educational attainment, employment status, survey year, and state and adjust standard errors for clustering of respondents at the state level. DSM-5 AUD = alcohol use disorder as defined by American Psychiatric Association's Diagnostic & Statistical Manual (DSM), fifth edition; HID 8+ = high-intensity drinking (eight or more drinks in a single day).

TABLE 4. Predictive Margins and Marginal Effects of Comprehensive State-level Same-Sex Policy Protections by Gender and Sexual Identity

	Women						men						
	Policy Score < 4			Policy Score 4+			Policy Score < 4			Policy Score 4+			
	Est	95% CI	Est	95% CI	Est	95% CI	Est	95% CI	Est	95% CI	Est	95% CI	
DSM-5 AUD													
Heterosexual	0.05	[0.05, 0.06]	0.05	[0.04, 0.06]	0.00	[0.04, 0.06]	0.887	0.12	[0.10, 0.14]	0.09	[0.06, 0.12]	-0.03	0.263
Sexual minority	0.11	[0.06, 0.17]	0.11	[0.05, 0.16]	-0.01	[0.05, 0.16]	0.895	0.12	[0.08, 0.16]	0.11	[0.07, 0.15]	-0.01	0.775
HID 8+													
Heterosexual	0.06	[0.05, 0.06]	0.05	[0.04, 0.07]	0.00	[0.04, 0.07]	0.848	0.20	[0.19, 0.21]	0.17	[0.15, 0.19]	-0.02	0.114
Sexual minority	0.12	[0.07, 0.17]	0.05	[0.01, 0.10]	-0.07	[0.01, 0.10]	0.071	0.17	[0.11, 0.23]	0.06	[0.03, 0.08]	-0.11	0.001
Marijuana Use													
Heterosexual	0.07	[0.05, 0.08]	0.07	[0.05, 0.09]	0.01	[0.05, 0.09]	0.634	0.10	[0.09, 0.12]	0.14	[0.10, 0.18]	0.04	0.124
Sexual minority	[0.15, 0.28]	0.15	[0.06, 0.24]	-0.06	0.330	[0.15, 0.28]	0.15	[0.08, 0.22]	0.24	[0.14, 0.34]	0.09	0.139	

Note. Predictive margins are from weighted logistic regression models controlling for age, partner status, children in the household, race and ethnicity, educational attainment, employment status, survey year, and state and adjusting standard errors for clustering of respondents at the state level. DSM-5 AUD = alcohol use disorder as defined by American Psychiatric Association's Diagnostic & Statistical Manual (DSM), fifth edition; HID 8+ = high-intensity drinking (eight or more drinks in a single day).