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# Risky Sexual Behaviors Among College Student Drinkers As A Function Of Drinking Motivation And Alcohol Use

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RISKY SEXUAL BEHAVIORS AMONG COLLEGE STUDENT DRINKERS AS A  
FUNCTION OF DRINKING MOTIVATION AND ALCOHOL USE

by

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Bachelor of Science, North Dakota State University, 2014

A Thesis

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

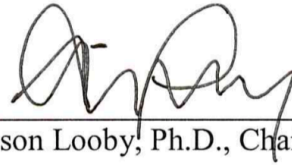
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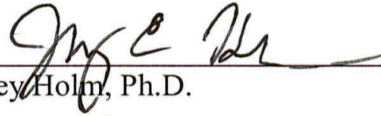
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This thesis, submitted by Tess M. Kilwein in partial fulfillment of the requirements for the Degree of Master of Arts from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.



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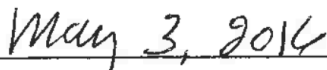


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This thesis is being submitted by the appointed advisory committee as having met all of the requirements of the School of Graduate Studies at the University of North Dakota and is hereby approved.



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Tess M. Kilwein  
05/2/2016

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## ABSTRACT

Risky sexual behaviors (e.g., sex without protection against pregnancy, sex with multiple partners) are common among college students. In order to decrease these behaviors, it is necessary to understand factors associated with their occurrence, such as alcohol use. Drinking motives are a known predictor of both alcohol use and alcohol-related consequences, which may theoretically include risky sex. However, no research has directly examined drinking motives as a predictor of engaging in a wide range of risky sexual behaviors. Thus, the current study examined whether drinking motives interact with alcohol use to predict risky sex among college students. 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 alcohol involvement, and if present, quantity of use, drinking motives for that episode, and engagement in risky sex. Four Generalized Estimating Equations were used to predict risky sex from person-centered drinking quantity and drinking motives (i.e., social, enhancement, coping, conformity). Results revealed marginally significant main effects of alcohol use in 3 of the 4 models, with higher levels of use increasing the odds of risky sex. Additionally, higher social motives increased the odds of engaging in risky sex by 10.3%. Finally, there was a significant interaction between alcohol use and enhancement motives, with individuals high in motives and low in alcohol use most at risk for engaging in risky sex. Interventions targeting social and enhancement motives for drinking may be particularly effective in reducing the occurrence of risky sex among college students, which may result in a reduction of the negative health outcomes accompanying this behavior.

## CHAPTER I

### INTRODUCTION

Risky sexual behaviors are among the most significant public health concerns affecting college-aged adults, with prevalence rates being highest among this population (Chandra, Billioux, Copen, & Sionean, 2012). In order to effectively decrease these behaviors, it is necessary to further understand factors associated with their occurrence. It is likely that college students have an increased chance of participating in risky sex in general because of a lack of supervision and more opportunities to engage in these behaviors. However, this does not provide a clear understanding as to why some individuals engage in risky sexual behavior, while others do not. One of the factors that may predict risky sex is heavy alcohol consumption, which is another behavior common among college-aged adults (O'Malley & Johnston, 2002; Velazquez et al., 2011). Specifically, risky sexual behaviors are most likely to occur in situations where the use of alcohol is involved to some degree (Fielder & Carey, 2010a; Fielder & Carey, 2010b; Grello, Welsh, & Harper, 2006).

Drinking motivation is a known predictor of both alcohol use and alcohol-related consequences, which may theoretically include risky sexual behaviors (Dvorak, Pearson, & Day, 2014; Merrill & Read, 2010; Merrill, Wardell, & Read, 2014). Specifically, existing research suggests that enhancement motives are directly related to alcohol use and indirectly related to alcohol-related problems, while coping motives directly predict alcohol-related problems (Carey & Correia, 1997; Dvorak et al., 2016; Martens et al., 2008; Read, Wood, Kahler, Madock, & Palfai, 2003; Simons et al., 2000). Limited research has examined drinking motivation as a

predictor of engaging in risky sexual behaviors. However, theory supports the notion that drinking to cope with negative emotions or to enhance mood may predict risky sex (Cooper, Frone, Russel, & Mudar, 1995). Thus, further examination of factors that motivate college students to consume alcohol may clarify the relationship between alcohol use and risky sex. Understanding the nature of this relationship may assist in developing strategies to reduce risky sex among college student drinkers by intervening at the level of drinking motivation.

## Risky Sexual Behaviors

### *Definition and Types of Risky Sexual Behaviors*

A wide range of risky sexual behaviors exists, making it difficult to formulate an all-inclusive definition. In general, however, risky sex can be defined as any sexual behavior that increases the probability of negative physical or psychological health outcomes (Centers for Disease Control and Prevention (CDC), 2012; Cooper, 2010a; Cooper, 2010b). These negative consequences are often accompanied by high social, economic, and health costs for people who are directly affected, along with society (CDC, 2009). Behavior that falls under the label of “risky sex” has changed over the years, but some well known risky sexual behaviors include sex without protection against pregnancy or sexually transmitted infections (STIs), sex without consent, having multiple sexual partners, drinking during or prior to sex, choosing poor or risky sexual partners, and failure to discuss risk related to sexual activity (Cooper, 2002; Cooper, 2010a; Donohew et al., 2000; O’Hare, 2001).

Frequency of intercourse, while often viewed as a risky behavior, is not considered risky sex because it is often associated with exclusive sexual partners, and is not typically related to negative outcomes (Cooper, Shapiro, & Powers, 1998). Instead, sexual behaviors are deemed “risky” only when they have the potential to either directly or indirectly lead to physical and/or

psychological consequences. For example, failure to use protection against STIs or pregnancy, and choosing poor or risky sexual partners, may directly lead to negative consequences such as STIs, unplanned pregnancy, or sexual assault. Drinking prior to sexual activity and failing to discuss risk-relevant topics with partners are risky sexual behaviors that have the potential to more indirectly lead to the same negative consequences. While drinking prior to sexual activity and failing to discuss risk-relevant topics with partners may not lead to these negative consequences on their own, they may increase the risk of engaging in behaviors that more directly lead to negative consequences (e.g., failure to use protection).

### *Prevalence and Demographics*

Over 60% of both men and women between the ages of 18 and 24 report having sexual intercourse (Cooper, 2010a). College students are particularly at an increased risk of engaging in risky sex, perhaps due to finding themselves in an environment with limited supervision and more opportunities to engage in behavioral risks. For example, college students report more sexual partners than peers of their same age who are not in college (Fromme, Corbin, & Kruse, 2008). This is concerning because sexual experiences that occur among college student drinkers often pose a risk for physical health consequences and emotional trauma (Cooper, 2010a).

A wealth of descriptive research demonstrates just how prevalent risky sexual behaviors are among college student drinkers. For example, sexual activity with multiple partners and inconsistent condom use is common among college student drinkers, which may explain why this age range accounts for the majority of new STI cases each year (Desiderato & Crawford, 1995; O'Hare, 2001). Additionally, approximately 33% of sexually active college students report having at least two sexual partners, and approximately 75% report either inconsistent or no use of condoms (Desiderato & Crawford, 1995). College students also often fail to discuss risk-

relevant topics (e.g., protection against pregnancy, existing STIs, past sexual experiences) with potential partners, and when discussed, both males and females report they would lie in order to have sex (Desiderato & Crawford, 1995). Lastly, sexual encounters with strangers or brief acquaintances, often referred to as sexual “hookups,” are also common among college student drinkers. Reported prevalence rates of these casual sexual encounters are as high as 81% (LaBrie, Hummer, Ghaidarov, Lac, & Kenney, 2014; Lambert, Kahn, & Apple, 2003; Paul, McManus, & Hayes, 2000; Paul & Hayes, 2002). Thus, it is apparent that many college students are engaging in high rates of risky sex, which may furthermore be exacerbated by drinking alcohol.

Risky sexual behaviors vary depending upon race, ethnicity, and gender (CDC, 2009). Young Black women report having sex at an earlier age and using at least one medical or family planning service at higher rates than either Hispanic or White women (CDC, 2009). While young Black women may utilize medical and family planning services at higher rates, Black women ages 20-24 are also more likely to have never been tested for human immunodeficiency virus (HIV) or an STI compared to Hispanic or White women (CDC, 2009). There are also disparities found between men and women in general. Between 2006 and 2010, men were more likely to report five or more opposite-sex partners than women, and women were more likely to report recent treatment for an STI (Chanda et al., 2012). Specifically for men, Black men are more likely to report five or more opposite-sex partners than Hispanic or White men (CDC, 2009). Additionally, Black men are more likely to report recent STI treatment than Hispanic or White peers, but are also more likely to report use of condoms. While specific differences exist between both genders and ethnicities, it is clear that risky sexual behaviors are prevalent across all demographic groups.

## *Consequences*

The potential consequences associated with risky sexual behaviors pose a significant public health concern to college-aged adults (CDC, 2009). For example, young adults who participate in these unsafe sexual behaviors are put at risk for adverse sexual and reproductive health consequences including STIs, unplanned pregnancies, and sexual assaults (Scott et al., 2011). While early progress was suggested by a decrease in these negative consequences among young adults (e.g., decreased rates of unplanned pregnancies and new cases of STIs), this progress appears to be slowing, and in some cases, reversing (CDC, 2009).

Each year, at least 20 million people are newly infected with STIs, and nearly half of the new cases in the United States occur in those under the age of 24 (CDC, 2012; Mokdad, Marks, Stroup, & Gerberding, 2004; Weinstock Berman, & Cates, 2004). Risky sexual behaviors, such as casual sexual encounters, are known to be associated with increased risks for STIs (Bersamin et al., 2014). Data from the CDC (2009) indicates that over 20,000 young adults were living with human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) in 2006, while approximately 1 million young adults reported having an STI such as chlamydia, gonorrhea, or syphilis. Additionally, among women ages 20-24, 45% had evidence of infection with human papillomavirus (HPV) in 2003. Cooper (2010a) reports that rates of STIs among sexually active college students range from approximately 12% in California to 25% on Midwestern campuses, which may reflect cultural and geographic differences.

The CDC (2009) reports that an estimated 2.4 million pregnancies occurred in 2004 among females under 25 years of age, with over 600,000 of these pregnancies ending in induced abortions and over 300,000 ending in fetal loss (i.e., stillbirth and miscarriage). Of the reported abortions, 400,000 occurred in women ages 20-24. Across existing studies, over 15% of both

male and female college students have either impregnated a partner or have been pregnant (Cooper, 2010a). Additionally, almost 10% of women ages 18-24 who had sex by the age of 20 report their first sexual encounter as involuntary (CDC, 2009). Beyond the first sexual encounter, between 15 and 20% of women between the ages of 18 and 24 report being forced to have intercourse at least once. Further, the CDC (2009) reports that over 100,000 young women visited hospital emergency departments for nonfatal injuries due to a sexual assault between the years 2004 and 2006. While these findings highlight the prevalence of adverse sexual and reproductive health outcomes for individuals engaging in risky sex, there are additional emotional and psychological consequences that are often associated with these behaviors.

Young adults who engage in risky sexual behaviors are also at an increased risk of experiencing negative mental health consequences, including low self-esteem, psychological distress, and depressive symptoms (Bersamin et al., 2014; Fielder, Walsh, Carey, & Carey, 2014). For example, individuals who engage in risky sexual behaviors, especially casual sexual encounters, often experience feelings of sexual regret (Fisher, Worth, Garcia, and Meredith, 2012). These feelings are often associated with lower life satisfaction, loss of self-worth, physical health problems, and depression (Grello et al., 2006). Having sex with multiple partners can also lead to an increased risk of later anxiety, substance dependency, and depression (Ramrakha et al., 2013). These findings underscore the potential negative consequences associated with risky sexual behaviors among college-aged adults. While these consequences may have detrimental effects on individual physical and psychological health outcomes, they can also be accompanied by social, economic, and health costs for society in general, emphasizing the importance of prevention and intervention efforts directed at risky sex among college-aged adults.



## *Measurement*

Risky sexual behaviors are most commonly assessed through self-report methods. One measure commonly used to assess these behaviors is the Risky Sexual Activities Scale of the Cognitive Appraisal of Risky Events (CARE) Questionnaire (Fromme, Katz, & Rivet, 1997). The CARE Questionnaire assesses risk, benefit, and expected involvement (or past frequency) for Risky Sexual Behavior, Heavy Drinking, Illicit Drug Use, Aggressive and Illegal Behaviors, Irresponsible Academic/Work Behaviors, and High-Risk Sports. The CARE—Risky Sexual Activities Scale is one of the specific scales that comprises the questionnaire, and has been used in prior research as a reliable and valid measure of risky sexual behavior among college students (Dvorak, Wray, Kuvaas, & Kilwein, 2013; Fromme et al., 2008; Dvorak et al., 2016). The CARE-Risky Sexual Activities Scale measures expected risks, expected benefits, expected involvement, and past frequency of six risky sexual activities: 1) Leaving a social event with someone the individual just met; 2) Sex without protection against pregnancy; 3) Sex without protection against sexually transmitted diseases; 4) Involvement in sexual activities without consent; 5) Sex with multiple partners; and 6) Sex with someone the individual just met or doesn't know well. Participants are asked to indicate how many times they have participated in the various activities in the past 6 months, as well as to rank how likely it is that they will engage in the various activities in the next months.

The CARE Questionnaire was later revised into the Cognitive Appraisal of Risky Events Revised (CARE-R) Questionnaire, which does not include the assessment of Irresponsible Academic/Work Behaviors, Aggression, or High Risk Sports (Katz, Fromme, & D'Amico, 2000). Instead, the CARE-R assesses drinking and drug behavior in more detail, assesses sexual behavior with both “new” and “regular” partners, and includes an assessment of coercive sexual

behavior. The CARE-R—Risky Sexual Activities Scale first asks participants to define how long one must be sexually active with a partner for this individual to be considered a “regular partner.” Using this definition, participants are asked to indicate how many times they have engaged in each risky sexual behavior over the past 6 months separately with regular partners and with someone the individual just met or does not know well. It is important to make this distinction because the opportunity to engage in risky sexual behaviors arises among regular partners, as well as new partners. The CARE-R—Risky Sexual Activities Scale also added questions related to sexual coercion and sex while under the influence of alcohol or other drugs. While it is difficult to obtain a completely accurate depiction of all of the risky sexual behaviors one has the potential to engage in, the CARE-R demonstrates sound psychometric properties in assessing a range of risky behaviors. Across all scales, the CARE-R has adequate test-retest reliability and internal reliability ranging from .64 to .90 (Katz et al., 2000). Previous research also supports the validity and reliability of the CARE-R—Risky Sexual Activities Scale as a measure of sexual risk history (Katz et al., 2000).

#### *Risk Factors, Correlates, and Causal Factors*

Identifying predictors of risky sexual behaviors may improve prevention and intervention efforts by identifying individuals who are at high risk for these behaviors. In an effort to elucidate several of these specific variables, Cooper (2010b) conducted multiple interviews with nearly 2000 adolescents about their sexual experiences for over a decade. Specifically, she examined the contributions of demographics (e.g., age, gender), personality (i.e., communal orientation, agency, negative emotionality, impulsivity, sexual venturesomeness), sexual situation (i.e., a first vs. subsequent sexual encounter), and relationship context (i.e., serious vs. casual partners) to shaping risky sexual behaviors.

With regard to demographics, age accounted for the majority of variance in engaging in risky sexual behaviors, with older respondents reporting more in-depth discussion about risk but more risky partners (Cooper, 2010b). This is likely because both the respondents and their partners were older on average, and had accumulated more experiences that put them at risk. Older individuals also reported fewer recent casual partners, with more of an emphasis on committed relationships. This emphasis on committed relationships and more “regular” partners may explain why older respondents also report fewer instances of condom use. Older respondents also reported more drinking prior to intercourse. Additionally, risky sexual behaviors varied across gender. Men reported more alcohol use, more casual relationships, and less discussion about risk, but more condom use and fewer risky partners. Consistent with these findings, Poppen (1995) found that men engage in more risk-taking behaviors related to partner choice (e.g., more partners, more casual partners) than women, and Chandra and colleagues (2012) found that between 2006 and 2010, men were more likely to report five or more opposite-sex partners than women, and women were more likely to report recent treatment for an STI. These disparities may exist because men are more likely to put an emphasis on physical gratification and pleasure-seeking, while women are more likely to place importance on relationship and intimacy motives (Cooper et al., 1998). While these findings suggest that specific sexual risk-taking differences exist depending on age and gender, risky sexual behaviors are prevalent across both genders and all ages.

Cooper (2010b) also found sexual situation and relationship context to play an important role in shaping risky sexual behaviors. First, sexual experiences, particularly those with casual partners, predicted riskier partners, higher levels of alcohol use, and less discussion about risk. Secondly, relationship context varied depending upon sexual situation, with casual relationships

being present most often on first rather than on subsequent sexual encounters. Personality risk factors also interacted with situational variables to predict these encounters. Specifically, the effects of one's personality on engaging in risky sexual behavior were stronger on first sex occasions and with partners who were more casual. Lastly, specific personality variables emerged as risk factors for sexual risk-taking behaviors, including negative affectivity (neuroticism), impulsivity (low conscientiousness), and sexual venturesomeness (extraversion). A possible explanation for this may be that individuals high in negative emotionality exhibit higher levels of risk-taking behaviors either in an attempt to alleviate distress or because negative emotions interfere with rational decision-making. Additionally, those high in impulsivity may have the tendency to engage in risk behaviors because they afford immediate benefits. Lastly, those high in sexual venturesomeness may be more likely to engage in risky sex because of their preference for sexual novelty and interest in sex.

While existing evidence indicates personality traits may predispose people to engage in sexual risk-taking behaviors, it is often the case that these traits interact with contextual cues or other factors to predict risky sex. For example, Cooper (2010b) recognized that individuals might engage in risky sex to enhance physical or emotional pleasure (e.g., enhancement) or to minimize negative emotions (e.g., coping). Similarly, Cooper (2006) also suggested that those with poor impulse control or coping skills might engage in risky sex to satisfy sensation-seeking needs or in an effort to cope with negative emotions. Sensation seeking, impulsive decision-making, and danger invulnerability (i.e., ignoring or failing to recognize associated risks) are known predictors of sexual risk-taking among college students (Ravert et al., 2009). These particular personality features may predispose individuals to engage in risky behavior in general, including risky sex. However, this does not provide a clear and comprehensive explanation as to

why some individuals engage in more risky sex and develop more associated negative consequences than others. It is possible that people who want to enhance pleasure might engage in both risky sexual behaviors and consume alcohol for this same purpose, and the combination of both of these behaviors might produce the worst outcomes. In support of this notion, Cooper (2006) recognizes that alcohol use is a well-known predictor of risky sexual behaviors, and O'Hare (2001) has found that risky sexual practices leading to negative consequences are often precipitated by the consumption of high levels of alcohol. Accordingly, further examination of the factors that promote alcohol use and risky sexual behavior occurring in the context of alcohol use is warranted.

### Risky Sexual Behaviors and Alcohol Use

Plenty of existing research has focused on examining the link between alcohol use and risky sex. Most studies find that excessive drinking among college students is positively associated with an increased likelihood of participating in risky sexual behaviors, including unplanned and unprotected sex, which successively increases the possibility of negative health outcomes (e.g., STIs and sexual assaults; Cooper & Orcutt, 1997; Leigh & Schafer, 1993; O'Hare, 2001). Further evidence demonstrates the association between different types of risky sexual behaviors and alcohol consumption. For example, related to condom use, Desiderato and Crawford (1995) found that 50% of participants were less likely to use condoms while consuming alcohol. A quantitative analysis conducted by Cooper (2002) also found that alcohol use was associated with lower rates of condom use, specifically at first intercourse occasions and in younger samples. Furthermore, Rehm, Shield, Joharchi, and Schuper (2012) found that just a slight increase (0.1 mg/ml) in blood alcohol content (BAC) resulted in a 5% increase in likelihood of having unprotected sex. Thus, the larger the quantity of alcohol consumed, the

higher one's intentions to engage in unsafe sex. Relatedly, Wechsler, Dowdall, Moeykens, and Castillo (1994) found that 20% of infrequent binge drinkers and 41% of frequent binge drinkers had consumed alcohol before unplanned sex at least one time within the past year. The same study found that 10% of infrequent binge drinkers and 22% of frequent binge drinkers had consumed alcohol before unsafe sex at least one time within the past month. Multiple studies indicate that individuals with new or casual sex partners are most likely to combine alcohol use with sexual behavior (Cooper & Orcutt, 1997; Graves & Hines, 1997). Additionally, alcohol use is often associated with sexual victimization of college women and may increase the risk of engaging in unprotected sex (Combs-Lane & Smith, 2002; Rehm et al., 2012).

There are multiple proposed explanations for the relationship between alcohol use and risky sex, including the possibility that both behaviors are directly influenced by a third variable. For example, research shows that individuals who are experiencing high levels of distress are more likely to drink to cope if they also believe that drinking provides an effective means to alleviating this distress (Cooper et al., 1995). If extended upon, it is likely that individuals who are distressed might also seek solace in a casual or risky sexual encounter to provide comfort or a needed diversion from this distress (Cooper, 2010b). Alternatively, it is also possible that a reverse causal relationship exists between alcohol use and risky sex, rather than an assumed forward causal relationship. Specifically, if one has the intention to engage in risky sex, they may be more driven to drink if a sexual opportunity is perceived (Cooper, 2006). Results from Cooper (2002) in support of this notion indicate that college students report both providing their partners with more alcohol to increase the likelihood of having sex, and consuming more alcohol themselves to make it easier to have sex. Additionally, individuals who plan a romantic evening with a partner may consume alcohol to enhance that experience, or consume alcohol so they have

an excuse for later inappropriate behavior (Cooper, 2006). While motives may differ as far as disinhibiting, enhancing, or excusing behavior, all of these scenarios assume that people hold beliefs about alcohol's capacity to lead to desired sexual outcomes (Cooper, 2006). Overall, some people may desire sex and thus consume alcohol, rather than have sex as a result of consuming alcohol.

Another explanation for the link between alcohol use and risky sex involves the role of alcohol-related cognitive impairment. Cooper (2006) suggests that drinking proximal to sexual activity may increase the risk of engaging in risky sexual behaviors because one is less able to process information relevant to the situation. Further, intoxication may diminish cognitive capabilities and thus narrow the range of cues that an individual can attend to at any given moment. The cues often ignored in this situation are those that would regularly inhibit an individual from engaging in risky behavior. This suggests an underlying causal relationship between alcohol and risky sex, which may explain why such a strong link exists between the two behaviors, particularly among college-aged adults. Uncovering the reason college student drinkers decide to drink alcohol in the first place (i.e., drinking motivation) may provide an explanation as to why this behavior often results in risky sexual behaviors as well.

### Drinking Motivation

Individuals decide, either consciously or unconsciously, to consume alcohol for a variety of reasons, which are referred to as drinking motives (Cox & Klinger, 1988; Merrill & Read, 2010). There are plenty of factors that influence one's decision to drink, but drinking motivation has been theorized as the final, and possibly most common pathway to alcohol consumption (Cox & Klinger, 1988). This motivational approach to alcohol consumption is often shaped by

expectations about how drinking will change affect. Over time, various factors (e.g., current life situation, past experiences) help form these expectations.

Motivation for alcohol use rests on two primary ideas: the first being that people drink to achieve valued outcomes, and the second being that drinking behavior motivated by different needs or serving different functions is characterized by unique patterns of antecedents and consequences (Cooper, 1994; Cox & Klinger, 1988). For example, individuals who drink alcohol to cope with negative emotions may have learned this behavior because they lack more productive ways to cope with these emotions. Over time, individuals who rely on alcohol in order to cope with negative emotions adopt more maladaptive coping strategies and become more dependent on alcohol to meet coping needs. The antecedent for this drinking behavior is the initial motivation of drinking to cope (which is internally-generated), while the consequence is an increased dependence on alcohol to cope with negative emotions over time (i.e., negative reinforcement).

In an attempt to better understand these antecedents of drinking behavior, Cooper, Russell, Skinner, and Windle (1992) created The Drinking Motives Questionnaire (DMQ), which identifies three types of psychological drinking motives: social, coping, and enhancement. Cooper (1994) later revised the DMQ into the Drinking Motives Questionnaire-Revised (DMQ-R), which identified four types of psychological drinking motives: enhancement, coping, social, and conformity. This measure provides a method to accurately assess drinking motives, which have been found to be invariant across demographic subgroups (i.e., gender, race, and age) and related to a specific pattern of antecedents and outcomes depending on the context. Enhancement motives (e.g., because one likes the feeling) are characterized by drinking to enhance mood. These motives are internally generated and positively reinforcing, because the individual is



thought to be drinking to manipulate or manage their own internal emotional state in order to obtain a positive outcome. Coping motives (e.g., to forget one's worries) are characterized by drinking to relieve negative mood. These motives are internally generated and negatively reinforcing, because the individual is thought to be drinking to manipulate or manage their own internal emotional state in order to avoid a negative outcome. Social motives (e.g., to be sociable) are characterized by drinking to improve social interactions. These motives are externally generated and positively reinforcing, because the individual is thought to be drinking to obtain a positive social outcome, such as social acceptance or approval from others. Lastly, conformity motives (e.g., to be liked) are associated with drinking to avoid negative social interactions or peer disapproval. These motives are externally generated and negatively reinforcing, because the individual is thought to be drinking to avoid a negative social outcome, such as social disapproval from others.

The relationship between drinking motives and both alcohol use and alcohol-related consequences vary depending upon the particular motive. This knowledge provides an understanding of how given drinking motives may be associated with the various outcomes that result from alcohol consumption. For example, there is evidence of an association between affect-relevant motives for drinking (i.e., enhancement, coping) and alcohol-related problems in general, including risky behaviors (Merrill & Read, 2010). Thus, there is theoretical reason to suspect that the alcohol-related consequences resulting from particular drinking motives may extend specifically to risky sex.

Existing research clearly suggests a positive association between enhancement drinking motives and alcohol use (Dvorak et al., 2016; Merrill et al. 2014; Read et al., 2003; Simons et al., 2000). When alcohol use is motivated by enhancement (or to increase positive affect), drinkers

have a tendency to consume higher levels of alcohol. In general, higher levels of alcohol use often lead to alcohol-related consequences including impaired control and risky behaviors (Merrill et al., 2014). On the other hand, coping drinking motives are found to directly predict alcohol-related consequences, regardless of level of alcohol use (Dvorak, et. al., 2016; Merrill et al., 2014; Read et al., 2003; Simons, Carey & Correia, 2000). Research specifically on college student drinkers has found that coping motives are often related to heavier, problematic drinking, and to drinking alone (Cooper, 1994). However, most data suggests that drinking to cope predicts alcohol-related consequences regardless of the frequency or quantity of alcohol consumption because of its affect-regulatory basis (Cooper et al., 1994; Merrill et al., 2014; Read et al., 2003).

Some theoretical and empirical evidence has focused on drinking to obtain positive social reward (i.e., social motives) and drinking to avoid social costs (i.e., conformity motives). However, both conformity and social drinking motives are less related to affect regulation and thus less related to problematic alcohol use among college student drinkers (Merrill et al., 2014). Additionally, there are inconsistent findings regarding whether or not social motives are related to alcohol use in general. While Dvorak et al. (2016) found social drinking motives to be positively associated with alcohol use, Merrill et al. (2014) found no association between social drinking motives and either alcohol use or alcohol-related consequences. Overall, social drinking motives are more often associated with non-problematic alcohol use in social settings (Cooper, 1994). Furthermore, the least amount of evidence exists to support a relationship between conformity motives and alcohol use. Dvorak, Sargent, et al. (2014) found conformity motives to be either not associated or inversely associated with alcohol use. In general, fewer people

endorse conformity reasons for drinking alcohol in the first place, and these motives are generally unrelated to problematic alcohol use (Cooper, 1994).

While research indicates that drinking motives plays a pivotal role in the prediction of alcohol use and/or alcohol-related consequences, there is limited research on drinking motivation as a specific predictor of risky sex. For example, at least one existing study found coping drinking motives among college students to be positively associated with expectations of a sexual encounter (Hasking, Lyvers, & Carlopio, 2011), suggesting that a relationship between the two variables may exist. However, due to lack of clear and conclusive research in this area, it remains unknown what specific role, if any, drinking motives play in predicting risky sex among college student drinkers.

### Alcohol Myopia

While existing research suggests a relationship between specific drinking motives and alcohol-related consequences, the effects of alcohol consumption on human behavior and emotion vary tremendously. The theory of alcohol myopia (Steele & Josephs, 1990) provides an explanation as to why these effects might differ so vastly between individuals. The theory is based on the idea that alcohol use generally impairs perception and thought, but its true effects on social behavior and emotion are contingent upon an interaction with the myopia it causes (i.e., the short-sighted information processing that is a part of alcohol intoxication) and the nature of environmental cues. When consuming alcohol, an individual's behavior and experiences are altered depending on which cues are most immediate and salient in a situation. Thus, alcohol myopia restricts thought and attention to cues that are most salient in a setting, and this is the general process through which alcohol consumption shapes social behavior. This may explain

why some people experience a better mood and social ease when drinking, while others experience anxiety, depression, hostility, and aggression (Steele & Josephs, 1990).

A pair of studies were conducted that illustrate the theory of alcohol myopia in relation to risky sexual behaviors (MacDonald, Fong, Zanna, & Martineau, 2000; MacDonald, MacDonald, Zanna, & Fong, 2000). Results from MacDonald, Fong, et al. (2000) showed that sexual arousal cues interact with level of alcohol use to predict intentions to engage in risky sex. Specifically, participants who were intoxicated and experiencing higher levels of arousal reported stronger intentions to engage in unprotected sex than those who were sober, and those who were intoxicated but experiencing low levels of arousal. According to the theory of alcohol myopia, individuals who were sober were able to consider both salient (e.g., arousal) and inhibiting (e.g., fear of STIs) cues during their drinking episode, making them less likely to intend to engage in risky sex. While intoxicated, individuals' intent to engage in risky sex was determined by the most salient cue. Consequently, when aroused, they were unable to attend to less salient inhibitory cues.

To demonstrate this even further, MacDonald, MacDonald, et al. (2000) conducted a second similar study to manipulate the saliency of the inhibitory cues (i.e., stamping "AIDS Kills" on subjects' hands). Results indicated that when this inhibitory cue was present, intoxicated individuals did not report greater intentions to engage in risky sex, likely because it became the most prominent cue in their environment, above and beyond level of arousal. Results from this pair of studies highlight the role that both internal and external cues play in directing one's behavior while intoxicated, dependent on which specific cue is most significant to the individual in that moment.

Alcohol myopia then provides a framework to understand the mechanism by which drinking motives may simultaneously influence alcohol use and risky sexual behaviors. Specifically, the theory predicts that drinking will result in a narrowing of one's ability to process a range of relevant situational cues, and the individual will focus attention on the cues most immediate to their situation. Thus, if a drinking motive is very salient in one's mind and also related to motives for engaging in sexual behavior (or the direct consequences of that behavior), the sexual behavior may end up being "risky" because intoxicated individuals may not be able to take into account less salient inhibitory cues. These highly salient cues that instigate drinking behavior in the first place (i.e., drinking motives) continue to be processed throughout the drinking session, whereas more distal cues that would regularly inhibit behavior (e.g., fear of STIs) are no longer processed adequately (Cooper, 2010b). Some possible inhibitory cues that may be ignored in sexual situations include fear of STIs, fear of unplanned pregnancy, anticipation of guilt or regret, and safety risks.

Results from MacDonald, Fong, et al. (2000) and MacDonald, MacDonald, et al. (2000) suggest being intoxicated may not fully predict risky sex because individuals may be drinking for reasons that are not conducive to engaging in sex. However, if an individual is intoxicated and seeking enhancement, or intoxicated and trying to cope with negative emotions, he or she may be more likely to engage in risky sex. To further demonstrate this idea, individuals who are motivated to drink for enhancement reasons are known to consume greater amounts of alcohol (Dvorak et al., 2016; Merrill et al. 2014; Read et al., 2003; Simons et al., 2000). If one's drinking motive is to enhance mood, enhancement may also be the reason for engaging in sexual activity in general (e.g., an individual who consumes greater amounts of alcohol in order to enjoy a party may become intoxicated and successively engage in sexual activity with someone at the party in

order to enjoy the party even more). If this enhancement motive is very salient in the individual's mind, the sexual behavior may turn risky because he or she might be unable to consider inhibitory cues (e.g., fear of STIs), and consequently engage in sexual activity without protection from STIs. Similarly, if one's drinking motive is to cope with negative emotions, coping may also be the reason for engaging in sexual activity in general (e.g., if an individual is drinking to cope with a recent breakup, he or she may also engage in sexual activity in order to cope with the breakup). If this coping motive is very salient in the individual's mind, intoxication may cause the individual to be unable to consider inhibitory cues (e.g., anticipation of guilt or regret) and engage in sexual activity with someone not known well. In sum, if specific types of drinking motives (i.e., coping with negative emotions, enhancing mood) are very salient in the drinker's mind, he or she may engage in sexual activity for these same reasons. This sexual activity may become risky if the individual is highly intoxicated, and unable to consider inhibitory cues (e.g., fear of STIs, fear of emotional trauma).

#### Purpose of the Current Study

Existing evidence suggests alcohol motivation is a predictor of both alcohol use and various alcohol-related consequences (Dvorak, Sargent, et al., 2014; Merrill & Read, 2010; Merrill et al., 2014). Additionally, alcohol use has been found to be consistently associated with the likelihood of engaging in risky sexual behaviors (Cooper, 2002; Cooper, 2006; Cooper, 2010a; Kiene, Barta, Tennen, & Armeli, 2009; Leigh & Stall, 1993). However, less is known about whether specific reasons for drinking are associated with risky sexual behaviors, and whether or not these reasons for drinking specifically predict engaging in risky sex. There is a lack of research directly examining the role that drinking motivation plays in predicting risky sexual behaviors among college student drinkers. The current study attempted to understand how

drinking motives interact with alcohol use to predict risky sex among college student drinkers. This knowledge targets a gap in the literature to help connect two sets of research suggesting 1) that drinking motivation predicts alcohol use and 2) that alcohol use predicts risky sexual behaviors.

The first aim of the current study was to replicate prior findings suggesting an association between level of alcohol use and risky sex. Previous research suggests that level of alcohol use is associated with risky sexual behaviors in general among both men and women (Kiene et al., 2009; Rehm et al., 2012; Shuper, Joharchi, Irving, & Rehm, 2009). Thus, it was hypothesized that risky sex would be more likely to occur in the context of higher levels of alcohol use rather than lower levels. The second aim of the study was to examine if drinking motives predict risky sex. Existing research suggests that enhancement drinking motives are positively related to higher levels of alcohol use, and consequently to related problems, while alcohol-related problems often directly arise from drinking specifically to cope with negative emotions (Carey & Correia, 1997; Martens et al., 2008). The current study expanded upon this past research by investigating whether or not coping motives predict risky sexual behaviors as a specific consequence. Additionally, past research has found that enhancement motives predict alcohol use, which is also related to consequences. Therefore, it was predicted that enhancement motives related to a drinking episode would also be related to risky sex as a specific consequence. Though it was hypothesized that coping and enhancement drinking motives would predict engaging in risky sexual behaviors during a drinking episode, it was not expected that social and conformity motives would predict engaging in risky sexual behaviors while drinking because they are less related to affect regulation.

The third and final aim of the study was to understand which situations pose the highest risk for college drinkers to engage in risky sex. While it is known that increased alcohol use is associated with risky sexual behaviors, this final aim was to understand whether risky sexual behaviors are more likely to occur when higher levels of alcohol are combined with stronger coping and/or enhancement motives. Enhancement and coping motives for drinking were expected to predict risky sexual behavior most strongly when the individual was also consuming large amounts of alcohol. Individuals who drink to relieve their negative mood (i.e., to cope) may also engage in risky sex to achieve this same relief. Similarly, individuals who drink to feel the pleasurable effects of alcohol (e.g., enhancement) may also engage in risky sex to achieve this same effect. Thus, it was hypothesized that risk of engaging in risky sex within the context of alcohol use is increased both when an individual consumes higher levels of alcohol and when strong coping or enhancement motives are present. While an interaction between level of alcohol use and level of either coping or enhancement motives was expected to be associated with risky sex, it was not expected that level of alcohol use would interact with either social or conformity drinking motives to predict risky sex because these motives are less related to affect regulation and problematic alcohol use.

Overall, it was hypothesized that risky sex in the context of alcohol use would be most likely to occur under conditions of high levels of alcohol consumption and high levels of either coping or enhancement motives. When low levels of alcohol are consumed and high levels of either coping or enhancement motives are present, risky sex would be less likely to occur than when high levels of alcohol are consumed because individuals would not be experiencing a myopic narrowing of attention. Similarly, when low levels of either coping or enhancement motives are present and high levels of alcohol are consumed, risky sex would still be less likely



to occur than when high levels of coping and/or enhancement motives were present. This is because individuals who do not have strong coping or enhancement drinking motives may not have salient motives for sexual behaviors. As a result, individuals who do not have strong drinking motives in either of these areas, and who are not consuming large amounts of alcohol, would not be as likely to be in a situation where risky sex would be most likely to occur. It was not expected that social or conformity drinking motives would interact with alcohol use to predict risky sexual behavior. Thus, at low levels of alcohol consumption, neither high or low conformity nor social drinking motives would put an individual at risk for engaging in risky sexual behaviors. Understanding the motives that underlie an individual's alcohol consumption provides valuable insight into what the probable consequences are, and how to best intervene, if warranted (Cooper, 1994). The current study will contribute knowledge about how specific drinking motives interact with level of alcohol use to produce risky sex, which may assist in developing targeted interventions designed to reduce these behaviors.

## CHAPTER II

### METHODS

#### Participants

Individuals who were students at the University of North Dakota (UND), enrolled in psychology courses utilizing the SONA system, and between the ages of 18 and 24 were eligible to complete a screening survey to determine eligibility for the main study. A college-aged sample was chosen because this is the population most likely to report alcohol consumption and risky sexual behaviors (Chandra et al., 2012; O'Malley & Johnston, 2002; Velazquez et al., 2011). Eligibility criteria for the main study additionally included: report of at least one instance of past-month alcohol (i.e., beer, wine, liquor) use, and at least one instance of lifetime sexual intercourse (i.e., vaginal or anal sex). The main variable of interest in the study is risky sex that occurred in the context of alcohol consumption; thus, the targeted sample consisted only of individuals who are sexually active and who consume alcohol. Individuals who had not been sexually active within their lifetime were unlikely to engage in risky sex in the next month. Additionally, individuals who did not report any alcohol consumption in the prior month were less likely to report drinking episodes in the following month. Participants had the option to enter their e-mail at the end of the survey in the screening phase if they wished to be contacted if they were eligible to participate in the main study.

A total of 405 UND students completed the screening survey. Only participants who were between the ages of 18 and 24, reported both alcohol consumption within the past month and sexual intercourse during their lifetime, and provided an email address were eligible to

participate in the main study ( $N = 174$ ). Of the 174 participants who were found eligible for the main study, 108 (62.07%) completed at least one week of data collection. Of these individuals, 90 (83.3%) were female. Participants reported their race/ethnicity as White (92.6%), Hispanic/Latino (0.9%), American Indian (2.8%), and mixed race (3.7%). The average age of participants was 19.09 ( $SD = 1.16$ ) years, and the average years of education was 13.79 ( $SD = 0.92$ ). The university IRB approved this study and all participants provided informed consent.

## Measures

### *Demographics*

In the screening phase, participants completed an initial demographics questionnaire assessing age, gender, ethnicity, and college status (see Appendix A). Participants were also asked whether or not they had consumed any alcohol (i.e., beer, wine, liquor) within the past month and whether or not they had engaged in sexual intercourse (i.e., vaginal or anal) during their lifetime.

### *Daily Drinking Questionnaire (DDQ)*

Participants' alcohol consumption was assessed via the DDQ (Collins, Parks, & Marlatt, 1985), a method that closely resembles retrospective interviews (e.g., Form 90, Timeline Followback). The DDQ measures both frequency and quantity of alcohol use. For the screening survey, participants were instructed to indicate, for each day of the week, how many standard drinks they consumed in a typical week over the past 6 months (see Appendix B). The results were summed to provide an index of the number of drinks consumed in a typical week. For the main study, participants were instructed to indicate, for each day of the previous week, how many standard drinks they consumed (see Appendix C). Previous research supports the validity and one-week test-retest reliability ( $r = 0.93$ ) of this measure of alcohol use (Miller et al., 1998).

### *Drinking Motives Questionnaire-Revised (DMQ-R)*

Alcohol motivation was assessed through the DMQ-R (Cooper, 1994), which assesses four aspects of drinking motivation: Coping ( $\alpha = .86$ ; sample item: “To forget your problems”), Enhancement ( $\alpha = .89$ ; sample item: “Because you like the feeling”), Social ( $\alpha = .91$ ; sample item: “Because it helps you enjoy a party”), and Conformity ( $\alpha = .86$ ; sample item: “To be liked”). For the screening survey, participants were presented with 20 reasons why people typically drink, and instructed to rate how often they drink for the following reasons on a scale of 1 (*almost never/never*) to 5 (*almost always/always*) (see Appendix D). For the main study, participants were instructed to rate to which extent each drinking motive applied to that particular drinking episode on a 5-point response scale ranging from 1 = *not at all* to 5 = *extremely* (see Appendix E). Existing research supports the DMQ as a measure of drinking motivation among college student drinkers (Cooper et al., 1995; Cooper et al., 2008; Kuntsche, Knibbe, Gmel, & Engels, 2005).

### *Risky Sexual Behaviors*

Risky sexual behaviors were assessed via the Cognitive Appraisal of Risky Events Revised (CARE-R)—Risky Sexual Activities Scale (Fromme et al., 1997). For the purpose of this study, sex was changed to sexual activity throughout the measure to include a range of sexual experiences outside of penetrative sex. Sexual activity was defined as any activity involving genital contact (e.g., vaginal sex, oral sex, anal sex, genital touching, etc.). Sexual intercourse was defined as either vaginal or anal penetration. In the screening survey, participants were presented with the Expected Frequency Scale which asked participants to indicate the number of times they expected to engage in various risky sexual activities (e.g.,

sexual activity without protection against pregnancy, sexual activity with multiple partners) over the next month with either a new or regular partner (see Appendix F).

In the main study, participants completed a modified version of the Past Frequency Scale for each drinking episode, which asked participants to indicate any risky sexual activities they engaged in during that particular episode (see Appendix G). Items removed from the CARE-R Risky Sexual Activities Scale for the study include: “Used condoms for sexual intercourse”, “Chose to abstain from sexual activity due to concerns about pregnancy or sexually transmitted diseases”, and “Sexual intercourse while under the influence of alcohol with a regular partner”. 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 sexually transmitted diseases with a regular partner” in an effort to distinguish risky sex from sexual behavior that is not inherently risky when between regular partners. Further, participants were asked to report on sexual activity with both a regular partner and someone other than their regular partner, but these activities were not distinguished in the analyses of risky sex. One final change from the original measure is that both male and female participants were asked about both sexual coercion and sexual coerciveness each time they were presented with the CARE-R—Risky Sexual Activities Scale. In the original measure, only males were asked about sexual coercion, and only females were asked about sexual coerciveness. Research has utilized the CARE-Risky Sexual Activities Scale as a measure of risky sexual behavior among college students (Dvorak et al., 2013; Dvorak et al., 2016). The validity and reliability of the scale as a measure of sexual risk history has been supported (Fromme et al., 2007).

## Procedure

The study was comprised of two phases: a screening survey to determine eligibility, and the main study. Participants were initially recruited to complete the online screening survey through the UND SONA research participant pool (i.e., SONA Systems). Individuals who were members of the university subject pool received e-mails from the SONA Research Participation System inviting them to participate in a study assessing drinking motivation, alcohol use, and risky sexual behaviors. During the screening phase of the study, participants completed an Internet survey via Qualtrics including the demographics questionnaire, the DDQ, the DMQ-R, and the CARE-R–Risky Sexual Activities Scale. Participants were awarded one hour of course credit via SONA Systems upon completion of the screening survey, regardless of meeting eligibility for the main study.

Only the participants who were deemed eligible through the screening phase had the option to participate in the main study. The main study consisted of completing weekly Internet surveys via Qualtrics over the next 4 weeks. Eligible participants who entered their e-mail address in the screening survey were sent an e-mail inviting them to participate in the main study, and notifying them that they would receive the first weekly survey by email on the upcoming Tuesday. For 4 weeks, every Tuesday morning at 8:00 a.m. an e-mail with a link to the weekly survey was sent out, and participants must have completed each week's online questionnaire within 48 hours in order to receive compensation for that week. On the first page of the weekly Qualtrics surveys, participants entered a personalized identification (ID) number before they were allowed access. This personal ID number was sent out as a reminder in each weekly e-mail, and was used to track participants and grant credit.

For each day of the prior week, participants were first asked about daily alcohol

involvement. If participants denied alcohol use on any given day, the survey automatically proceeded to the previous day (e.g., Monday to Sunday). On each day that a participant reported consuming alcohol, they completed modified versions of the DDQ, the DMQ-R, and the CARE-R—Risky Sexual Activities scale for that particular drinking episode. These measured quantity of alcohol use, drinking motives related to that episode, and engagement in risky sexual behavior for each day over the past week, respectively. Participants were instructed to only indicate if they engaged in various risky sexual behaviors either during their drinking episode or while they were still intoxicated. The survey instructed participants to begin reporting on the most recent Monday, and to work their way back through the previous week (i.e., Sunday, Saturday, Friday, Thursday, Wednesday, Tuesday). It was explained to participants that they should report information related to each drinking episode for the day the drinking episode started. For example, if a participant began drinking on a Saturday night and this episode continued into Sunday morning, participants were told to report all information related to that episode (e.g., drinking motives, quantity of alcohol use, risky sexual behaviors) for Saturday, even if drinking and/or sexual behavior carried on into Sunday morning. The rationale for this was that sexual behavior in the context of each drinking episode is what is important, rather than the specific day of the week on which it occurred. Each weekly survey took approximately 30 minutes to complete, and participants who had not yet completed their survey within 24 hours were sent a reminder e-mail that they had 24 hours remaining to complete that week's survey.

Compensation for participating in the main study was commensurate with the number of weekly questionnaires each participant completed. Each week, participants in the main study had the option to obtain compensation in one of two ways: 1) obtain .5 course credits through SONA System, or 2) be entered into a drawing to receive an Amazon gift card. This choice could

change each week, depending on the participant's preference. Additionally, if a participant missed one weekly questionnaire, they were still able to obtain course credit or have their name entered into the drawing for the remainder of the three weeks. Thus, throughout the month of weekly Internet surveys, participants had the opportunity to obtain up to two additional course credits, with each weekly survey being worth .5 hours of course credit. Participants were awarded course credit commensurate with the number of weekly surveys they completed (and how many times this compensation option was chosen) at the conclusion of the four weeks.

Participants could instead opt to have their name entered in up to four separate drawings that were held at the conclusion of data collection. Each participant's name was entered into separate drawings on a progressively increasing scale for the number of weekly surveys he or she completed. At the conclusion of data collection, there were four drawings where participants who completed at least one survey (and chose the raffle as their preferred compensation) were placed into a drawing to receive one of two \$20 gift cards, participants who completed at least two weekly surveys (and chose the raffle as their preferred compensation) were also placed into a drawing to win one of two \$30 gift cards, participants who completed at least three weekly surveys were also placed into a drawing to win one of two \$40 gift cards, and participants who completed all four of the weekly surveys were also placed into the drawing to win one of two \$50 gift cards. If a participant completed all 4 surveys, and chose the drawing as their preferred compensation each time, he or she was entered into all 4 drawings. If a participant completed and chose the drawing option only 2 times, he or she was entered into the first two drawings regardless of which 2 weeks the participant actually took the survey.



## Data Analysis

Descriptive statistics for all experimental variables were assessed to examine differences between individuals who reported drinking episodes and individuals who denied drinking episodes throughout their participation in the study. The dependent variable of interest, risky sex, was examined as a dichotomous variable (i.e., risky sex occurred vs. risky sex did not occur), rather than as a continuous variable (i.e., number of risky sexual behaviors), because the study was not particularly concerned with the type of risky sexual behavior or specific number of risky sexual behaviors that occurred, just whether or not risky sexual behaviors in general occurred on a given day. Additionally, the current study was the first to examine the relationship between drinking motives and risky sexual behaviors, so the initial focus was on whether risky sexual behaviors in general, rather than specific type or number of behaviors, were associated with drinking motives and alcohol use.

The three hypotheses were analyzed using four Generalized Estimating Equations (GEEs) with a separate model for each drinking motive (i.e., conformity, social, coping, and enhancement). The main effect of level of alcohol use was used to examine the first hypothesis (i.e., risky sex will be more likely to occur in the context of higher levels of alcohol use than lower levels of alcohol use). The main effect of level of drinking motive was used to examine the second hypothesis (i.e., coping and enhancement drinking motives will predict engaging in risky sex, but social and conformity motives will not). Lastly, the interaction between level of alcohol use and level of drinking motive was used to examine the third hypothesis (i.e., high levels of alcohol use and strong coping and enhancement motives will best predict risky sex, while no interaction is expected between level of alcohol use and either social or conformity motives).

GEEs for each drinking motive were run using an auto-regressive order 1 structure because the data was collected as repeated measures equally spaced over time (i.e., by day). Additionally, because the response variable was binary (i.e., whether or not risky sexual behaviors had occurred on that day), binary logistic regression models were used. Each GEE utilized a person-centered approach for both strength of drinking motive (i.e., the discrepancy between each participants' strength of drinking motives on any given day and their average strength of drinking motives throughout the study) and level of alcohol consumption (i.e., the discrepancy between each participants' level of alcohol consumption on any given day and their average level of alcohol consumption throughout the study). A person-centered approach, rather than a grand mean-centered approach, was chosen because how individual participants' strength of drinking motives and levels of alcohol use for each drinking episode varied within that person was deemed more relevant to the study's hypotheses than how participants' levels varied across the entire sample. GEEs were first run including gender and all gender interactions to examine gender differences, since prior research indicates that men report both higher levels of alcohol use and endorse more risky sexual behaviors than women in general (Cooper, 2006; Cooper, 2002; Dvorak et al., 2016; Leigh & Schafer, 1993; Read et al., 2003). No interactions with gender were significant; thus, these interactions were removed in the final models and gender was instead included as a covariate. Additionally, average grand-mean drinking (i.e., the discrepancy between each participants' average level of alcohol consumption throughout the study and the overall sample's average level of alcohol consumption throughout the study) was included as a covariate in each model to examine whether individuals who were, on average, consuming more alcohol throughout the study than the overall sample were at an increased risk of engaging in risky sexual behavior.

## CHAPTER III

### RESULTS

One-hundred and eight individuals participated in the main study, with 98 providing at least one drinking episode throughout their participation in the study (i.e., up to 4 weeks of data collection). Thus, the final sample included only these 98 individuals (i.e., drinkers), as participants who never contributed a drinking episode (i.e., non-drinkers) were removed from the primary GEE analyses. Throughout the four weekly surveys, drinkers provided data on 412 drinking episodes; however, 9 drinking episodes were removed because the participant did not provide data on drinking motives or risky sexual behaviors on that day. Thus, the final sample included 403 drinking episodes. Across drinking episodes, drinkers reported consuming an average of 5.38 ( $SD = 3.28$ ) standard drinks, with a minimum of 1 drink and a maximum of 25 drinks per episode. Risky sexual behaviors occurred on 22.2% of days, regardless of whether or not alcohol was consumed. Risky sexual behaviors were reported more often during drinking days (42.7%) than non-drinking days (18.1%;  $\chi^2 = 116.92, p < .001$ ). Across participants and drinking episodes, averages for drinking motives on a 5-point Likert scale of 1 = 'Not at all' to 5 = 'Extremely' were as follows: 2.86 ( $SD = 1.06$ ) social, 0.78 ( $SD = 1.86$ ) coping, 2.73 ( $SD = 1.01$ ) enhancement, and 1.43 ( $SD = 0.70$ ) conformity. These averages are consistent with existing norms for college students (Cooper, 1994). Drinkers ( $n = 98$ ) were compared on demographic indices to non-drinkers ( $n = 10$ ). Results revealed no significant differences between drinkers and non-drinkers with regard to age, gender, race/ethnicity, or years of education (see Table 1). Additionally, there were no significant differences between drinkers and non-drinkers in drinking

motives, frequency of risky sexual behaviors over the past 6 months, or expected frequency of risky sexual behaviors in the next month; however, drinkers reported significantly higher levels of alcohol use in the month prior to participation than non-drinkers (see Table 2).

Table 1. Comparisons of Demographic Indices by Drinking Status.

	<u>Drinkers (n = 98)</u>	<u>Non-Drinkers (n = 10)</u>	<i>t</i>	$\chi^2$	<i>p</i>
	Mean (SD)	Mean (SD)			
Age	19.12 (1.19)	18.80 (0.79)	-0.82		0.413
Education (years)	13.82 (0.92)	13.50 (0.85)	-1.04		0.301
Gender	82 F / 16 M	8 F / 2 M		0.09	0.767
Ethnicity	91 W / 7 NW	9 W / 1 NW		0.11	0.742

*Note:* Drinkers = individuals who reported at least one drinking episode throughout their participation in the study; Non-Drinkers = individuals who did not report any drinking episodes throughout their participation in the study. F = Female, M = Male. W = White, NW = Non-White.

Table 2. Comparisons of Drinking/Risky Sex Indices at Baseline by Drinking Status

	<u>Drinkers (n=98)</u>	<u>Non-Drinkers (n=10)</u>	<i>t</i>	<i>p</i>
	Mean (SD)	Mean (SD)		
Past-Month Weekly Drinks	8.21 (7.28)	2.30 (2.50)	-2.54	0.012
Average Social Motives	3.30 (1.00)	2.10 (0.71)	-0.62	0.537
Average Coping Motives	1.93 (0.94)	1.96 (0.95)	0.08	0.933
Average Enhancement Motives	2.92 (1.01)	2.51 (0.77)	-1.18	0.243

Table 2. cont.

	<u>Drinkers (n=98)</u>	<u>Non-Drinkers (n=10)</u>	<i>t</i>	<i>p</i>
	Mean ( <i>SD</i> )	Mean ( <i>SD</i> )		
Average Conformity Motives	1.53 (0.70)	1.34 (0.40)	-0.82	0.414
Expected Risky of Risky Sex	1.87 (0.74)	1.70 (0.38)	-0.68	0.497

*Note:* Drinkers = individuals who reported at least one drinking episode throughout their participation in the study; Nondrinkers = individuals who did not report any drinking episodes throughout their participation in the study.

Each drinking motive model initially examined the likelihood of engaging in risky sexual behaviors as a function of strength of drinking motives, quantity of alcohol consumption, gender, and all interactions between the three variables. However, the main effects of gender and all interactions with gender were not significant in any of the four drinking motive models; thus, gender was removed as a predictor and instead included as a covariate in the models. The reduced models examined likelihood of engaging in risky sexual behaviors as a function of strength of drinking motives, quantity of alcohol consumption, and their interaction, while controlling for gender and average grand-mean drinking. Gender was not a significant covariate in any of the equations, while average grand-mean drinking was a significant covariate in the social, coping, and conformity models and a marginally significant covariate in the enhancement model (see Table 3).

Table 3. Generalized Estimating Equations for Individual Drinking Motives.

	Wald $\chi^2$	<i>p</i>	<i>OR</i>	95% CI
<b>Social Drinking Motives Model</b>				
Gender	0.11	0.741	0.88	0.42, 1.86
Average Grand-Mean	4.01	0.045	1.14	1.00, 1.29
Person-Centered Alcohol Use	0.90	0.343	1.04	0.96, 1.14
Person-Centered Social Motives	8.26	0.004	1.10	1.03, 1.18
Alcohol*Motives Interaction	0.03	0.871	1.00	0.98, 1.03
<b>Coping Drinking Motives Model</b>				
Gender	0.06	0.807	0.91	0.44, 1.91
Average Grand-Mean	4.41	0.036	1.14	1.01, 1.28
Person-Centered Alcohol Use	3.77	0.052	1.10	1.00, 1.20
Person-Centered Coping Motives	0.25	0.615	0.97	0.86, 1.09
Alcohol*Motives Interaction	1.54	0.215	0.97	0.92, 1.02
<b>Enhancement Drinking Motives Model</b>				
Gender	0.08	0.733	0.90	0.43, 1.87
Average Grand-Mean	3.44	0.064	1.12	0.99, 1.24
Person-Centered Alcohol Use	2.99	0.084	1.09	0.99, 1.20
Person-Centered Enhancement Motives	3.40	0.065	1.12	0.99, 1.24
Alcohol*Motives Interaction	5.27	0.022	0.95	0.91, 0.99

Table 3. cont.

	Wald $\chi^2$	<i>p</i>	OR	95% CI
<b>Conformity Drinking Motives Model</b>				
Gender	0.07	0.799	0.91	0.44, 1.89
Average Grand-Mean	4.24	0.039	1.14	1.01, 1.28
Person-Centered Alcohol Use	3.57	0.059	1.09	1.00, 1.20
Person-Centered Conformity Motives	0.63	0.428	0.96	0.87, 1.06
Alcohol*Motives Interaction	0.87	0.352	0.98	0.93, 1.03

*Note:* OR = odds ratio. CI = confidence interval. Gender was coded as 0 = female, 1 = male.

Average Grand-Mean = the discrepancy between each participants' average level of alcohol consumption throughout the study and the overall sample's average level of alcohol consumption throughout the study.

#### Aim 1: Main Effect of Alcohol Use on Risky Sex

For aim 1 (i.e., examining whether risky sexual behaviors would be more likely to occur in the context of higher levels of alcohol use), each drinking motive model examined the likelihood of engaging in risky sexual behaviors as a function of quantity of alcohol consumption. Results revealed a marginally significant main effect for quantity of alcohol consumption in the coping, enhancement, and conformity models (see Table 3), with higher quantities of alcohol consumption on any given day increasing the odds of engaging in risky sexual behaviors. No effect was found for quantity of alcohol consumption in the social model.

#### Aim 2: Main Effect of Drinking Motives on Risky Sex

For aim 2 (i.e., examining whether coping and enhancement drinking motives would predict engaging in risky sexual behaviors during a drinking episode), each drinking motive

model examined the likelihood of engaging in risky sexual behaviors as a function of strength of drinking motive. Results revealed a significant main effect for social motives (see Table 3), as participants were 10.3% more likely to engage in risky sexual behavior with every one-unit increase in social motives on a given day. Additionally, there was a marginally significant main effect for enhancement motives (see Table 3), with stronger drinking motives on a given day increasing the odds of engaging in risky sexual behaviors. No effect was found for strength of drinking motives in either the coping or conformity models.

### Aim 3: Interaction Effect Between Alcohol Use and Drinking Motives on Risky Sex

For aim 3 (i.e., examining whether risk of engaging in risky sexual behaviors within the context of alcohol use is increased both when an individual consumes higher levels of alcohol and when strong coping or enhancement [but not social or coping] motives are present), each drinking motive model examined the likelihood of engaging in risky sexual behaviors as a function of the interaction between quantity of alcohol consumption and strength of drinking motive. Results revealed a significant interaction effect between strength of enhancement motives and quantity of alcohol consumption (see Figure 1 and Table 3), with individuals high in strength of enhancement motives and low in quantity of alcohol consumption being most at-risk for engaging in risky sexual behaviors on that day ( $OR = 1.28$ ). However, both individuals who are high in quantity of alcohol consumption and low in strength of enhancement motives ( $OR = 1.26$ ), and individuals who are high in both quantity of alcohol consumption and strength of enhancement motives ( $OR = 1.18$ ) were still at an increased risk of engaging in risky sexual behaviors on a given day. Finally, individuals low in quantity of alcohol consumption and low in strength of enhancement motives were at a decreased risk of engaging in risky sexual behaviors



on a given day ( $OR = 0.52$ ). No interaction effect was found for the coping, social, or conformity models (see Table 3).

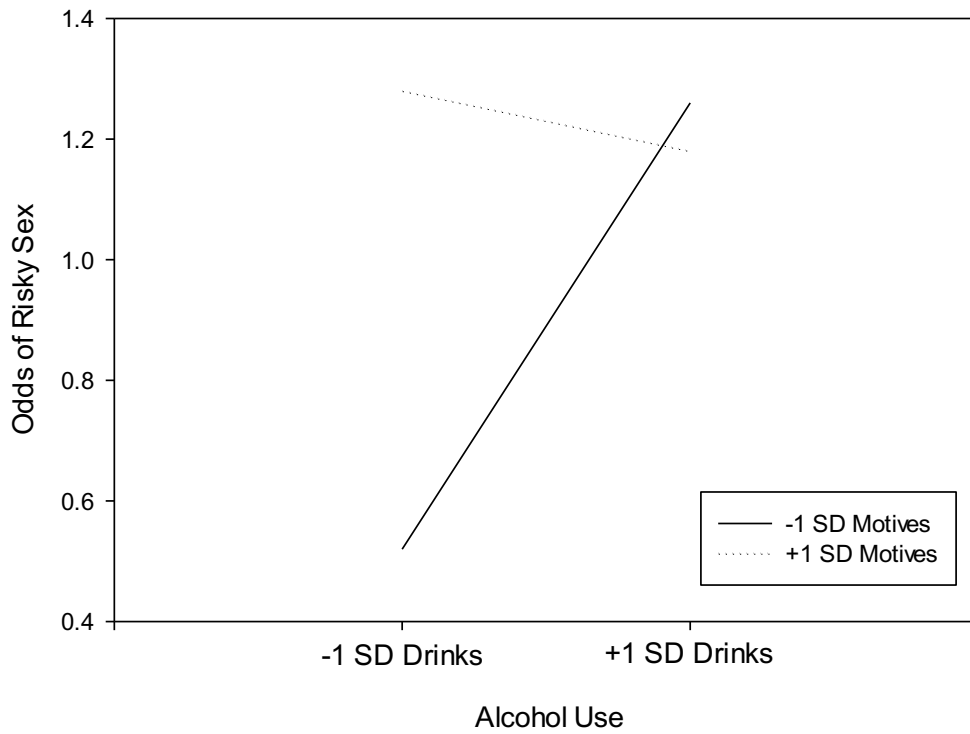


Figure 1. Interaction Effect Between Enhancement Motives and Alcohol Consumption.

## CHAPTER IV

### DISCUSSION

Current research shows an association between quantity of alcohol use and alcohol-related consequences, such as risky sexual behaviors (Cooper, 2002; Cooper, 2006; Cooper, 2010a; Kiene, Barta, Tennen, & Armeli, 2009; Leigh & Stall, 1993). However, this was only somewhat reflected in the current study as evidenced by the marginally significant main effects of level of alcohol use in the coping, enhancement, and conformity drinking motive models. As a result, the current study adds limited but consistent support to past research that has found an association between quantity of alcohol use and risky sexual behaviors by suggesting that these behaviors may be more likely to occur in the context of higher quantities of alcohol consumption rather than lower quantities. However, given the existing literature in this area, it remains surprising that there were not significant main effects of alcohol use on risky sexual behaviors found in any of the four models examined in the current study. Though the current study aimed to examine levels of alcohol consumption during individual drinking episodes that may put an individual at risk for engaging in risky sexual behaviors, finding average grand-mean drinking to be a significant or marginally significant covariate in all four models may explain why level of alcohol use did not have a significant effect in any of the four models. This finding indicates that participants who, on average, tended to consume more alcohol compared to the entire sample were more at risk for engaging in risky sexual behaviors across all models, seemingly regardless of how much alcohol they consumed during individual drinking episodes.

This finding is consistent with previous research indicating that individuals who tend to consume higher levels of alcohol are at higher risk for engaging in risky sexual behaviors (Cooper, 2002; Cooper, 2006; Cooper, 2010a; Kiene et al., 2009; Leigh & Stall, 1993). Overall, the finding that average grand-mean drinking is a significant or marginally significant covariate in all four models suggests that individuals who, on average, consume higher levels of alcohol are more at risk for alcohol-related consequences, regardless of the level of alcohol consumption on any given drinking day. It is possible that individuals who generally consume higher levels of alcohol may have more risky patterns of drinking, and are subsequently more likely to experience alcohol-related problems (e.g., risky sex) while drinking, or that these individuals have a tendency to engage in various risk-taking behaviors (e.g., risky sex) more often than individuals who generally consume lower levels of alcohol. Further, individuals who are generally consuming high quantities of alcohol may be consuming lower levels of alcohol for themselves on a certain day but still drinking above the average of the overall sample. Because this research examined person-centered drinking and not objective number of drinks, it is possible that this effect of drinking on risky sex may have been tempered. Finally, with extant research suggesting male college students endorse higher rates of alcohol consumption and more risky sexual behaviors than their female counterparts (Cooper, 2006; Cooper, 2002; Dvorak et al., 2016; Leigh & Schafer, 1993; Read et al., 2003), the predominantly female sample in the current study may explain why stronger support was not found for an association between quantity of alcohol use and risky sexual behaviors.

Existing research also suggests drinking motivation is a predictor of not only alcohol use, but also alcohol-related consequences (Dvorak, Sargent, et al., 2014; Merrill & Read, 2010; Merrill et al., 2014). While it was hypothesized that coping and enhancement motives would be

associated with risky sexual behaviors because of their affect-regulatory properties, a significant effect was instead found for social drinking motives while a marginally significant effect was found for enhancement drinking motives. Individuals high in social, and to a lesser extent perhaps enhancement motives, were subsequently more at risk for engaging in risky sexual behaviors on any given day. Overall, these findings suggest individuals who are drinking for the purpose of social interaction are at an increased likelihood of engaging in risky sexual behaviors during that drinking episode.

Past research suggests that when alcohol use is motivated by social purposes, individuals have a tendency to consume higher levels of alcohol, which may subsequently result in more alcohol-related consequences (Dvorak et al. 2016; Merrill et al., 2014, Read, 2003). This association may be related to the patterns of alcohol use and salience of drinking motives for those drinking for social purposes. Heavy drinking for social reasons is considered normative among college students (Read et al., 2003; Wechsler et al, 1994), which may explain why more risky sexual behaviors are being reported among those drinking for this purpose among the current college-aged sample. Having highly salient social drinking motives may result in college students being more likely to go out and drink in public places, such as bars or parties, which may subsequently increase opportunities to engage in risky sexual behaviors. Further, it is important to note that previous research has found significant overlap between social and enhancement drinking motives (Read et al., 2003), which may explain the significant association between social drinking motives and risky sex, and the marginally significant association between enhancement drinking motives and risky sex.

Overall, findings from the current study suggest that both alcohol use and alcohol-related consequences (e.g., risky sexual behaviors) are strongly influenced by an individual's social

environment. Within the alcohol myopia framework, the current sample of college students may be in a time in their lives where social factors are most salient and play the greatest role in drinking behavior, explaining the current association between social drinking motives and risky sexual behaviors (Read et al., 2003). Finally, the hypothesis that individuals high in coping motives would also be at risk for engaging in risky sexual behaviors was not supported. However, this is not necessarily inconsistent with existing research suggesting that drinking to cope, particularly with stress/anxiety, is more typical of college graduates rather than current college students (Read et al., 2003). Thus, drinking for the purpose of coping with stress or negative mood may have been less salient among the current sample, a young sample of college undergraduates, and subsequently unrelated to engaging in risky sexual behaviors.

Further, within the alcohol myopia framework, it was hypothesized that individuals high in either coping or enhancement motives and high in quantity of alcohol use would be most at risk for engaging in risky sexual behaviors because of the interaction between the myopia caused by alcohol and the nature of salient environmental cues present during drinking. This hypothesis was partially supported. Results suggest individuals are at risk for engaging in risky sexual behaviors when their enhancement drinking motives are particularly high on any given day, regardless of their alcohol intake. It is possible that among individuals with highly salient enhancement drinking motives, higher levels of alcohol consumption are not necessary to put them at risk for engaging in risky sexual behaviors. For instance, highly salient enhancement cues in the context of drinking for enhancement purposes may have the power to overcompensate for drinking smaller amounts of alcohol, thus reducing the impact of level of alcohol consumption when enhancement motives are high.

However, the same is not true when individuals hold particularly weak enhancement motives for themselves, as individuals with weak enhancement motives are at risk only when also high in quantity of alcohol use. Thus, results suggest alcohol consumption only plays a role when enhancement drinking motives are low. Overall, this suggests that the effect of salient drinking motives on risk-taking behavior may be more complex and individually determined than originally thought. Specifically, being at risk for engaging in risky sexual behaviors may depend more on situational and environmental factors. For example, for some individuals, level of alcohol consumption may have more of an effect on engaging in risky sexual behaviors than level of enhancement motives because they find themselves in a social situation where the expectation or opportunity for engaging in risky sexual behaviors is higher. Further, it is also difficult to determine which environmental cues are most salient during a drinking episode. Aside from drinking motivation, other factors undoubtedly play a role in drinking outcomes, such as expectancy and inhibiting cues (i.e., having to leave a party or bar with your peers, or having peers deter you from making risky decisions). It is also possible that when consuming higher levels of alcohol, the effects of intoxication may result in an individual being unaware of or less likely to accurately recall their drinking motives that were most salient during that drinking episode at a later time. Thus, participants in the current study may have inaccurately reported or underreported the strength of their drinking motives during episodes where they were consuming high quantities of alcohol.

Finally, the hypothesis that individuals high in both coping motives and level of alcohol consumption would also be at risk for engaging in risky sexual behaviors was not supported. However, this is not necessarily inconsistent with existing research which suggests coping motives may affect alcohol misuse (e.g., binge drinking, more frequent use) less strongly among

populations where alcohol use is more normative, such as college students (Read et al., 2003). This may be why individuals in this sample who were high in both coping motives and level of alcohol consumption were not at an increased risk of engaging in risky sexual behaviors, because drinking is heavily normative in this particular sample. Additionally, and as mentioned previously, past research suggests drinking to cope is more typical of college graduates rather than current college students and associated with increased alcohol consumption during the post-graduate stage of life (Perkins, 1999). Thus, among the current sample of college students who are in a time in their lives where drinking behavior is more often determined by social and enhancement factors, rather than coping factors, drinking for coping purposes may have been less salient (Read et al., 2003).

Findings from the current study offer valuable information regarding the relationship between alcohol use, drinking motivation, and risky sexual behaviors. The primary strength of the current research is that it is the first to examine the association between specific drinking motives and a wide range of risky sexual behaviors. Though some existing research has examined the association between coping motives and risky sexual behaviors (Hasking et al., 2011), and other research has examined the association between drinking motives and sexual hookups (Dvorak et al., 2016), this research is the first to examine the association between various drinking motives and risky sexual behaviors at the event-level. Rather than examining whether individuals who have a tendency to consume high levels of alcohol or hold specific drinking motives are more at-risk for engaging in risky sexual behaviors, the current study was able to examine these behaviors at the daily level. This is a particular strength of the current study, given that existing research suggests drinking motives vary by day (Dvorak, Pearson, et al., 2014). Additionally, this sample was drawn from a particularly relevant population for this

research question (i.e., college students), as college students report high rates of alcohol consumption and risky sexual behaviors. Finally, the use of past-week reports of level of alcohol consumption, drinking motivation, and occurrence of risky sexual behaviors is another strength of the current study, as individuals are more likely to accurately recall and report their level of alcohol consumption, drinking motives, and occurrence of risky sexual behaviors over the past week than over the past month, 6 months, or longer.

The primary limitation of the current study is the homogeneous sample largely comprised of White female college students from a single university. Given that prior research indicates men endorse proportionally more risky sexual behaviors than women (Cooper, 2006; Cooper, 2002; Dvorak et al., 2016; Leigh & Schafer, 1993; Read et al., 2003), stronger associations between alcohol use, drinking motives, and risky sexual behaviors may have been observed among a sample more heavily comprised of men. However, there were no significant gender differences in any of the models examined in the current study. All participants were undergraduate students, limiting generalizability to other populations, such as graduate students or college graduates. Further, all measures were self-report and assessed socially sensitive behaviors, which may have resulted in inaccurately low estimates of alcohol use and risky sexual behaviors (Durant, Carey, & Schroder, 2002). However, the study utilized a confidential Internet survey which may have limited invalid responding (Brener, Billy, & Grady, 2003). Though participants in the current study provided relatively recent (i.e., weekly) retrospective data regarding their level of alcohol use, strength of drinking motives, and risky sexual behaviors on each day, more accurate estimates could be observed if participants were to report these variables daily rather than weekly, which would limit self-report and memory bias. Finally, because participants provided data on drinking episodes for no more than 28 days, a longer measurement



interval may have been more optimal for identifying the associations between drinking motivation, alcohol use, and risky sexual behaviors, especially given that research suggests alcohol use and alcohol-related problems among college students remain stable over time, while variables related to alcohol use (e.g., drinking motivation, alcohol expectancies) are more dynamic (Dvorak, Pearson, et al., 2014; Sher, Wood, Wood, & Raskin, 1996).

The current research, in addition to existing literature, suggests an association between both social and enhancement motives and risky sexual behaviors. However, it is currently unknown which facets of drinking for social and enhancement purposes increase the risk for engaging in risky sexual behaviors. For example, future research should examine if the mechanism driving this relationship is in fact the salience of these motives as hypothesized by the current study, or an alternative explanation, such as drinking for social and enhancement purposes leading drinkers to situations or environments where there are more opportunities to engage in risky sexual behaviors (i.e., drinking in a bar or at a party), or a unique combination of the factors. Further research should also examine similar hypotheses among different populations, such as graduate students or college graduates, given that existing research suggests college graduates may be more likely to drink to cope whereas current college students may be more likely to drink for social or enhancement purposes (Perkins, 1999).

Given the alarming rates of risky sexual behaviors among college students, it is necessary to understand factors associated with their occurrence in order to effectively decrease these behaviors. Negative physical and psychological consequences are often associated with risky sexual behaviors; thus, intervention efforts directly targeted towards this behavior are needed. Further examining the factors that motivate college students to consume alcohol helps clarify the relationship between alcohol use and risky sexual behaviors. Specifically, knowledge that social

and enhancement motives for drinking are associated with engaging in risky sexual behaviors can inform prevention efforts. For example, interventions that are specifically targeted at social and enhancement motives for drinking may be particularly effective in reducing the subsequent occurrence of risky sexual behaviors among college students. These interventions could include intervening at the level of drinking motivation, in addition to challenging social drinking norms on college campuses, providing psychoeducation on the negative consequences associated with these drinking motives, and offering alternative means or more productive ways to achieving positive mood and social interaction. Reducing these behaviors may result in a decrease in the negative physical and psychological health outcomes accompanying risky sex, thus limiting the social, economic, and health costs for the individual and society

## APPENDICES

Appendix A  
Demographics Questionnaire (Screening Survey)

Please answer the following questions related to demographics.

1. What is your current age? \_\_\_\_\_
  
2. What is your gender?    Female            Male
  
3. What is your ethnic group? Select all that apply.
  - Asian/Pacific Islander
  - Black or African American
  - Caucasian/White
  - Hispanic or Latino
  - Middle Eastern/Arab
  - Native American
  - Would rather not say
  - Other: \_\_\_\_\_
  
4. What is your year in school?
  - Freshman
  - Sophomore
  - Junior
  - Senior
  
5. Have you consumed any alcohol (e.g., hard alcohol, wine, beer) within the past month?
  - Yes            No
  
6. Have you had intercourse (i.e., anal or vaginal) during your lifetime?
  - Yes            No

Appendix B  
DDQ (Screening Survey)

*One standard drink = 12 oz. can/bottle of beer, 4 oz. glass of wine, 1.5 oz. hard liquor.*

**INSTRUCTIONS FOR RECORDING DRINKING DURING A TYPICAL WEEK**

IN THE CALENDAR BELOW, PLEASE FILL-IN YOUR DRINKING DURING A **TYPICAL WEEK** IN THE LAST **30 Days**.

First, think of a *typical week* in the last *30 days*. (Where did you live? What were your regular weekly activities? Were you working or going to school? Etc.) Try to remember as accurately as you can, *how much* you typically drank in a week during that one-month period.

For each day of the week in the calendar below, fill in the **number of standard drinks typically consumed on that day** in the box. Please fill in a number for each day. If you do not typically consume any alcohol on that day, or you wish not to respond, please enter a 0.

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of Drinks							

Appendix C  
DDQ (Main Study)

*One standard drink = 12 oz. can/bottle of beer, 4 oz. glass of wine, 1.5 oz. hard liquor.*

**INSTRUCTIONS FOR RECORDING DRINKING ON THE MOST RECENT MONDAY**

IN THE CALENDAR BELOW, PLEASE FILL-IN YOUR DRINKING RATE **ON MONDAY**.

First, think of *the most recent Monday*. (Where do you live? What are your regular Monday activities? Were you working or going to school? Etc.) Try to remember as accurately as you can, *how much* you drank on this particular day of the week.

Fill in the **number of standard drinks consumed on Monday** in the box. Please round up to the nearest whole number.

	<b>Monday</b>
<b>Number of Drinks</b>	

**INSTRUCTIONS FOR RECORDING DRINKING ON THE MOST RECENT SUNDAY**

IN THE CALENDAR BELOW, PLEASE FILL-IN YOUR DRINKING RATE **ON SUNDAY**.

First, think of *the most recent Sunday*. (Where do you live? What are your regular Monday activities? Were you working or going to school? Etc.) Try to remember as accurately as you can, *how much* you drank on this particular day of the week.

Fill in the **number of standard drinks consumed on SUNDAY** in the box. Please round up to the nearest whole number.

	<b>Sunday</b>
<b>Number of Drinks</b>	

**Continue for Saturday, Friday, Thursday, Wednesday, Tuesday...**

Appendix D  
DMQ-R (Screening Phase)

Below is a list of reasons people sometimes give for drinking alcohol. Thinking of all the times you drink, how often would you say that **you** drink for each of the following reasons on a scale of **1 (almost never/never)** to **5 (almost always/always)**?

	Almost never/ never	Some of the time	Half of the time	Most of the time	Almost always/ always
1. To forget your worries					
2. Because your friends pressure you to drink					
3. Because it helps you enjoy a party					
4. Because it helps you when you feel depressed or nervous					
5. To be sociable					
6. To cheer up when you are in a bad mood					
7. Because you like the feeling					
8. So that others won't kid you about <i>not</i> drinking					
9. Because it's exciting					
10. To get high					
11. Because it makes social gatherings more fun					
12. To fit in with a group you like					
13. Because it gives you a pleasant feeling					
14. Because it improves parties and celebrations					
15. Because you feel more self-confident and sure of yourself					
16. To celebrate a special occasion with friends					
17. To forget about your problems					
18. Because it's fun					
19. To be liked					
20. So you won't feel left out					

Appendix E  
DMQ-R (Main Study)

Below is a list of reasons people sometimes give for drinking alcohol. Thinking of the reason(s) you drank on this particular day, how much would you say that **you** were motivated to drink by each of the following reasons on this day on a scale of **1 (not at all)** to **5 (extremely)**?

	Not at all	Barely	Some -what	Mostly	Extremely
1. To forget your worries					
2. Because your friends pressure you to drink					
3. Because it helps you enjoy a party					
4. Because it helps you when you feel depressed or nervous					
5. To be sociable					
6. To cheer up when you are in a bad mood					
7. Because you like the feeling					
8. So that others won't kid you about <i>not</i> drinking					
9. Because it's exciting					
10. To get high					
11. Because it makes social gatherings more fun					
12. To fit in with a group you like					
13. Because it gives you a pleasant feeling					
14. Because it improves parties and celebrations					
15. Because you feel more self-confident and sure of yourself					
16. To celebrate a special occasion with friends					
17. To forget about your problems					
18. Because it's fun					
19. To be liked					
20. So you won't feel left out					



Appendix F  
CARE-R—Risky Sexual Behaviors, Expected Involvement (Screening Phase)

Please complete the following sentence for your own use:

- A.** A regular partner is someone that I have dated for at least \_\_\_\_\_ (**specify number**) weeks. When asked about a regular partner below, please **use this definition**.
- B.** Using a scale of 1 (**not at all likely**) to 7 (**extremely likely**), please rate how likely it is that you will engage in each activity **in the next month**.

*Sexual activity includes any activity involving genital contact (vaginal sex, oral sex, anal sex, genital touching, etc.). Sexual intercourse includes vaginal or anal penetration.*

	Not at all Likely	Moderately Likely	Extremely Likely
<b>1. Sexual activity with:</b>			
... a regular partner (as defined in A)			
... someone I just met or do not know well			
<b>2. Sexual activity without protection against pregnancy with:</b>			
... a regular partner (as defined in A)			
... someone I just met or do not know well			
<b>3. Sexual activity without protection against sexually transmitted diseases with:</b>			
... a regular partner (as defined in A)			
... someone I just met or do not know well			
<b>4. Using condoms for sexual intercourse with:</b>			
... a regular partner (as defined in A)			
... someone I just met or do not know well			
<b>5. Sexual activity while under the influence of alcohol with:</b>			
... a regular partner (as defined in A)			
... someone I just met or do not know well			
<b>6. Sexual activity while under the influence of drugs other than alcohol with:</b>			
... a regular partner (as defined in A)			
... someone I just met or do not know well			
<b>7. Sexual intercourse without a condom with:</b>			
... a regular partner (as defined in A)			
... someone I just met or do not know well			

Using a scale of 1 (**not at all likely**) to 7 (**extremely likely**), please rate how likely it is that you will engage in each activity **in the next month**?

*Sexual activity includes any activity involving genital contact (vaginal sex, oral sex, anal sex, genital touching, etc.). Sexual intercourse includes vaginal or anal penetration.*

	Not at all Likely		Moderately Likely			Extremely Likely	
8. Sexual activity with someone other than my regular partner (as defined in A)							
9. Sexual activity with a NEW partner							
10. Leaving a social event with someone I just met or do not know well							
11. Choosing to abstain from sexual activity due to concerns about pregnancy or sexually transmitted diseases							
12. Sexual activity because partner uses verbal pressure or threats							
13. Sexual activity because partner uses physical force							
14. Being drunk with someone I do not know well							
15. Sexual activity because partner is too aroused to stop							
16. Sexual activity because of partner's continual pressure (e.g., threats to end relationship)							
17. Convincing partner to engage in sexual activity through use of verbal pressure or threats							
18. Convincing partner to engage in sexual activity through use of physical force							
19. Making sexual advances toward a drunk date							
20. Convinced partner to have sexual intercourse because I was too aroused to stop							
21. Convincing partner to engage in sexual activity through continual pressure (e.g., threats to end relationship)							

Appendix G  
CARE-R—Risky Sexual Behaviors, Past Frequency (Main Study)

Please complete the following sentence for your own use:

- A.** A regular partner is someone that I have dated for at least \_\_\_\_\_ **(specify number)** weeks. When asked about a regular partner below, please **use this definition**.
- B.** We would like to know which of the following activities you participated in during this day. Please indicate if you engaged in any of these behaviors either **during your drinking episode or while you were still intoxicated**. Please check as many as apply.

*Sexual activity includes any activity involving genital contact (vaginal sex, oral sex, anal sex, genital touching, etc.). Sexual intercourse includes vaginal or anal penetration.*

I engaged in  
this behavior

1. Sexual activity with:	
... a regular partner (as defined in A)	
... someone I just met or do not know well	
2. Sexual activity without protection against pregnancy with:	
... a regular partner (as defined in A) without intent to become pregnant	
... someone I just met or do not know well	
3. Sexual activity without protection against sexually transmitted diseases with:	
... a regular partner (as defined in A) when a risk of contracting an STI potentially exists	
... someone I just met or do not know well	
4. Sexual activity while under the influence of alcohol with:	
... a regular partner (as defined in A)	
... someone I just met or do not know well	
5. Sexual activity while under the influence of drugs other than alcohol with:	
... a regular partner (as defined in A)	
... someone I just met or do not know well	
6. Sexual intercourse without a condom with:	
... a regular partner (as defined in A)	
... someone I just met or do not know well	

Please indicate if you engaged in any of these behaviors either **during your drinking episode or while you were still intoxicated**. Please check as many as apply.

*Sexual activity includes any activity involving genital contact (vaginal sex, oral sex, anal sex, genital touching, etc.). Sexual intercourse includes vaginal or anal penetration.*

	I engaged in this behavior
7. Sexual activity with someone other than my regular partner (as defined in A)	
8. Left a social event with someone I just met or did not know well	
9. Was drunk with someone I did not know well	
10. Sexual activity because partner used verbal pressure or threats	
11. Sexual activity because partner used physical force	
12. Sexual activity because partner was too aroused to stop	
13. Sexual activity because of partner's continual pressure (e.g., threats to end relationship)	
14. Convinced partner to engage in sexual activity through verbal pressure or threats	
15. Convinced partner to engage in sexual activity through use of physical force	
16. Made sexual advances toward a drunk date	
17. Convinced partner to engage in sexual activity because I was too aroused to stop	
18. Convinced partner to engage in sexual activity through continual pressure (e.g., threats to end relationship)	

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