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Sexual identity of drinking companions, drinking motives, and drinking behaviors among young sexual minority women: An analysis of daily data

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Abstract

Research indicates that sexual minority women (SMW) drink more than their heterosexual counterparts. Minority stress theory postulates that this increased drinking is motivated by efforts to modulate distress related to minority status, highlighting the potential importance of *coping* and *enhancement* drinking motives. Social learning theory postulates that SMW are motivated to drink more because their social companions model drinking behavior and convey social norms regarding appropriate alcohol consumption, suggesting that *social* and *conformity* motives may be important. The degree to which different motives for drinking affect SMW's alcohol consumption may depend in part on whether SMW drink with other sexual minorities, but this has not been investigated. This study examined daily data across two 14-day bursts to understand associations among daily drinking motives, the sexual identity of drinking companions, and alcohol consumption among 67 young SMW who reported on 553 social drinking days. On days when SMW had higher-than-typical social and enhancement motives, they tended to drink more, and that SMW who typically had higher coping motives tended to drink more on any given day. Further, higher-than-typical enhancement motives were associated with heavier drinking on days when SMW drank with only heterosexual companions, relative to days when they drank only with sexual minority companions, or in mixed-sexual-identity groups. SMW's typical conformity motives were more strongly related to drinking on days when SMW drank in mixed-sexual-identity groups relative to heterosexual companions only. These results indicate that SMW's drinking motives and drinking companions may be important targets for future research and intervention.

Keywords

alcohol; substance use; lesbian; bisexual; daily diary

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SMW report higher rates of alcohol use and alcohol-related problems than their heterosexual peers. National probability studies have found that SMW are significantly less likely than heterosexual women to abstain from drinking and are more likely to be current alcohol drinkers, to be heavy drinkers, to binge drink, and to have an alcohol-use disorder (Drabble, Midanik, & Trocki, 2005; SAMHSA et al., 2016). Further, in a meta-analytic study, King and colleagues (2008) found that SMW were at higher risk for alcohol dependence than heterosexual women (*RR* = 4.00). These sexual identity differences in drinking are particularly evident in young adults. For example, SMW report more drinking days and more average drinks consumed than their heterosexual peers in high school (Hatzenbuehler, Corbin, & Fromme, 2008) and during young adulthood (for reviews see Marshal et al., 2008 and Hughes, 2011). Further, research has shown that drinking patterns vary across subgroups of SMW. In particular, bisexual women consistently report higher rates of high-risk drinking than do lesbian women (Eisenberg & Wechsler, 2003; Hughes, McCabe, Wilsnack, Boyd, & West, 2010; Wilsnack et al., 2008, cf. Steele, Ross, Dobinson, Veldhuizen, & Tinmouth, 2009).

Explanations for High Rates of Drinking in SMW

Two complementary theoretical explanations have been proposed to account for drinking disparities among SMW. First, minority stress theory posits that SMW's minority status results in increased risk of trauma, discrimination, and the internalization of stigma, which in turn, increase risk of heavy/hazardous drinking in an effort to manage stress (Hatzenbuehler, 2009; Hughes & Eliason, 2002; Meyer, 2003). Indeed, evidence suggests that minority stressors such as internalized heterosexism and victimization are associated with increased substance use among SMW (Hughes et al., 2010; Lehavot & Simoni, 2011; Szalacha, Hughes, McNair, & Loxton, 2017; Wilson, Gilmore, Rhew, Hodge, & Kaysen, 2016). Second, social learning theory-based models of LGB drinking suggest that less-restrictive norms regarding drinking among sexual minorities, and frequent socialization with other LGB individuals in drinking-oriented contexts, contribute to higher levels of alcohol consumption (Condit, Kitaji, Drabble, & Trocki, 2011; Litt, Lewis, Rhew, Hodge, Kaysen, 2015; McNair et al., 2015). Social learning theory-based models of drinking in the general young adult population emphasize the importance of peers in exerting pressure to drink, modeling drinking behavior, and setting norms for drinking (Borsari & Carey, 2001; Durkin, Wolfe, & Clark, 2005; Lee, Akers, & Borg, 2004). Indeed, individuals with heavier-drinking peers tend to drink more (Rosenquist, Murabito, Fowler, & Christakis, 2010). As a result, membership in an identity group where heavy alcohol use is less stigmatized, as with SMW, or drinking in settings that normalize heavy drinking (e.g., lesbian bars), may lead to increased use.

Drinking motives, defined as the valued outcomes that proximally precede drinking behavior (Arbeau, Kuiken, & Wild, 2011; Cox & Klinger, 1988; Kuntsche, Knibbe, Gmel, & Engels, 2005), are one means of understanding how minority stress and social learning influence drinking. Cooper (1994) categorized drinking motives into four types. Two of these motives involve affect modulation, and thus may be relevant to understanding drinking to manage minority stress: *enhancement* involves drinking to increase positive affect (e.g., to counteract minority stress) and *coping* involves drinking to reduce negative affect (e.g., stemming from

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minority stress). Indeed, qualitative research on SMW's drinking motives indicate that drinking to modulate minority stress is common (Gruskin, Byrne, Kools, & Altschuler, 2006; McNair et al., 2015). The other two motives involve socialization and are relevant to understanding drinking motivated by sexual minority-based social learning: *social* involves drinking to obtain social rewards and *conformity* involves drinking to avoid social consequences. Research indicates that some SMW report drinking to fit in, especially with other sexual minority people, and some report difficulty abstaining from drinking given the frequency of drinking in sexual minority communities (Condit et al., 2011; McNair et al., 2015).

No research to our knowledge has directly tested associations between drinking motives and alcohol consumption in SMW; thus, it is unclear to what extent drinking motives are associated with drinking in this population. However, in other samples, individuals who have stronger enhancement, social, and coping motives tend to evidence the highest levels of drinking, whereas relatively lower levels of drinking have been observed among those who endorse conformity motives (Cooper, 1994; Cooper, Russell, Skinner, & Windle, 1992). Moreover, although the majority of studies treat drinking motives as an individual difference trait, recent studies have found that motives vary across days and situations (Arbeau et al., 2011) and day-today variation in motives may influence drinking behavior (O'Hara, Armeli, & Tennen, 2015).

Effect of Drinking Motives on Alcohol Consumption as a Function of Drinking Companion Sexual Identity

Whether minority stress and/or social learning motivate drinking may depend in part on whether SMW drink with other LGB individuals. As summarized in Table 1, motives may be differently activated and lead to different drinking patterns as a function of the sexual identity of companions.

Minority stress, and drinking to modulate such stress, may be more likely when SMW drink with heterosexual individuals and less likely when SMW drink with LGB individuals. Indeed, LGB young adults reported that situations involving interactions with heterosexual individuals were more likely to make their LGB identity salient in a negative way than interactions with LGB individuals (Mohr & Sarno, 2016). It is important to note that SMW may experience greater minority stress around heterosexual individuals regardless of whether or not such individuals are explicitly prejudiced or engage in other biased behavior. For example, in the company of heterosexual peers, SMW may need to maintain vigilant against possible sources of minority stress or conceal their sexual identity to protect against minority stress (Herek, Gillis, & Cogan, 2009; Meyer, 2003). In contrast, socializing in LGB settings has been associated with greater feelings of safety and support (Gruskin et al., 2006), as well as reductions in minority stress (Hequembourg & Brallier, 2009). Thus, socialization with heterosexual individuals, but not LGB individuals, may increase drinking in response to minority stress. This hypothesis has been supported in recent research: among LGB college students with more LGB friends, minority stress was not associated with alcohol abuse, whereas LGB students with fewer LGB friends were not similarly protected

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from the impact of minority stress on alcohol abuse (Woodford, Kulik, & Atteberry, 2015). Importantly, while high levels of minority stress in one's life in general may result in greater drinking (Lehavot & Simoni, 2011), there is also evidence that situation-specific minority stress (e.g., stress elicited from interactions with heterosexual individuals) may have immediate effects on drinking behavior. In a study of sexual and gender minorities, experiencing any discrimination in a given measurement window was associated with a 359% increase in odds of substance use in that measurement window (Livingston, Flentje, Heck, Szalda-Petree, & Cochran, 2017). Together, results of these studies provide theoretical and empirical evidence that drinking in the company of heterosexual drinking companions may increase minority stress, which could lead to more drinking for SMW who endorse more enhancement or coping motives for drinking.

Social learning may be more likely to motivate SMW's drinking when SMW drink in LGB settings. Gaining entry into SMW communities and connecting with other SMW is a primary driver of drinking among SMW (McNair et al., 2015). This may be due to the fact that socialization in LGB communities is often tied to drinking (e.g., gay/lesbian bars have historically served as safe spaces for LGB socialization) (Gruskin et al., 2006; Wolfe, 1992). These LGB-specific socialization settings may create a context for SMW's drinking in which alcohol is readily available, drinking is directly encouraged, and LGB-specific drinking norms are salient (Hughes & Eliason, 2002; Parks, Hughes, & Kinneson, 2008; Trocki, Drabble, & Midanik, 2005). Indeed, in a study of SMW's drinking settings, drinking in lesbian bars was associated with past-year problem drinking (Parks et al., 2008). Further, findings from a qualitative study conducted with SMW suggested that, when socializing with LGB individuals, SMW women were motivated to drink to fit in and connect with other SMW and to affirm their identity; SMW in this study reported having difficulty abstaining from drinking in settings like lesbian bars (McNair et al., 2015).

Despite evidence that SMW's drinking motives may be differently activated and thus produce different levels of alcohol consumption depending on the sexual identity of their drinking companions, to our knowledge no research has examined this possibility. Instead, research has focused on general differences in alcohol consumption among SMW as a function of their friends' sexual identities (who may or may not be their drinking companions). In general, this research has found that SMW with social networks comprised of LGB individuals tend to drink more (Green & Feinstein, 2012; Parks et al., 2008; Parks & Heller, 2013). To clarify whether the presence of drinking companions of various sexual identities is associated with drinking behavior and understand the degree to which context-specific motives for drinking are associated with drinking behavior as a function of these companions, micro-longitudinal research (i.e., involving daily or event-level data collection) is needed. The focus on within-person relationships afforded by micro-longitudinal research makes it possible to examine situation-specific drinking behavior and test the degree to which fluctuations in drinking motives in a given person predict alcohol consumption. Although micro-longitudinal research has begun to explore differences in relationships between motives and behaviors as a function of drinking companions (O'Hara et al., 2015; O'Hara et al., 2014), this has not been explored among SMW.

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The Current Study

In the current study, we collected daily data from SMW to understand day-to-day relationships between drinking motives and level of alcohol consumption, as well as how these relationships differed on days when SMW drank with LGB versus heterosexual drinking companions. Consistent with past research on daily variation in motives (O'Hara et al., 2014) and best practices for modeling repeated-measures data (Curran & Bauer, 2011), we explored typical levels of various drinking motives (i.e., averaged within each person across days) as well as day-to-day variation in these motives. We based hypotheses regarding main effects between drinking motives and alcohol consumption (i.e., not dependent on characteristics of drinking companions) on minority stress and social learning theory, and on research using samples from the general population, as we had no theoretical reason to believe that these relationships would differ for SMW. Specifically, we hypothesized that SMW with overall higher mean levels of coping, social, or enhancement (but not conformity) motives would drink more on any given day (H1), and that SMW would drink more alcohol on days when they had higher coping, social, conformity, or enhancement motives (H2). Based on past research (Green & Feinstein, 2012; Parks et al., 2008; Parks & Heller, 2013), we also expected that SMW would report drinking more when in the company of other LGB people. Specifically, we hypothesized that SMW would drink more on days that they drank with LGB individuals only or with both heterosexual and LGB individuals relative to days that they drank with heterosexual individuals only (H3). We also hypothesized that drinking companion sexual identity would moderate relationships between drinking motives and alcohol consumption. Consistent with minority stress theory, we hypothesized that higher coping or enhancement motives would be associated with more drinking on days when SMW drink with heterosexual individuals only or both heterosexual and LGB individuals relative to LGB individuals only (H4). Based on social learning theory, we hypothesized that higher social or conformity motives would be associated with more drinking on days when SMW drink with LGB individuals only or with both heterosexual and LGB individuals relative to heterosexual individuals only (H5).

Method

Procedures

Procedures were approved by the University of Washington Institutional Review Board and a Federal Certificate of Confidentiality was obtained. A national non-probability sample of lesbian and bisexual women aged 18–25 were recruited though Facebook and Craigslist for a larger 4-wave longitudinal study. The broader study from which data were drawn examined alcohol consumption, physical health, and mental health among young lesbian and bisexual women (Kaysen et al., 2014; Litt et al., 2015) annually for four years. Those interested in participating provided informed consent and completed a brief screening survey. Women were eligible if they lived in the U.S., had a valid e-mail address, were between 18 and 25 years old, and self-identified as lesbian or bisexual. Participants were paid $25 for completing the baseline survey and $30 for completing each subsequent annual survey. Those interested in participating (n = 4119) completed an initial 20-minute online screening survey, and eligible respondents (n = 1877) were invited to participate in the

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longitudinal study. Of the eligible respondents, 1057 women consented and completed the baseline survey.

Women who reported consuming at least 2 drinks in a single drinking occasion at least 7 times in the past 30 days were recruited from the larger longitudinal study to participate in the daily monitoring portion of the study. This involved completing brief surveys twice daily for 14 consecutive days each year, for a total of 56 days. A target sample size of 100 was determined on the basis of a power analysis regarding the relationship between daily affect and drinking behavior. A random sample of 124 participants were recruited to participate in the daily diary component, 114 of whom completed at least one day of monitoring. Participants were emailed daily at a set time with a link to the survey, which could be completed online at any time during the day. In the 24-month and 36-month waves of daily assessments (i.e., waves 3 and 4), the sexual identity of drinking companions and drinking motives were assessed, so data from these waves were used for the present study. Daily diary participants were paid $5 for each daily assessment completed; participants who completed all 14 days of assessment received a $10 bonus.

Of the 114 women who participated in daily diary assessments at waves 3 and/or 4, 67[1] who reported drinking with companions at least twice during the 28 days of assessment[2] were included in the current analyses. More of the participants identified as bisexual (59.7%) than lesbian (40.3%). The majority (82.1%) identified as White; 14.9% identified as African American, 11.9% as Asian or Asian American, 3.0% as American Indian/Alaskan Native, and 9.0% as Hispanic/Latina (participants could select more than one racial/ethnic identity). Participants' mean age at wave 3 was 23.65 (*SD* = 2.16, range: 20 to 27). Educational level included: less than a high school diploma (1.5%), high school diploma (13.0%), vocational or associate's degree (11.9%), some college (43.3%), bachelor's degree (29.9%), and graduate or professional degree (4.5%). Most of the sample was currently employed: 44.8% reported full-time employment and 28.4% reported part-time employment. About one-third of the sample (31.3%) reported that they were currently enrolled in school. Personal annual income varied substantially with one-third reporting incomes of less than $10,000 (38.8%). Slightly more than one-third reported incomes of $10,000-$19,999 (32.8%), 13.4% reported incomes of $20,000-$29,999, and 15.0% reported incomes of $30,000 or more.

Measures

Daily measures—Participants were provided with a definition of a standard drink and asked, "How many standard drinks have you had yesterday [*day of the week inserted here*]?" Participants were asked to indicate the specific number of drinks consumed (0 to 24) or indicate that they had consumed 25 or more drinks. If participants reported consuming at least one drink, they were then asked a series of questions about their drinking companions, including whether they drank alone. To assess the sexual identity of drinking companions for participants who did not drink alone, participants were asked, "what was the sexual

[1]An additional 5 participants who identified as sexual minorities at wave 1 had changed their identification to heterosexual by wave 3 and were thus excluded from analyses.
[2]As described in the Analytic Plan, at least two observations from each individual were needed to compute meaningful within-person means and deviations.

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orientation of those you were drinking with?" Participants could select as many of the following options as applied: lesbian women, bisexual women, bisexual men, gay men, heterosexual women, heterosexual men, unknown. Responses were collapsed into a categorical variable indicating whether participants drank with only LGB drinking companions, only heterosexual drinking companions, or both LGB and heterosexual drinking companions on a given day. Finally, drinking motives were assessed using a list of items modified for daily administration from the Drinking Motives Questionnaire (Cooper, 1994; Grant, Stewart, O'Connor, Blackwell, & Conrod, 2007). Items followed the heading "Reasons for drinking yesterday" and included a 2-item conformity subscale, e.g., "To fit in with a group I like" ($\alpha = 0.79$[3]), a 2-item enhancement subscale, e.g., "I liked the feeling" ($\alpha = 0.81$), a 4-item coping subscale that included 2 items about drinking to cope with anxiety and 2 about drinking to cope with depression, e.g., "It helped me feel less nervous" ($\alpha = 0.81$), and a 2-item social subscale, e.g., "It made a social gathering more enjoyable" ($\alpha = 0.79$). Items were rated on a 4-point Likert-type scale ranging from 1 (not at all) to 4 (very much); a sum score was calculated for each subscale. Intraclass correlation values for each motive were as follows: social = 0.39, enhancement = 0.49, conformity = 0.44, coping = 0.50.

Analytic Plan

Because our research hypotheses pertained to associations between the sexual identity of drinking companions and drinking behavior, we focused on days in which SMW drank with companions. Of 1647 total days in which SMW reported on their drinking during waves 3 and 4, days in which no drinking occurred ($n = 922$) and days in which participants drank alone ($n = 39$) were excluded. In addition, days with missing data on drinking companions ($n = 79$), days with missing data on one or more drinking motive ($n = 21$), and days in which participants exclusively drank with companions of unknown sexual identity ($n = 23$) were excluded. Our use of multilevel modeling allowed us to retain participants in analyses even if they had missing data on some days. Participants in this sample completed 70% of the daily monitoring days (representing a high level of completion for daily diary studies; Black, Harel, & Matthews, 2012) and fewer than 5% of participants had too much missing data to be included in any analyses ($n = 4$). As a result of this small amount of missing data, we excluded days of observation listwise. We then excluded an additional 10 participants who did not report at least two social drinking days per wave, given that at least two observations were necessary to calculate meaningful person-means and daily deviations. This left $N = 553$ social drinking days for analyses ($n = 247$ days from wave 3; $n = 306$ days from wave 4).

We then explored potential demographic covariates by testing bivariate associations with an aggregate variable representing average number of drinks consumed across social drinking days. The following variables were not significantly associated with average number of drinks: age, $r = -.20$, $p = .10$, income, $r = -.22$, $p = .07$, race/ethnicity (White vs. other: $t(65) = 0.23$, $p = .82$), student status (student vs. nonstudent), $t(75) = -0.74$, $p = .46$, and employment status (employed vs. unemployed), $t(75) = -0.23$, $p = .98$. Only highest degree earned was significantly associated with average number of drinks, $r = -.35$, $p < .01$; thus, it

[3]Alphas were calculated using all daily data across participants.

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was included with sexual identity, assessment day, and assessment wave as a control variable.

When modeling repeated measures covariates, like the drinking motives variables in this study, it is necessary to disaggregate between- and within-person variance in order to avoid making errors of inference (Curran & Bauer, 2011). A best-practice strategy for accomplishing this is person-mean centering, which involves entering two versions of each time-varying covariate into random-effects models. First, a mean value of the covariate for each person is computed and entered into models. This value, known as the person-mean, represents typical levels of the covariate for a given person and can be used to understand between-person differences. Thus, we calculated person-mean values for each drinking motive by averaging participant's responses across the 14 days of observation in a given wave. We computed these means separately for each wave, so SMW had either one or two person-mean values for each drinking motive, depending on whether they participated in one or both waves. Second, a deviation from the person-mean was computed by subtracting the person-mean from each observation. This person-mean-centered daily deviation can be used to understand within-person differences. In the case of drinking motives, this daily deviation represents whether a given motive was more or less important on a given day than was typical for the participant in that wave.

Observations from participants across both waves were combined using multilevel modeling. Using the glmmADMB package (Fournier et al., 2012; Skaug, Fournier, Nielsen, Magnusson, & Bolker, 2013) in R 3.3.1 (R Development Core Team, 2008), we tested random intercept models to account for nonindependence of observations within participants across assessment waves. Three-level models were specified in which drinking days were nested within individuals, who were nested within assessment waves. Because the dependent variable (i.e., daily number of drinks) was a highly-skewed count variable that included no zero values, a zero-truncated negative binomial distribution was selected. We tested models containing only main effects and models containing both main and interaction effects.

Results

Descriptive Statistics

Of the 67 participants in the current study, 56 reported drinking with others at wave 3 and 58 reported drinking with others at wave 4; 47 participants reported drinking with others at both waves. Across the two waves, participants reported on between 2 to 26 social drinking days ($M = 8.25$, $SD = 5.68$), for a total of 553 social drinking days across waves.

Descriptive statistics and correlations for continuous daily variables are presented in Table 2. In general, statistically-significant positive correlations were observed between number of drinks consumed on a given day and each of the drinking motive variables corresponding to that day, such that more drinks were consumed on days where deviation from the mean level of the drinking motive was higher (with the exception of conformity), as well as on any given day for people with higher mean levels of each type of motive across days. In addition, daily motive deviations were significantly positively intercorrelated, as were mean motives for a given person within each wave. Assessment day was significantly negatively correlated

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with deviations in enhancement motives, such that enhancement motives were increasingly less likely to be higher than normal for a given person as each day of data collection progressed.

Although we were underpowered to test differences between lesbian and bisexual women in the multivariate analyses, we compared these two groups on mean levels of focal variables. We found no statistically-significant differences on mean number of drinks consumed per day or average level of any drinking motives. On average, lesbian women reported drinking with LGB individuals on 79.64% of days, whereas bisexual women reported drinking with LGB individuals on 58.43% of days. This difference was significant, $t(65) = 2.69$, $p < .01$, $d = 0.67$. Bisexual women reported drinking with heterosexual companions on 76.37% of days, and lesbian women reported drinking with heterosexual companions on 52.52% of days. This difference was also significant, $t(65) = 3.15$, $p < .01$, $d = 0.78$.

Comparisons by characteristics of drinking companions

Although too few nonsocial drinking days (i.e., days in which SMW drank alone) were reported (35 days) to permit multivariate comparison with social drinking days (i.e., days in which SMW drank with companions), we were able to test bivariate relationships with drinking motives. Participants who reported social drinking days did not differ from those who did not on mean levels of drinking motives or average number of drinks consumed. Examining bivariate relationships in daily data, social drinking motives, $t(48.74) = 8.09$, $p < .001$, $d = 1.41$, were significantly higher on social drinking days, but no significant difference was observed for coping motives, $t(586) = 0.61$, $p = .54$, $d = 0.11$, conformity motives, $t(42.56) = 1.98$, $p = .05$, $d = 0.35$, or enhancement motives, $t(586) = 1.72$, $p = .09$, $d = 0.30$. Participants drank significantly more on social drinking days than nonsocial drinking days $t(586) = -3.19$, $p < .001$, $d = 0.56$.

Sexual identity of drinking companions—On average, SMW drank with heterosexual people only on 33.02% of their social drinking days ($SD = 33.10$, range: 0% to 100%), LGB people only on 33.24% of their social drinking days ($SD = 32.43\%$, range: 0% to 100%), and both LGB and heterosexual people on 33.73% of their social drinking days ($SD = 25.71\%$, range: 0% to 100%).

In bivariate comparisons testing differences in study variables by drinking companion sexual identity (Table 3), SMW consumed significantly more drinks on days that they drank with both heterosexual and LGB companions as compared to days in which they drank with heterosexual companions only, $d = 0.30$, or LGB companions only, $d = 0.33$. On days that SMW drank with both heterosexual and LGB companions, SMW tended to endorse higher social ($d = 0.43$) and enhancement ($d = 0.20$) motives than on days that they drank with heterosexual companions only. They also tended to endorse higher social ($d = 0.81$), conformity ($d = 0.41$), and enhancement ($d = 0.38$) motives than on days that they drank with both heterosexual and LGB companions as compared to days that they drank with LGB companions only. When comparing days that SMW drank with LGB companions only to days that they drank with heterosexual companions only, SMW were more likely to endorse lower social motives ($d = -0.37$) when drinking with LGB companions only. SMW who

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endorsed higher person-mean coping motives were more likely to report drinking with both heterosexual and LGB companions than with heterosexual companions only ($d = 0.39$), whereas SMW with lower person-mean coping motives were more likely to report drinking with heterosexuals only as compared to LGB people only ($d = -0.41$). SMW who endorsed higher person-mean social motives were more likely to report drinking with both heterosexual and LGB companions ($d = 0.56$) and heterosexuals only ($d = 0.44$) as compared to LGB companions only.

Multivariate Models

In the model containing only main effects (Table 4), there was a significant main effect for person-mean coping motives, such that SMW who had generally higher coping motives tended to drink more on a given day; there were no significant main effects for the other three person-mean motives. Therefore, H1 (that SMW with overall higher mean levels of coping, social, or enhancement motives would drink more on any given day) was partially supported. Statistically-significant main effects were observed for daily deviation in social and enhancement motives, such that on days when an individual reported higher social, coping, or enhancement motives (compared to their person-mean level of motives), they reported greater alcohol use, which provides partial support for H2 (that SMW would drink more alcohol on days when they had higher coping, social, conformity, or enhancement motives). There were no significant main effects for conformity motives at the daily level. H3 (that SMW would drink more on days that they drank with LGB individuals only or with both heterosexual and LGB individuals) was not supported. In terms of covariates, SMW reported significantly more drinks consumed as assessment day increased, and reported significantly fewer drinks at wave 4 relative to wave 3. SMW with higher levels of education reported fewer drinks consumed on any given day.

In the model including interaction effects, all of the previously-observed main effects remained significant with the exception of daily deviation in coping motives. There was a statistically-significant interaction effect for daily deviation in enhancement motives and with whom SMW drank on a given day (Figure 1). Specifically, on days when SMW drank with heterosexual drinking companions only, there was a positive association between daily deviation in enhancement motives and number of drinks consumed (i.e., higher-than-typical enhancement motives were associated with more drinking on these days) (simple slope: $B = 0.25$, $p < .001$). This relationship was significantly less strong on days when SMW drank with sexual minority drinking companions only (simple slope: $B = 0.12$, $p = .14$) or with both sexual minority and heterosexual drinking companions (simple slope: $B = 0.08$, $p = .33$). In addition, we found a statistically-significant interaction for person-mean conformity motives (Figure 2), such that the relationship between person-mean conformity motives and number of daily drinks consumed when drinking with heterosexual companions only (simple slope: $B = -0.12$, $p = .17$) was significantly more positive when drinking with both LGB and heterosexual companions (simple slope: $B = 0.08$, $p = .47$). Thus, H4 (that higher coping or enhancement motives would be associated with more drinking on days when SMW drink with heterosexual individuals only relative to both heterosexual and LGB individuals or LGB individuals only) was not supported, but there was partial support for H5 (that higher social or conformity motives would be associated with more drinking on days when SMW

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drink with LGB individuals only or with both heterosexual and LGB individuals relative to heterosexual individuals only).

Discussion

The primary goal of this study was to better understand day-to-day relationships between drinking motives and alcohol consumption among SMW, and how such relationships may be influenced by the sexual identity of drinking companions. In light of the two predominant theoretical explanations for SMW's higher rates of drinking, which focus on drinking motivated by minority stress and social learning, we examined relationships between drinking motives and number of drinks consumed on days that SMW reported drinking with others across two 14-day periods. Results provide evidence in support of both explanations of SMW's drinking: drinking motivated by affect modulation (i.e., enhancement) was more strongly associated with heterosexual drinking companions and drinking motivated by social learning (i.e., conformity) was more strongly associated with drinking when in the company of both heterosexual and LGB drinking companions. Overall findings also supported the importance of looking at proximal relationships between drinking motives and alcohol use, as well as considering the degree of variability of drinking motives from day-to-day rather than treating drinking motives solely as something that is more fixed and immutable.

Contrary to expectations, drinking companion sexual identity was not itself associated with alcohol consumption in social settings. This is inconsistent with prior research conducted with SMW during the coming-out process, which found that SMW who had social networks of predominately LGB individuals tended to drink more (Parks et al., 2008; Parks & Heller, 2013). However, Parks' research focused on social networks as a whole, rather than individuals with whom SMW drank. This research also focused on typical drinking patterns rather than specific drinking episodes. Thus, it is possible that these relationships are observable over the long-term, but not on a day-to-day basis. That is, SMW may develop patterns of drinking as a result of social learning processes within the context of their *typical* drinking companions, rather than their drinking companions on a given day. Notably, results of our bivariate analyses suggested that drinking in mixed sexual identity settings was associated with the most drinking. It is also possible that settings in which SMW drink with companions of mixed sexual identity include larger numbers of people, which is, itself, associated with more drinking (Oostveen, Knibbe, & De Vries, 1996). We were unable to test this possibility because we did not collect data on number of drinking companions.

Consistent with research in general population samples, it appears that social, coping, and enhancement motives are most relevant to understanding SMW's drinking behavior. Moreover, these relationships were most notable in terms of day-to-day variation in motives (i.e., daily deviations), rather than typical levels of these motives (i.e., person-means). When focusing on within-person associations, we found that on days when SMW experienced higher social (i.e., drinking to obtain social rewards), coping (i.e., drinking to reduce negative affect), or enhancement (i.e., drinking to increase positive affect) motives, they tended to drink more. This suggests that proximal changes in motives may be more influential on drinking behavior than typical drinking motives. These findings are consistent with daily diary studies of young adults in college populations that found daily increases in

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social, coping, and enhancement motives were associated with more social drinking (O'Hara et al., 2014; O'Hara et al., 2015).

In contrast, only person-mean coping motives (but not social, enhancement, or conformity motives) were associated with drinking quantity on a given social drinking day. Cross-sectional research has found positive associations between coping motives and alcohol consumption in young people (see Kuntsche et al., 2005 for a review). Although evidence from a past daily diary study of college students unselected for sexual identity suggested that mean levels of coping across observation periods were *negatively* associated with drinking when in social settings (O'Hara et al., 2014; O'Hara et al., 2015), this difference in results could be due to the association between discrimination, coping motives, and alcohol-related problems that has been observed among sexual minorities (Hatzenbuehler, Corbin, & Fromme, 2011). Because social contexts are a key source of minority stress (Meyer, 2003), some social drinking situations may generate minority stress that lead SMW who tend to drink to cope to consume more alcohol.

Because applying social learning theory to drinking implies that drinking motives may be differently engaged depending on characteristics of drinking companions, we examined how day-to-day relationships between drinking motives and drinking behavior differed as a function of young SMW's drinking companions' sexual identity. Results extended prior research (Parks et al., 2008; Parks & Heller, 2013; Schulenberg & Maggs, 2002; Senchak, Leonard, & Greene, 1998) by suggesting that the combination of drinking motives and sexual identity of drinking companions is potentially important in predicting level of drinking.

Results provided partial support for the premise that drinking with heterosexual individuals may strengthen the association between drinking to modulate affect (e.g., stemming from minority stress) and alcohol consumption. SMW drank more in the company of heterosexual companions when their enhancement motives (i.e., drinking to increase positive affect) were higher than usual. In contrast, when drinking with LGB companions (both with and without heterosexual companions), daily deviations in enhancement motives were less strongly associated with alcohol consumption. This suggests that, on a given day, being motivated to drink to increase positive affect may lead to more drinking for SMW when they are the only sexual minority person in a social drinking situation. As established in prior research (Mohr & Sarno, 2016), minority stress may produce discomfort or social anxiety for SMW, especially if their sexual identity is not known or approved of. This could drive more alcohol consumption to produce positive affect or interfere with the effects of alcohol on positive affect, leading to greater alcohol consumption. In contrast, SMW may experience greater comfort and authenticity when in the presence of other sexual minorities and thus may need less alcohol to achieve positive affect. Although it is possible that some SMW in this sample had heterosexual drinking companions who were affirming of their sexual identity, research has demonstrated that LGB people are more comfortable with LGB friends than with heterosexual friends. For example, in a sample of LGB youth, LGB friends were reported to provide the most social support specific to sexual identity, which was in turn associated with less distress (Doty, Willoughby, Lindahl, & Malik, 2010). Findings from micro-longitudinal research focusing on individuals with concealable stigmas, including sexual minority status,

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indicate that the presence of a similar other was associated with improved mood and self-esteem (Frable, Platt, & Hoey, 1998). Similarly, among LGB individuals with high levels of internalized heterosexism, relationships with a close LGB friend, but not a close heterosexual friend, were associated with lower levels of distress (Mereish & Poteat, 2015). Thus, being the only LGB individual in a drinking situation may produce minority stress, even with supportive heterosexual drinking companions. Future research should examine the association between the degree of minority stress experienced in a given drinking situation and level of drinking. Research is also needed that examines whether the relationship between drinking motives and alcohol consumption differs in other marginalized demographic groups depending on whether they drink with in-group versus out-group members.

Our results also provided support for social learning theory-based models of SMW drinking, which suggest that SMW may drink to conform when in the company of other LGB individuals. SMW's mean level of conformity motives was more strongly related to drinking on days when they drank in mixed-sexual-identity groups relative to when they drank with heterosexual companions only. When socializing with other LGB individuals, SMW may be motivated by the implicit or explicit cues of their peers, or by the setting itself (e.g., a lesbian bar). Mixed-sexual-identity groups may put relatively more pressure on SMW motivated by conformity to orient their drinking norms to other sexual minorities in the setting and thus engage in more drinking. This is consistent with past qualitative work which found that SMW reported difficulty in avoiding drinking around LGB individuals given the desire to connect with other LGB people and affirm their identity (McNair et al., 2015). We extend this research by suggesting that mixed-sexual-identity groups may be particularly important when understanding SMW's conformity-motivated drinking.

Calls have been made to tailor substance abuse interventions for sexual minorities, and research specific to sexual minority populations is important to inform these efforts (Talley, 2013). It has often been assumed that drinking among sexual minority people is predominantly motived by drinking to cope. Our results highlight that drinking behavior is multiply determined and varies by context. Healthcare providers working with SMW presenting with concerns about their drinking may wish to examine both typical and daily motives for drinking to inform their recommendations. For example, SMW who have higher typical coping motives may benefit from interventions aimed at building coping skills to reduce negative affect in more healthy ways. At the same time, individuals may drink in situations that are likely to elicit various specific motives to drink, and these may need to be addressed in treatment as well. For example, as part of an individually-tailored intervention (Stewart et al., 2005), providers could work with SMW to help them recognize drinking situations during which social and enhancement motives may be higher and develop behavioral plans for these days to reduce risk of hazardous drinking (e.g., identifying ways to increase positive affect other than alcohol consumption).

Strengths of this study included its use of daily observational data and its examination of an at-risk and under-researched population. However, there were also limitations that should be considered when evaluating the study findings. Because we did not assess the number of drinks consumed by drinking companions, we were unable to evaluate the potential direct

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impact of peer modeling. As a result, it is unclear whether LGB drinking companions' drinking behaviors in a given situation, or their sexual identity, affected SMW's drinking behaviors. Experimental designs that manipulate the sexual identity and alcohol consumption of drinking companions could help to clarify this. We also did not assess the nature of SMW's relationship with their drinking companion (e.g., friend, family, partner, date) or the number of drinking companions; it is possible that these variables differed as a function of drinking companion sexual identity and may have accounted for observed differences. In addition, because data were collected on a day-to-day basis, rather than specific to a particular episode of drinking, it is unclear how many drinks were actually consumed with each type of companion (e.g., some participants may have had multiple drinking episodes in one day). Further, it should be noted that drinking motives were assessed retrospectively the day after the drinking occasion and referenced their motives for drinking on the prior day, which could have increased recall bias. Event-specific designs could address these limitations. Because SMW reported drinking with others on the majority of days assessed, we were unable to test differences between days in which SMW drank alone and days in which they drank with companions. Although the main focus of our analyses was on social influences on drinking, understanding the relationship between drinking motives and alcohol consumption on social versus nonsocial drinking days is an important direction for future research. Additionally, because SMW did not record information about drinking companions on days when they did not drink, we were unable to account for days in which SMW were in social drinking contexts but did not drink. As a result, it is unclear whether characteristics of drinking companions are associated with *whether* SMW drink, in addition to *how much* they drink. Further, although participants provided data on most days of observation, there was still missing data. Future research should attempt to replicate these findings to assess the degree to which missing data resulted in biased estimates. Finally, the sample was predominantly White. Indeed, a major limitation of much research on SMW's substance use is its lack of diversity (Boehmer, 2002; Institute of Medicine, 2011). Given that minority stress theory and theories of intersectionality suggest that SMW of color experience unique stressors that could differentially impact their drinking behavior when in the company of various drinking companions, future research should recruit diverse samples to explore the relationship between SMW's drinking motives and drinking behavior in various demographic contexts.

In sum, this study provides evidence that day-to-day differences in drinking motives may be associated with some SMW's daily drinking behavior, and the sexual identity of SMW's drinking companions appear to be an important factor in understanding associations between drinking motives and drinking behaviors in this vulnerable population group. Our results highlight the importance of both drinking motives and drinking companions as targets for research and intervention in this population.

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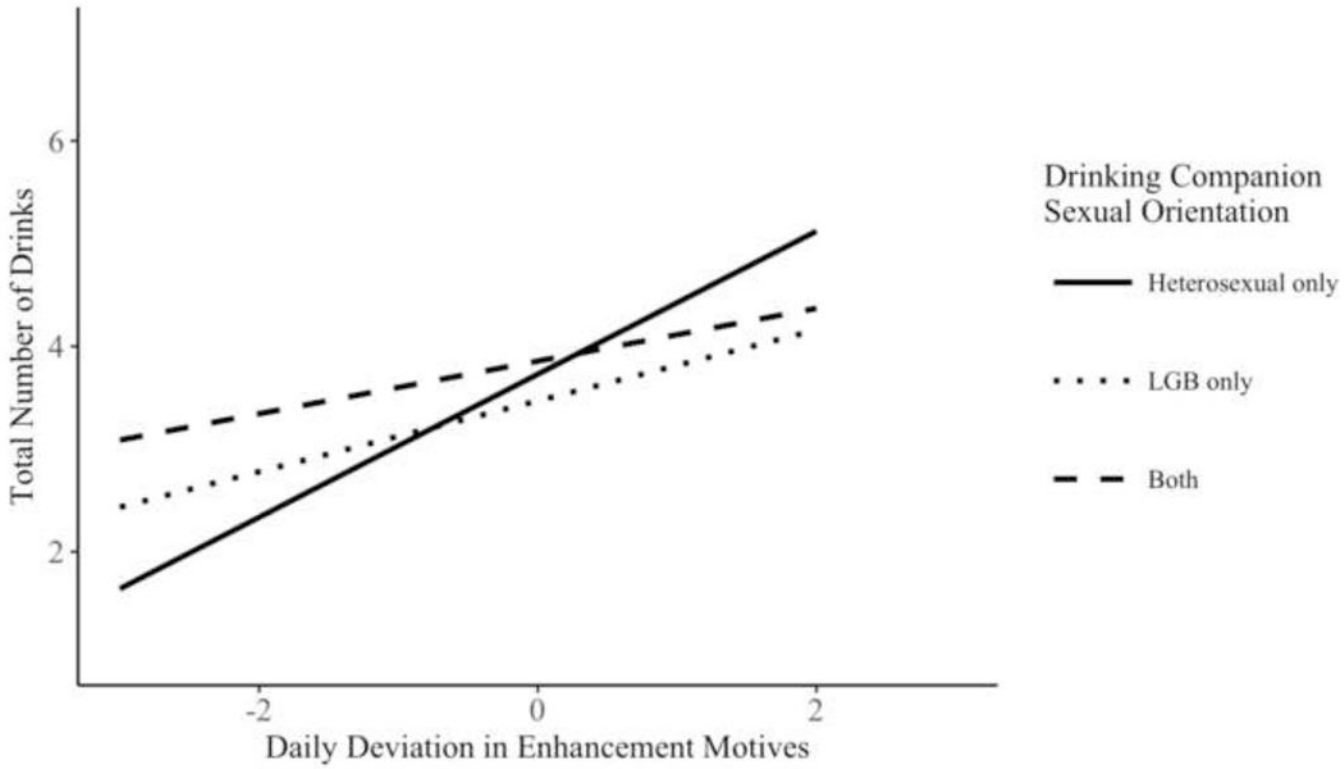

Figure 1.
Interaction between daily deviation in enhancement motives and drinking companion sexual identity [Attached]

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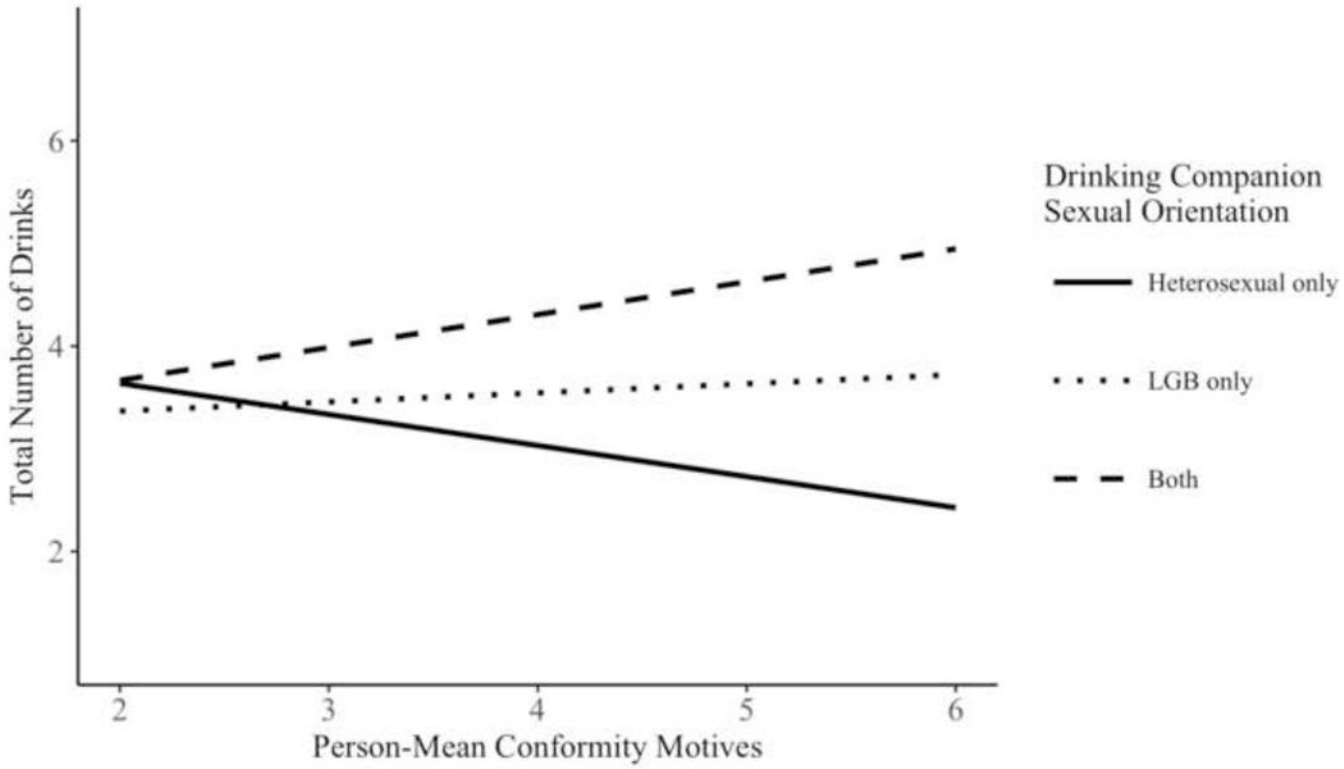

Figure 2.
Interaction between average conformity motives and drinking companion sexual identity [Attached]

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Table 1

Effects of Drinking Companions' Sexual Identity on Drinking Behavior

Theoretical explanation for SMW's drinking behavior	Motives associated with theoretical explanation	Expected effect of drinking companions' sexual identity on associations between motives and drinking behavior	
		LGB companions	Heterosexual companions
Minority stress theory: Minority stress leads SMW to drink to modulate affect	**Coping** (reducing negative affect associated with minority stress) **Enhancement** (increasing positive affect to counteract minority stress)	**Drinking** ↓ less minority stress leads to less drinking to modulate affect)	**Drinking** ↑ (more minority stress leads to more drinking to modulate affect)
Social learning theory: Heavy drinking is normalized among LGB individuals; LGB socialization often occurs in drinking-oriented contexts	**Conform** (avoiding social punishment by adhering to drinking norms of setting and/or referent group) **Social** (gaining social reward by adhering to drinking norms of setting and/or referent group)	**Drinking** ↑ (More permissive LGB drinking norms and LGB socialization contexts lead to more drinking)	**Drinking** ↓ (More restrictive heterosexual drinking norms lead to less drinking)

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Table 2

Descriptive statistics and variable intercorrelations

Variable	Range	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Total drinks	1–15	3.96	2.62									
2. Assessment day within wave	1–14	7.47	3.98	.04								
3. Social (daily deviation)	−4.00–5.07	0.00	1.24	.22**	−.06							
4. Conformity (daily deviation)	−3.38–3.67	0.00	0.68	.08	.07	.34**						
5. Coping (daily deviation)	−5.00–10.00	0.00	1.66	.13**	−.03	.24**	.10*					
6. Enhancement (daily deviation)	−3.00–3.67	0.00	1.14	.22**	−.18**	.44**	.11*	.10*				
7. Social (person-mean)	2.00–8.00	3.76	1.24	.27**	−.03	.00	.00	.00	.00			
8. Conformity (person-mean)	2.00–6.40	2.50	0.92	.26**	−.04	.00	.00	.00	.00	.57**		
9. Coping (person-mean)	4.00–13.50	6.53	2.38	.32**	.00	.00	.00	.00	.00	.19**	.43**	
10. Enhancement (person-mean)	2.00–8.00	5.02	1.49	.19**	−.01	.00	.00	.00	.00	.46**	.26**	.17**

Note.

* indicates $p < .05$;

** indicates $p < .01$. M and SD are used to represent mean and standard deviation, respectively.

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Table 3

Bivariate differences by drinking companion sexual identity on social drinking days

	1. Hetero only (n = 158)	2. LGB only (n = 222)	3. Both hetero and LGB (n = 173)	Difference
Total drinks	M = 3.72, SD = 2.83	M = 3.69, SD = 2.53	M = 4.51, SD = 2.45	$F(2,550) = 5.81^{ab}$
Assessment day within wave	M = 7.44, SD = 3.87	M = 7.28, SD = 4.02	M = 7.73, SD = 4.03	$F(2,550) = 0.63$
Social (daily deviation)	M = 0.02, SD = 1.19	M = −0.42, SD = 1.16	M = 0.52, SD = 1.18	$F(2,550) = 31.37^{abc}$
Conformity (daily deviation)	M = 0.03, SD = 0.69	M =−0.13, SD = 0.65	M = 0.14, SD = 0.68	$F(2,550) = 8.11^{b}$
Coping (daily deviation)	M = −0.01, SD = 1.40	M = −0.04, SD = 1.69	M = 0.07, SD = 1.82	$F(2,550) = 0.21$
Enhancement (daily deviation)	M = −0.04, SD = 1.04	M = −0.18, SD = 1.17	M = 0.26, SD = 1.15	$F(2,550) = 7.47^{ab}$
Social (person-mean)	M = 3.93, SD = 1.32	M = 3.41, SD = 1.05	M = 4.06, SD = 1.28	$F(2,550) = 16.32^{b}$
Conformity (person-mean)	M = 2.43, SD = 0.93	M = 2.43, SD = 0.82	M = 2.63, SD = 1.02	$F(2,550) = 2.87$
Coping (person-mean)	M = 5.87, SD = 2.11	M = 6.85, SD = 2.53	M = 6.73, SD = 2.29	$F(2,550) = 8.97^{ac}$
Enhancement (person-mean)	M = 5.17, SD = 1.39	M = 4.87, SD = 1.59	M = 5.06, SD = 1.45	$F(2,550) = 1.97$

[a] Significant difference between 1 and 3

[b] Significant difference between 2 and 3

[c] Significant difference between 1 and 2

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Table 4

Model testing interactions by sexual identity of drinking companions

Model effects	Main effects only *B (SE)*	Full model *B (SE)*
Intercept	1.03 (0.27)***	1.01 (0.35)**
Main effects		
Assessment day within wave	0.02 (0.01)**	0.02 (0.01)***
Assessment wave 4 (vs. 3)	−0.20 (0.09)*	−0.20 (0.08)*
Highest degree earned	−0.15 (0.03)***	−0.16 (0.03)***
Bisexual identity (vs. lesbian)	−0.08 (0.09)	−0.07 (0.09)
Drank with sexual minorities only (vs. heterosexuals only)	−0.06 (0.08)	−0.12 (0.36)
Drank with sexual minorities and heterosexuals (vs. heterosexuals only)	0.04 (0.07)	0.33 (0.37)
Social (person mean)	0.08 (0.04)	0.09 (0.06)
Conformity (person mean)	−0.01 (0.06)	−0.12 (0.08)
Coping (person mean)	0.07 (0.02)***	0.08 (0.03)*
Enhancement (person mean)	0.03 (0.03)	0.06 (0.05)
Social (deviation from mean)	0.07 (0.02)**	0.09 (0.05)*
Conformity (deviation from mean)	−0.01 (0.03)	0.02 (0.07)
Coping (deviation from mean)	0.04 (0.01)**	0.01 (0.03)
Enhancement (deviation from mean)	0.13 (0.02)***	0.25 (0.05)***
Interaction terms		
Social (person mean) × Drank with sexual minorities only	–	0.01 (0.09)
Social (person mean) × Drank with sexual minorities and heterosexuals	–	−0.07 (0.08)
Conformity (person mean) × Drank with sexual minorities only	–	0.13 (0.12)
Conformity (person mean) × Drank with sexual minorities and heterosexuals	–	0.20 (0.10)*
Coping (person mean) × Drank with sexual minorities only	–	−0.01 (0.04)
Coping (person mean) × Drank with sexual minorities and heterosexuals	–	−0.04 (0.04)
Enhancement (person mean) × Drank with sexual minorities only	–	−0.04 (0.06)
Enhancement (person mean) × Drank with sexual minorities and heterosexuals	–	−0.04 (0.06)
Social (deviation from mean) × Drank with sexual minorities only	–	−0.04 (0.06)
Social (deviation from mean) × Drank with sexual minorities and heterosexuals	–	−0.03 (0.06)
Conformity (deviation from mean) × Drank with sexual minorities only	–	−0.03 (0.09)
Conformity (deviation from mean) × Drank with sexual minorities and heterosexuals	–	−0.05 (0.10)
Coping (deviation from mean) × Drank with sexual minorities only	–	0.02 (0.04)
Coping (deviation from mean) × Drank with sexual minorities and heterosexuals	–	0.02 (0.04)
Enhancement (deviation from mean) × Drank with sexual minorities only	–	−0.12 (0.06)*
Enhancement (deviation from mean) × Drank with sexual minorities and heterosexuals	–	−0.17 (0.07)*

Note.

* indicates $p < .05$;

** indicates $p < .01$;

*** indicates $p < .001$.

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