Structural Stigma and Sexual Orientation Disparities in Adolescent Drug Use

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Abstract

Although epidemiologic studies have established the existence of large sexual orientation disparities in illicit drug use among adolescents and young adults, the determinants of these disparities remain understudied. This study sought to determine whether sexual orientation disparities in illicit drug use are potentiated in states that are characterized by high levels of stigma surrounding sexual minorities. State-level structural stigma was coded using a previously established measure based on a 4-item composite index: (1) density of same-sex couples; (2) proportion of Gay-Straight Alliances per public high school; (3) 5 policies related to sexual orientation discrimination (e.g., same-sex marriage, employment non-discrimination); and (4) public opinion toward homosexuality (aggregated responses from 41 national polls). The index was linked to individual-level data from the Growing Up Today Study, a prospective community-based study of adolescents (2000–2010). Sexual minorities report greater illicit drug use than their heterosexual peers. However, for both men and women, there were statistically significant

interactions between sexual orientation status and structural stigma, such that sexual orientation disparities in marijuana and illicit drug use were more pronounced in high-structural stigma states than in low-structural stigma states, controlling for individual- and state-level confounders. For instance, among men, the risk ratio indicating the association between sexual orientation and marijuana use was 24% greater in high- versus low-structural stigma states, and for women it was 28% greater in high- versus low-structural stigma states. Stigma in the form of social policies and attitudes may contribute to sexual orientation disparities in illicit drug use.

Keywords

sexual orientation; adolescents; stigma; illicit drug use

1. Introduction

Lesbian, gay, and bisexual (LGB, or sexual minority) populations are at greater risk for substance use and substance disorders than heterosexuals (Cochran, Keenan, Schober, & Mays, 2000; Drabble, Midanik, & Trocki, 2005). These well-documented disparities emerge early in development, with LGB youth using substances at significantly higher rates than their heterosexual peers (e.g., Austin et al., 2004; Corliss et al., 2010).

Although research has tended to focus on individual and interpersonal risk factors for sexual orientation disparities in health more broadly, and in substance use specifically, researchers have begun to identify structural determinants of these disparities. One structural risk factor to emerge in the literature is structural stigma, which refers to societal-level conditions, cultural norms, and institutional practices and policies that constrain the resources and opportunities of the stigmatized (Hatzenbuehler & Link, 2014). State-level policies that differentially target gays and lesbians for social exclusion, such as constitutional amendments that ban same-sex marriage (e.g., Hatzenbuehler, McLaughlin, Keyes, & Hasin, 2010), represent one example of structural stigma.

LGB populations who live in communities with greater structural stigma have higher rates of adverse health outcomes compared to LGB populations living in low structural stigma communities (Hatzenbuehler, 2014). For instance, gay and lesbian youth living in counties whose school districts had fewer protective antibullying policies were over two times more likely to have attempted suicide compared to those living in counties with more protective policies (Hatzenbuehler & Keyes, 2013). Conversely, sexual orientation health disparities are significantly reduced, or even eliminated, in communities with low levels of structural stigma (Hatzenbuehler et al., 2009). Drawing on this literature, we hypothesized that sexual orientation disparities in illicit drug use would be more pronounced in high structural stigma environments compared to low-structural stigma environments.

2. Methods

2.1. Sample

The Growing Up Today Study (GUTS) is a national, prospective cohort study of youth. Women in the Nurses' Health Study II (NHSII) cohort who were mothers of children ages 9

to 14 years (N=34,174) were initially contacted; of this sample, 18,526 (54%) consented and provided information on over 26,000 children. In 1996, letters and baseline questionnaires were mailed to the children whose mothers had granted consent (13,261 girls and 13,504 boys). Approximately 68% of the girls (N=9,033) and 58% of the boys (N=7,842) returned completed questionnaires. Follow-up questionnaires have been administered annually or biennially since 1996. For the current analyses, we used data from 5 waves spanning 2001–2010. Demographics of the study sample are provided in Table 1.

2.2. Measures

2.2.1. Sexual Orientation—In the fall of 1999, a sexual-orientation question was added to the GUTS survey, and participants were asked this item again in subsequent waves. The measure was adapted from the Minnesota Adolescent Health Survey (Remafedi, Resnick, Blum, & Harris, 1992) and asked about feelings of attraction using the following 6 mutually exclusive response options: "Which one of the following best describes your feelings? (1) Completely heterosexual (attracted to persons of the opposite sex), (2) mostly heterosexual, (3) bisexual (equally attracted to men and women), (4) mostly homosexual, (5) completely homosexual (gay/lesbian, attracted to persons of the same sex), or (6) not sure." Respondents who in each wave reported that they were unsure about their sexual orientation or who had missing information on the sexual-orientation item, were excluded from analyses from that wave

Based on responses to the sexual-orientation item, participants were categorized as heterosexual (n=9431) or sexual minority, which combined the categories mostly heterosexual (n=527), bisexual (n=73), mostly homosexual/completely homosexual (n=31) (numbers refer to respondents' sexual orientation in 1999). Because responses to the sexual orientation variable could change across the follow-up time points, we used the category that the respondent identified at each time point rather than his/her initial response in 1999.

2.2.2. Structural Stigma—We used a previously-validated scale of structural stigma (Hatzenbuehler, 2011), which is composed of 4 items: (1) density of same-sex partner households by state from the 2000 U.S. Census (Gates & Ost, 2004); (2) number of Gay-Straight Alliances (GSAs) in each state and divided this by the number of public high schools in that state to create a variable of the proportion of GSAs per high school; (3) a composite variable of 5 state-level policies related to sexual orientation (e.g., absence of constitutional amendments banning same-sex marriage, employment non-discrimination policies); and (4) public opinion toward sexual minorities in each U.S. state, using aggregated responses from 41 national polls from the Roper Center's iPol archive, dating from 1999–2008 (Lax & Phillips, 2009). A factor analysis (using Principal Component Analysis as the extraction method) of these 4 items indicated that a single-factor solution provided adequate fit. Consequently, these values were standardized and then summed; values ranged from -5.07 to 8.23, indicating substantial variation in structural stigma. Positive scores indicate more supportive social climates, and therefore lower levels of structural stigma. More information on this variable can be found elsewhere (Hatzenbuehler et al. 2014).

Home addresses for all mothers of GUTS participants were updated every two years beginning in 1989, the year that the NHSII cohort was begun. By linking with the NHSII database, we determined the state of residence for all GUTS participants in the year 2000. Thus, each of the 50 states received a value for the structural stigma variable in 2000.

2.2.3. Past-Year Drug Use—Respondents were asked about their past-year use of the following illicit drugs: marijuana, ecstasy (MDMA), cocaine, heroin, amphetamines (methamphetamine and speed), and LSD/mushrooms (psilocybin) in years 2001, 2003, 2005, 2007, and 2010. Following Corliss and colleagues (2010), we created a composite variable that includes any illicit drug use other than marijuana, with a separate variable for any marijuana use (because it was the most frequently used substance in the sample).

2.2.4. Covariates—Individual-level covariates including participants' race/ethnicity (white vs. non-white), age, sex, and family income (obtained from the mothers' self-report from the 2001 wave of NHSII) were included as potential confounders. We also controlled for 3 potential state-level confounders: (1) state-level income inequality (Bernstein, 2000); (2) median household income at the state level (obtained from 2000 U.S. Census); and (3) prevalence of marijuana use and illicit drug use among adolescents in each state from 2003–2006, obtained from the National Survey on Drug Use and Health.

2.3. Statistical Analyses

Given the nested and longitudinal structure of the data, we used the modified Poisson method to estimate risk ratios (RR) and 95% confidence intervals (CI), with multivariate generalized estimating equations (GEE) accounting for repeated measures and sibling clusters (Zou, 2004). We used an exchangeable residual covariance structure for these models. Analyses proceeded in two steps. First, we examined sexual orientation-related disparities in past-year illicit drug use using repeated-measures GEE regression. Second, we examined whether structural stigma influenced sexual orientation disparities in illicit drug use outcomes. To accomplish this aim, we tested multiplicative interactions between sexual orientation and structural stigma among men and women separately, given established sex differences in illicit drug use among sexual minorities (e.g., Corliss et al., 2010). Based on these interactions, we next divided the structural stigma variable into high and low categories (top quintile versus bottom 4 quintiles), and then examined the relationship between sexual orientation and illicit drug use outcomes within the high- and low-stigma categories, adjusting for covariates. Evidence that structural stigma contributes to sexual orientation disparities in illicit drug use would be indicated if the relationship between sexual orientation and illicit drug use was weaker (or non-significant) in states with low-structural stigma environments and more pronounced in states with high-structural stigma environments. Analyses were conducted using SAS 9.3.

3. Results

During the 5 waves of data examined, sexual minority youth were significantly more likely to have used drugs in the past year than their heterosexual peers (Table 1), providing evidence for sexual orientation disparities in illicit drug use.

The next set of analyses examined whether structural stigma influenced the magnitude of these disparities (Table 2). Multiplicative interactions between sexual orientation and structural stigma were statistically significant in predicting marijuana use for both men (p=0.002) and women (p<0.001), indicating that sexual orientation disparities in marijuana use were higher in high-structural stigma states than in low-structural stigma states, controlling for confounders. Among men, the risk ratio indicating the association between sexual orientation and marijuana use was 24% greater in high- versus low-structural stigma states, and for women it was 28% greater in high- versus low-structural stigma states.

For illicit drug use, the multiplicative interactions between sexual orientation and structural stigma were statistically significant for the women (p=0.004). Sexual minority women living in high-structural stigma states were over 4 times more likely to use illicit substances than were heterosexual women in those states; in contrast, sexual minority women were less than 3 times more likely to use illicit drugs than heterosexual women in low-structural stigma states. Among the men, the risk ratio indicating the association between sexual orientation and illicit drug use was 19% greater in high- versus low-structural stigma states, but this difference was not statistically significant (p=0.29).

4. Discussion

The present study examined structural risk factors for sexual orientation disparities related to illicit drug use among youth. Using a measure of structural stigma at the state level and data from a large, prospective study of sexual minority and heterosexual youth, we showed that sexual orientation disparities in marijuana and illicit drug use were larger in high-structural stigma states than in low-stigma states. Previous studies have examined several social-contextual influences of substance use among sexual minority youth, including family- (Ryan, Huebner, Diaz, & Sanchez, 2009), school- (Heck et al., 2014) and neighborhood-level factors (Duncan, Hatzenbuehler, & Johnson, 2014). Our results contribute to, and expand upon, this research by demonstrating that broader structural factors, including laws and social attitudes, are additional determinants of sexual orientation disparities in adolescent illicit drug use.

We note several limitations. First, with observational data, there is the possibility that an unmeasured common factor is responsible for the observed relationships between structural stigma and drug use. However, we sought to minimize confounding through controlling for multiple established risk factors at both the individual and state levels. Second, the GUTS cohort is not a representative sample of U.S. adolescents, and participants are primarily white, restricting generalizability. Third, longitudinal studies, including the GUTS cohort, are subject to attrition bias. There was no difference in baseline illicit drug use between those who were lost-to-follow-up and those who remained in the sample. It is not known, however, how differential loss-to-follow-up could influence estimates of illicit drug use related to sexual orientation. Finally, this study captures structural stigma at the state level, which may obscure within-state variation in structural stigma. Nevertheless, our results are particularly noteworthy, given that state-level factors are more distal determinants of health than local factors; thus, our results should likely be considered conservative estimates of the consequences of structural stigma for drug use.

Despite these limitations, the study also had a number of methodological strengths. Because the youth who comprise the GUTS cohort are primarily children of nurses, confounding by socioeconomic status, an established risk factor for drug illicit use and abuse (Compton, Thomas, Stinson, & Grant, 2007), is reduced. Moreover, GUTS is one of only two prospective cohort studies measuring sexual orientation that provide adequate geographic variation across the U.S. that permits the opportunity to examine state-level social/structural determinants of sexual orientation health disparities. In addition, the study used a composite measure of structural stigma based on objective indicators rather than relying on respondents' self-report perceptions of stigma, which can be confounded with health status (Meyer, 2003). Consequently, this approach overcomes same-source bias, which can create spurious associations when both the exposure and outcome are self-reported (Diez Roux, 2007).

This research suggests that structural forms of stigma contribute, at least in part, to explaining sexual orientation disparities in illicit drug use among youth. Further research is needed to explore factors that protect sexual minorities living in high-structural stigma states against the development of drug use problems. Such information will aid in the development of interventions aimed at reducing sexual orientation disparities in illicit drug use among youth.

Acknowledgments

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Highlights

- Sexual-orientation disparities in drug use are elevated in high-structural stigma states

- Results were robust to adjustment for individual- and state-level confounders

- Study identifies social determinants of sexual-orientation disparities in drug use

Table 1

Demographics and Study Variables of Youth Participating in the Longitudinal Growing Up Today Study (2000–2010)

Variable	Heterosexual (N=9934)	Sexual Minority[1] (N=2789)	Chi-Square Statistic or Independent-Samples T-Test, df, p-value
Demographics			
	N (%)	**N (%)**	
Sex			X^2 (1) = 294.4, p=<.0001
Female	5508 (55.4)	2050 (73.4)	
Male	4426 (44.6)	739 (26.6)	
Race/Ethnicity			X^2 (1) = 25.3, p=<.0001
White	9323 (93.8)	2542 (91.1)	
Other	611 (6.2)	247 (8.9)	
Family income (in 2001)			X^2 (2) = 17.5, p=0.0002
<$49,000	1019 (10.3)	300 (10.8)	
>$50,000	6968 (70.1)	2040 (73.1)	
Missing	1947 (19.6)	449 (16.1)	
Independent Variable[2]	**Mean (SD)**	**Mean (SD)**	
State-Level Structural Stigma	1.07 (3.16)	1.56 (3.26)	t=6.96, p<0.0001
State-Level Covariates[2]	**Mean (SD)**	**Mean (SD)**	
Income Inequality[3]	44.94 (2.02)	45.20 (2.05)	t=6.01, p<0.0001
Median Household Income	54.49 (6.56)	55.48 (6.89)	t=6.65, p<0.0001
Marijuana Prevalence	7.45 (0.95)	7.56 (0.97)	t=4.97, p<0.0001
Illicit Drug (other than marijuana) Prevalence	5.14 (0.52)	5.12 (0.52)	t=-1.52, p=0.1273
Marijuana[4]			
	N (%)	**N (%)**	
2001	1416 (20.9)	369 (48.3)	X^2 (1) = 314.4, p<0.001
2003	2166 (25.7)	471 (55.6)	X^2 (1) = 345.9, p<0.001
2005	2340 (28.4)	672 (55.5)	X^2 (1) = 354.0, p<0.001
2007	1966 (26.6)	876 (52.9)	X^2 (1) = 431.7, p<0.001
2010	1498 (22.8)	624 (46.6)	X^2 (1) = 319.8, p<0.001
All Years	9386 (25.1)	3012 (52.1)	X^2 (1) = 1779.6, p<0.001
Illicit Drugs[4]			
	N (%)	**N (%)**	
2001	299 (4.4)	138 (17.5)	X^2 (1) = 249.9, p<0.001
2003	579 (6.9)	211 (24.3)	X^2 (1) = 326.1, p<0.001
2007	624 (8.6)	376 (23.1)	X^2 (1) = 280.5, p<0.001
2010	427 (6.7)	244 (18.9)	X^2 (1) = 203.7, p<0.001
All Years	1929 (6.7)	969 (21.2)	X^2 (1) = 1089.5, p<0.001

Notes:

[1]The sexual minority group is composed of individuals who self-identified as mostly heterosexual, bisexual, mostly homosexual and completely homosexual.

[2]State-level structural stigma and state-level covariates were measured in 2000.

[3]State-level income inequality was determined by calculating the ratio of the top fifth to the bottom fifth of household income for each state using Census data from 1998–2000 (Bernstein et al., 2000).

[4]To create age-standardized prevalence estimates for marijuana and illicit drugs, we created weights based on the proportion of individuals in each age category among the total sample and then used those weights to adjust the age proportions of the sexual minorities and heterosexuals to be equivalent. We did this to control for potential confounding by age because the sexual orientation observations in GUTS tend to be slightly older than the heterosexuals.

Table 2

Age-standardized Prevalences and Multivariable Results Examining Sexual Orientation Disparities in Illicit Drug Use Stratified by Sex and by High- Versus Low-Structural stigma States: Growing Up Today Study (2001–2010)

Outcome	High Structural Stigma States		Low Structural Stigma States	
	Age-standardized Prevalence (%, SD)	Risk Ratio (95% CI)[2]	Age-standardized Prevalence (%, SD)	Risk Ratio (95% CI)[2]
Men				
Marijuana	38.8 (48.7)	1.60 (1.46, 1.75)	28.2 (45.0)	1.29 (1.16, 1.43)
Illicit Drug Use	13.8 (34.5)	2.22 (1.83, 2.70)	8.9 (28.5)	1.86 (1.49, 2.33)
Women				
Marijuana	33.6 (47.2)	2.02 (1.88, 2.16)	23.6 (42.5)	1.58 (1.47, 1.69)
Illicit Drug Use	9.8 (29.8)	4.03 (3.47, 4.67)	6.5 (24.7)	2.72 (2.32, 3.18)

Notes:

[1] The states were broken up into a 2-level variable (top quintile vs. bottom 4 quintiles) indicating the level of structural stigma.

[2] Risk Ratio and 95% confidence interval comparing marijuana and illicit drug use between sexual minority and heterosexual individuals (reference group), adjusted for age, ethnicity/race (White vs. Non-White), family income (obtained from the mothers' self-report from the 2001 wave of NHSII), and three-state-level covariates, including prevalence of illicit drug use among adolescents in that state, state-level income inequality, and state-level median household income.