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Does comparing alcohol use along a single dimension obscure within-group differences? Investigating men's hazardous drinking by sexual orientation and race/ethnicity

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Abstract

Background—Some studies have found that gay, bisexual, and other men who have sex with men (MSM) have higher odds of alcohol abuse and dependence than heterosexual men, but others have found no differences. We investigated whether the association between sexual orientation and hazardous drinking varied by race/ethnicity.

Methods—We estimated the odds of past-year heavy daily, heavy weekly, and binge drinking by sexual orientation and race/ethnicity among non-Latino White, non-Latino Black, and Latino (any race) men (n=9,689) who reported current alcohol use in the 2004–2005 National Epidemiological Survey of Alcohol and Related Conditions (NESARC). Interaction terms were included in multivariable logistic regression models to evaluate possible effect modification.

Results—In most comparisons, sexual minority men reported equivalent or lower levels of hazardous drinking than heterosexual peers. There was no association between sexual orientation and heavy daily drinking. Sexual minority Black men had lower odds of heavy weekly drinking and binge drinking than both heterosexual White men and heterosexual Black men. Among Latinos, the odds of heavy weekly drinking were higher for sexual minority men than heterosexuals; there was no difference by sexual orientation for binge drinking among Latinos.

Conclusions—With one exception, sexual minority men were at equivalent or lower risk of hazardous drinking than heterosexual men. The Black-White advantage observed in other alcohol studies was observed in our study and was heightened among sexual minority men, suggesting the presence of protective factors that curb hazardous drinking. Additional research is necessary to identify the mechanisms responsible for these patterns.

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Contributors

PAG conceived of the study and KC helped refine the research question. PAG conducted all analyses. All authors interpreted findings. PAG drafted this manuscript, and JDU and KC contributed revisions.

Conflict of Interest

The authors have no conflicts of interest to disclose.

Keywords

gay; bisexual; Black; Latino; binge drinking; disparities

1. Introduction

Frequent or high-volume alcohol consumption (i.e., heavy drinking) has long been an important public health concern as it has been associated with increased risk of gastrointestinal disease, some cancers, stroke, and cognitive impairment (Boffetta and Hashibe, 2006; Meyerhoff et al., 2005; Thakker, 1998). Heavy drinking may also exert indirectly harmful effects through associations with inter-personal violence (Caetano et al., 2001; Lipsky et al., 2005; Testa et al., 2003), motor-vehicle crashes (Blomberg et al., 2009; Hingson and Winter, 2003; Peck et al., 2008; Zador et al., 2000), and risky sexual behaviors (Bimbi et al., 2006; Diaz et al., 1996; Poppen et al., 2004). Excessive alcohol use has been identified as the fourth leading preventable cause of death in the United States (Mokdad et al., 2004). Accordingly, *Healthy People 2020*, has called for reductions in heavy drinking, binge drinking, and average annual alcohol consumption among adults (US Department of Health and Human Services, 2011).

Gays and lesbians have long been assumed to drink more heavily, and to be at higher risk of alcohol abuse and dependence, than their heterosexual counterparts (Israelstam and Lambert, 1983). Until recently, epidemiological data on drinking patterns across sexual orientation has been quite limited. Early research found high levels of alcohol abuse and dependence among gay men and lesbian women (Fifield, 1975; Lewis et al., 1982; Lohrenz et al., 1978; Saghir and Robins, 1973); however, these studies suffered from a number of methodological limitations, such as small samples recruited via non-probability methods, poorly operationalized definitions of sexual orientation, and lack of appropriate comparison groups. Over the past two decades, there has been growing attention to identifying and understanding the health of sexual minorities—a group that includes gay, lesbian, bisexual, and “mostly heterosexual” people in relation to that of exclusively heterosexual peers—resulting in theoretical and methodological advances. Early research often focused on men who self-identified as gay or bisexual. With the emergence of the HIV epidemic, behavioral definitions (i.e., men who have sex with men [MSM]) gained prominence. However, recent critiques have highlighted the shortcomings of relying on a single indicator of sexual orientation and have advocated that both identity and behavior be considered (Midanik et al., 2007; Pathela et al., 2006; Sexual Minority Assessment Research Team [SMART], 2009; Young and Meyer, 2005). Measures of sexual attraction, behavior, and identity are increasingly included in general population surveys (e.g., National Epidemiological Survey on Alcohol and Related Conditions; National Alcohol Survey; National Survey on Drug Use and Health) as a basic demographic characteristic. This has facilitated development of a more rigorous, albeit still limited, epidemiological profile of substance use by sexual orientation.

Although most studies have found higher levels of hazardous drinking, abuse, and dependence among sexual minority women versus heterosexual peers (Burgard et al., 2005;

Case et al., 2004; Cochran et al., 2000; Drabble et al., 2005), findings among men have been inconsistent. Some studies have found that gay, bisexual, and other men who have sex with men (MSM) have greater risk of some adverse alcohol outcomes. For example, examining US adults' data in the National Epidemiological Survey on Alcohol and Related Conditions (NESARC), McCabe and colleagues (2009) found no difference in odds of binge drinking by sexual orientation; however, men who identified as gay or bisexual, were attracted exclusively to men, or had both male and female sex partners had higher odds of alcohol dependence compared to their exclusively heterosexual counterparts. Studying drinking during the transition from adolescence to young adulthood, Dermody and colleagues (2014) analyzed data from the National Longitudinal Study of Adolescent Health (Add Health); the researchers found that the proportion engaging in heavy drinking increased more rapidly among gay, bisexual, and mostly heterosexual young men than their exclusively heterosexual peers from Wave 1 (age 14-18) to Wave 4 (age 27-31). Another study of young adults used a national non-probability sample of undergraduate college students (Kerr et al., 2014). The researchers found that gay and bisexual young men had higher odds of recent drinking and more alcohol-related problems than male students who identified as heterosexual.

In contrast, other studies have found few differences by sexual orientation. Pooling four waves of the California Health Interview Survey, Boehmer and colleagues (2012) found that gay-identified men had higher odds of any alcohol consumption, but equivalent odds of binge drinking, as heterosexual and bisexual men. Similarly, Trocki and colleagues (2005) analyzed data from the National Alcohol Survey (NAS). They found that gay-identified men spent more time in bars versus other drinking contexts than their heterosexual counterparts, but there was no difference between sexual orientation groups in the number of drinks consumed per occasion. In a separate analysis of the NAS data, the researchers found that a smaller proportion of gay-identified men abstained from alcohol than heterosexual men; however, the groups had equivalent odds of drunkenness, alcohol-related problems, and alcohol dependence (Drabble et al., 2005). Finally, analyzing data from the National Household Survey of Drug Abuse, Cochran and Mays (2000) determined that odds of alcohol dependence did not differ between men who had any past year same-sex partners and their exclusively heterosexual peers. Findings across these studies likely vary due to differences in measures of sexual orientation, alcohol use, and sample composition.

Concurrent with recent research on sexual minorities, there has been growing interest in the effects of multiple disadvantaged statuses for a variety of health outcomes. Scholars have argued that examining health disparities along a single axis of inequality may obscure important within-group variation (Braveman et al., 2011; Schulz and Mullings, 2006; Weber and Fore, 2007). Cognizant of these critiques, we draw on intersectionality theory (Crenshaw, 1989, 1991) as an overarching conceptual framework for this study. Originating in Black feminist theory, intersectionality theory posits that inter-connected systems of privilege and disadvantage that must be considered together. For example, being Black cannot be fully understood independent of gender, and being a woman cannot be fully understood independent of race. Recent theoretical advances propose that disadvantage related to sexual orientation may be contingent upon other social categories (Bowleg, 2008);

however, few studies have incorporated an intersectionality framework to examine substance use among sexual minorities.

The few alcohol studies that have investigated concurrent minority race/ethnicity and minority sexuality have stratified samples or controlled for one factor rather than testing interactions. For example, examining a four-city probability sample of sexual minority men by race/ethnicity, Stall and colleagues (2001) found no difference in heavy drinking by race/ethnicity, but Latino sexual minority men had higher odds of alcohol problems than White sexual minority men. More recently, Cochran et al. (2007) looked at substance use and psychiatric disorders by sexual orientation in a national probability sample of Latino and Asian-American men. Controlling for race/ethnicity, the researchers found no difference in odds of lifetime or past-year alcohol abuse or dependence between sexual minority and heterosexual men. Finally, Newcomb and colleagues (2014) analyzed a sample of young sexual minority men in a large mid-western city recruited via respondent-driven sampling. Among sexual minority young men, Black and Latino men had lower odds of any drinking, and that Black men had lower odds of binge drinking, than their White peers.

Alcohol misuse has been identified as a health concern not only among the general population but also among sexual minorities (Institute of Medicine [IOM], 2011; Yong et al., 2008). Given inconsistent evidence about drinking patterns, but strong evidence of health and social consequences associated with heavy alcohol use, this study sought to clarify our understanding of hazardous drinking at the intersection of sexuality and race/ethnicity among men. Using data gathered in Wave 2 of NESARC, we evaluated whether the association between sexual orientation and three hazardous drinking outcomes varied by race/ethnicity among non-Latino White men, non-Latino Black men, and Latino men of any race.

2. Materials and Methods

2.1 Analytic Sample

Data for this study come from Wave 2 (2004-2005) of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Details of NESARC have been described elsewhere (Grant and Dawson, 2006). Briefly, NESARC consisted of a nationally representative sample of the US adult population that included oversamples of racial/ethnic minorities and young adults. At Wave 1 (2000-2001), 43,093 participants completed a computer-assisted interview administered by Census Bureau professional interviewers. At Wave 2 (2004-2005), participants were re-contacted, approximately 80% of whom completed a similar interview. The Wave 2 interview added a number of additional measures, including sexual attraction, sexual behavior, and sexual identity. Our study focused on the sub-set of self-identified non-Latino White, non-Latino Black, and Latino (any race) men (hereafter referred to as White, Black, and Latino men) who completed a Wave 2 interview and who reported any alcohol use in the past year ($n=9,947$). NESARC administrators used an algorithm to impute race when that information was missing and assigned a single race to individuals who identified as more than one race (Westat, 2006). As these manipulations were performed prior to release of the data set, we are unable to account for men reporting multiple racial identities in our study. Of potential participants,

we excluded 51 men missing data on one or more alcohol outcomes and an additional 207 men for whom we could not determine their sexual orientation, resulting in a final analytic sample of 9,689 men. Characteristics of the analytic sample are shown in Table 1.

2.2 Measures

Previous analyses of NESARC data have used sexual identity alone in determining participants' sexual orientation (McCabe et al., 2010; McLaughlin et al., 2010) or have stratified analyses by sexual identity, attraction, and behavior (Bostwick et al., 2010). To improve precision in determining sexual orientation, we followed Sweet and Welles (2012), using the identity, attraction, and behavioral measures of sexual orientation to construct a nominal descriptive variable: (1) exclusively heterosexual (i.e., only opposite-sex attraction and opposite-sex partners); (2) heterosexual identity with any same-sex attraction but only opposite-sex partners; (3) heterosexual with any same-sex partners; (4) gay identity (regardless of attraction or behavior); and (5) bisexual identity (regardless of attraction or behavior). To avoid problems associated with small cell counts in multivariate analyses, we collapsed sexual orientation into two groups for analysis: the sexual minority group included gay- or bisexually- identified men with any attraction or behavior and heterosexually-identified men with any same-sex partners. In contrast, the referent group consisted of heterosexually-identified men who reported only opposite-sex partners, with or without any same-sex attraction.

The NESARC interview included the Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS), a validated measure of substance use and psychiatric disorders (Ruan et al., 2008). We examined three hazardous drinking outcomes: (1) heavy daily drinking in the past year, defined as more than two drinks per day; (2) heavy weekly drinking in the past year, defined as more than 14 drinks per week; and (3) binge drinking in the past year, defined as five or more drinks within a two hour period. Each outcome was dichotomized (any hazardous drinking vs. none). To account for potential confounding, we examined six demographic variables (age, educational attainment, employment status, annual income, relationship status, and residential area) as covariates in multiple variable models.

2.3 Analysis

First, we computed descriptive statistics and estimated the prevalence of each hazardous drinking outcome by sexuality within each racial/ethnic group. Differences were assessed by Rao-Scott Chi-Square tests of association. Next, we tested potential demographic confounders of each outcome in bivariate tests of association. Following Hosmer and Lemeshow (2000), we used $p < .25$ as the criterion for inclusion in multiple regression models. Finally, after assessing the main effects of sexuality and race/ethnicity, we entered interaction terms between sexuality and race/ethnicity into our regression models to assess the presence of effect modification. We then added the set of covariates. To better understand significant interactions, we calculated conditional log-odds of heavy daily drinking, heavy weekly drinking, and binge drinking for each combination of sexual orientation and race/ethnicity. We exponentiated the results and graphed the resulting fitted odds. All analyses were completed using SAS v9.3 (SAS Institute, Cary NC) with sampling

weights provided with the NESARC and accounted for the complex survey design via survey procedures (e.g., proc surveylogistic).

3. Results

3.1 Differences in Hazardous Drinking

In our sample of current drinkers, we found comparable or lower levels of hazardous drinking among sexual minority men in nearly all comparisons. Furthermore, differences in hazardous drinking by sexual orientation varied by racial/ethnic group (Table 2). Among White men, a larger proportion of heterosexuals exceeded the recommended daily drinking limit than their sexual minority peers (52% vs. 48%, $p=.004$), but approximately equivalent proportions engaged in heavy weekly drinking. Among Black men, there was no difference in heavy daily drinking by sexual orientation, but a larger proportion of heterosexual men reported heavy weekly drinking than sexual minority men (22% vs. 12%, $p<.001$). Larger proportions of both White and Black heterosexual men reported binge drinking than their same-race sexual minority peers (49% vs. 41%, $p<.001$; and 41% vs. 31%, $p<.001$, respectively). Sexual minority Latinos were the only sub-group to report a higher level of heavy weekly drinking than their heterosexual peers (25% vs. 14%, $p=.003$). There were no sexual orientation differences in heavy daily drinking or binge drinking among Latino men.

3.2 Interactions between Sexual Orientation and Race/Ethnicity

In the final models (Table 3), there was no interaction between sexual orientation and race/ethnicity for heavy daily drinking. Examining main effects, sexual orientation was not associated with the outcome; however, Black men had 40% lower odds (adjusted odds ratio [aOR] 0.60; 95% confidence interval [95% CI] 0.55, 0.64). There was no difference in odds of heavy daily drinking between Latino men and White men. In contrast, we found statistically significant interactions between sexual orientation and race/ethnicity for heavy weekly drinking (Wald chi-square (df=2) 57.55, $p<.001$) and binge drinking (Wald chi-square (df=2) 14.19, $p<.001$), indicating that for other outcomes the association between sexual orientation and hazardous drinking depended on race/ethnicity.

To better understand the interactions, we estimated conditional odds of heavy weekly drinking and binge drinking for Black and Latino men and compared results to heterosexual White men, the referent group. We found an antagonistic relationship for heavy weekly drinking (Figure 1). In other words, the joint effect of sexual orientation and race/ethnicity produced differences in opposite directions for Black and Latino men. Among Blacks, heterosexual men had approximately equivalent odds but Black sexual minority men had 61% lower odds of heavy weekly drinking compared to White heterosexual men. Among Latinos, heterosexual men had 36% lower odds of heavy weekly drinking than White heterosexual men, but sexual minority Latinos had 25% higher odds.

Examining the interaction between sexual orientation and race/ethnicity for binge drinking (Figure 2), heterosexual Black men had approximately half the odds of binge drinking compared to heterosexual White men. Furthermore, a greater reduction in risk was found among sexual minority Black men, who had 79% lower odds of binge drinking compared to

heterosexual White men. The lower odds of binge drinking among heterosexual Latinos, and larger decrement among sexual minority Latinos, failed to reach statistical significance. Thus, there was no difference in odds of binge drinking between Latinos and heterosexual White men.

Discussion

This study examined the joint effect of sexual orientation and race/ethnicity on three types of hazardous drinking in a national sample of men. To date, the majority of research on alcohol disparities among men has focused on race/ethnicity, with a smaller number of studies examining differences by sexual orientation. Recognizing the promise of intersectionality theory—a key tenet of which holds that there are intersecting systems of privilege and disadvantage (Bowleg, 2012)—we believe that analyses focusing on a single axis of inequality may ignore important within-group variation and may mis-characterize risk. In other words, the factors associated with hazardous drinking among Black and Latino sexual minority men may differ from those of their White peers due to both minority race/ethnicity and minority sexuality. By testing interactions between these factors, our findings extend the current epidemiologic literature. Our study provides a more nuanced understanding of men's drinking patterns, which may improve alcohol risk-reduction efforts.

As hypothesized, the prevalence of hazardous drinking varied by sexuality within racial/ethnic groups. The direction of differences, however, suggests equivalent or lower risk among sexual minority men. In four comparisons, greater proportions of heterosexual men engaged in hazardous drinking than their sexual minority peers; in another set of four comparisons, there were no differences by sexual orientation. In only one instance did a larger share of sexual minority men report hazardous drinking than their heterosexual peers. Thus, there was little support for the popular assumption of greater hazardous drinking among gay, bisexual, and other men who have sex with men (MSM). As epidemiologic evidence suggests higher levels of illicit drug use among gay and bisexual men than heterosexual men (Conron et al., 2010; King et al., 2008; Trocki et al., 2009), substitution may account for these findings. If sexual minority men replace alcohol with other substances, such as cannabis, observed levels of hazardous drinking may remain low. Future research that considers alcohol use in the context of other concurrent substance use may better explain these findings.

We found significant interactions between race/ethnicity and sexual orientation for two out of three hazardous drinking outcomes, which suggests that neither race/ethnicity nor sexuality should be considered without the other. This is congruent with the recent Institute of Medicine report on the health status of sexual and gender minorities (Institute of Medicine [IOM], 2011), which advocates for an intersectional conceptualization of risks, among other theoretical orientations. With increasing adoption of sexual orientation as a basic demographic variable in general population surveys, we look forward to future research that is able to examine the combined effect of these two factors. We recognize, however, that jointly modeling race/ethnicity and sexual orientation may raise concerns about small counts and reduced statistical power. Some strategies have been adopted to circumvent this potential limitation, such as collapsing samples across survey waves to

increase the number of sexual minority respondents. Despite the methodological challenges, we urge public health and alcohol researchers to collect large samples and to examine health patterns by multiple social characteristics which represent a number of axes of inequality.

In contrast to the double jeopardy hypothesis (Dowd and Bengston, 1978; Ferraro, 1987), which predicts poorer health outcomes among those with multiple minority statuses, and reactive drinking models (Conger, 1956; Greeley and Oei, 1999), which hold that some people turn to alcohol as a coping response to stressors associated with minority status, we found little indication that men who are both racial/ethnic minorities and sexual minorities are at greater risk of hazardous drinking. Our study showed that Black men are at lower risk of heavy daily drinking, regardless of sexual orientation. Furthermore, the interactions we detected suggest an enhanced protective effect of sexual minority status for Black men, who have lower odds of heavy weekly drinking and binge drinking than both heterosexual White men and their same-race heterosexual peers. Among Latino men, the pattern differed slightly. Although sexual minority Latinos had higher odds of heavy weekly drinking than their heterosexual peers, they were at equivalent risk of heavy daily drinking and binge drinking. Our findings challenge the popular notion that multiple minority statuses must necessarily lead to poorer health outcomes. In fact, empirical tests of the double jeopardy hypothesis have been inconsistent, with indications that the effect of multiple disadvantage varies by gender, race/ethnicity, and outcome under study (Brown et al., 2012; Cummings and Jackson, 2008; Piatt, 2011). Thus, we advocate for a more holistic conceptualization of drinking behaviors that takes account of multiple concurrent risk and protective factors. In other words, presumptions that multiple minority statuses inevitably lead to greater substance use through exacerbated stress may be overly simplistic.

There are several possible explanations for our findings. First, it has been widely observed that greater proportions of Blacks and Latinos abstain from alcohol than their White counterparts and that heavy drinking trajectories differ for racial/ethnic minority men (Chartier and Caetano, 2010; Dawson et al., 1995; Galvan and Caetano, 2003). Thus, there may be social and cultural factors associated with minority race/ethnicity, such as greater religiosity or maturational factors (e.g., earlier age of first full-time parenting), that suppress hazardous drinking. It remains unknown, however, if such social and cultural factors may be responsible for the lower risk of heavy drinking among sexual minority Black and Latino men.

Second, immigration and assimilation are potentially important factors that may influence drinking among Latino men. Generally speaking, greater integration into US society has been associated with poorer health outcomes, including greater hazardous drinking. Although a majority of Latino men (54%) in our sample had been born outside the US, their average time in the US was 19 years, suggesting a well-integrated subgroup. Thus, Latino men's drinking patterns may resemble those of heterosexual White men, accounting for the few differences we detected.

Third, bars have historically served as a social nexus for gay men (Chauncy, 1994; D'Emilio, 1993), and sexual minority men are more likely to attend bars than their heterosexual peers (Trocki et al., 2005). Several recent studies have documented pervasive

racism and discrimination within gay male communities (Giwa and Greensmith, 2012; Loiacano, 1989). If Black and Latino sexual minority men are less likely to socialize at traditionally White gay bars, they may also be less likely to engage in hazardous drinking. As the NESARC interview did not include sufficiently detailed information about drinking contexts, we were unable to explore this potential explanation. We look forward to future research that incorporates drinking context among explanatory variables.

Fourth, there may be factors that are more prevalent among exclusively heterosexual men that increase the risk of hazardous drinking across all racial/ethnic groups. For example, pro-drinking gender norms and expectations that appropriate masculine behavior includes alcohol consumption may encourage heavier drinking (Courtenay, 2000; Lemle and Mishkind, 1989; Mahalik et al., 2007). Sexual minority men may be less likely to identify with traditional masculinity, and therefore be better able to resist gendered pressures to drink heavily. To our knowledge, only one study has investigated gender norms among sexual minority men. Recruiting a diverse, online sample of gay-identified men, Hamilton and Mahalik (2009) found that endorsement of traditional masculinity was associated with greater substance use. As the analysis combined alcohol with other drug use, and did not disaggregate effects by race/ethnicity, further research is needed to determine whether the relationship between traditional masculinity and hazardous drinking varies jointly by sexual orientation and race/ethnicity.

This study also suggests directions for future research. We examined three types of hazardous drinking, but other alcohol outcomes also warrant study. Specifically, we encourage research on alcohol-related social consequences (such as failure to fulfill work, family, or other social obligations), health consequences (such as sexually transmitted infections associated with heavy alcohol use), and alcohol-related harms to others (such as interpersonal violence and unintentional injuries). Analyzing data from the National Alcohol Survey, Mulia and colleagues (2009) found that racial/ethnic minorities experienced greater alcohol-related problems than Whites, particularly at low and moderate levels of consumption. It remains unknown whether the patterns holds for sexual minorities. In addition, we encourage further methodological research on sexual orientation as a risk factor. McCabe and colleagues (2009) have already established that prevalence estimates and risk of substance use disorders among men varied by the sexual orientation measure used. Although we advocate for use of multiple measures of sexual orientation to improve precision, we recognize that a single dimension may be more salient at different points in the life course, such as attraction among youth and emerging adults or behavior among older adults.

Several potential limitations must be considered. First, although we advocate for a more nuanced understanding of men's drinking patterns based on sexual orientation and race/ethnicity, we recognize that we constrained some variation in our study. For example, we reduced variation by using Latino as a homogeneous ethnic category and by collapsing different minority sexual orientations for analysis. It has already been shown that drinking patterns and risk of alcohol use disorders differ between the major US Latino groups (Caetano et al., 2009; Caetano et al., 2012). In addition, some studies have found differences among sexual minorities, suggesting greater substance abuse among bisexual men than gay

men (Ford and Jasinski, 2006; Kerr et al., 2014). We look forward to future general population studies that invest in large samples and/or use quota-sampling in order to further disaggregate sexual orientation and racial/ethnic categories. Second, despite using a large nationally representative sample, our study excluded American Indian/Alaskan Native and Asian, Native Hawaiian, and other Pacific Islander men. This limits the generalizability of our findings to those groups. As there is evidence of high levels of hazardous drinking among American Indians (Chartier and Caetano, 2010; Landen et al., 2014; Wu et al., 2011) and some subgroups of Asian-Americans (Lee et al., 2013; Lee et al., 2014; Maxwell et al., 2012), we encourage future research on alcohol use by sexual minority men that includes these groups. Third, we utilized data from a single survey wave because sexual orientation measures were not originally included in the NESARC interview. As our study is descriptive, cross-sectional data are appropriate. With the greater inclusion of sexual orientation measures in general population surveys, we look forward to future analyses of sexual minorities' hazardous drinking that take advantage of longitudinal data.

Conclusions

Based on our findings of interactions between sexual orientation and race/ethnicity, we conclude that investigating men's drinking patterns along a single axis of inequality is insufficient as it may obscure important within-group differences. We found that sexual minority men were rarely at greater risk of hazardous drinking than their exclusively heterosexual peers, but that the direction and magnitude of difference varies by race/ethnicity and outcome. Additional research is necessary to identify the mechanisms responsible for this pattern, such as potential protective factors associated with minority race/ethnicity or substitution of illicit drugs for alcohol use.

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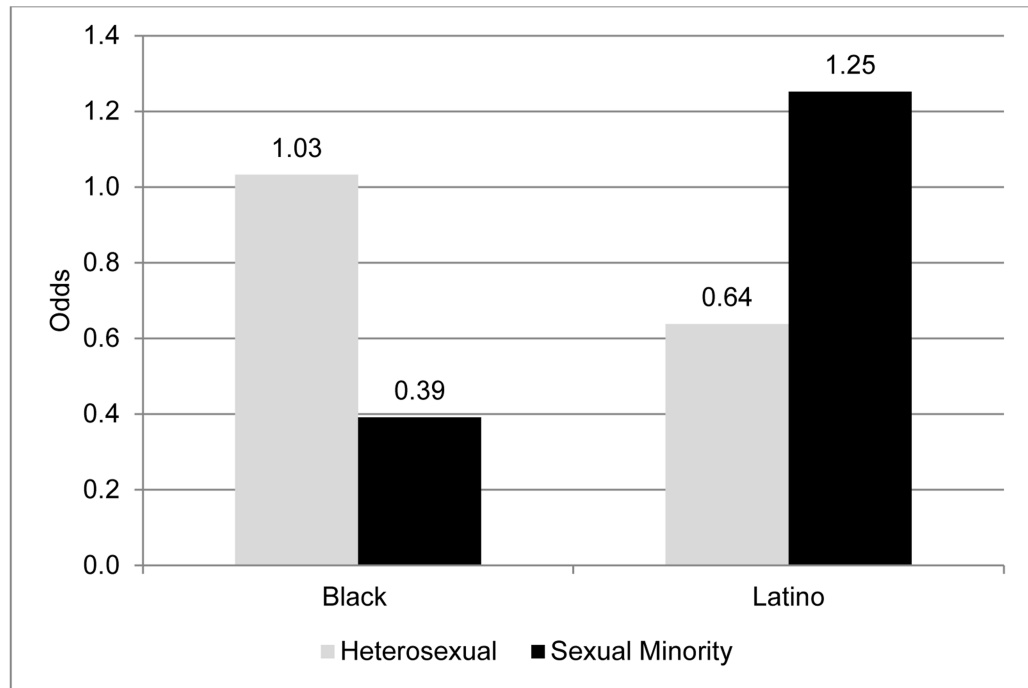


Figure 1. Fitted odds of heavy weekly drinking in past year by sexual orientation and race/ethnicity among men (referent = heterosexual White men)

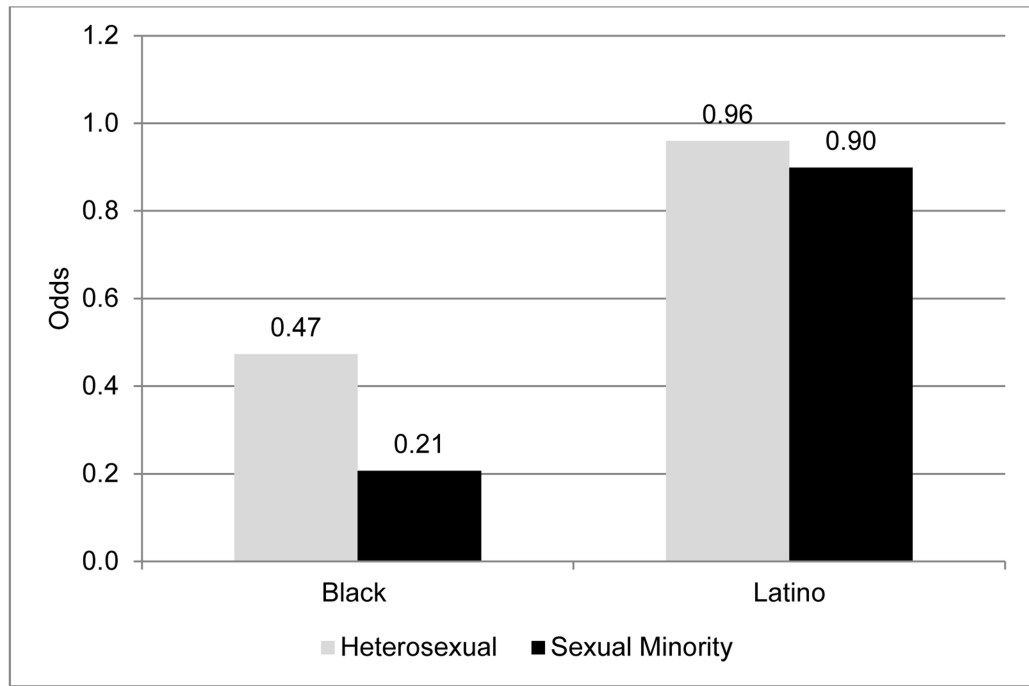


Figure 2. Fitted odds of binge drinking in past year by sexual orientation and race/ethnicity among men (referent = heterosexual White men)

Table 1

Sample characteristics of male current drinkers who completed the 2004-2005 NESARC survey by race/ethnicity, n (%)

	White (n=6384)		Black (n=1403)		Latino (n=1902)		
Sexual orientation							
Exclusively heterosexual	5969	(94.4)	1318	(94.3)	1789	(95.2)	<.001
Heterosexual identity with same-sex attraction but only female partners	102	(1.4)	30	(2.0)	32	(1.3)	
Heterosexual identity with some same-sex partners	164	(2.4)	33	(2.4)	44	(1.9)	
Gay	108	(1.3)	13	(0.6)	25	(1.2)	
Bisexual	41	(0.5)	9	(0.7)	12	(0.4)	
Age							
Less than 30 years	1190	(21.7)	313	(31.0)	570	(37.4)	<.001
30-44 years	2100	(31.9)	502	(35.4)	746	(39.7)	
45-60 years	1827	(28.3)	400	(23.8)	391	(16.4)	
60 years and older	1267	(18.1)	188	(9.8)	195	(6.6)	
Educational attainment							
Less than high school diploma or GED	484	(7.6)	239	(17.6)	492	(32.1)	<.001
High school diploma or GED	1565	(25.2)	444	(31.1)	457	(23.5)	
Some college	2012	(31.8)	466	(33.8)	572	(27.6)	
Bachelor's degree and higher	2323	(35.4)	254	(17.5)	381	(16.8)	
Employment status							
Not working	1642	(24.4)	407	(27.6)	344	(14.4)	<.001
Full-time	4267	(68.2)	866	(62.9)	1420	(78.4)	
Part-time	475	(7.3)	130	(9.5)	138	(7.1)	
Annual income							
Less than \$20,000	1261	(19.8)	500	(36.9)	540	(31.5)	<.001
\$20,000 - \$34,999	1431	(22.5)	349	(25.2)	566	(31.2)	
\$35,000 - \$69,999	2226	(34.7)	442	(30.6)	577	(28.1)	
\$70,000 and higher	1466	(23.0)	112	(7.3)	219	(9.3)	
Relationship status							
Married/cohabitating	4058	(70.0)	669	(51.4)	1197	(67.7)	<.001
Widowed/divorced	1131	(12.5)	302	(15.7)	250	(8.8)	
Never married	1195	(17.5)	432	(32.9)	455	(23.5)	
Residence							
Urban	2034	(31.8)	510	(35.8)	654	(34.0)	<.001
Suburban	3334	(52.2)	691	(49.0)	940	(50.3)	
Rural	1016	(15.9)	202	(15.2)	308	(15.7)	
Foreign birth							
Foreign birth	264	(4.1)	126	(9.9)	913	(53.9)	<.001
Years in US among foreign-born, mean (SD)	29.0	(17.9)	21.5	(10.5)	19.1	(12.9)	<.001

Note: Counts are unweighted; percentages and means are weighted.

Hazardous drinking among male current drinkers who completed the 2004–2005 NESARC survey by sexual orientation and race/ethnicity, n (%)

Table 2

	White			Black			Latino		
	Heterosexual	Sexual minority ^a	p	Heterosexual	Sexual minority ^a	p	Heterosexual	Sexual minority ^a	p
Heavy daily drinking ^b	3117 (52.0)	149 (48.3)	.004	607 (48.6)	24 (50.9)	.600	1040 (61.2)	42 (63.3)	.419
Heavy weekly drinking ^c	1074 (17.4)	56 (17.1)	.654	267 (21.5)	10 (11.6)	<.001	248 (13.5)	11 (25.1)	.003
Binge drinking ^d	2917 (48.8)	127 (40.6)	<.001	520 (41.2)	20 (31.3)	<.001	999 (59.3)	37 (58.9)	.909

Note: counts are unweighted; percentages are weighted.

^aSexual minority = gay, bisexual, or heterosexually identified men with at least some same-sex partners

^bHeavy daily drinking = more than two drinks per day

^cHeavy weekly drinking = more than 14 drinks per week

^dBinge drinking = five or more drinks within a two hour period

Odds of hazardous drinking in the past year by sexual orientation and race/ethnicity among male current drinkers who completed the 2004-2005 NESARC survey (n=9,689)

	Heavy daily drinking ^a		Heavy weekly drinking ^b		Binge drinking ^c	
	aOR	(95% CI)	aOR	(95% CI)	aOR	(95% CI)
Sexuality						
Heterosexual	ref.	--	ref.	--	ref.	--
Sexual minority	0.930	(0.827, 1.045)	0.912	(0.826, 1.006)	0.777	(0.686, 0.881)
Race/Ethnicity						
White	ref.	--	ref.	--	ref.	--
Black	0.595	(0.552, 0.641)	1.033	(0.958, 1.114)	0.474	(0.434, 0.516)
Latino	0.949	(0.899, 1.001)	0.639	(0.587, 0.695)	0.960	(0.907, 1.015)
Interactions						
* Black sexual minority	0.799	(0.602, 1.060)	0.416	(0.318, 0.544)	0.563	(0.380, 0.835)
* Latino sexual minority	1.097	(0.901, 1.338)	2.151	(1.296, 3.569)	1.206	(0.982, 1.480)
Age						
Less than 30 years	ref.	--	ref.	--	ref.	--
30-44 years	0.523	(0.484, 0.565)	0.980	(0.907, 1.059)	0.536	(0.497, 0.578)
45-59 years	0.294	(0.271, 0.320)	1.001	(0.914, 1.095)	0.279	(0.257, 0.302)
60 years and older	0.104	(0.091, 0.119)	0.818	(0.730, 0.917)	0.091	(0.080, 0.104)
Educational attainment						
Less than HS or GED	ref.	--	ref.	--	ref.	--
HS diploma or GED	0.860	(0.792, 0.934)	0.928	(0.822, 1.046)	0.834	(0.767, 0.906)
Some college	0.735	(0.680, 0.794)	0.737	(0.658, 0.827)	0.656	(0.602, 0.714)
Bachelor's degree or higher	0.571	(0.521, 0.626)	0.664	(0.588, 0.750)	0.498	(0.451, 0.550)
Employment status						
Full-time	ref.	--	ref.	--	ref.	--

	Heavy daily drinking ^a		Heavy weekly drinking ^b		Binge drinking ^c	
	aOR	(95% CI)	aOR	(95% CI)	aOR	(95% CI)
Not working	0.879	(0.816, 0.948)	1.145*	(1.027, 1.276)	0.934	(0.865, 1.007)
Part-time	1.069	(0.961, 1.188)	1.267***	(1.155, 1.389)	1.027	(0.928, 1.137)
Annual income						
Less than \$20,000	ref.	--	ref.	--	ref.	--
\$20,000-\$34,999	0.857***	(0.787, 0.933)	0.856**	(0.764, 0.959)	0.930	(0.848, 1.020)
\$35,000-\$69,999	0.972	(0.889, 1.062)	0.818***	(0.734, 0.911)	1.038	(0.948, 1.137)
\$70,000 and greater	1.096	(0.983, 1.221)	0.831**	(0.732, 0.944)	1.091	(0.977, 1.219)
Relationship status						
Married/cohabitating	ref.	--	ref.	--	ref.	--
Never married	1.675***	(1.557, 1.801)	1.796***	(1.661, 1.943)	1.642***	(1.529, 1.764)
Widowed/divorced/separated	1.652***	(1.515, 1.803)	1.613***	(1.497, 1.738)	1.632***	(1.496, 1.780)
Residential area						
Urban	ref.	--	ref.	--	ref.	--
Rural	1.052	(0.975, 1.136)	0.914	(0.810, 1.031)	1.041	(0.962, 1.127)
Suburban	1.059*	(1.005, 1.116)	0.936	(0.872, 1.005)	1.061*	(1.007, 1.117)

aOR = adjusted odds ratio, estimates are weighted and 95% confidence intervals are adjusted to account for NESARC's complex survey design.

* p<.05

** p<.01

*** p<.001

^a Heavy daily drinking = more than two drinks per day

^b Heavy weekly drinking = more than 14 drinks per week

^c Binge drinking = five or more drinks within a two hour period