


The Relationships of Sexual Identity, Hazardous Drinking, and Drinking Expectancies With Risky Sexual Behaviors in a Community Sample of Lesbian and Bisexual Women

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Abstract

This study examined the influence of demographic characteristics, sexual identity, hazardous drinking, and sexuality/intimacy enhancement alcohol expectancies on rates of risky sexual behaviors in a community sample of women who self-identified as lesbian, mostly lesbian, and bisexual ($N = 349$). Structured interview data were collected as part of a larger longitudinal study of sexual minority women's health, the Chicago Health and Life Experiences of Women study. We used structural equation modeling, controlling for demographic characteristics, to evaluate the influence of sexual identity, hazardous drinking, and alcohol-related sexuality/intimacy enhancement expectancies on sexual risk behaviors. Controlling for demographic characteristics and for sexual identity, higher levels of both hazardous drinking and sexuality/intimacy enhancement alcohol expectancies were associated with higher sexual risk scores. The final model predicted 36% of the variance in risky sexual behavior scores. Our findings regarding the central role of alcohol use and sexuality/intimacy enhancement expectancies in sexual risk behaviors among sexual minority women are consistent with previous research focusing on predominantly heterosexual women. Future efforts at sexual risk reduction in sexual minority women will need to address the influences of alcohol use and drinking-related expectancies on sexual behaviors and decision making.

Keywords

sexual risk behaviors, hazardous drinking, alcohol use, sexual minority women

In the United States, hazardous alcohol consumption, in the form of either heavy or binge drinking, is associated with a myriad of costly social, physical, mental, and public health problems (Centers for Disease Control and Prevention, 2010). The prevention of negative health outcomes associated with alcohol use is a major objective of the *Healthy People 2020* agenda, which outlines national health priority areas (U.S. Department of Health and Human Services [USDHHS], 2011). Among the *Healthy People 2020* goals of particular relevance to women's health is the focus on eliminating negative sexual health outcomes associated with alcohol use including unwanted pregnancies, infection with HIV and other sexually transmitted infections, and experiences of sexual violence (USDHHS, 2011). Sexual minority women (SMW; lesbian and bisexual women and women who have sex with women) have been identified as a subpopulation of women with higher rates of alcohol use. For example,

research from our group and others consistently shows elevated rates of current alcohol use, hazardous drinking (e.g., heavy episodic drinking, intoxication), and problems related to alcohol use (e.g., adverse drinking consequences, symptoms of potential alcohol dependence) in SMW (Bloomfield, Wicki, Wilsnack, Hughes, & Gmel,

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2011; Dermody et al., 2013; Drabble, Trocki, Hughes, Korcha, & Lown, 2013; McCabe, West, Hughes, & Boyd, 2013). For example, compared with heterosexual women, SMW are two to four times as likely to report indicators of hazardous drinking (Drabble, Midanik, & Trocki, 2005; McCabe, Hughes, Bostwick, West, & Boyd, 2009; Wilsnack et al., 2008). In previous analyses of the combined National Survey of Health and Life Experiences of Women (NSHLEW) and the Chicago Health and Life Experiences of Women (CHLEW) data, exclusively heterosexual women reported significantly lower rates than all other SMW of heavy drinking, lifetime problem consequences, alcohol-dependence symptoms, concern about having a drinking problem, and receiving help for a drinking problem (all p values $< .001$) as well as on rates in the past 12 months of heavy episodic drinking, intoxication, problem consequences, and dependence symptoms (all p values $< .001$; Wilsnack et al., 2008). These findings are consistent with those from general population studies comparing sexual minority and heterosexual women (e.g., Drabble et al., 2013; Hughes, Szalacha, & McNair, 2010; McCabe et al., 2009).

The Minority Stress Model (Meyer, 2003) has been used to explain the excess in prevalence of mental and physical health risks among sexual minorities. According to the model, sexual minorities experience stressors over and above those of heterosexually identified persons due to social marginalization. This additional stress and the behaviors engaged in as a response to chronic stress contributes to poor physical and mental health among SMW and men. Several factors consistent with the Minority Stress Model may explain alcohol-related disparities based on sexual orientation (Talley, Sher, Steinley, Wood, & Littlefield, 2012) including using drinking to cope with the stress due to stigma, prejudice, and discrimination based on sexual orientation (Keyes, Hatzenbuehler, & Hasin, 2011; Meyer, 2003), subcultural behavioral or social norms (Hatzenbuehler, Corbin, & Fromme, 2008), fewer roles and responsibilities that have traditionally limited drinking among heterosexual women (Hughes & Eliason, 2002), and higher rates of mood disturbance such as depression (Matthews, Hughes, Johnson, Razzano, & Cassidy, 2002), which is a known correlate of substance use (Conner, Piquart, & Gamble, 2009). Given the strong associations between alcohol use and sexual risk behaviors among heterosexual women (described below), we examined the influence of hazardous drinking on sexual risk behaviors in a community-based sample of adult women who identified as lesbian, mostly lesbian, or bisexual. Furthermore, we examined whether alcohol-related sexuality/intimacy enhancement expectancies were an important predictor of engagement in hazardous drinking and sexual risk behaviors among SMW.

Alcohol Use and Sexual Risk Behaviors

Alcohol use in general population samples of (predominantly heterosexual) women has been linked to a number of risky sexual behaviors and negative sexual outcomes, including unprotected sexual intercourse, multiple sexual partners, and sexually transmitted infections (STIs; Cook & Clark, 2005; Cook et al., 2006; Cooper, 2002; Goldstein, Barnett, Pedlow, & Murphy, 2007; Kalichman, Simbayi, Jooste, Cain, & Cherry, 2006; Kiene, Barta, Tennen, & Armeli, 2009; Leigh et al., 2008; Weinhardt & Carey, 2000; Wilsnack, Wilsnack, Kristjanson, Vogeltanz-Holm, & Harris, 2004). Among college-aged women, heavy alcohol consumption has been associated with greater sexual risk-taking intentions (Cooper, 2002; George et al., 2009; George & Stoner, 2000; Norris et al., 2009) and a greater likelihood of engaging in sex with a casual partner and having unprotected sex during those sexual experiences (Goldstein et al., 2007; Kiene et al., 2009). In a sample of adult heterosexual women attending an STI clinic, binge drinking was associated with greater likelihood of engaging in anal sex, reporting a history of multiple partners, and infection with gonorrhea compared with nonbinge drinkers or alcohol abstainers (Hutton, McCaul, Santora, & Erbeling, 2008). Among heterosexual women reporting multiple sexual partners, alcohol and/or drug use was associated with greater likelihood of unprotected sex (Richards et al., 2008).

Research examining the relationship between alcohol use and sexual risk behaviors suggest that in addition to lowered levels of inhibition, cognitive factors play an important role in how drinking affects sexual behavior. For example, regardless of the level of drinking, alcohol-related expectancies—particularly expectancies of sexual enhancement, behavioral disinhibition, and social facilitation—have been shown to influence sexual risk behaviors in heterosexual women (Stappenbeck et al., 2013). Expectations that alcohol will increase sexual desire and pleasure are related to HIV-risk behaviors among patients seeking services for sexually transmitted infection (Kalichman et al., 2006). Beliefs that alcohol will enhance sexual experiences are also related to having greater numbers of sex partners, feelings of regret about having had sex, greater frequency of drinking before sex, and having partners who drink before sex (Hendershot, Stoner, George, & Norris, 2007; Kalichman et al., 2006; Morojele et al., 2006). In a study of female bar drinkers (Parks, Hsieh, Collins, Levonyan-Radloff, & King, 2009), expectations of sexual disinhibition when drinking were associated with higher rates of risky sexual behavior with new partners. In a three-wave longitudinal study of young adults (White, Fleming, Catalano, & Bailey, 2009), expectancies that drinking

would enhance sexual experience were related to greater likelihood of casual sex, an indirect effect mediated through greater likelihood of drinking before sex.

Research Questions

A growing number of studies suggest an association between sexual orientation and rates of sexual risk behaviors among women (Austin, Conron, Patel, & Freedner, 2007; Mays, Yancey, Cochran, Weber, & Fielding, 2002). However, the extant literature on sexual risk behaviors and sexual orientation is primarily descriptive and does not identify explanatory variables that may be associated with risk behaviors among SMW. There are known associations between alcohol use and alcohol expectancies and sexual risk behaviors among women in the general population; however, little is known about the relationships between these factors among SMW. This study addressed a significant gap in the literature on women's sexual health by examining associations between alcohol use and sexual risk behaviors in a sample of SMW. Study aims were to (a) examine the presence of alcohol and sexually related risk behaviors in this sample of mid-life SMW and (b) explore the relationships between sexual identity, hazardous drinking, and sexuality/intimacy enhancement drinking expectancies on sexual risk behaviors.

Method

Participants

Data for this study were collected as part of the first two waves of a larger longitudinal study of the health and life experiences of lesbian women (the CHLEW, conducted between 2001 and 2004). A volunteer sample was recruited for the CHLEW study using sampling methods designed to minimize the limitations and maximize the strengths of convenience sampling strategies. Clusters of social networks (e.g., formal community-based organizations and informal community social groups) and individual social networks, including those of women who participated in the study, were used. The study was advertised in local newspapers and on flyers posted in churches and bookstores and distributed to individuals and organizations via formal and informal social events and social networks. Study advertisements indicated that the study was being conducted to better understand the health and life experiences of women who identify as lesbian and encouraged interested women to call for a screening interview. Eligibility criteria included age 18 years or older, English speaking, and residence in Chicago or surrounding suburbs. Consistent with the original study aims (to study drinking and its predictors among lesbians), the

initial target population of SMW who were recruited into the study was lesbians. Over time, the goals of the study were expanded and included more targeted recruitment of bisexual and other non-heterosexual women. In addition, women who initially reported a lesbian sexual orientation went on to later identify as "mostly lesbian" or "bisexual." Consequently, the study is now focused on women who belong to a range of SMW including lesbian, mostly lesbian, and bisexual women.

In 2001-2002, CHLEW study staff recruited and interviewed 447 English-speaking women who met the eligibility criteria. Approximately 4 years after baseline data were collected, women in the study were invited to participate in a follow-up interview. Wave 2 follow-up interviews were conducted with 384 women for a response rate of 85.9% (94.6% of the respondents who were still living and eligible to participate). Lost to follow-up were 33 (7.4%) women who could not be located, 10 (2.2%) who were deceased, 10 (2.2%) who refused, and 8 (1.8%) who were located but were unable to participate for various reasons (e.g., scheduling conflicts). To assess possible bias due to attrition, nonresponse rates (combining refusals and locating failures) were examined in relation to all major drinking variables and demographic variables (age, race/ethnicity, education, income, employment, relationship status, and having children living at home). We fit a logistic regression model to the data, examining possible predictors of attrition. When controlling for both demographic and major drinking variables, the only significant predictor of attrition was having a high school education or less (odds ratio = 3.39, confidence interval = 1.12-10.2, $p = .03$).

Procedures

Face-to-face structured interviews were conducted in a private setting (usually the respondent's home) by female interviewers. Interviewers received extensive training in general interviewing techniques as well as study-specific training that included attention to potentially sensitive topics, such as sexual experience and substance use. Following a description of the study's purposes and procedures, participants were asked to read and sign a consent form. The interviews averaged 90 minutes in length. Questions about potentially sensitive topics, such as sexual experiences, were located toward the end of the interview, when rapport was well established. To increase privacy, confidentiality, and comfort with self-disclosure, questions about sexual activity and behaviors were self-administered using a computer assisted survey instrument (e.g., answers were entered directly by the participant into the laptop computer and were not seen by the interviewer). In appreciation for their time, participants were paid \$35 in Wave 1 and \$45 in Wave 2. The

study protocol, including informed consent and confidentiality procedures, was reviewed and approved by Institutional Review Board of the University of Illinois at Chicago.

Measures

Sexual Risk Behavior. The two of the strongest yet modifiable contributors to sexually transmitted infections include number of sexual partners and the consistent use of condoms or other barrier methods (Chandra, Billiouz, Copen, & Sionean, 2012). In this study, a measure of risky sexual was developed based on two items: (a) number of sexual partners reported and (b) use of safer sex practices (e.g., use “condoms, dental dams or other precautions against sexually transmitted diseases”). In Wave 1, the question about number of sexual partners asked about the *previous 12 months*, but did not distinguish between female and male partners. In Wave 2, separate questions were asked about the number of female partners and the number of male partners *since the last interview*. Based on results of a national survey of women’s sexual behavior (Mosher, Chandra, & Jones, 2005), the overall number of sexual partners for each wave was recoded: Having 0 to 2 partners (male, female, or both types of sexual partners) was coded as not risky (0) and 3 or more partners (male, female, or both types of sexual partners) as risky (1). The question about use of safer sex practices, with response categories of *never, rarely, sometime, often, or always*, asked about “sex with women” and “sex with men” in both waves of data collection. This question about the use of safer sex practices was collected at both Waves 1 and 2. Responses to both questions were recoded: never or rarely = risky (1) and sometimes, often or always = not risky (0), when having sex with men or women. The cut points for the two sexual risk items just described were determined based on the extant literature (Mosher et al., 2005; Ramrakha et al., 2011) and a series of exploratory factor analyses with different cut points. The cut points that produced the best fitting measurement model with significant factor loadings were then used as final cut points for the two sexual risk indicators.

Two other latent variables, *hazardous drinking* and *drinking-related expectancies*, were constructed (described below). As presented in Table 1, the indicator variables of each latent construct showed statistically significant factor loadings and produced a well-fitted measurement model.

Predictors

Sexual identity. Participants were asked, “Recognizing that sexuality is only one part of your identity, how do you define your sexual identity?” Response options were

Table 1. Standardized Factor Loadings of Latent Constructs’ Indicator Variables.

	Wave 1	Wave 2
Sexual risk behavior		
3 or more partners	0.564**	0.871***
Unprotected	0.422**	0.770***
Sex-related drinking expectancies		
Feel less shy or more self confident	0.720***	0.703***
Feel less inhibited about sex	0.914***	0.906***
Sexual activity is more pleasurable	0.697***	0.680***
Hazardous drinking		
Any heavy episodic drinking	0.872***	0.858***
Any intoxication	0.853***	0.838***
Any problem consequence	0.832***	0.816***
Any dependence	0.843***	0.828***

Note. Model fit $\chi^2 = 153.7$ ($df = 117$), $p < .01$ ($\chi^2/df = 1.31$). Root mean square error of approximation = .03; comparative fit index = .99; Tucker–Lewis index = .99.

** $p < .01$. *** $p < .001$.

exclusively lesbian, mostly lesbian, bisexual, mostly heterosexual, and exclusively heterosexual. Although women who identified as bisexual or heterosexual in the screening interview were not invited to participate, 11 women in the Wave 1 interview and 21 women in the Wave 2 interview identified as bisexual. Therefore, our analyses focus on women who identify as exclusively lesbian, mostly lesbian, and bisexual. Four percent of the sample ($n = 16$) who did not identify as only or mostly lesbian or bisexual were excluded from the analyses. These women either identified as mostly or only heterosexual ($n = 9$) or chose “other” for their sexual identity ($n = 7$).

Race/ethnicity. Participants were asked which of seven groups—White, Black/African American, Asian, Pacific Islander, American Indian, Eskimo, Aleut, or “other”—most closely described their race. They were then asked whether they were of Hispanic or Latino descent. Women of any racial category who reported Hispanic or Latino descent were categorized as Hispanic/Latina. Because of the small sample sizes of women reporting other racial/ethnic backgrounds ($n = 19$), analyses were restricted to women who self-identified as White, African American, or Hispanic.

Other demographic characteristics. In addition to race/ethnicity, we examined other known sociodemographic correlates of sexual risk behaviors, including age, education, employment status, income, and relationship status (single vs. in a committed relationship).

An index of *hazardous drinking* was constructed by dichotomous responses to each of five past-12-month indicators of hazardous drinking: heavy drinking, heavy episodic drinking, intoxication, adverse drinking consequences, and symptoms of potential alcohol dependence (range = 0-5). Level of drinking was calculated based on estimates of mean ounces of ethanol consumed per day (with a standard drink of beer [12 oz], wine [5 oz], or liquor [1.5 oz of 80-proof spirits] each containing approximately 0.5 ounces of ethanol). Information about drinking frequency, drinking quantity, typical size of drinks, and ethanol content for beer, wine, and liquor consumption in the past 30 days was combined, and this estimate was adjusted to take into account the frequency of heavy episodic drinking (defined as 6 or more drinks in a day) in the past 12 months. Consumption of less than 1/2 drink per day was classified as light drinking, 1/2 to 1½ drinks per day as moderate drinking, and 2 or more drinks as heavy drinking.

Participants were asked about their lifetime and past-12-month experience of eight adverse drinking consequences (e.g., driving a car while high from alcohol, starting fights with partner or with people outside the family when drinking) and five symptoms of potential alcohol dependence (e.g., blackouts, rapid drinking, morning drinking). Participants were also asked about the frequency of subjective intoxication (“drinking enough to feel drunk—where drinking noticeably affected your thinking, talking, and behavior”; see Table 1).

Drinking-related expectancies were assessed by three questions that were part of a larger, 12-item drinking expectancies scale (Klassen & Wilsnack, 1986; Wilsnack, Vogeltanz, Klassen, & Harris, 1997). The three questions tapped expectancies that directly or indirectly relate to the use of alcohol to facilitate intimate or sexual interactions. The question stem asked, “When you drink, how true would you say each of these statements is for you?” Individual questions were (a) “you feel less shy or more self-confident?”; (b) “you feel less inhibited about sex?”; and (c) “sexual activity is more pleasurable for you?” Responses options were never = 1 to usually = 3. Cronbach’s alpha for the 3-item scale at each wave was .99 and .98, respectively (see Table 1).

Data Analysis

We used structural equation models to address the research questions. We fitted a simultaneous measurement model of latent constructs of sex-related drinking expectancies, hazardous drinking, and sexual risk behavior at Wave 1 and Wave 2 and the structural model with causal paths among the variables of interest, as depicted in Figure 1. The model was estimated using the mean and variance-adjusted weighted least-squares method (WLSMV estimator), which is suitable for models with categorical

variables (Muthén, du Toit, & Spisic, 1997). The model fit was assessed by three fit statistics: chi-square to degrees of freedom ratio (χ^2/df), Tucker–Lewis index (TLI), and root mean square error of approximation (RMSEA). The model chi-square statistic provides a general guideline for overall fit; a χ^2 - df ratio less than 3 indicates good fit. RMSEA less than .05 and TLI greater than .95 are also considered “good fit” (Fan, Thompson, & Wang, 1999; Hu & Bentler, 1999; Jöreskog & Sörbom, 1981).

Results

Sample

The sample consisted of the 349 participants who completed both Wave 1 and Wave 2 interviews and who also provided sexual identity information and were White, African Americans, or Hispanic. The mean age of the sample was 42 years ($SD = 11.7$). A total of 249 participants (71.3%) self-identified as exclusively lesbian, 79 (22.6%) self-identified as mostly lesbian, and 21 (5.7%) self-identified as bisexual. Nearly half of the sample reported a racial/ethnic background other than White (25.5% African American, 20.1% Latina; see Table 2).

Table 3 summarizes the sexual risk behaviors and drinking-related study variables measured at both waves. At Waves 1 and 2, 13.8% and 24.6% of the sample reported having more than 3 sexual partners since the last interview, respectively. About 10% at Wave 1 and 16% at Wave 2 reported no or rare use of safer sex methods. Level of endorsement of sex-related drinking expectancies varied somewhat based on the item. At Wave 2, 40% of the women reported feeling less shy during sex after drinking, 28% felt less inhibited, and about 8% reported that sex was more pleasurable. Indicators of hazardous drinking were prevalent including heavy episodic drinking (25.2% at both waves), experiences of intoxication (55.3% at Wave 1 and 48.9% at Wave 2), adverse drinking consequences (21.9% at Wave 1 and 24.6% at Wave 2), and alcohol dependence symptoms (22.6% at Wave 1 and 25.5% at Wave 2).

Model Testing

Latent measures of hazardous drinking, sex-related drinking expectancies, and sexual risk behavior at each wave are presented in the measurement model in Figure 1. All drinking and sexual risk indicators loaded positively and significantly on their respective latent measures at each wave. When proposed relationships were simultaneously estimated, sex-related drinking expectancies at Wave 1 were highly predictive of sex-related drinking expectancies at Wave 2 as expected ($\beta = 0.57$). Likewise, hazardous drinking and sexual risk behavior at Wave 1 predicted

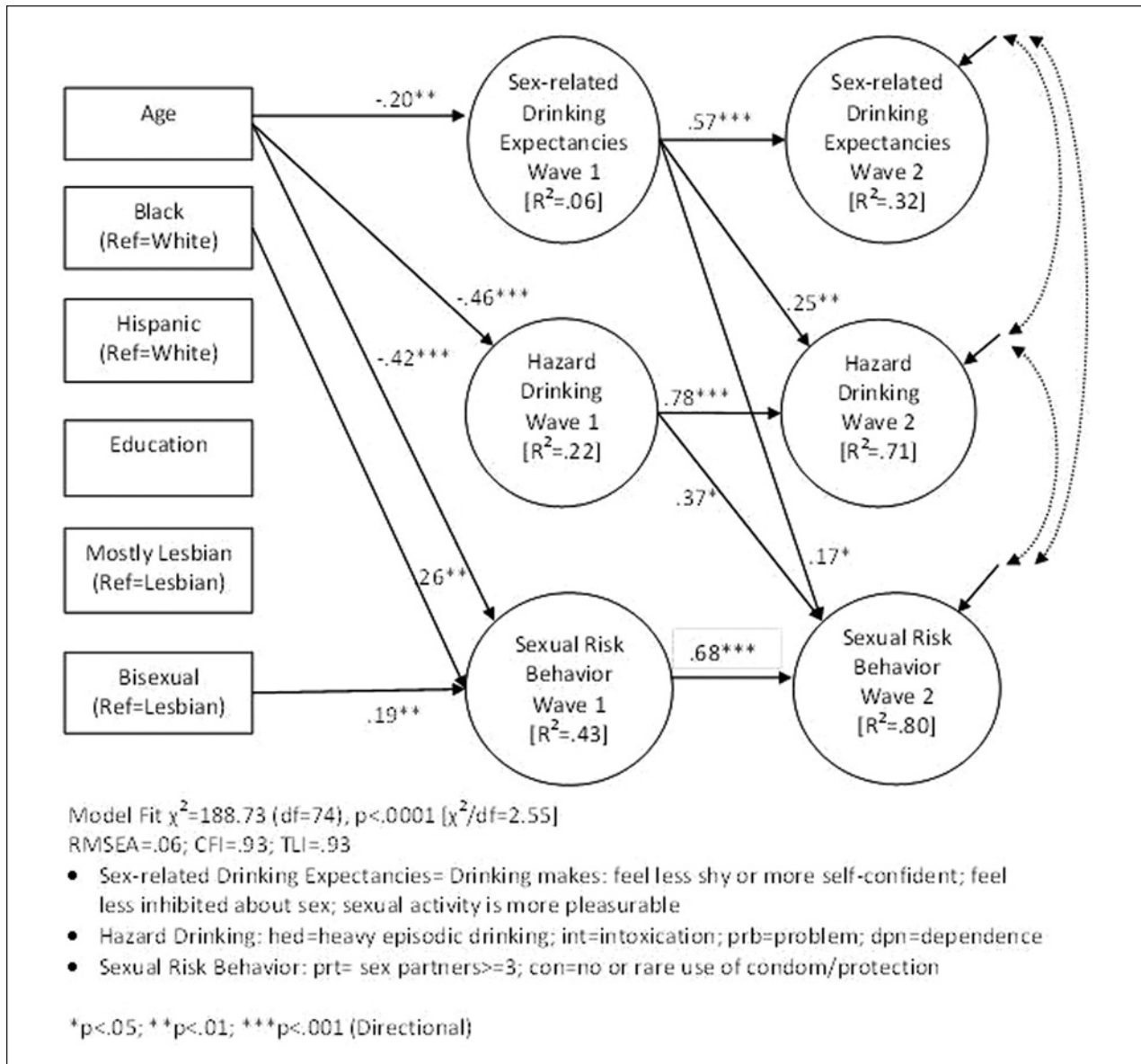


Figure 1. SEM model of relationships between drinking-related expectancies and risk outcomes.

the same behaviors at Wave 2 ($\beta = 0.78$ and $\beta = 0.68$, respectively). Sex-related drinking expectancies at Wave 1 were predictive of hazardous drinking at Wave 2 ($\beta = 0.25$) and sexual risk behavior at Wave 2 ($\beta = 0.17$). Hazardous drinking at Wave 1 was also predictive of higher sexual risk scores at Wave 2 ($\beta = 0.37$).

Several of the exogenous variables were found to be directly related to sex-related drinking expectancies, hazardous drinking, and sexual risk behavior at Wave 1. Respondent's age was highly correlated with sex-related drinking expectancies, hazardous drinking, and sexual risk behavior at Wave 1 ($\beta = -0.20$, $\beta = -0.46$, and $\beta = -0.42$, respectively), indicating that risk of each of these

variables was elevated among younger women. Bisexuals were more likely than lesbians or mostly lesbians to report sexual risk behaviors ($\beta = 0.19$). African American race also predicted more sexual risk behavior at Wave 1 ($\beta = 0.26$). Overall model fit measures suggested a close fit between the specified model and the data ($\chi^2 = 188.73$, $df = 74$, $p < .0001$; $\chi^2/df = 2.55$; RMSEA = .06; CFI = .93; TLI = .956).

Discussion

Reduction of negative sexual outcomes associated with alcohol use has important public health implications and

Table 2. Summary of Demographic Variables ($N = 349$).

Variables	<i>n</i>	<i>M (SD)</i>
Age in years (range = 18-83)	349	41.95 (11.71)
	<i>n</i>	%
Race		
White	190	54.4
Black	89	25.5
Hispanic	70	20.1
Education		
High school or less	29	8.3
Some college	90	25.8
Bachelor's degree	102	29.2
Graduate/professional degree	128	36.7
Sexual identity		
Lesbian	249	71.3
Mostly lesbian	79	22.6
Bisexual	21	6.0

has been identified as a priority area for the national health agenda (USDHHS, 2011). Alcohol use represents a strong and consistent contextual risk factor for engaging in sexual risk behaviors and experiencing negative sexual outcomes among women in the general population (Goldstein et al., 2007; Kalichman et al., 2006; Kiene et al., 2009). Numerous studies have documented disproportionately high rates of hazardous drinking among SMW (Drabble et al., 2005; McCabe et al., 2009; Wilsnack et al., 2008), but few have examined relationships between alcohol use and sexual risk behaviors in this population. To address this gap in the literature, the first goal of this study was to examine the level of engagement in hazardous drinking and sexual risk behaviors in a sample of mid-life SMW. Consistent with previous research, indicators of hazardous drinking were prevalent in our sample including heavy episodic drinking, experiences of intoxication, and adverse drinking consequences. In addition, nearly one-third of participants in both Wave 1 and Wave 2 reported symptoms consistent with alcohol dependency. This level is significantly higher than women in general. For example, in 2011, an estimated 5.7% of the females in the United States aged 12 or older were classified with substance dependence or abuse in the previous year (Substance Abuse and Mental Health Services Administration, 2012). These rates have remained fairly stable between 2002 and 2010—the time period roughly corresponding to the time period for which the data for the present analyses were collected. Although it should be noted that our indicator of alcohol dependence was not a standardized clinical measure, we did, however, include five symptoms of potential alcohol dependence (e.g.,

blackouts, rapid drinking, morning drinking) that are shown to be highly correlated with actual alcohol dependency and abuse (Chavez, Williams, Lapham, & Bradley, 2012). Despite the consistent evidence of the strong disparities in rates of hazardous drinking among SMW, there are few, if any, evidence-based alcohol treatment programs for this population. As noted by the Institute of Medicine's Report on Lesbian, Gay, Bisexual and Transgender Research (2011), interventions aimed at reducing risk behaviors such as alcohol abuse are lacking and the development of efficacious and culturally appropriate treatments should be made a priority by behavioral scientists.

Next, we examined the rates of sexual risk behaviors of study participants. Despite the common perception that SMW are a low risk group for sexually transmitted infections (Bailey, Farquhar, Owen, & Mangtani, 2003; Petersen, Doll, White, Chu, & Blood, 1992; Skinner, Stokes, Kirlew, Kavanagh, & Forster, 1996), recent evidence indicates that they may be as likely to engage in risky sexual behavior and to experience STIs as heterosexual women (Lindley, Walsemann, & Carter, 2013). Given that the primary focus of our study was not on sexual risk, the assessment of sexual risk was limited to the number of sexual partners and use of protective barriers. However, these two variables are known to be primary drivers of sexually transmitted diseases (Chandra et al., 2012). On average, our study participants reported relatively low levels of unprotected sexual contact. The most prevalent risk behavior was ever having had unprotected sex with women (data not shown). More common was the reporting of multiple sexual partners. About 3.7% of women in the general population aged 40 to 44 years reported 3 or more sexual partners in the previous 12 months (Mosher et al., 2005). At Wave 1, 13.8% of participants in the current study reported 3 or more sexual partners in the previous 12 months with this percentage increasing to 24.6% in the 12 months prior to Wave 2 data collection.

Demographic factors associated with higher rates of sexual risk behaviors included younger age, African American race, and a bisexual sexual identity. These findings differ somewhat from general population data where indicators of socioeconomic status, particularly education and income, tend to be associated with women's sexual risk profiles (Gavin et al., 2009; Hallfors, Iritani, Miller, & Bauer, 2007; Halpern et al., 2004). However, these findings are in line with previous research on SMW. Research from population- and non-population-based samples of adolescent and young adult females (typically including participants ages 16-24 years) suggests that, compared with their heterosexual peers, SMW engage in sexual intercourse at an earlier age (Mercer et al., 2007), have a greater number of sexual partners (Marrazzo, Stine, & Wald, 2003), are

Table 3. Sexual and Drinking Variables (*N* = 349).

	Wave 1		Wave 2	
	<i>n</i>	%	<i>n</i>	%
Sexual risk behavior indicators from both waves				
Sex partners ≥ 3 (last 12 months/since last interview)	48	13.8	86	24.6
3 or more sex partners and no or rare use of safer sex practices	36	10.3	56	16.0
Sex-related drinking expectancies from both waves				
Feel less shy or more self confident				
Never true	88	26.2	73	21.8
Sometimes true	154	45.8	127	37.9
Usually true	94	28.0	135	40.3
Feel less inhibited about sex				
Never true	140	41.8	131	39.1
Sometimes true	119	35.5	110	32.8
Usually true	76	22.7	94	28.1
Sexual activity is more pleasurable				
Never true	206	61.5	196	58.7
Sometimes true	103	30.7	112	33.5
Usually true	26	7.8	26	7.8
Hazardous drinking indicators				
Heavy episodic drinking	88	25.2	88	25.2
Intoxication	193	55.3	170	48.9
Adverse drinking consequences (last 12 months)	76	21.9	86	24.6
Alcohol dependence symptoms (last 12 months)	79	22.6	89	25.5

more likely to have unprotected sex (Goodenow, Szalacha, Robin, & Westheimer, 2008), and to exchange sex for drugs or money (Marrazzo, 2000; Scheer et al., 2002). In addition, young SMW are equally as likely as heterosexual adolescents to report male sexual partners (Herrick, Matthews, & Garofalo, 2010; Saewyc, Bearinger, Blum, & Resnick, 1999). The combinations of risk behaviors place younger SMW at elevated risk for negative sexual health consequences such as STIs (Herrick et al., 2010; Lindley, Barnett, Brandt, Hardin, & Burcin, 2008), unintended pregnancies (Blake et al., 2001; Goodenow et al., 2008; Saewyc et al., 1999), and sexual victimization (Austin et al., 2007). Additionally, evidence across a range of health risk and protective behaviors suggest substantial differences in characteristics of sexual minorities based on subgroup differences in self-identification. Consistent with the extant literature (Bailey et al., 2003; Diamant, Schuster, McGuigan, & Lever, 1999; Gonzales et al., 1999; Koh, 2000; Mercer et al., 2007), the bisexually identified women in our sample reported higher levels of sexual risk behaviors. Recent studies are also suggesting that women who identify as mostly heterosexual also have elevated sexual risk profiles (Corliss, Austin, Roberts, & Molnar, 2009). As such, it is important to examine subpopulations of women reporting non-heterosexual sexual identities and behaviors to obtain an accurate portrayal of risk profiles. Furthermore, sexual health promotion strategies specifically targeting bisexual and other adolescent and young adult SMW for education and intervention are warranted.

The second goal of the study was to explore the relationships between sexual identity, hazardous drinking, and sexuality/intimacy enhancement drinking expectancies on sexual risk behaviors among SMW. Our results are consistent with those of previous studies of women from the general population that suggest alcohol use is directly and positively associated with elevated rates of risky sexual behaviors (Kiene et al., 2009). Controlling for demographic characteristics and for sexual identity, hazardous drinking was positively and significantly associated with an increased likelihood of engaging in sexual risk behaviors. Furthermore, sexuality/intimacy-related expectancies were a relatively strong predictor of subsequent hazardous drinking and sexual risk behavior. In terms of temporal order and causality, it is likely that drinking experiences and drinking expectancies have a reciprocal relationship, each influencing the other (Leigh & Stacy, 2004). Our analyses, however, showed no significant effects of Wave 1 drinking and sexual risk behavior on Wave 2 expectancies, suggesting that for SMW the influence of sexuality-related expectancies on subsequent drinking and sexual risk behavior may be stronger than the reverse pattern.

Although beliefs that alcohol enhances sexual experience are widespread (Bogren, Kristjanson, & Wilsnack, 2007; George & Stoner, 2000), most studies of these expectancies have used general population (predominantly heterosexual) samples. The present study is among the few to confirm the importance of sexuality-related expectancies among SMW.

If future research supports the importance of sexuality-related expectancies as influences on SMW's alcohol use and sexual risk behavior, the findings may suggest possible prevention strategies. Expectancy challenge interventions, in which expected effects are shown to occur even when a placebo beverage is consumed rather than alcohol (Labbe & Maisto, 2011), might conceivably be used to reduce sexuality-related expectancies in women at risk for hazardous drinking and/or sexual risk behavior. Further restrictions on advertising that links alcohol consumption with enhanced sexuality could help to weaken sexuality-related alcohol expectancies in the general population.

Strengths and Limitations

This study has several strengths. First, we examined associations between sexual risk behaviors and their predictors in a population that was not restricted to high-risk individuals. Thus, the sample was less subject to potential biases inherent in college or clinical samples, or in community samples recruited on the basis of help-seeking for sexual health or substance abuse services. Second, studies examining sexual risk behaviors typically combine non-heterosexually identified women (lesbian, bisexual, and mostly heterosexual) into a single category for analysis, thus potentially obscuring important subgroup differences (Bostwick, Boyd, Hughes, & McCabe, 2010). Our findings of varying rates of sexual risk behaviors across the subgroups of SMW point to the need to examine within group differences (vs. comparisons of all SMW with heterosexual women) whenever possible. Third, we examined both hazardous drinking and drinking-related expectancies as predictors of sexual risk behaviors. Finally, the study also controlled for a variety of demographic characteristics such as age, ethnicity, education, income, and relationship status that might have otherwise confounded the association between sexual identity and sexual risk profiles.

Despite a number of strengths, the study does have limitations that should also be considered. As with most research focusing on SMW's health, our sample was selected using nonprobability methods. Although probability samples are preferable, even they typically overrepresent White, middle-class, and well-educated SMW who are relatively comfortable about disclosing their sexual orientation. By active outreach to groups that have been underrepresented, the CHLEW research team was able to recruit a sample that was quite diverse in terms of age, race/ethnicity, and income—and thus reduce sample bias and enhance generalizability of the findings. Although it can be argued that the current sample does not represent SMW unwilling to disclose their sexual orientation, it does likely represent many SMW living in

large urban settings who are willing to disclose their sexual orientation (e.g., to health care providers).

The data analyzed here were collected as part of a larger study of lesbian health. Although sexual risk behaviors were measured, these measures did not include a detailed assessment of sexual risk and protective behaviors with female and male partners. The assessment of sexual risk behaviors among the subsample of SMW who have male partners was particularly limited, potentially obscuring higher risk for women in this category. Sexual risk behaviors, such as prevalence and type of sexual activities (e.g., unprotected anal intercourse), number of lifetime sexual partners, and prevalence and type of activities engaged in while under the influence of alcohol or other drugs (and the context of these activities) were not assessed in the study. Sexual risk data were based on retrospective report and may be influenced by recall bias or social desirability factors. Given that negative sexual outcomes among women appear to be on the rise in the United States (Gavin et al., 2009), it would be useful to assess these outcomes among SMW including unintended pregnancies, history of current and past sexually transmitted infections, and sexually related trauma. Finally, the current analyses did not take into consideration victimization experiences such as childhood and adult experiences of sexual victimization which may have influenced level of engagement in sexual risk or hazardous drinking.

Conclusions

Despite epidemiological evidence suggesting that younger and bisexually identified SMW experience sexual health disparities—both risk behaviors and sexual health outcomes—little is known about the context of these behavioral risks. The results of this study reinforce previous findings that SMW do engage in sexual behaviors that put them at risk for HIV, other STIs, and unintended pregnancy, despite frequent assumptions by clinicians and health educators that this group is at low or no risk. Our findings regarding the role of alcohol use and sexuality/intimacy-related expectancies in sexual risk behaviors among SMW are consistent with previous research on predominantly heterosexual women. These findings have important implications for developing effective education and interventions to reduce adverse sexual, reproductive, and general health outcomes associated with sexual risk behaviors among SMW. In particular, future efforts at sexual risk reduction in SMW will need to address the influence of alcohol on sexual behaviors and decision making to design the most effective strategies for promoting SMW's sexual health.

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Author Roles

Matthews: lead author, conceptualization of the article, measurement selection, writing, and revision.

Cho: analytical analyses, statistical interpretation, and write up of results.

Hughes: contributed to the conceptualization of the article, expertise in CSA, writing, and revision.

Wilsnack: contributed to the conceptualization of the article, measurement selection.

Johnson: analytical analyses and statistical interpretation.

Martin: contributed to the conceptualization of the article, measurement selection.

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