Does Sexual Self-Concept Ambiguity Moderate Relations Among Perceived Peer Norms for Alcohol Use, Alcohol-Dependence Symptomatology, and HIV Risk-Taking Behavior?

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ABSTRACT. Objective: The current study examines the relation between peer descriptive norms for alcohol involvement and alcohol-dependence symptomatology and whether this relation differs as a function of sexual self-concept ambiguity (SSA). This study also examines the associations among peer descriptive norms for alcohol involvement, alcohol-dependence symptomatology, and lifetime HIV risk-taking behavior and how these relations are influenced by SSA. **Method:** Women between ages 18 and 30 years ($N = 351$; $M = 20.96$, $SD = 2.92$) completed an online survey assessing sexual self-concept, peer descriptive norms, alcohol-dependence symptomatology, and HIV risk-taking behaviors. Structural equation modeling was used to test hypotheses of interest. **Results:** There was a significant latent variable interaction between SSA and descriptive norms for peer alcohol use. There was a stronger positive relationship between peer descriptive norms for alcohol and alcohol-dependence symptomatology when SSA was higher compared with when SSA was lower. Both latent variables exhibited positive simple associations with alcohol-dependence symptoms. Peer descriptive norms for alcohol involvement directly and indirectly influenced HIV risk-taking behaviors, and the indirect influence was conditional based on SSA. **Conclusions:** The current findings illustrate complex, nuanced associations between perceived norms, identity-related self-concepts, and risky health behaviors from various domains. Future intervention efforts may be warranted to address both problem alcohol use and HIV-risk engagement among individuals with greater sexual self-concept ambiguity. (*J. Stud. Alcohol Drugs, 75,* 1023–1031, 2014)

RELATIVE TO HETEROSEXUAL WOMEN, sexual minority women (e.g., those who self-identify as non-heterosexual) endorse greater alcohol-dependence symptoms (Drabble et al., 2005), hazardous drinking levels (Wilsnack et al., 2008), alcohol consumption levels (Burgard et al., 2005; Valanis et al., 2000), and alcohol-related social problems (Drabble et al., 2005). Further, there is equivocal evidence suggesting that, among sexual minority women, those who engage in sexual behavior with both men and women may endorse riskier alcohol use patterns relative to those who report only same-sex sexual partners (e.g., Burgard et al., 2005).

Sexual minority women also engage in sexual risk behaviors that increase their risk for sexually transmitted infections, including HIV (Bevier et al., 1995; Goodenow et al., 2008). For example, data from the Massachusetts Youth Risk Behavior Survey (Goodenow et al., 2008) indicate that female adolescents who report any same-sex sexual partners endorse a greater number of lifetime sexual partners and greater likelihood of injection drug use; in addition, female adolescents who report only male sexual partners yet also endorse being unsure of their sexual identity were less likely to use a condom during their last sexual encounter (Goodenow et al., 2008). Given that sexual minority women report engaging in both problematic alcohol use and risky sexual encounters, there is a need to understand mechanisms that may underlie the association between alcohol misuse and HIV risk-behavior engagement among sexual minority women.

Perceived peer descriptive norms for alcohol involvement (i.e., one's perception of the quantity and frequency of their peers' alcohol consumption) have been linked to various indices of alcohol use, such as heavy drinking and alcohol-related consequences (Borsari and Carey, 2001, 2003; Lewis and Neighbors, 2004; Neighbors et al., 2006), including in bivariate associations with alcohol-dependence symptoms (Larimer et al., 2004). Injunctive norms (i.e., one's perception of their peers' approval of drinking) have also been shown to relate to alcohol use and negative consequences (e.g., LaBrie et al., 2010), including alcohol-dependence symptoms (Larimer et al., 2004). Last, both descriptive and injunctive norms for alcohol consumption have been shown to independently relate to sexual minority women's alcohol use before college matriculation (Hatzenbuehler et al., 2008).

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Of note, Larimer and colleagues posit that descriptive norms may be more pertinent for predicting concurrent alcohol consumption, whereas injunctive norms may be more enduring and robustly relate to downstream consequences, outside of concurrent use. Consistent with this assertion, Hatzenbuehler et al. (2008) found that the association between women's sexual minority identity and alcohol use during college matriculation—assessed with a composite variable reflecting quantity/frequency of drinking, frequency of intoxication, and frequency of heavy episodic drinking over the previous 3 months—was partially explained by both descriptive and injunctive peer alcohol norms, with the qualification that injunctive norms were more robustly associated with concurrent alcohol consumption in multivariate analyses.

Researchers have sought to better understand the association between social norms and problematic alcohol involvement with regard to how this relation is influenced by identity-related characteristics (e.g., identification with peers; Lewis et al., 2010; Reed et al., 2007). Uncertainty-identity theory (Hogg, 2000, 2007, 2012) states that social groups (e.g., close others) are used to inform behaviors of an individual experiencing heightened identity uncertainty (Jetten et al., 2000) in order to reduce felt uncertainty and inform perceptions, beliefs, and behaviors (see also Tajfel, 1978). Others have also hypothesized that the behavior of individuals with less self-relevant certainty are more influenced by environmental factors (Campbell and Fehr, 1990; Epstein, 1973). For example, Setterlund and Niedenthal (1993) showed that individuals who had been randomly assigned to an experimental condition that evoked self-concept confusion were more likely to use external factors as a basis for decision-making behaviors, whereas those in a condition that elicited greater self-concept clarity were less likely to use external factors as a basis for decision-making.

Important for the current work, Turner (1991) argues that descriptive norms are more closely related to modeling behaviors in which an individual imitates or matches the behavior of a peer (e.g., alcohol consumption). Turner's idea is consistent with Larimer and colleagues' (2004) hypothesis that descriptive norms may be more likely than injunctive norms to inform an individual's concurrent drinking behavior "at that time" (p. 209) that drinking is occurring. As such, individuals with ambiguous, less coherent identity-related self-concepts may be more likely to rely on descriptive norms of their close peers to guide their alcohol consumption in vivo, which may ultimately contribute to greater risk for problematic use and negative consequences (including risky sexual encounters) in cases where close friends are permissive with regard to drinking behaviors. Hatzenbuehler and colleagues (2008, 2009) have theorized that sexual minority individuals, who more commonly grapple with identity-related self-concept concerns (e.g., Wright and Perry, 2006), may rely more heavily than their heterosexual peers on peers' drinking behaviors to inform their own alcohol behaviors.

Meta-analytic work (Borsari and Carey, 2003) shows that, although a discrepancy is typically reported between alcohol use behaviors among peers and the self, perceptions are less discrepant for peer reference groups that participants ostensibly know to a greater extent (i.e., "best friends"; Baer et al., 1991; Perkins, 1997). More accurate estimates, reflecting factually based consumption patterns, are likely when participants are asked about a proximal reference group (e.g., "close friends"). Of note, meta-analytic findings also show that assessments of perceived drinking behaviors (descriptive norms) only elicit small self–other discrepancies, whereas assessments of perceived approval of alcohol use (injunctive norms) typically show medium-sized self–other discrepancies. Last, assessing specific alcohol behaviors is also likely to result in smaller self–other discrepancies (Borsari and Carey, 2003) compared with those phrased in general terms. Taken together, we assert that greater levels of peers' descriptive norms for alcohol use likely reflect factually based, typical drinking contexts, particularly when assessed for proximal peer groups and specific alcohol use behaviors.

Consistent with Hatzenbuehler and colleagues' (2008, 2009) assertions that sexual minority individuals may rely more on situational factors to guide their drinking behaviors, it is reasonable to suggest that individuals who report an ambiguous sexual orientation self-concept (e.g., who are actively engaged in sexual questioning) will also be more likely to rely on close others' drinking behaviors to guide their alcohol use. During sexual identity development, an individual may experience ambiguous identity-related self-concepts. Rosario and colleagues (2011) conceived of sexual identity development as having two distinct but related processes. Identity formation has been described as the exploration of one's sexual minority identity, including becoming aware of an alternative, nonheterosexual sexual orientation; initiating sexual questioning; and engaging in sexual behaviors with same-sex partners (Rosario et al., 2011). By contrast, identity integration involves a commitment to a recently acknowledged sexual identity and "a continuation of sexual identity development as individuals integrate and incorporate the [new] identity into their sense of self" (p. 4, Rosario et al., 2011). Acknowledgment of difficulties with integrating aspects of one's sexual orientation into one's sense of self would likely result in what is termed here as sexual self-concept ambiguity (SSA). More specifically, SSA is defined as the extent to which dimensions of an individual's sexual orientation are unclear and ill defined, internally inconsistent, and temporally unstable. Based on the literature reviewed, we hypothesized that individuals higher in SSA (i.e., individuals with an ambiguous sexual orientation self-concept) would be more likely to use their peers' descriptive norms as a means for guiding their alcohol involvement, and consequently

be at greater risk for alcohol-dependence symptomatology (ADS).

In addition to the harm associated with ADS, per se, descriptive peer norms for alcohol consumption may indirectly influence other risk behaviors commonly associated with hazardous drinking, such as sexual risk taking, via permissive norms for alcohol misuse and related consequences. Indeed, the literature suggests that descriptive peer norms influence ADS (e.g., Larimer et al., 2004) and that ADS is related to engagement in risky sexual behaviors in both heterosexual (Tapert et al., 2001) and sexual minority samples (Irwin et al., 2006). Given these observations, it is reasonable to hypothesize that perceptions of acceptable drinking behaviors may correlate with perceptions of permissive sexual norms through common associations between alcohol misuse and associated risk behaviors, particularly in peer groups that engage in greater alcohol consumption. Further, given that individuals higher in SSA may have a more pronounced relation between descriptive peer norms and ADS, we suspect that the potential indirect influence of alcohol descriptive peer norms on risky sex through ADS may be more pronounced among individuals with elevated levels of SSA.

The purpose of the current study was to examine whether associations between peer descriptive norms for alcohol involvement and ADS differ as a function of SSA. In addition, we examined (a) whether descriptive norms for alcohol involvement affect HIV risk-taking behaviors through ADS and (b) whether this indirect influence changed based on level of SSA. Given that previous work suggests descriptive norms may be more pertinent for drinking "in the moment" (Larimer et al., 2004, p. 209)—that is, at the time consumption is occurring—and that our data are cross-sectional, we hypothesized that higher levels of descriptive peer norms would relate to increased ADS. Novel to the current study, we also expected to demonstrate that individuals who report greater frequency of peer drinking and drunkenness and higher levels of SSA would report even greater ADS than those who report greater frequency of peer drinking and drunkenness and lower levels of SSA. Last, we expected (a) frequency of peer drinking and drunkenness relates to engagement in HIV risk-taking behaviors, and this relation is mediated by ADS, and (b) this mediated effect is stronger among those higher in SSA.

Method

Participants

This report used previously collected data from a larger study examining associations among aspects of women's sexual self-concept and their alcohol and other drug use behaviors. The current sample consists of 351 women ranging in age from 18 to 30 (M = 20.96, SD = 2.92). Participants were able to select more than one racial identity category. Most participants identified as White (83.8%, n = 294), 10.8% (n = 38) identified as Black or African American, 4.7% (n = 17) as Asian, 4.6% (n = 16) as Hispanic/Latino, 2% (n = 7) as American Indian, and 1.4% (n = 5) refused to provide their racial identity. Approximately 58% of women (n = 203) currently identified as heterosexual, and 42% currently identified as sexual minorities (n = 147). Sexual minority identity categories included queer (2.6%, n = 9), exclusively homosexual (7.4%, n = 26), primarily homosexual (2.8%, n = 10), equally homosexual and heterosexual (6.3%, n = 22), primarily heterosexual (20.2%, n = 71), questioning/unlabeled (2.0%, n = 7), and other (e.g., "pansexual," n = 2). Respondents who indicated that they had no sexual interest were not included in the current analyses.

Procedure

Introductory psychology students and eligible women from the surrounding community were recruited into the larger study from fall 2010 to spring 2013. Introductory psychology students were recruited from the psychology pool at a large midwestern university and received experimental credit in return for participating in the online survey. Community participants were recruited with advertisements in local newspapers and campus-wide email notices, flyers distributed in the surrounding community, and snowball sampling techniques. Sexual minority women were oversampled based on information provided during a brief telephone screening relevant for the purposes of the larger study. Participants were instructed to set aside 2.5–3 hours to complete the online survey, and informed consent was obtained before participation. During the survey, participants were asked detailed questions about their average alcohol consumption, sexual history, and sexual self-concept. Community participants received a $25 gift certificate to Amazon.com in exchange for participation.

Measures

Peer descriptive norms. Perceived peer descriptive norms were assessed with two items: "When your close friends drink, how much (on average) does each person drink?" (0 = *they don't drink,* 4 = *more than six drinks*) and "How many of your close friends get drunk on a regular basis (at least once a month)?" (0 = *they don't get drunk,* 5 = *all*). Given previous work showing that assessing specific alcohol behaviors is likely to result in smaller self–other discrepancies (Borsari and Carey, 2003) compared with those phrased in general terms, we chose to assess typical quantity of close friends' alcohol consumption in addition to a more hazardous indicator of peers' drinking behavior (i.e., proportion of those who drink to intoxication regularly).

Sexual self-concept ambiguity. SSA was measured with a subset of nine items adapted from Campbell and colleagues'

TABLE 1. Percentage of sample endorsing elevated sexual self-concept ambiguity, specific risk behaviors, and alcohol disorder symptoms

Variable	% Endorsing
Sexual orientation self-concept ambiguity scores > 1	
Overall sample (n = 348)	52.4
Any lifetime sexual minority identity subsample (n = 162)	76.5
Lifetime exclusively heterosexual identity subsample (n = 186)	32.3
Alcohol-dependence symptoms—rate of endorsement in prior 3 months	
Withdrawal	74.5
Larger/longer	57.3
Craving	49.6
Tolerance	42.7
Role impairment	28.3
Attempts to quit	27.5
Time spent	24.6
Continued use	14.8
Give up activities	6.1
HIV-related risk taking—rate of endorsement in lifetime	
One-night stand	52.2
Sex with stranger/prostitute	31.8
Unprotected anal intercourse	26.3
Sex with gay/bisexual man	9.4
Sex with intravenous drug user	5.9
Sex for drugs/money	4.1
Sex with person living with HIV	2.9

Notes: Alcohol-dependence symptoms were defined based on seven diagnostic criteria from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (American Psychiatric Association, 1994), as well as an assessment of craving for alcohol. Symptoms assessed were (a) tolerance to alcohol's effects; (b) physical symptoms that occur when alcohol use stops or is reduced; (c) drinking larger amounts of alcohol or for a longer period than intended; (d) unsuccessful attempts to cut down on drinking; (e) spending a great deal of time on obtaining alcohol, drinking, or recovering from the effects of drinking; (f) giving up important social, recreational, or work-related activities in favor of drinking; and (g) continuing to drink despite physical or psychological problems caused or made worse by drinking. The most frequently endorsed dependence symptom, alcohol withdrawal, was assessed based on manifestations of severe alcohol withdrawal syndrome ("In the past year, have you had 'the shakes' after stopping or cutting down on drinking?"; endorsed by 4%) and mild acute alcohol withdrawal ("In the past year, have you had a headache [hangover] the morning after you have been drinking?"; endorsed by 74%), which researchers have viewed as a "manifestation of mild AW" (p. 55, Swift and Davidson, 1998 [AW = alcohol withdrawal]). HIV-related risk-taking items specifically referred to unprotected anal intercourse, one-night stands, intercourse with a stranger or prostitute, intercourse in exchange for drugs or money, intercourse with a gay or bisexual man, and intercourse with someone who has used intravenous drugs or who is infected with HIV, which are behaviors that the Centers for Disease Control and Prevention (1991) consider "high risk" for contracting HIV.

Self-Concept Clarity Scale (Campbell et al., 1996). Nine items were modified to assess individuals' perceptions that their sexual orientation (defined as "your self-identification as well as your sexual attractions, fantasies, and behaviors") was incoherent, inconsistent, and unstable (Talley and Stevens, 2014). Item response theory analyses support that the current nine items measure SSA equally well in self-identified exclusively heterosexual and sexual minority women. Descriptive information suggested that this variable was relatively normally distributed in the current sample (M = 0.46, SD = 0.66, range: 0–3, skewness = 1.46, kurtosis = 1.24). An example item was, "My beliefs about my sexual orientation often conflict with one another" (0 = *strongly disagree,* 3 = *strongly agree*).

Alcohol-dependence symptomatology. We constructed a count of nine alcohol-dependence symptoms (i.e., tolerance, withdrawal, craving) derived from the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5; American Psychiatric Association, 2013), experienced within the past year, from 14 items contained in the Young Adult Alcohol Problems Screening Test (Hurlbut and Sher, 1992) as well as additional items culled from the National Epidemiologic Survey on Alcohol and Related Conditions (Grant et al., 2006) study to assess craving. Because sexual minority women are at greater risk for an alcohol-dependence diagnosis over their lifetime (e.g., Drabble et al., 2005) and emerging adulthood is a developmental period in which the highest likelihood of alcohol use disorder would occur (Chen et al., 2004; Fillmore et al., 1991), we focused on disordered symptomatology. Rates of symptom endorsement in the current sample are included in Table 1.

HIV risk-taking behavior. Participants were asked the frequency with which they had engaged in a number of sexual activities that the Centers for Disease Control and Prevention

(1991) consider "high risk" for contracting HIV. A lifetime frequency variable was created to denote how often, using a 10-point scale, participants had engaged in seven risky sexual activities (0 = *never in my life,* 10 = *more than 30 times*). Items specifically referred to unprotected anal intercourse, one-night stands, intercourse with a stranger or prostitute, intercourse in exchange for drugs or money, intercourse with a gay or bisexual man, and intercourse with someone who has used intravenous drugs or who is infected with HIV. Rates of specific lifetime behaviors endorsed in the current sample are included in Table 1.

Covariates. All analyses adjusted for lifetime sexual minority status (0 = *exclusively heterosexual,* 1 = *non-heterosexual*), current age (range: 18–30 years; $M = 20.96$, $SD = 2.92$), and typical quantity/frequency of drinking in the past year (range: -3.20–7.44; $M = 0.33$, $SD = 1.13$; product of two standardized variables [Zquantity × Zfrequency]), which was constructed by multiplying two standardized items assessing typical number of drinking days and typical number of drinks during each drinking occasion in the previous year. Given that peer descriptive norms are often gender linked (Borsari and Carey, 2003), we adjusted for the self-reported proportion of close female friends in primary analyses. Last, because the measure of SSA was adapted from a previously published measure of general self-concept clarity (Campbell et al., 1996), we adjusted for general self-concept clarity in all analyses to investigate whether SSA provided incremental predictive validity for the hypothesized effects.

Analytic procedure

All structural equation models used full-information maximum likelihood (FIML) with robust standard errors (Satorra and Bentler, 1994) in Mplus Version 6.11 (Muthén and Muthén, 1998–2010). FIML allows for the analysis of data containing missing values. First, a measurement model with two latent variables (i.e., SSA; descriptive peer norms for alcohol use) was fit to the data. Next, a structural model was estimated (Figure 1), which included an interaction between the two latent variables. Because the structural model incorporated latent variable interactions, a random-effects model was estimated (ALGORITHM = INTEGRATION; INTEGRATION = MONTECARLO). Given these estimation procedures, Mplus provides no standardized effects or standard model fit indices. To test whether the mediated effect (i.e., indirect effect) of descriptive peer norms for alcohol on HIV risk-taking behavior via ADS differed as a function of SSA (i.e., to test for conditional indirect effects, sometimes referred to as moderated mediation; Baron and Kenny, 1986), we used the procedure outlined in Preacher et al. (2007; see Model 2). Given that latent variable interactions were estimated in our model, bootstrapped estimates were unavailable.

Results

The primary measurement model fit the data well (Hu and Bentler, 1995): $\chi^2(54) = 112.47$, $p < .001$; comparative fit index = .96; and root mean square error of approximation = .06. Based on model specifications, SSA factor scores conformed to a normal distribution in the current sample ($\alpha = .00$, $\psi = .52$, range: -0.49–2.85, skewness = 1.52, kurtosis = 1.40). As shown in Figure 1, when typical alcohol consumption, age, percentage of close female friends, general self-concept clarity, and lifetime sexual minority status were adjusted for, the structural model supported our primary hypotheses. More specifically, there was a significant latent variable interaction between the constructs of descriptive norms for peer alcohol use and SSA. Probes of this interaction (Figure 2) showed a stronger positive relationship between peer descriptive norms for alcohol use and ADS when SSA was higher compared with those having lower levels of SSA.

Consistent with hypotheses, perceived frequency of peer drinking and drunkenness was also directly related to greater engagement in HIV risk-taking behaviors. Moreover, the indirect effect of peer descriptive norms on HIV risk-taking behavior through ADS was moderated by SSA. Specifically, for women with higher levels of SSA (+1 *SD*), the indirect effect was significant (.06, $SE = .01$, $p = .001$), whereas for women with lower levels of SSA (-1 *SD*), the indirect effect was significant but comparatively smaller (.04, $SE = .02$, $p = .01$). Further, a direct test comparing the two indirect effects suggested that the indirect effect for individuals higher in SSA was significantly larger compared with individuals lower in SSA (-.03, $p = .04$, one-tailed).

Because the construct of SSA is primarily relevant to sexual minority individuals ($r = .49$), we conducted a supplemental multigroup analysis (analyses available on request) based on lifetime sexual minority status to examine whether the primary hypotheses were particularly relevant to women who had indicated a sexual minority (i.e., non–exclusively heterosexual) identity at some point in their lifetime ($n = 162$) compared with women who had always identified as exclusively heterosexual ($n = 186$). Findings suggested that the hypothesized moderated mediation effect (i.e., indirect effect from descriptive peer norms for alcohol use to risky sexual behavior via greater ADS) was reliable among sexual minority women (.05, $SE = .03$, $p = .05$) but not among exclusively heterosexual women (.04, $SE = .03$, $p = .21$). Thus, the current hypotheses were primarily supported among women who had reported a non–exclusively heterosexual identity at least once in their lifetime.

We also sought to examine whether perceived peer approval of alcohol use functioned similarly to perceived peer drinking behavior in the overall sample. Thus, we replaced the latent variable reflecting descriptive norms in the current model with one reflecting injunctive norms (i.e., "How

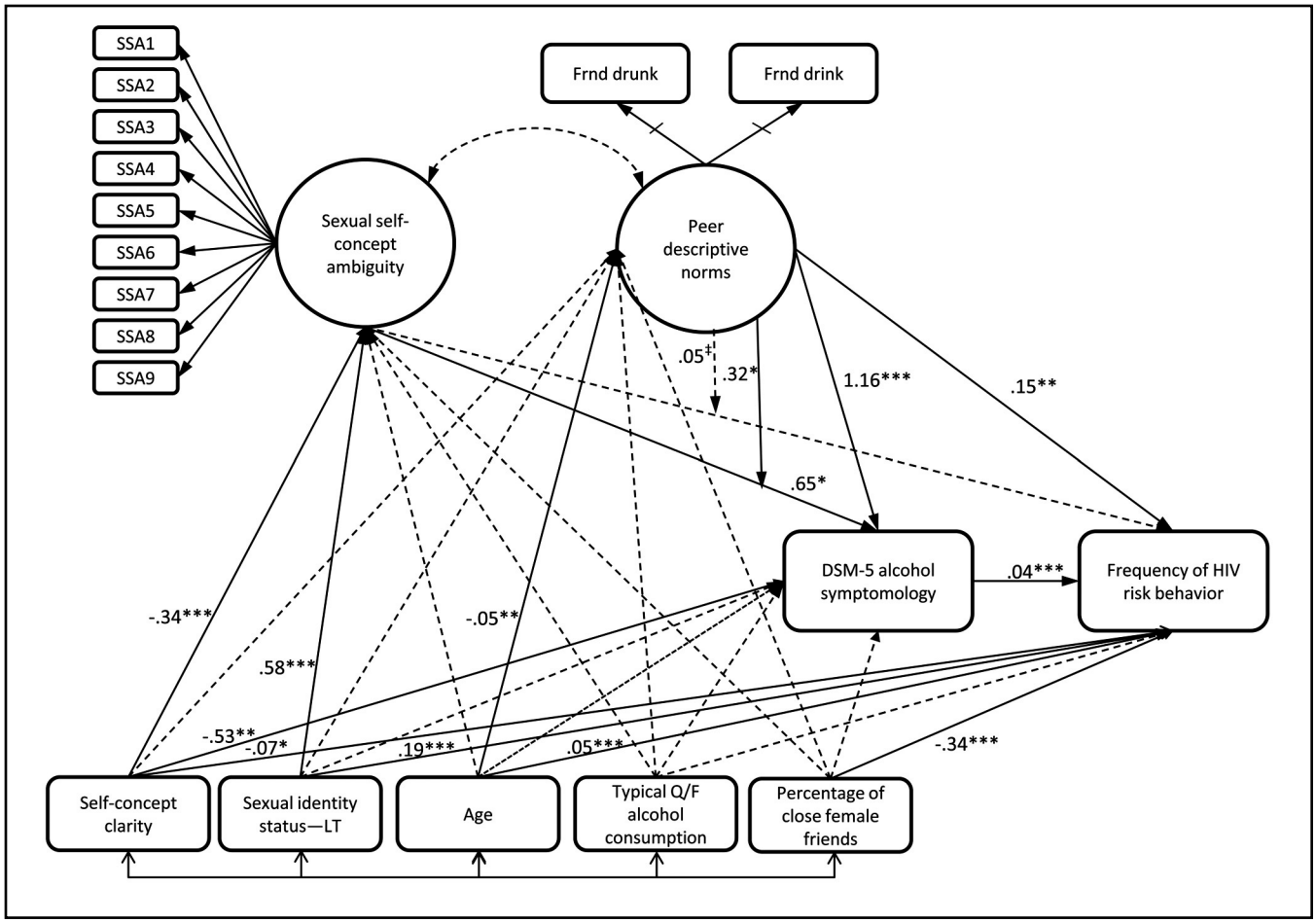

FIGURE 1. Primary path model depicting significant unstandardized effects. SSA = sexual self-concept ambiguity; DSM-5 = *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition;* LT = lifetime; Q/F = quantity/frequency; Frnd drink = "When your close friends drink, how much (on average) does each person drink?"; Frnd drunk = "How many of your close friends get drunk on a regular basis (at least once a month)?" Dashed lines indicate nonsignificant paths that were included in the final model.
‡$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

do most of your friends feel about people drinking?" "How do most of your friends feel about people getting drunk?" 1 = *strongly disapprove,* 5 = *strongly approve*). Although, as expected, perceived peer approval of drinking was directly associated with greater endorsement of ADS, there was no evidence for simple associations with lifetime risky sexual behaviors, latent-variable interaction effects, or moderated mediation.

Discussion

This is the first study to empirically examine whether the association between peer descriptive norms for alcohol involvement and ADS varies as a function of SSA. It has been argued that sexual minority individuals may rely more heavily on their peers' drinking behaviors to inform their own alcohol use (Hatzenbuehler et al., 2008, 2009). Indeed, given current results showing that women with higher levels of SSA report stronger associations between perceived drinking behaviors of close friends and their own alcohol-dependence symptoms, there is reason to believe that those with higher SSA more highly identify with, and perhaps subsequently match, their alcohol consumption patterns to their close friend groups (see Rimal and Real, 2005, for a review). Results are consistent with prior work by Setterlund and Niedenthal (1993) that showed that individuals who were exposed to experimental manipulations evoking self-concept confusion, as opposed to self-concept clarity, were more likely to use situational factors for decision making. Further, to our knowledge, this is the first study to examine whether domain-specific norms (i.e., descriptive norms for alcohol involvement) indirectly influence risk-taking behaviors in other related domains (i.e., HIV risk behaviors) through ADS and whether this relation is conditional on SSA.

Both peer descriptive norms for alcohol involvement and SSA were associated with increased ADS. As hypothesized, we found a significant interaction between SSA and descrip-

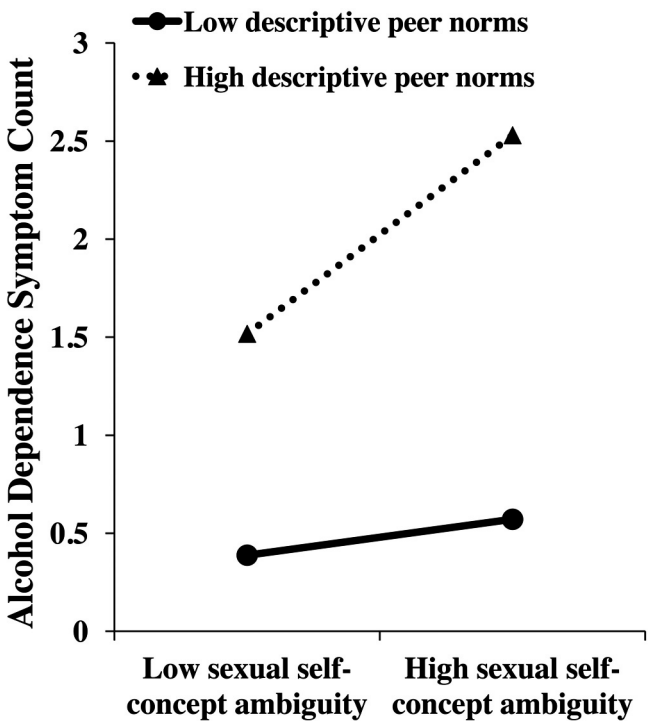

FIGURE 2. Estimated alcohol-dependence symptomatology based on low (*-SD*) and high (*+SD*) levels of perceived peer descriptive norms for alcohol involvement and sexual self-concept ambiguity, respectively

tive norms for peers' alcohol use with a stronger, positive relationship between peer descriptive norms and ADS when SSA was higher. Thus, environmental cues (Campbell and Fehr, 1990; Epstein, 1973; Hogg, 2000, 2007, 2012), such as peer descriptive norms, may be especially salient for individuals with ambiguous, less coherent identity-related self-concepts, including those high in SSA. Nevertheless, because sexual minority women are shown to endorse elevated (a) levels of alcohol use before college matriculation (Hatzenbuehler et al., 2008), (b) ADS (Drabble et al., 2005), and (c) alcohol-related problems (Drabble et al., 2005), an alternative explanation may be that individuals undergoing the sexual identity process, or those who endorse higher levels of SSA, may select into heavier drinking peer groups in adolescence and throughout emerging adulthood and be influenced by hazardous drinking environments as a result (Kahler et al., 2003).

Results are also consistent with the literature demonstrating a positive association between alcohol-dependence symptoms and greater engagement in HIV risk-taking behaviors (Irwin et al., 2006; Tapert et al., 2001). Interestingly, these findings suggest that peer descriptive norms regarding alcohol involvement may influence risky sexual behaviors both directly and indirectly. Perhaps more importantly, the indirect influence of peer descriptive norms for alcohol involvement on HIV risk taking through ADS may be exacerbated among individuals grappling with identity-related issues. This finding is consistent with previous work suggesting that sexual minority individuals may rely more heavily on their peers' drinking patterns (Hatzenbuehler et al., 2008, 2009). Although the relation between problematic alcohol involvement and sexual risk behavior is well known (e.g., Dingle and Oei, 1997; Rehm et al., 2012; Shuper et al., 2010), the current findings illustrate complex, nuanced associations between perceived social norms, identity-related self-concepts, and risky health behaviors from various domains. Future research should further explore potential mechanisms that may underlie the association between increased alcohol-dependence symptoms and increased HIV risk behavior engagement, and for which individuals these mechanisms are most relevant. In particular, further examination of the interplay of these mechanisms among sexual minority women is particularly important given engagement in HIV risk behaviors in this study and previous similar findings (e.g., Goodenow et al., 2008).

Although we consider findings of multigroup models based on lifetime sexual identity status to be of potential interest to the reader, we elected not to discuss these findings in depth because of relatively small subsample sizes, complexity of the current primary models, and our theoretical approach, that which is germane to SSA across various sexual identity categories, including self-identified heterosexual individuals. We urge researchers to conduct future research on the role of identity-related characteristics, such as SSA, in contributing to greater risk behaviors among individuals with diverse sexual identities, attractions, and behaviors.

Limitations of the current study include a sample comprising only young women recruited from a midwestern city who were predominantly White. Thus, results may not generalize to women of other ages, geographic locations, or racial/ethnic groups, or to men. In addition, our assessment of HIV risk behaviors assessed only lifetime engagement in each of the behaviors. Consequently, we are unable to determine the specific period during which these behaviors occurred. Of note, our assessment of descriptive alcohol use norms among close friends included only two items, and more comprehensive measures are available (see Borsari and Carey, 2003) for further replication efforts. Strengths of the study include recruitment of a large sample of self-identified sexual minority women reporting a range of sexual minority identity categories. In addition, this study used a computerized assessment approach, an approach associated with increased reporting of sensitive behaviors relative to other assessment modalities (Brown and Vanable, 2009; Brown et al., 2012).

This study highlights the moderating role of SSA on the expected association between descriptive norms for peer alcohol use and DSM-5 ADS. Individuals with greater SSA may be at greater risk for conforming to their peers'

heavy drinking patterns. Of additional concern are direct and indirect associations between higher levels of perceived peer alcohol use and engagement in HIV risk behaviors, which may be exacerbated for individuals with ambiguous, less coherent identity-related self-concepts. Unfortunately, sexual minorities (particularly men who have sex with men) continue to experience the highest incidence of new HIV infections (Centers for Disease Control and Prevention, 2012), and those experiencing delays in or active engagement in sexual identity development may be at greatest risk for transmission. Future intervention efforts may be warranted to address both problematic alcohol use and HIV risk engagement among individuals with greater SSA and to explore the extent to which this pattern of findings extends to sexual minority men.

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