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### Predicting risky sexual behaviors among college student drinkers as a function of event-level drinking motives and alcohol use

ABSTRACT



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#### HIGHLIGHTS

- Strong social motives increase the odds of engaging in risky sexual behaviors.
- The relationship between risky sex and drinking depends on enhancement motives.
- · Coping and conformity drinking motives had no effect on risky sexual behaviors.
- Interventions targeting social/enhancement drinking motives may reduce risky sex.

#### ARTICLE INFO

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Background: Risky sexual behaviors (e.g., sex without protection against pregnancy or sexually transmitted infections, sexual coercion, sex with unknown partners) are common among college students. To effectively decrease these behaviors, it is necessary to further understand factors associated with their occurrence. Drinking motives are a known predictor of both alcohol use and alcohol-related consequences, which may theoretically include risky sex. This study aimed to understand how drinking motivation interacts with alcohol use to predict risky sexual behaviors among college student drinkers.

Methods: One-hundred and eight primarily female (83.3%) college students (age: M=19.09, SD=1.16) who endorsed past-month alcohol use and lifetime history of sexual activity completed up to four weekly Internet surveys assessing daily quantity of alcohol use, drinking motives (i.e., social, enhancement, coping, conformity), and engagement in risky sexual behavior. From 403 reported drinking episodes, four Generalized Estimating Equations were used to predict risky sex from person-centered drinking quantity and drinking motives.

Results: Strong social motives significantly increased the odds of engaging in risky sexual behaviors (p = 0.004). Additionally, there was a significant interaction, such that the relationship between risky sex and drinking depends on enhancement motives (p = 0.021).

*Conclusions:* Interventions targeting social and enhancement motives for drinking may be particularly effective in reducing the occurrence of risky sexual behaviors among college students, which may result in a reduction of the negative physical and psychological health outcomes accompanying these behaviors.

#### 1. Introduction

Prevalence rates for risky sexual behaviors, or any sexual behavior that increases the probability of negative physical or psychological health outcomes (Cooper, 2010a,b), are highest among college-aged adults (Chandra, Billioux, Copen, & Sionean, 2012). For example, sexual activity with multiple partners, failure to discuss risk-relevant topics (e.g., protection against pregnancy, existing sexually transmitted infections [STIs]), and inconsistent condom use are common among college students. Additionally, lifetime prevalence rates of sexual "hookups" among this population range from approximately 56 to 81%

(Fielder & Carey, 2010; Garcia & Reiber, 2008; LaBrie, Hummer, Ghaidarov, Lac, & Kenney, 2014; Lambert, Kahn, & Apple, 2003; Paul, McManus, & Hayes, 2000). Thus, it is apparent that many college students are engaging in high rates of risky sex.

The potential consequences associated with risky sexual behaviors pose a significant public health concern to college-aged adults. Specifically, young adults are put at risk for adverse sexual and reproductive health consequences including STIs, unplanned pregnancies, and sexual assaults (Scott et al., 2011), as well as emotional and psychological consequences such as sexual regret, psychological distress, and depressive symptoms (Bersamin et al., 2014; Fielder, Walsh,

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Carey, & Carey, 2014; Fisher, Worth, Garcia, & Meredith, 2012). In order to effectively decrease these behaviors, it is necessary to further understand factors associated with their occurrence. One important variable is alcohol use, which has been found to be associated with an increased likelihood of unplanned and unprotected sex (Cooper & Orcutt, 1997; O'Hare, 2001), decreased condom use (Leigh et al., 2008; Rehm, Shield, Joharchi, & Schuper, 2012), and sexual victimization among college students (Combs-Lane & Smith, 2002; Rehm et al., 2012). However, a recent comprehensive review of the literature in this area has suggested that the relationship between alcohol use and risky sexual behavior outcomes is more nuanced, and likely influenced by additional variables (Brown, Gause, & Northern, 2016). Accordingly, further examination of the factors that promote alcohol-related risky sexual behavior is warranted.

Drinking motivation, or the initial decision to consume alcohol (Cox & Klinger, 1988; Merrill & Read, 2010), is a known predictor of both alcohol use and alcohol-related consequences, which may theoretically include risky sex (Dvorak, Pearson, & Day, 2014; Merrill & Read, 2010; Merrill, Wardell, & Read, 2014). The four primary drinking motives identified by Cooper (1994) are social (i.e., drinking to obtain social rewards), enhancement (i.e., drinking to enhance mood), coping (i.e., drinking to relieve negative mood), and conformity (i.e., drinking to avoid social disapproval) motives. Among college students, drinking for social purposes (e.g., to facilitate social interaction) plays a central role in drinking behavior (Read, Wood, Kahler, Madock, & Palfai, 2003; Simons, Correia, & Carey, 2000). Given the norms surrounding drinking on college campuses, social drinking motives are particularly salient for this population and related to higher levels of alcohol use (Dvorak et al., 2016; Read et al., 2003). Similarly, research suggests that enhancement motives are linked to both higher alcohol consumption and related consequences among college students (Dvorak et al., 2016; Simons et al., 2000). Overall, social and enhancement motives for drinking are likely the most salient to college students given the unique social milieu and perceived injunctive norm surrounding drinking behavior on college campuses.

Further, though coping drinking motives are less common among college students (Dvorak et al., 2016; Lewis et al., 2008; Neighbors, Larimer, Markman Geisner, & Knee, 2004), research suggests that these motives are associated with both higher levels of alcohol use and especially alcohol-related problems (Carey & Correia, 1997; Cooper, Kuntsche, Levitt, Barber, & Wolf, 2016; Dvorak et al., 2016; Martens et al., 2008). LaBrie et al., (2010) demonstrated a relationship between strong coping motives and nonsexual alcohol-related consequences, and a more recent comprehensive review of the literature in this area has suggested that coping motives may be the strongest predictor of alcohol-related problems (Cooper et al., 2016). Finally, research on conformity drinking motives is more limited and mixed, with some research suggesting that these motives are unrelated to alcohol use among college students (Cooper, 1994; Dvorak et al., 2016) and other research finding these motives to be related to alcohol problems (Lewis et al., 2008). Though research has examined the relationship between drinking motives and both alcohol use and associated problems, only a single study has directly examined whether motives are related to risky sex in the context of alcohol use (Dvorak et al., 2016). In addition, no research to date has examined this association at the event level.

Accordingly, the current study aimed to understand how drinking motives interact with alcohol use to predict risky sexual behaviors among college student drinkers using an event-level prospective design. Consistent with past research (Kiene, Barta, Tennen, & Armeli, 2009; Rehm et al., 2012; Shuper, Joharchi, Irving, & Rehm, 2009), it was hypothesized that these behaviors would be more likely to occur in the context of higher levels of alcohol use. Second, it was hypothesized that social, enhancement, and coping motives would be associated with engaging in risky sexual behaviors during a drinking episode. Finally, it was hypothesized that social, enhancement, and coping motives for drinking would be associated with risky sexual behavior most strongly

when the individual was also consuming large amounts of alcohol. No hypotheses were made with regard to conformity motives because the relationship between conformity motives and both alcohol use and alcohol-related problems is less established among college students, especially heavy drinkers.

#### 2. Methods

#### 2.1. Participants

Participants were 108 Midwestern university undergraduate students who reported both past-month alcohol use and lifetime sexual intercourse (i.e., vaginal or anal). The sample included 90 women (83.3%) aged 18 to 24 (M=19.09, SD=1.16) years with an average of 13.79 (SD=0.92) years of education. Participants reported their race/ethnicity as White (92.6%), Hispanic/Latino (0.9%), American Indian (2.8%), and mixed (3.7%). The university IRB approved this study and all participants provided informed consent.

#### 2.2. Measures

#### 2.2.1. Daily Drinking Questionnaire (DDQ)

Quantity of alcohol consumption was assessed via the DDQ (Collins, Parks, & Marlatt, 1985). Participants were instructed to indicate, for each day of the previous week, how many standard drinks they consumed. Previous research supports the validity and one-week test-retest reliability (r = 0.93) of this measure (Miller et al., 1998).

#### 2.2.2. Drinking Motives Questionnaire-Revised (DMQ-R)

The DMQ-R (Cooper, 1994) assessed four aspects of drinking motivation: Coping ( $\alpha=0.86$ ; e.g., "To forget your problems"), Enhancement ( $\alpha=0.89$ ; e.g., "Because you like the feeling"), Social ( $\alpha=0.91$ ; e.g., "Because it helps you enjoy a party"), and Conformity ( $\alpha=0.86$ ; e.g., "To be liked"). Participants were instructed to rate to which extent 20 drinking motives applied to each particular drinking episode on a 5-point Likert scale (1= 'not at all' to 5= 'extremely').

#### 2.2.3. Risky sexual behaviors

Risky sexual behaviors were assessed via the Cognitive Appraisal of Risky Events Revised (CARE-R)—Risky Sexual Activities Scale (Fromme, Katz, & Rivet, 1997). For the purpose of this study, "sex" was changed to "sexual activity" (i.e., any activity involving genital contact) throughout the measure to include a range of sexual experiences outside of penetrative sex. Participants were asked to indicate whether they engaged in any of 21 possible risky sexual activities during each drinking episode. Three items that either did not describe risky sexual behavior (i.e., "Used condoms for intercourse"; "Chose to abstain from sexual activity due to concerns about pregnancy or STDs") or were redundant with the premise of the study (i.e., "Sexual intercourse while under the influence of alcohol with a regular partner") were removed. Additionally, the phrase "...without the intent to become pregnant" was added to the item "Sexual activity without protection against pregnancy with a regular partner", and the phrase "...when a risk of contracting an STI potentially exists" was added to the item "Sexual activity without protection against STIs with a regular partner" to distinguish risky sex from sexual behavior that is not inherently risky when between regular partners. Finally, both male and female participants were asked the items about sexual coercion and sexual coerciveness, while the original CARE-R asks only males about sexual coercion and females about sexual coerciveness.

#### 2.3. Procedure

Participants were recruited using an online screening survey assessing eligibility criteria for a study examining drinking motivation, alcohol use, and risky sex. Eligibility criteria included the typical college

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