



Published in final edited form as:

*Drug Alcohol Depend.* 2016 April 1; 161: 127–134. doi:10.1016/j.drugalcdep.2016.01.022.

## Religiosity as a protective factor for hazardous drinking and drug use among sexual minority and heterosexual women: Findings from the National Alcohol Survey

Laurie Drabble<sup>1,\*</sup>, Karen F. Trocki<sup>2,a</sup>, and Jamie L. Klinger<sup>2,b</sup>

Laurie Drabble: laurie.drabble@sjsu.edu; Karen F. Trocki: ktrocki@arg.org; Jamie L. Klinger: jklinger@arg.org

<sup>1</sup>San José State University School of Social Work, One Washington Square, San José, CA 95192-0124

<sup>2</sup>Alcohol Research Group, Public Health Institute, 6475 Christie Ave. Suite 400, Emeryville, CA 94608

### Abstract

**Objective**—Despite research documenting disparities in risk for alcohol-related problems among sexual minority women, few studies explore potential protective factors within this population. This study examines how religiosity may function as a protective or risk factor for alcohol-problems or other substance use among sexual minorities compared to heterosexuals.

**Method**—Data from 11,169 women who responded to sexual identity and sexual behavior questions from three population-based National Alcohol Survey waves (2000, 2005, 2010) were utilized for analyses of religiosity in relation to lifetime drinking, past year hazardous drinking, and past year drug use.

**Results**—Religiosity was significantly greater among exclusively heterosexual women compared to all sexual minority groups (lesbian, bisexual and heterosexual women who report same sex partners). Lesbians reported the lowest rates of affiliation with religions/denominations discouraging alcohol use. Past year hazardous drinking and use of any illicit drugs were significantly lower among exclusively heterosexual women compared to all sexual minority groups. High religiosity was associated with lifetime alcohol abstinence and was found to be protective against hazardous drinking and drug use among both sexual minority and heterosexual women. Reporting religious norms unfavorable to drinking was protective against hazardous drinking among exclusively heterosexual women but not sexual minority women

**Conclusions**—Findings reveal the importance of considering sexual minority status in evaluation of religion or spirituality as protective among women. Future studies should explore

\*Corresponding author. Tel.: (408) 924-5836; Fax: (408) 924-5912.

<sup>a</sup>phone: 510-597-3440; fax: 510-985-6459

<sup>b</sup>phone: 510-597-3440

**Conflict of Interest:** No conflicts declared.

**Publisher's Disclaimer:** This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

religiosity in the context of other individual and environmental factors, such as positive identity development and community-level acceptance, which may be salient to resiliency among sexual minorities.

## Keywords

Women; sexual minorities; alcohol consumption; religiosity; risk factors; protective factors

---

## 1. Introduction

A growing body of research on sexual-orientation-related disparities in risk for alcohol use and alcohol-related problems among sexual minorities has found that sexual minority women are less likely to abstain from drinking alcohol and are more likely to report heavy episodic drinking, negative consequences associated with drinking, and symptoms of alcohol dependence. (Cochran and Mays, 2000; Drabble et al., 2005; McCabe et al., 2009; Wilsnack et al., 2008). Although both sexual minority women and men appear to have significantly higher rates of illicit drug use compared to heterosexuals, disparities in risk for drug use and for alcohol-related problems among sexual minorities compared to heterosexuals are generally more pronounced among women than men. (Cochran et al., 2004; Cochran and Mays, 2000; Drabble et al., 2005; McCabe et al., 2009; Trocki et al., 2009). For example, the largest population-based study to date, the National Epidemiologic Survey on Alcohol and Related Conditions with a sample of 34,653 adults in the U.S. (McCabe et al., 2009) found significantly lower rates of past year heavier drinking among heterosexual women (8.4%) compared to lesbians, (20.1%), bisexuals (25.0%), and women who were 'not sure' of sexual identity (14.0%). Similar significant differences were found for past year marijuana use (heterosexuals, 2.6%; lesbians, 16.7%, bisexuals, 22.2%; not sure, 9.0%) and other drug use (heterosexuals, 3.3%; lesbians, 12.6%; bisexuals, 14.1%; and not sure, 8.2%). Lesbian and bisexual women also reported higher rates of past year alcohol dependence symptoms (12.2% and 15.5% respectively) compared to heterosexual women (2.5%).

The accumulation of lifetime stressors, both sexual-minority specific (e.g., experiences of discrimination or internalization of negative societal attitudes about sexual minorities) and general stressors that may differentially impact sexual minorities (e.g., experiences of victimization), may contribute to disparities in risk for alcohol-related problems and drug use among sexual minority women compared to heterosexuals (Hughes, 2011). Furthermore, factors often considered protective against alcohol and drug use among women may be less salient to sexual minority women (Hughes and Eliason, 2002).

Research to date on alcohol-related problems among sexual minorities has focused disproportionately on risk factors, neglecting exploration of possible factors that may be protective against substance use (Balsam, 2003; Condit et al., 2011; Hughes et al., 2003; Kwon, 2013). Religion is generally recognized as a protective factor against hazardous drinking and the development of alcohol use disorders among both adults and adolescents (Allen and Lo, 2010; Borders et al., 2010; Edlund et al., 2010; Haber et al., 2012; Michalak et al., 2007). Religiosity has a strong influence on abstention from alcohol use, although abstention rates vary considerably in relation to the degree that individuals perceive their

religion as discouraging of alcohol consumption (Michalak et al., 2007). Research findings suggesting that religiosity is generally protective against alcohol problems are consistent across national population-based studies in the United States, including studies based on data from the National Alcohol Survey (Michalak et al., 2007), the National Survey on Drug Use and Health (Edlund et al., 2010; Vaughan et al., 2011), and the General Social Survey (Allen and Lo, 2010).

Although there is a paucity of research about religiosity among sexual minorities, studies to date in the U.S. suggest that religiosity is generally lower among sexual minorities compared to heterosexuals and that differences are most notable among women (Rostosky et al., 2008; Sherkat, 2002). Using data from the General Social Survey, Sherkat found that religiosity among sexual minority women was significantly lower than heterosexual women and sexual minority men. Research about religiosity in the U.S. is of particular interest because the U.S. has higher rates of self-reported religiosity compared to other industrialized countries (Wald and Calhoun-Brown, 2011). Religious institutions are frequently a social context in which sexual minorities are marginalized (Wald and Calhoun-Brown, 2011) and many denominations and groups in the United States are non-affirming or intolerant of sexual minorities. This may generate conflicts between individuals' sexual and religious identities, or cause sexual minorities to disengage from religious contexts (Anderton et al., 2011; Barnes and Meyer, 2012; Page et al., 2013; Rostosky et al., 2007, 2010).

In contrast to research based on general population samples, recent studies suggest that religion may not be protective against alcohol-related problems or psychological distress among sexual minorities (Anderton et al., 2011; Barnes and Meyer, 2012; Eliason et al., 2011; Page et al., 2013; Rostosky et al., 2007, 2010). Higher levels of religiosity and religious affiliation with religions that promote rejecting messages appear to be associated with increased internalized homophobia (Barnes and Meyer, 2012; Page et al., 2013; Ream and Savin-Williams, 2005). Furthermore, religious climate at a community level may also impact risk and resilience among sexual minorities; specifically living in communities where the composition of religious adherents is supportive of homosexuality appears to be protective against alcohol abuse symptoms and other health risks among sexual minority youth (Hatzenbuehler et al., 2012). Consequently, religiosity may function as both a source of risk and a source of resilience among sexual minorities (Dahl and Galliher, 2010; Gattis et al., 2014; Page et al., 2013; Ream and Savin-Williams, 2005).

Few national studies examine explicitly how religiosity may function as a protective or risk factor for substance use-related problems among sexual minorities compared to heterosexuals. Notable exceptions include research based on the National Longitudinal Study of Adolescent Health (NLSAH). Rostosky and colleagues (2007) examined the relationship between religiosity at baseline (adolescence) and substance use six years later, and found that religiosity was associated with reduced odds of binge drinking and other substance use among heterosexuals, but not among sexual minorities. In subsequent analyses of the NLSAH data, (Rostosky et al., 2010) also found that religiosity was protective against heavy episodic drinking among young adult men (both heterosexual and sexual minority) and heterosexual women; however religiosity was not protective for lesbian women and was associated with increased risk among bisexual women.

Studies related to religiosity and substance use among sexual minorities have been largely based on community samples or samples from educational settings (high schools or universities) and, consequently, limited in generalizability. Research using population-based samples will contribute to better understanding of possible relationships between religiosity and use of alcohol or other drugs among sexual minorities, particularly among sexual minority women where differences in alcohol consumption and alcohol-related problems are pronounced. Research to date has primarily focused on adolescents and young adults, and there is a need for research about how religiosity may act as a protective or risk factor in adult populations. Although prior studies have found lower rates of religiosity among sexual minorities, it is important to investigate whether lower or higher rates of religiosity have any protective effect among sexual minority adults compared to heterosexuals.

The National Alcohol Survey (NAS) is one of the few national population-based surveys in the U.S. that includes both adequate religion variables (Michalak et al., 2007) as well as sexual orientation variables (Drabble et al., 2005; Midanik et al., 2006). Using NAS data, this study examined the following research questions: 1) Does religiosity differ between sexual minority women and heterosexual women? 2) Is religiosity predictive of abstinence from alcohol use among sexual minority women compared to heterosexual women? 3) Is religiosity protective against hazardous drinking and illicit drug use among sexual minority women compared to heterosexual women?

## 2. Methods

The National Alcohol Survey (NAS) is a population-based study, conducted every 5 years, which examines alcohol consumption and a wide range of alcohol-related problems. Since 2000, data have been collected using computer-assisted telephone interviews (CATI) of the adult population (age 18 or older) in all 50 U.S. states and Washington, DC. Data for the current study are from 2000, 2005 and 2010. Respondents were contacted using random digit dialing (RDD) with oversampling of African-Americans, Latinos and low-population states. Cooperation rates were 58% in 2000, 56% in 2005, and 52% in 2010—levels typical of U.S. telephone surveys since the widespread use of caller identification (Keeter et al., 2006). Data are weighted to be representative of the U.S. population and to adjust for study design. The current study includes data from 11,169 women who responded to sexual identity and sexual behavior questions from the three survey waves: NAS 2000 (n=3,880), NAS 2005 (n=3,464) and NAS 2010 (n=3,825). Women who responded “don’t know” or who refused to answer the sexual identity question (5.5%; n=649) were excluded from the analyses.

### 2.1 Measures

**2.1.1. Sexual Orientation**—The sexual orientation measure was derived primarily from responses to a question about self-identity, with the addition of responses to a question about sexual behavior used to classify women who identified as heterosexual but reported same-sex partners (Drabble et al., 2005). Respondents were asked which of the following correctly identified their sexual orientation: heterosexual, bisexual, or homosexual. Respondents were also asked about sexual partners in the past five years with the response options including the following: only men, mostly men, the same number of men and women, mostly women,

only women, and no sexual relationships in past five years. Using responses to these two questions we constructed a four-category sexual orientation variable: (1) exclusively heterosexual (no same-sex partners; n=10,723), (2) heterosexual identity with reports of same-sex partners (n=184), (3) bisexual identity (n=140), and (4) lesbian identity (n=122).

This operationalization uses primarily respondent sexual identity, which has been shown to be particularly salient in studies of hazardous drinking (McCabe et al., 2009; Midanik et al., 2006). Although recent research suggests that women who identify as “mostly heterosexual” have elevated risks for hazardous drinking and substance use compared to exclusively heterosexual women (Hughes et al., 2010, 2015; Vrangalova and Savin-Williams, 2014), the data used for this study did not intermediate identity categories, such as including “mostly heterosexual” and “mostly lesbian/gay. Consequently, we used the behavior variable to create a separate category for women who self-identify as heterosexual but report same sex partners. Many individuals with same-gender partners do not self-identify as homosexual or bisexual (Laumann et al., 1994), and it is important to disaggregate exclusively heterosexual women from women who may identify as heterosexual but who are not exclusively heterosexual in relation to identity or behavior. Studies using sexual behavior measures to disaggregate exclusively heterosexual women from heterosexual women who report same-sex sexual behavior have found significantly greater risk for substance use, hazardous drinking, and alcohol use disorders among heterosexual women who report same-sex partners compared to exclusively heterosexual women reporting (Bauer et al., 2010; Gattis et al., 2012), including prior research using National Alcohol Survey data (Drabble et al., 2005; Trocki et al., 2005, 2009). Because of significant differences in risk between these sub-groups of heterosexuals in past research, we used the four-category variable for the current study

### **2.1.2 Alcohol and drug-related variables**

**Lifetime drinking abstinence:** Lifetime drinking status was determined based on several beverage-specific (e.g., wine, beer, and whisky/liquor) alcohol frequency questions. Respondents who never consumed wine, beer or other liquor were considered lifetime abstainers. If they consumed alcohol in the past, but not in the past year, they were considered an ex-drinker. Lifetime abstinence compares lifetime abstainers versus current drinkers and ex-drinkers.

**2.1.2.1 Drug use (past 12 months):** Past year drug use was based on response to a series of questions about use of drugs including marijuana/hash/THC, illicit drugs (e.g., cocaine, heroin/opium, hallucinogens), or non-medical use of prescription drugs. Respondents who endorsed using any drug were compared to respondents who endorsed “never” using any substances within the past year.

**2.1.2.2 Alcohol consumption (past 12 months):** Consumption of five or more drinks in a sitting was assessed using a graduated frequency (GF) methodology (Greenfield, 2000). The GF assesses maximum number of drinks consumed followed by questions about frequency of drinking at descending levels of quantity (Greenfield et al., 2009). *Drinking to intoxication 2+ times (past 12 months):* Drinking to intoxication was based on a single item,

“How often in the last 12 months did you drink enough to feel drunk?” (two or more in the past year vs. never or once).

**2.1.2.3 Alcohol-related dependence symptoms (past year):** This measure assessed five alcohol dependence symptoms such as unsuccessful attempts to quit or cut down drinking, drinking in amounts larger than intended, and withdrawal symptoms. Respondents were dichotomized into two groups: any versus no alcohol dependence symptoms.

**2.1.2.4 Alcohol-related consequences:** This variable was derived from nine questions about negative consequences associated with alcohol use in five problem areas including fights/arguments, accidents/legal problems, health issues, work problems, and negative reactions from others (Midanik and Greenfield, 2000). Respondents reporting one or more consequences were compared to those who reported no consequences.

**2.1.2.5 Hazardous drinking index:** A dichotomous measure of hazardous drinking was created to include indicators of heavy episodic drinking and adverse consequences. This index was constructed using four dichotomous variables including consuming five or more drinks on one or more occasion in the past year (heavy episodic drinking), drinking to intoxication 2 or more times in the past year, one or more past year dependence symptoms and one or more past year negative consequences. Measures were selected based on their prevalence in prior studies of alcohol consumption and alcohol-related problems among sexual minorities using the National Alcohol Survey (Drabble et al., 2005, 2013). We elected to use the composite measure because separate analysis of each of the outcomes of interest would have increased the number of model parameters. The composite measure also allows for inclusion of indicators of risky drinking beyond diagnosable alcohol use disorders, which are relatively rare among women in the sample. Similar indices have been used successfully in other studies of sexual minority women (Hughes et al., 2014; Johnson et al., 2013). Dichotomized variables for each of the four indicators were used to create a score for respondents (0-4). Because intoxication twice or more in the past 12 months was reported by close to one-fifth of respondents (17.9%), we used a cutoff of two or more indicators for the dichotomous measure of hazardous drinking. Just over ten percent of the respondents in the full sample were classified as past year hazardous drinking (11.5%). The internal consistency of the four-item index was adequate (Chronbach alpha=.70).

### 2.1.3. Religiosity Variables

**2.1.3.1 Religiosity:** Religiosity was assessed based on responses to the question “how important is religion in your life?”, Would you say: very important, somewhat important, not really important, or not at all important. A dichotomous religiosity variable was created: important (very) compared to the other three categories; this has been used in past studies of the relationship between religiosity and alcohol variables (see Michalak, 2007).

**2.1.3.2 Religious norms:** Religious norms associated with alcohol use were assessed primarily based on the question “Does your religion discourage drinking alcoholic beverages?” A dichotomous religious alcohol norm variable was created: favorable (no) and unfavorable (yes) (Michalak et al., 2007). Respondents with no religion were categorized as

“no,” for the religious alcohol norm variable, based on a “no preference” response to an earlier question that asked about religious preference (Protestant, Catholic, Jewish, something else, do not have a religious preference).

**2.1.4. Demographics and Sample Characteristics**—Demographic measures include relationship status (partnered status included married and living with a spouse, living with someone as a couple, or married and not living with spouse; not partnered included those who were separated, divorced, widowed, or never married), age (18-29, 30-49, and 50 and older), race (White, Black [African-American, African, Black], Hispanic [Latina, Mexican, Central or South American, or any other Hispanic origin], Other [Asian, Pacific Islander, American Indian, Alaska Native, and other]), and highest year of education ([less than or equal to] high school or >high school). *2.2 Data Analysis*

We used Chi square analyses in comparisons of categorical variables and analysis of variance (ANOVA) in comparisons using continuous measures. Follow-up tests for significant differences in bivariate analyses were conducted using logistic regression for categorical variables and Bonferroni post hoc tests for ANOVA analyses. We used logistic regression analyses to test models predicting hazardous drinking.

### 3. Results

#### 3.1 Demographics

Mean age of women in the exclusively heterosexual group was significantly older (45.8 years) than each of the three sexual minority groups (heterosexual women reporting same-sex partners, 40.6; bisexual; 33.6, lesbians, 40.3.  $p < .001$ ). The groups also differed significantly in terms of relationship status: 59.1% of exclusively heterosexual women were married or lived with a partner compared with 31.9% of bisexual women, 51% of heterosexual women with same-sex partners, and 50.5 % of lesbians ( $p < .001$ ). Bisexual women were less likely than exclusively heterosexual women to have completed a bachelor's degree (22.0% vs. 28.7% respectively,  $p = .05$ ). Differences in relationship status and education are likely due, at least in part, to age differences.

Table 1 summarizes the distribution of variables related to alcohol and drug use. The percentage of women reporting past year hazardous drinking or reporting past year use of any illicit drugs was significantly lower among exclusively heterosexual women compared to all sexual minority groups. Exclusively heterosexual women were also more likely to report lifetime abstinence from alcohol use compared to all sexual minority groups. Findings from analyses using logistic regression for items comprising the index, lifetime abstinence, and past year drug use variables are described under Table 1. Information about differences in hazardous drinking by sexual identity in the NAS have been reported previously (Drabble et. al, 2005, 2013; Trocki et. al, 2009).

#### 3.2 Religiosity and Sexual Orientation

Table 1 also summarizes the distribution of religiosity by sexual orientation among women. A greater proportion of exclusively heterosexual women (62%) reported high religiosity compared the other groups (lesbian, 31.3%; bisexual, 34.2%; and heterosexual women who

report having same sex partners, 43%). This difference remained significant in multivariate logistic regression analysis, with high religiosity as an outcome variable, combining sexual minority groups compared to heterosexuals, controlling for other variables (analyses not shown). Specifically, the odds of sexual minority women reporting high religiosity were less than half that of heterosexual women (OR=0.41, 0.34, 0.51,  $p < .01$ ), even when controlling for other demographic variables. Furthermore, the prevalence of perceived religious norms unfavorable to alcohol use were lowest among lesbian-identified women (16.8%) and bisexual identified women (30.4%) compared to exclusively heterosexual women (43.2%) and heterosexual women who reported same sex partners (45.4%). This difference remained significant in multivariate logistic regression, suggesting that sexual minority women may be less likely to belong to a religion with norms unfavorable to drinking (OR= 0.66, 0.52, 0.83,  $p < 0.01$ ). As described in the methods, women who reported no religious preference were classified as “no” in relation to perceiving religious norms unfavorable to alcohol; the proportion of sexual minority women reporting no religious preference (heterosexual with same sex partners, 26.1 %; bisexual, 28%, lesbian, 30%) was higher than exclusively heterosexual women (13.3%;  $p < .001$ ; analyses not shown in tables).

The three sexual minority groups were combined in subsequent logistic regression analyses (reported below in 3.3 and 3.4). The sample size of sexual minorities was insufficient to allow for meaningful separate multivariate analyses of each of the three sexual minority groups. For example, the number of lesbians who reported both high religiosity and hazardous drinking was small ( $n=5$ ). Similarities in key outcome and predictor variables of interest among sexual minorities compared to heterosexuals justified combining the groups. Specifically, each of the sexual minority groups were significantly more likely to report the alcohol and drug outcomes compared to heterosexual women and were similar in relation to the distribution of religion variables (as reported in Table 1). Although numbers were too small to permit reliable statistical comparisons, we did conduct exploratory analyses of individual sexual minority groups (analyses not shown), which were consistent in direction with the findings in the combined analyses (described below).

### 3.3 Religiosity as predictive of lifetime abstinence from alcohol use and past year drug use

Table 2 summarizes findings of separate adjusted multiple logistic regression analyses for exclusively heterosexual women and sexual minority women in relation to odds of lifetime alcohol consumption and past year use of illicit drugs (bolded data points indicate significance at the  $p < .05$  level). Women who reported high religiosity were significantly less likely to report lifetime use of alcohol or past year use of illicit drugs, even when controlling for other demographic variables. Women who reported that their religion/denomination was unfavorable toward drinking were significantly less likely to report lifetime use of alcohol, but no significant effect was found for illicit drug use. Black, Latina and other ethnic minority heterosexual women were less likely than white women to report lifetime drinking; however, differences by ethnicity among sexual minority women were only evident for Latinas who had lower odds for lifetime drinking compared to white sexual minority women.



### 3.4 Religiosity as protective against hazardous drinking

Table 2 also summarizes findings of separate adjusted multiple logistic regression analyses for exclusively heterosexual women and sexual minority women in relation to odds of past year hazardous drinking (bolded data points indicate significance at the  $p < .05$  level).

Women who reported high religiosity were significantly less likely to report hazardous drinking in the past year. Notably, the perception that religious norms are unfavorable to drinking was significant as a protective factor for hazardous drinking among exclusively heterosexual women, but not for sexual minority women. Older age and partnered relationship status was generally associated with lower rates of hazardous drinking among both heterosexual and sexual minority women, however these factors were less evident as protective for drug use among sexual minority women. Black and Latina heterosexual women were less likely than white women to report hazardous drinking; however, differences by ethnicity among sexual minorities was only evident for Black women.

## 4. Discussion

In the current study, each of the three categories of sexual minority groups were less likely than exclusively heterosexual women to report that religion was very important to them. These findings are consistent with those of national studies in the United States which suggest that sexual minority women have lower religiosity compared to heterosexual women (Rostosky et al., 2008; Sherkat, 2002). Although the design of the current study does not allow for exploration of reasons for differences in religiosity, other studies have suggested that processes of distancing or critical evaluation of religion among sexual minorities may contribute to differences in religiosity. For example, Sherry and colleagues (2010) found that sexual identity was often identified as a catalyst for questioning and changing religious beliefs. Notably, another study examining the trajectory of religiosity between adolescence to young adulthood found significantly greater decline in religiosity among sexual minorities compared to heterosexuals (Rostosky et al., 2008). The authors point out that “rejecting religion may be a necessary strategy in the process of negotiating a positive sexual minority identity, particularly for women, given that many religious traditions are often sites of heterosexism (and male) privilege” (p.559).

In general, the process of distancing from rejecting or hostile environments and connecting with affirming communities has been identified as an important resiliency factor among sexual minorities (Asakura and Craig, 2014). One study that focused explicitly on strategies for addressing possible conflict between sexual and religious identity confirms that dissociating from non-affirming religions or rejecting religions entirely is common among sexual minorities (Anderton et al., 2011). In addition to distancing, other strategies include finding more affirming religious contexts, developing a spiritual rather than religious identity, and compartmentalizing religious and sexual identities and contexts (Anderton et al., 2011). Future studies might explore religiosity as one possible protective factor in the context of other individual and environmental factors that may be salient to resiliency among sexual minorities, such as positive identity development and community-level acceptance.

In our sample, we found that high religiosity was protective against hazardous drinking and drug use among both sexual minority and heterosexual women. This finding contrasts with studies of adolescents and young adults where religiosity was not consistently protective and, in some cases, was associated with increased risks (Eliason et al., 2011; Rostosky et al., 2008, 2007, 2010). Some researchers note that relationships with religiosity appear to change over time among sexual minorities, and that adult conceptualizations of religion or spirituality for sexual minorities may differ considerably from those in which they were raised (Halkitis et al., 2009; Sherry et al., 2010). Religion remains important for many sexual minorities (Halkitas, 2009), and distancing from religion may generate feelings of loss and grief (Hansen and Lambert, 2011; Ream and Savin-Williams, 2005; Wood and Conley, 2014). It may be that religiosity becomes protective after conflicts related to spirituality in adolescence and young adulthood have been resolved.

Notably, we found that belonging to religions with unfavorable views about alcohol consumption was protective against hazardous drinking for heterosexual women, but not for sexual minority women. Some studies of youth suggest that the potential protective effect of religion on alcohol problems or other health risks among sexual minorities may be moderated by to the degree to which religion or the overall religion climate is perceived as supportive to sexual minorities (Gattis, et al, 2014; Hatzenbuehler et al, 2012). The absence of a protective effect when respondents reported that their religion has unfavorable views about alcohol consumption may be an artifact of other conservative religious norms or values perceived as non-affirming to sexual minorities. Denominations or religious groups unfavorable toward alcohol may also be more 'conservative' and proscriptive in relation to other health behaviors and general lifestyles (Chatters, 2000; Michalak et al., 2007). The more conservative nature of such groups may be stress-producing for some sexual minorities. Future studies would be needed to explore this possibility.

This study has a number of limitations. First, the cross-sectional design does not allow for documenting changes over time. We cannot determine whether respondents changed their levels of religiosity or religious affiliations over time. Second, the sample size of sexual minorities in the current study were insufficient to conduct meaningful exploration about how religion variables may differ in predicting hazardous drinking and other alcohol and drug use outcomes between sexual minority groups. The sample size also precluded exploration of possible differences in the protective effects of religiosity among sexual minorities by ethnicity. Third, there are several limitations related to the measures used in the study. The study primarily used a single measure of religiosity, which does not allow for more nuanced assessment of various dimensions of religiosity. The study included measures of religion but did not have measures of spirituality, which is an important limitation in the context of research suggesting that sexual minorities often place more importance on spirituality than religiosity (Halkitis et al., 2009; Sherry et al., 2010). It is possible that spirituality may be more important as a protective factor than religiosity. For example, one study found that having no religious affiliation but higher levels of spirituality was associated with better self-reported health among African American lesbians (Battle and DeFreece, 2014). Given the absence of questions about spirituality, it is not possible to discern whether respondents were considering or excluding perceived importance of spirituality in their lives when answering the question about religiosity. In addition, there are

no measures in the data used for this study to document whether respondents are involved in congregations that are affirming of sexual minorities, which may be an important factor in the relationship between religiosity and reduced risk of past year hazardous drinking. Furthermore, questions used in the study asked about current religious affiliation, not about religion in the respondents family of origin, which according to other research is an important source of possible conflict in the process of developing a positive sexual identity (Sherry et al., 2010). Finally, methodological studies suggest that response categories for sexual identity questions should include intermediate identity options, such as “mostly heterosexual” and “mostly lesbian or gay” in addition to categories of heterosexual, bisexual and lesbian/gay (Austin et al., 2007; McCabe et al., 2012; Savin-Williams and Vrangalova, 2013; Vrangalova and Savin-Williams, 2012). Although these response options were not available, the current study used behavior to disaggregate heterosexuals who reported same-sex partners and exclusively heterosexual women. Future research would be needed to better understand whether the classification using behavior is comparable to “mostly heterosexual” populations in relation to the variables of interest in this study.

In spite of these limitations, this study underscores the importance of considering sexual minority status in evaluation of religion or spirituality as protective among sexual minority populations. Future population-based studies could address gaps in research by including both measures of sexual identity and survey items about religion and spirituality that are relevant to sexual minority populations. Epidemiology research on alcohol and drug issues with larger sample sizes of sexual minority women could provide a more nuanced understanding of possible differences in protective and risk factors between sexual minority groups, as well as possible variations within those groups by other characteristics such as race and ethnicity. Future studies might also examine how differences in religious contexts in various regions of the country impact risk for hazardous drinking or act as a protective factor for other behaviors among sexual minority women. Oversampling sexual minority populations in national studies, in addition to oversampling smaller states and by race and ethnicity would be helpful to investigating within group differences.

## Acknowledgments

Role of Funding Source: Nothing declared

Research reported in this publication was supported by the National Institute On Drug Abuse of the National Institutes of Health under Award Number R01DA036606 and the National Institute on Alcohol Abuse and Alcoholism under Award Number P50 AA05595. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

## References

- Allen TM, Lo CC. Religiosity, spirituality, and substance abuse. *J Drug Issues*. 2010; 40:433–459.
- Anderton CL, Pender DA, Asner-Self KK. A review of the religious identity/sexual orientation identity conflict literature: Revisiting Festinger's cognitive dissonance theory. *J LGBT Issues Couns*. 2011; 5:259–281.
- Asakura K, Craig SL. “It Gets Better” ... but how? Exploring resilience development in the accounts of LGBTQ adults. *J Hum Behav Soc Environ*. 2014; 24:253–266.

- Austin SB, Conron KJ, Patel A, Freedner N. Making sense of sexual orientation measures: Findings from a cognitive processing study with adolescents on health survey questions. *J LGBT Health Res.* 2007; 3:55–65.
- Balsam KF. Trauma, stress, and resilience among sexual minority women: rising like the Phoenix. *J Lesbian Stud.* 2003; 7:1–8.
- Barnes DM, Meyer IH. Religious affiliation, internalized homophobia, and mental health in lesbians, gay men, and bisexuals. *Am J Orthopsychiatr.* 2012; 82:505–515.
- Battle J, DeFreece A. The impact of community involvement, religion, and spirituality on happiness and health among a national sample of Black Lesbians. *Women, Gender, and Families of Color.* 2014; 2:1–31.
- Bauer GR, Jairam JA, Baidoobonso SM. Sexual health, risk behaviors, and substance use in heterosexual-identified women with female sex partners: 2002 US National Survey of Family Growth. *Sex Transm Dis.* 2010; 37:531–537. [PubMed: 20502395]
- Borders TF, Curran GM, Mattox R, Booth BM. Religiousness among at-risk drinkers: is it prospectively associated with the development or maintenance of an alcohol-use disorder? *J Stud Alcohol Drugs.* 2010; 71:136–142. [PubMed: 20105423]
- Cochran SD, Ackerman D, Mays VM, Ross MW. Prevalence of non-medical drug use and dependence among homosexually active men and women in the US population. *Addiction.* 2004; 99:989–998. [PubMed: 15265096]
- Cochran SD, Mays VM. Relation between psychiatric syndromes and behaviorally defined sexual orientation in a sample of the US population. *Am J Epidemiol.* 2000; 151:516–523. [PubMed: 10707921]
- Condit M, Kataji K, Drabble L, Trocki K. Sexual minority women and alcohol: intersections between drinking, relational contexts, stress and coping. *J Gay Lesbian Soc Serv.* 2011; 23:351–375. [PubMed: 22228984]
- Dahl A, Galliher R. Sexual minority young adult religiosity, sexual orientation conflict, self-esteem and depressive symptoms. *J Gay Lesbian Ment Health.* 2010; 14:271–290.
- Drabble LA, Midanik LT, Trocki KF. Reports of alcohol use and alcohol-related problems for bisexual and homosexual respondents: results of the Year 2000 National Alcohol Survey. *J Stud Alcohol.* 2005; 66:111–120. [PubMed: 15830911]
- Drabble LA, Trocki KF, Hughes TL, Korcha RA, Lown AE. Sexual orientation differences in the relationship between victimization and hazardous drinking among women in the National Alcohol Survey. *Psychol Addict Behav.* 2013; 27:639–648. [PubMed: 23438246]
- Edlund MJ, Harris KM, Koenig HG, Han X, Sullivan G, Mattox R, Tang L. Religiosity and decreased risk of substance use disorders: Is the effect mediated by social support or mental health status? *Soc Psychiatry Psychiatr Epidemiol.* 2010; 45:827–836. [PubMed: 19714282]
- Eliason MJ, Burke A, van Olphen J, Howell R. Complex interactions of sexual identity, sex/gender, and religious/spiritual identity on substance use among college students. *Sex Res Soc Policy.* 2011; 8:117–125.
- Gattis MN, Sacco P, Cunningham-Williams RM. Substance use and mental health disorders among heterosexual identified men and women who have same-sex partners or same-sex attraction: results from the National Epidemiological Survey on Alcohol and Related Conditions. *Arch Sex Behav.* 2012; 41:1185–1197. [PubMed: 22549338]
- Gattis MN, Woodford MR, Han Y. Discrimination and depressive symptoms among sexual minority youth: Is gay-affirming religious affiliation a protective factor? *Arch Sex Behav.* 2014; 43:1589–1599. [PubMed: 25119387]
- Greenfield TK. Ways of measuring drinking patterns and the difference they make: Experience with graduated frequencies. *J Subst Abuse.* 2000; 12:33–49. [PubMed: 11288473]
- Greenfield TK, Kerr WC, Bond J, Ye Y, Stockwell T. Improving graduated frequencies alcohol measures for monitoring consumption patterns: results from an Australian national survey and a US diary validity study. *Contemp Drug Probl.* 2009; 36:705–733.
- Haber JR, Grant JD, Jacob T, Koenig LB, Heath A. Alcohol milestones, risk factors, and religion/spirituality in young adult women. *J Stud Alcohol Drugs.* 2012; 73:34. [PubMed: 22152660]

- Halkitis PN, Mattis JS, Sahadath JK, Massie D, Ladyzhenskaya L, Pitrelli K, Bonacci M, Cowie SAE. The meanings and manifestations of religion and spirituality among lesbian, gay, bisexual, and transgender adults. *J Adult Dev.* 2009; 16:250–262.
- Hansen JE, Lambert SM. Grief and loss of religion: the experiences of four rural lesbians. *J Lesbian Stud.* 2011; 15:187–196. [PubMed: 21491314]
- Hatzenbuehler ML, Pachankis JE, Wolff J. Religious climate and health risk behaviors in sexual minority youths: a population-based study. *J Info.* 2012; 102:657–663.
- Hughes T. Alcohol use and alcohol-related problems among sexual minority women. *Alcohol Treat Q.* 2011; 29:403–435. [PubMed: 22470226]
- Hughes T, Szalacha LA, McNair R. Substance abuse and mental health disparities: Comparisons across sexual identity groups in a national sample of young Australian Women. *Soc Sci Med.* 2010; 71:824–831. [PubMed: 20579794]
- Hughes TL, Eliason M. Substance use and abuse in lesbian, gay, bisexual and transgender populations. *J Prim Preve.* 2002; 22:263–298.
- Hughes TL, Johnson TP, Steffen AD, Wilsnack SC, Everett B. Lifetime victimization, hazardous drinking, and depression among heterosexual and sexual minority women. *LGBT Health.* 2014; 1:192–203. [PubMed: 26789712]
- Hughes TL, Matthews AK, Razzano L, Aranda F. Psychological distress in African American lesbians and heterosexual women. *J Lesbian Stud.* 2003; 7:51–68. [PubMed: 24815714]
- Hughes TL, Wilsnack SC, Kristjanson AF. Substance use and related problems among US women who identify as mostly heterosexual. *BMC Public Health.* 2015; 15:803. [PubMed: 26289792]
- Johnson TP, Hughes TL, Cho YI, Wilsnack SC, Aranda F, Szalacha LA. Hazardous drinking, depression, and anxiety among sexual-minority women: self-medication or impaired functioning? *J Stud Alcohol Drugs.* 2013; 74:565. [PubMed: 23739020]
- Keeter S, Kennedy C, Dimock M, Best J, Craighill P. Gauging the impact of growing nonresponse on estimates from a national RDD telephone survey. *Public Opin Q.* 2006; 70:759–779.
- Kwon P. Resilience in lesbian, gay, and bisexual individuals. *Person Soc Psychol Rev.* 2013; 17:371–383.
- Laumann, EO.; Gagnon, JH.; Michael, RT.; Michaels, S. *The Social Organization Of Sexuality: Sexual Practices In The United States.* University of Chicago Press; Chicago: 1994.
- McCabe SE, Hughes TL, Bostwick W, Morales M, Boyd CJ. Measurement of sexual identity in surveys: Implications for substance abuse research. *Arch Sex Behav.* 2012; 41:649–657. [PubMed: 21573706]
- McCabe SE, Hughes TL, Bostwick WB, West BT, Boyd CJ. Sexual orientation, substance use behaviors and substance dependence in the United States. *Addiction.* 2009; 104:1333–1345. [PubMed: 19438839]
- Michalak L, Trocki K, Bond J. Religion and alcohol in the US National Alcohol Survey: How important is religion for abstention and drinking? *Drug Alcohol Depend.* 2007; 87:268–280. [PubMed: 16987610]
- Midanik L, Greenfield TK. Trends in social consequences and dependence symptoms in the United States: the National Alcohol Surveys, 1984-1995. *Am J Public Health.* 2000; 90:53–56. [PubMed: 10630137]
- Midanik LT, Drabble L, Trocki K, Sell R. Sexual orientation and alcohol use: Identity versus behavior measures. *Journal of Lesbian, Gay, Bisexual, and Transgender Health Res.* 2006; 3:25–35.
- Page MJ, Lindahl KM, Malik NM. The role of religion and stress in sexual identity and mental health among lesbian, gay, and bisexual youth. *J Res Adolesc Epub.* 2013
- Ream GL, Savin-Williams RC. Reconciling Christianity and positive non-heterosexual identity in adolescence, with implications for psychological well-being. *J LGBT Youth.* 2005; 2:19–36.
- Rostosky SS, Danner F, Riggle ED. Religiosity and alcohol use in sexual minority and heterosexual youth and young adults. *J Youth Adolesc.* 2008; 37:552–563.
- Rostosky SS, Danner F, Riggle EDB. Is religiosity a protective factor against substance use in young adulthood? Only if you're straight! *J Adolesc Health.* 2007; 40:400–447.

- Rostosky SS, Danner F, Riggle EDB. Religiosity as a protective factor against heavy episodic drinking (HED) in heterosexual, bisexual, gay, and lesbian young adults. *J Homosex.* 2010; 57:1039–1050. [PubMed: 20818529]
- Savin-Williams RC, Vrangalova Z. Mostly heterosexual as a distinct sexual orientation group: A systematic review of the empirical evidence. *Dev Rev.* 2013; 33:58–88.
- Sherkat DE. Sexuality and religious commitment in the United States: an empirical examination. *J Sci Study Relig.* 2002; 41:313–323.
- Sherry A, Adelman A, Whilde MR, Quick D. Competing selves: negotiating the intersection of spiritual and sexual identities. *Prof Psychol Res Pr.* 2010; 41:112.
- Trocki KF, Drabble LA, Midanik LT. Use of heavier drinking contexts among heterosexuals, homosexuals, and bisexuals: results from a national household probability survey. *J Stud Alcohol.* 2005; 66:105–110. [PubMed: 15830910]
- Trocki KF, Drabble LA, Midanik LT. Tobacco, marijuana use and sensation-seeking: comparisons across gay, lesbian, bisexual and heterosexual groups. *Psychol Addict Behav.* 2009; 23:620–631. [PubMed: 20025368]
- Vaughan EL, de Dios MA, Steinfeldt JA, Kratz LM. Religiosity, alcohol use attitudes, and alcohol use in a national sample of adolescents. *Psychol Addict Behav.* 2011; 25:547. [PubMed: 21766976]
- Vrangalova Z, Savin-Williams RC. Mostly heterosexual and mostly gay/lesbian: Evidence for new sexual orientation identities. *Arch Sex Behav.* 2012; 41:85–101. [PubMed: 22327566]
- Vrangalova Z, Savin-Williams RC. Psychological and physical health of mostly heterosexuals: a systematic review. *J Sex Res.* 2014; 51:410–445. [PubMed: 24754361]
- Wald, K.; Calhoun-Brown, A. *Religion And Politics In The United States.* Rowman & Littlefield; New York: 2011.
- Wilsnack SC, Hughes TL, Johnson TP, Bostwick WB, Szalacha LA, Benson P, Aranda F, Kinnison KE. Drinking and drinking-related problems among heterosexual and sexual minority women. *J Stud Alcohol Drugs.* 2008; 69:129–139. [PubMed: 18080073]
- Wood AW, Conley AH. Loss of religious or spiritual identities among the LGBT population. *Couns Values.* 2014; 59:95–111.

### Highlights

- Religiosity was greater among heterosexual women than sexual minority women.
- Higher religiosity was associated with lifetime alcohol abstinence among all women.
- Higher religiosity was similarly protective against hazardous drinking and drug use.
- Religious norms unfavorable to drinking was protective only for heterosexuals.

**Table 1**

Drinking status, hazardous drinking, drug use and religiosity by sexual orientation (full sample).

	Exclusively heterosexual (n=10,723)	Heterosexual identity/same sex partners (n=184)	Bisexual (n=140)	Lesbian (n=122)
	%	%	%	%
<b>Religiosity***</b>				
Important (very) <sup>a</sup>	62.2	43.0	34.2	31.3
<b>Religious Norms***</b>				
Unfavorable drinking norms <sup>b</sup>	43.2	45.4	30.4	16.8
<b>Drinking status***</b>				
Current drinker	60.7	75.4	72.6	79.8
Ex-drinker	14.3	12.3	13.0	10.1
Lifetime abstainers <sup>a</sup>	25.0	12.3	14.4	10.1
<b>Hazardous drinking (past year)***</b>				
5+ Drinks on one or more occasions <sup>a</sup>	2.2	7.3	12.3	6.7
Intoxication 2+ times a year <sup>a</sup>	16.9	38.6	39.7	38.7
1+ Consequences <sup>c</sup>	1.6	4.5	3.4	5.8
1+ Dependence symptoms <sup>a</sup>	3.1	8.9	8.9	7.6
2+ Hazardous drinking Index <sup>a</sup>	10.7	31.3	32.2	28.3
<b>Drug Use (past year)***</b>				
Any drug (marijuana or other illegal drug use) <sup>d</sup>	17.7	36.0	44.1	33.0

\*\*\* all between group Chi square  $p < 0.001$

<sup>a</sup>  $p < 0.05$  exclusively heterosexual group significantly different than all other groups

<sup>b</sup>  $p < 0.05$  lesbian group significantly lower than exclusively heterosexual group, heterosexuals with same-sex partners, and bisexual group

<sup>c</sup>  $p < 0.05$  exclusively heterosexual group significantly lower than heterosexuals with same-sex partners and lesbians; difference between exclusively heterosexual and bisexual women approached but did not reach significance.



**Table 2**  
**Multivariate logistic predictors among women for alcohol use, hazardous drinking, and illicit drug use**

	Any lifetime alcohol use		Hazardous drinking (past year) <sup>1</sup>		Illicit drug use (past year)	
	Heterosexual women Adj OR(95%CI)	Sexual Minority women Adj OR(95%CI)	Heterosexual women OR(95%CI)	Sexual Minority women Adj OR(95%CI)	Heterosexual women Adj OR(95%CI)	Sexual Minority women Adj OR(95%CI)
<b>Religiosity</b>						
Low (ref)						
High	<b>0.45 (0.40, 0.52)</b>	<b>0.40 (0.19, 0.86)</b>	<b>0.61 (0.52, 0.72)</b>	<b>0.50 (0.27, 0.95)</b>	<b>0.79 (0.69, 0.91)</b>	<b>0.33 (0.19, 0.58)</b>
<b>Religious norms</b>						
Favorable (ref) unfavorable	<b>0.43 (0.36, 0.45)</b>	<b>0.43 (0.21, 0.87)</b>	<b>0.72 (0.60, 0.87)</b>	1.15 (0.57, 2.31)	1.00 (0.89, 1.14)	1.27 (0.68, 2.16)
<b>Age</b>						
18-29	1.14 (0.99, 1.33)	1.15 (0.45, 2.93)	<b>15.39 (11.71, 20.23)</b>	<b>8.74 (3.15, 24.23)</b>	<b>1.59 (1.34, 1.89)</b>	1.84 (0.90, 3.76)
30-49	<b>1.55 (1.37, 1.75)</b>	1.64 (0.71, 3.81)	<b>5.49 (4.22, 7.16)</b>	<b>4.70 (1.75, 12.66)</b>	<b>1.40 (1.22, 1.60)</b>	0.84 (0.43, 1.64)
50+ (ref)						
<b>Ethnicity</b>						
White (ref)						
Black	<b>0.60 (0.52, 0.70)</b>	0.98 (0.35, 2.74)	<b>0.64 (0.48, 0.87)</b>	<b>0.28 (0.10, 0.81)</b>	0.98 (0.80, 1.19)	0.43 (0.16, 1.18)
Latina	<b>0.38 (0.33, 0.45)</b>	<b>0.26 (0.10, 0.68)</b>	<b>0.59 (0.43, 0.81)</b>	1.15 (0.33, 4.01)	<b>0.46 (0.36, 0.59)</b>	0.54 (0.20, 1.43)
Other	<b>0.49 (0.39, 0.61)</b>	1.50 (0.40, 5.63)	0.93 (0.65, 1.34)	0.59 (0.23, 1.47)	0.83 (0.63, 1.11)	1.64 (0.66, 4.405)
<b>Relationship Status</b>						
partnered (ref) not partnered	1.07 (0.96, 1.19)	0.50 (0.23, 1.06)	<b>1.58 (1.33, 1.88)</b>	<b>3.38 (1.81, 6.30)</b>	<b>1.39 (1.19, 1.53)</b>	1.61 (0.93, 2.78)
<b>Education HS or less (ref)</b>						
Some college +	<b>2.20 (1.98, 2.45)</b>	<b>5.26 (2.49, 11.10)</b>	1.05 (0.87, 1.26)	1.15 (0.57, 2.31)	<b>1.20 (1.05, 1.36)</b>	0.87 (0.51, 1.50)