Published in final edited form as:

Psychol Addict Behav. 2012 December ; 26(4): 782–790. doi:10.1037/a0027840.

Correlates of Alcohol-Related Regretted Sex among College Students

Lindsay M. Orchowski, Ph.D.^{a,c}, Nadine R. Mastroleo, Ph.D.^a, and Brian Borsari, Ph.D.^{a,b}

^aBrown University, Center for Alcohol and Addiction Studies, Providence, RI 02912

^bMental Health and Behavioral Sciences Service, Providence VA Medical Center, Providence, RI 02908

^cThe Warren Alpert Medical School of Brown University, Women and Infants Hospital, Providence RI, 02905

Abstract

The prevalence of alcohol-related regretted sex in college students warrants a better understanding of the characteristics of students who report such experiences. Therefore, the present study examined correlates of regretted sexual experiences involving alcohol use among two specific high-risk college student samples: Students mandated to alcohol intervention ($N = 522$) and volunteer first-year students transitioning to college ($N = 481$). Results indicated that alcohol-related regretted sex occurred in similar rates in mandated and volunteer students, with approximately 25% of the students reporting at least one occurrence in the past month. Women were more likely to report alcohol-related regretted sex compared to men. The belief that alcohol use would result in “liquid courage” was associated with alcohol-related regretted sex among college students, even after accounting for greater alcohol use and problem alcohol use behaviors. These findings have significant implications for intervention efforts and future research.

Keywords

Regretted sex; alcohol use; college students

Alcohol use in college students significantly increases the risk for experiencing a number of sexual consequences (Lewis, Rees, Logan, Kaysen, & Kilmer, 2010; Testa & Parks, 1996; Ullman, Karbatsos, & Koss, 1999). More specifically, alcohol use increases the likelihood that an individual fails to use a condom during sexual activity (Bagnall, Plante, & Warwick, 1990; Cooper, 2002; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994), engages in sexual activity with new partners (Cooper & Orcutt, 1997), or engages in unplanned sexual activity (Wechsler, Dowdall, Maenner, Gledhill-Hoyt, & Lee, 1998). Further, alcohol use is associated with lower sexual assertiveness (Maisto et al., 2004) and increased risk for sexual aggression (Abbey, 2008). Over an academic year, 1 in 20 college women experience rape, and 72% of these assaults occur when the victim was too intoxicated to consent (Mohler-Kuo, Dowdall, Koss, & Wechsler, 2004).

Alcohol use is also associated with sexual regret, a construct defined as a negative emotion involving self-blame (Connolly & Zeelenberg, 2002; Gilovich & Medvec, 1995; Zeelenberg,

Address correspondence to: Brian Borsari, Ph.D., Associate Professor of Behavioral & Social Sciences (Research), Associate Professor of Psychiatry & Human Behavior (Research), Center for Alcohol and Addiction Studies, Warren Alpert Medical School of Brown University, Box G-S121-5, Providence, RI 02912-9001, Office: 1-401-863-6659, FAX: 1-401-863-6697, Brian_Borsari@brown.edu.

1999). Conceptually, regretted sexual experiences are considered to be “regrets of action”, in which regret is related to a behavior the individual feels they *should not have done* and resulted in an undesired outcome (Gilovich & Medvec, 1995; Zeelenberg, van den Bos, van Dijk, & Pieters, 2002). Whereas sexual encounters that last only one night with a brief acquaintance or stranger (e.g., “hookups”) are common among college students (Armstrong, Hamilton, & England, 2010; Paul, McManus, & Hayes, 2000), such experiences are frequently associated with disappointment and regret (Paul & Hayes, 2002). In fact, Eshbaugh and Gute’s (2008) study of sexually active college women indicated that sexual intercourse with a partner only once and engaging in sexual intercourse with someone known for less than 24 hours were predictive of sexual regret. Other common reasons for regretted sexual experiences include engaging in sexual activity with someone they normally would not have desired (Workman, 2001), failure to use a condom (Morojele et al., 2004), or realizing that alcohol influenced the decision to have sex (Oswalt, Cameron, & Koob, 2005). Regarding the prevalence of sexual regret, as many as 194 of 270 (72%) sexually active college students report at least one regretted sexual experience in their lifetime (Oswalt et al., 2005).

Alcohol is a common correlate of regretted sex. Over a relatively short 4-week period, 9% of undergraduates report regretting a sexual experience that occurred after consuming alcohol (Kypri, Paschall, Langley, Cashell-Smith, & Bourdeau, 2009), and 21% of college students report an alcohol-related regretted sexual experiences in the past year (Mallett, Lee, Neighbors, Larimer, & Turrise, 2006). Specifically, individuals who report alcohol-related regretted sex, compared to peers without such an experience, are more likely to engage in high levels of weekly (Mallett, Bachrach, & Turrise, 2008) and monthly drinking (Morojele et al., 2004). Alcohol is also commonly involved in sexual “hookups” (Armstrong et al., 2010; Paul et al., 2000).

To our knowledge, only one study has examined the attitudes and beliefs associated with alcohol-related regretted sex. Specifically, Morojele and colleagues’ (2004) study of South African adults ages 24 to 44 indicated the belief that alcohol enhances sex appeal predicted regretted sexual experiences. Whereas Morojele and colleagues’ (2004) research utilized a single item to assess beliefs regarding the effect of alcohol on sexuality, there are several well-validated assessments that survey several domains of alcohol expectancies (e.g., Fromme, Stroot, & Kaplan, 1993; Ham, Stewart, Norton, & Hope, 2005). Alcohol expectancies are beliefs about the anticipated outcomes of alcohol consumption (Cooper, 1994). Given the individuals who believe alcohol enhances sexuality tend to perceive fewer negative consequences associated with risky behavior when drinking (Dermen, Cooper, & Agocha, 1998; Fromme, D’Amico, & Katz, 1999), it is feasible that alcohol expectancies may play a role in alcohol-related regretted sex among college students. For example, individuals who report that alcohol consumption will enhance their sexuality may use alcohol to pursue sexual partnerships (Kotchick, Shaffer, Forehand, & Miller, 2001), and underestimate the likelihood of encountering an undesired outcome as a result of the experience.

Understanding the characteristics of students who report alcohol-related regretted sex is warranted, given the prevalence of this behavior and the lack of research addressing this phenomenon. Therefore, the purpose of the present study was to explore correlates of regretted sexual experiences that involve alcohol use among two of the most commonly studied high-risk groups on campus, mandated and first-year volunteer college students. We examined four hypotheses based on the existing literature. First, we hypothesized reports of alcohol-related regretted sex would be more common in mandated students, as they had already manifested problem drinking behaviors. Studies of alcohol interventions for college students typically utilize students who are mandated to intervention following an alcohol

policy violation (e.g., Borsari & Carey, 2005; White et al., 2006), or samples of students who volunteer to participate (e.g., Walters & Neighbors, 2005; Turrissi et al., 2009). However, questions remain regarding potential differences between these two populations in the frequency and type of consequences experienced (Barnett & Read, 2005). Second, we hypothesized women would be more likely than men to report engaging in alcohol-related regretted sex. Research has explored whether rates of regretted sex (regardless of alcohol use) vary between men and women (Bonomo et al., 2001; Oswalt et al., 2005; Roese et al., 2006). Studies suggest social norms for acceptable sexual behavior tend to vary by gender (Herold & Mewhinney, 1993) such that men are rewarded for having more sexual partners (Crawford & Popp, 2003), women are more likely to regret engaging in a sexual encounter, and men are more likely to regret not engaging in a sexual encounter (Dickson, Paul, Herbison, & Silva, 1998; Klassen, Williams, & Levitt, 1989; Roese et al., 2006).

We also examined two hypotheses testing theoretical constructs. First, according to Problem Behavior Theory (Jessor & Jessor, 1975), alcohol related problems occur as a result of shared risk factors for other risk behaviors. We therefore predicted that risk for regretted sex after consuming alcohol would be significantly associated with other heavy alcohol use and the experience of other drinking-related problems. Second, alcohol myopia theory (Steele & Josephs, 1990; Taylor & Leonard, 1983) posits that increased alcohol consumption is associated with decreased attention to impelling and inhibiting cues. Thus, when attention is narrowed to the most salient cues following alcohol consumption, behavior may be influenced by intra-individual expectations for sexual enhancement (George & Stoner, 2000). Thus, we hypothesized alcohol expectancies, including expectancies for sexuality (Corbin, Bernat, Calhoun, McNair, & Seals, 2001) and assertiveness or “liquid courage” (see Martin & Hoffman, 1993 for a review) would significantly predict alcohol-related regretted sex.

Method

Study Sample

The current study is a secondary data analysis combining data from two independent studies examining the efficacy of a brief alcohol intervention with college students. Study 1 participants were students from a private, liberal arts college in the Northeast mandated to a brief alcohol intervention following a campus alcohol policy violation. Study 2 participants were first-year voluntary students recruited from the overall first-year student population at a large, public university as they transitioned to college. Data from both studies were collected during baseline assessments conducted prior to randomization to any further intervention procedures. Each study was approved by their institutions' Institutional Review Board, was in compliance with American Psychological Association ethical guidelines, and participants completed an informed consent form before participating.

Study 1: Students Mandated to Alcohol Intervention—Study 1 examined the course of alcohol use in mandated college students following an alcohol policy violation (e.g., alcohol possession, intoxication, property damage, and medical transport for intoxication, etc). Participants were undergraduate students who violated campus alcohol policy at a four-year, private liberal arts university located in the Northeast. Of 982 mandated students invited, 598 (61%) agreed to participate, provided informed consent, and completed a paper-pencil baseline survey. Only data from the baseline assessment were included in the current study and students were paid \$15 for completing the survey.

Study 2: Students Volunteering for Alcohol Research—The purpose of Study 2 was to examine the efficacy of a brief, peer-led alcohol intervention on drinking behaviors

of first-year students as they transition to college (Mastroleo, Turrissi, Carney, Ray, & Larimer, 2010). First semester, first-year students ($N = 947$) were randomly selected through the university database of student information at a large, rural, public Northeastern university. Potential participants were mailed an introductory letter inviting their participation during the first week of the fall academic semester, which included a web-link, a personalized identification number (PIN) and information describing how to access the informed consent form and web-based survey. A total of 481 undergraduate students (50.7%) logged into the survey and completed baseline measures within two weeks of their first semester of classes. Only data from the baseline assessment were included in the current study. Students were paid \$20 for completing the survey.

Measures

Whereas the measures utilized to examine study constructs varied somewhat between Study 1 and Study 2, for the purpose of the current study only the items common to both data sets were utilized.

Alcohol use—Participants in Study 1 and Study 2 completed the same measure of alcohol use. Drinking rates were evaluated using a modified version of the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). The DDQ is a self-report measure of drinking quantity and frequency that has been used extensively with college students (Borsari and Carey, 2000, 2005). The scale has demonstrated reliability and validity in studies of college student alcohol use (Baer, Kivlahan, & Marlatt, 1995).

Alcohol-related problems—Participants in Study 1 completed questions from the Brief Young Adult Alcohol Consequences Questionnaire (B-YAACQ; Kahler, Strong, & Read, 2005). Participants in study 2 completed questions from the Young Adult Alcohol Problems Screening Test (Hurlbut & Sher, 1992). The B-YAACQ is a 24-item measure that was created using a confirmatory factor analysis of a variety of alcohol consequences measures. Dichotomous items (yes/no) are summed for a total number of alcohol-related consequences experienced in the past month. This measure has demonstrated high internal consistency in previous research with college students ($\alpha = .89$; Kahler et al., 2005). The YAAPST is a 27-item questionnaire that assesses lifetime and past-year's frequency of negative consequences of alcohol use among college students. The YAAPST has demonstrated good test-retest reliability (.73, past year) and internal consistency with a coefficient alpha of .83 (past year). Response options ranged on a 10-point scale from "never" to "40 times or more in the past year," but were then dichotomized to a yes/no response. For the current study, 12 items common to both the B-YAACQ and the YAAPST were examined, including one item assessing alcohol-related regretted sex. Alcohol-related regretted sex was surveyed over the past year. Specifically, participants indicated "yes" or "no" in response to the following prompt: "Has drinking ever gotten you into sexual situations which you later regretted?"

Peer alcohol use—Participants in Study 1 and Study 2 completed the same measure of peer alcohol use. The Drinking Norms Rating Form (DNRF; Baer, Stacy, & Larimer, 1991) was used to measure individual perceived norms (descriptive norms) of alcohol use. Participants estimate the typical drinking patterns of important reference groups (i.e., closest friends, typical college students). The current sample was asked about the number of drinks their closest friends have on a typical day, for each day of the week (i.e., Sunday through Saturday). Specifically, the participant was asked to fill in the number of drinks for each day of the week via an open ended response option. An item example includes "What is the number of drinks consumed by the closest friends of your gender on a typical Monday?"

Alcohol expectancies—Participants in Study 1 and Study 2, respectively, completed either the long or short form of the Comprehensive Effects of Alcohol Scale ([CEOA]; Fromme et al., 1993; Ham et al., 2005). The CEOA examines outcome expectancies through items such as, “If I were under the influence from drinking alcohol I would enjoy sex more” Responses are on a 4-point scale ranging from 1 = disagree to 4 = agree. For the purpose of this study, participant’s subjective ratings of alcohol effects were not assessed. The long-form of the CEOA includes 30-items (Fromme et al., 1993). The shortened version of the original CEOA contains 15 items from the original measure (CEOA-S; Ham et al., 2005). For the purpose of the current study, only the 15 items that are present on the long and the short form of the measure were utilized. Given that these resulting items corresponded to the short form of the measure, the CEOA was scored according to guidelines for the CEOA-S. Subscales included: 1) liquid courage; 2) cognitive and behavioral impairment; 3) risk and aggression; 4) tension reduction; 5) self-perception; 6) sexuality; and 7) sociability. Summary scores for the participants’ agreement with expectancies were used in the analyses. The CEOA has been widely used in college populations with good internal consistency reliability (alpha’s range from .59–.89) and acceptable test-retest reliability (e.g., .41–.65 across 3 months; Fromme & D’Amico, 2000).

Analysis Plan

A series of chi-square analyses were conducted to examine whether the frequency of sexual consequences varied as a function of volunteer/mandated status (hypothesis #1) and participant gender (hypothesis #2). Chi-square analyses examining variation in the frequency of consequences between men were conducted separately for each sample. The Bonferroni (1936) correction was applied to control for inflation in family wise error within each series of tests. Then, we conducted a second series of bivariate correlations using a Bonferroni (1936) correction within each series of tests to assess the relationships between various risk factors and regretted alcohol-related sexual experience. Finally, we conducted a hierarchical multivariate logistic regression analysis to examine hypothesis 3 and 4, which posited that risk factor variables (i.e., alcohol use, descriptive norms, alcohol expectancies) would be positively related to alcohol-related regretted sexual experiences, accounting for other alcohol-use problems.

Results

Preliminary Analyses

To ensure that the study sample included only students who reported past alcohol use, only students who identified consuming alcohol and endorsed an alcohol related consequence over the past year were included in the final sample for analyses ($N_{\text{Mandated}} = 522$, $N_{\text{Volunteer}} = 415$). The total combined study sample included 937 participants. The two samples were very similar: Respondents were primarily Caucasian (Mandated = 96.5%; Volunteer = 88.9%), between 18 to 19 years of age ($M_{\text{Mandated}} = 18.7$; $M_{\text{Volunteer}} = 18.1$), and living in residence halls (Mandated = 90%; Volunteer = 99.2%). Students in the mandated sample were primarily first-year students ($n = 360$; 68.9%), followed by sophomores (24%), juniors (7.4%) and seniors (1.5%). All students from the voluntary sample were first-year students. Participants in the mandated group had a higher proportion of male students compared to the voluntary group (Mandated = 66.8%; Volunteer = 47.7%). Mandated students reported drinking significantly more than voluntary students with the average number of total drinks consumed per week in the past month was $M_{\text{Mandated}} = 19.04$ ($SD = 14.56$) and $M_{\text{Volunteer}} = 9.67$ ($SD = 10.55$) ($t(1, 933) = 11.01$, $p < .001$). The mean peak drinking event (most consumed on any one day) in the past month was $M_{\text{Mandated}} = 10.94$ ($SD = 5.46$) and $M_{\text{Volunteer}} = 5.87$ ($SD = 5.04$) ($t(1, 935) = 14.62$, $p < .001$).

Chi-Square Analyses

Gender—The frequency of alcohol-related consequences among men and women in each sample is presented in Table 1. Contrary to our hypothesis, there were no differences between male and female students on the prevalence of alcohol-related regretted sex in either the volunteer sample or the mandated student sample. The only alcohol-related consequence that varied between men and women in the volunteer and mandated students samples was damaging property following drinking, $\chi^2(1, N = 415) = 11.08, p < .004$; $\chi^2(1, N = 522) = 15.04, p < .004$.

Mandated vs. Volunteer Students—Results in Table 2 indicate that, contrary to our prediction, there were no differences in the prevalence of alcohol-related regretted sex between mandated and volunteer students ($\chi^2(1, N = 937) = .245, p = .62$). However, compared to students mandated to intervention, students in the volunteer sample were more likely to feel guilty about their drinking, $\chi^2(1, N = 937) = 27.07, p < .004$; more likely to feel sick to their stomach after drinking, $\chi^2(1, N = 937) = 29.29, p < .004$; less likely to receive a lower grade on an exam or paper because of drinking, $\chi^2(1, N = 937) = 28.81, p < .004$; less likely to black out when drinking, $\chi^2(1, N = 937) = 15.86, p < .004$; and less likely to report the “shakes” after drinking, $\chi^2(1, N = 927) = 10.86, p < .004$.

Univariate Correlations between Risk Factors and Alcohol-Related Regretted Sex

Given the similar presentation of consequences between men and women in each sample, we decided against running gender-specific analyses of the univariate correlates of regretted sex. Likewise, given that rates of alcohol-related regretted sex did not vary between the volunteer and mandated student sample, we decided against running separate analyses of univariate correlates of this consequence among the two samples. As such, a series of correlation analyses were conducted to examine correlates of alcohol-related regretted sex among both men and women in the combined sample of volunteer and mandated students. The correlation coefficients presented in Table 3 indicate that several variables were significantly and positively associated with alcohol-related regretted sex: other problem drinking behaviors as well as alcohol expectancies regarding sexuality, liquid courage, and risk and aggressiveness. Regretted alcohol-related sexual experiences were also positively associated with peer alcohol use, personal alcohol use, and alcohol expectancies regarding sociability.

Multivariate Associations between Risk Factors and Alcohol-Related Regretted Sex

Next, a hierarchical multivariate logistic regression was conducted to examine multivariate associations with alcohol-related regretted sex among both men and women in the combined sample of volunteer and mandated students. To ensure that the study sample included only students who reported past alcohol use, only students who identified consuming alcohol and endorsed an alcohol related consequence over the past year were included in the final sample for analyses ($N = 937$). For the criterion variable of the hierarchical multivariate logistic regression analysis, participants were classified into one of two categories depending on whether or not they reported an alcohol-related regretted sexual experience. In each model, the following demographic variables were entered into the model in the first block: age, gender (1 = male, 2 = female), race (0 = Non-white, 1 = White) and intervention type (1 = Mandated to intervention, 2 = Volunteer). The second block of variables entered into the model consisted of other putative risk factors for alcohol-related sexual consequences, which included: weekly alcohol use, weekly alcohol use among peers, and number of problem drinking behaviors (excluding alcohol-related regretted sex). The third block consisted of alcohol expectancies (i.e., liquid courage, cognitive and behavioral impairment, risk and aggression, tension reduction, self-perception, sexuality, sociability).

Examination of the hierarchical multivariate logistic regression indicated that demographic characteristics entered in block 1 were not associated with alcohol-related regretted sex, $G^2(4, N = 906) = 1.90, p = .75$. Block 2 significantly added to the model, $G^2(5, N = 906) = 211.50, p < .001$. Block 3 did not significantly add to the model, $G^2(7, N = 906) = 9.23, p = .24$, however, the omnibus model was significant, $G^2(16, N = 906) = 222.63, p < .001$, Nagelkerke $R^2 = .32$. In the full model (see Table 4), the following factors were associated with alcohol-related regretted sexual experiences: self-identifying as female, higher weekly alcohol consumption, more alcohol-related problem behaviors, and expecting to have “liquid courage” when drinking alcohol, Wald $X^2(1, N = 906) = 5.68, p < .05$; Wald $X^2(1, N = 906) = 10.26, p < .01$; Wald $X^2(1, N = 906) = 76.08, p < .01$; Wald $X^2(1, N = 906) = 5.68, p < .05$.

Discussion

The results of this study add to the literature on regretted sex in college students in several ways. Of particular note was the high prevalence of alcohol-related regretted sex in college students, with approximately a quarter of the students ($N = 232$) reporting experiencing the behavior in the past month. Some but not all of our hypotheses were confirmed. First, univariate and multivariate analyses suggested that alcohol-related regretted sex did not vary as a function of mandated or volunteer student status as we had expected (hypotheses #1). Second, the multivariate analyses suggested that women were more likely to report alcohol-related regretted sex compared to men (hypothesis #2). Third, alcohol-related regretted sex was associated with greater alcohol use and alcohol-related problems (hypothesis #3). Fourth, multivariate analyses indicated the belief that alcohol use would result in “liquid courage” was associated with alcohol-related regretted sex among college students (hypothesis #4), even after accounting for other factors. More specifically, these data support findings suggesting alcohol may foster sexual risk taking by providing individuals with a “liquid courage” that offsets fear associated with engagement in inappropriate or risky behavior (Stoner, George, Peters, & Norris, 2007). One explanation may be that students who expect to feel more assertive when drinking use alcohol to pursue sexual partnerships, and do not anticipate that they will later regret the encounter.

Gender differences were evident in univariate analyses of individual alcohol-related consequences. Specifically, men were more likely than women to report damaging property after drinking or driving a car after drinking. Although gender did not demonstrate a univariate association with regretted, multivariate analyses indicated that self-identifying as female was significantly associated with alcohol-related sex, even after accounting for alcohol use and problem drinking behaviors. Although it is unclear why women are more likely than men to report alcohol-related regretted sex, there is evidence to suggest that men and women may conceptualize sexual experiences as regretted for different reasons. Broadly, men are generally more willing to engage in casual sexual experiences; whereas women express more caution (Buss & Schmitt, 1993; Hamilton & Armstrong, 2009). College men also report desiring more frequent engagement in sexual intercourse than they are currently experiencing (Baumeister, Catanese, & Vohs, 2001), whereas college women report often responding to sexual advances by needing to set sexual boundaries (McCormick, Brannigan, & LaPlante, 1984; Risman & Schwartz, 2002). These contextual factors may influence how women and men identify alcohol-related regretted sexual experiences. In adolescents (primarily 14 year olds), Wright and colleagues (2000) found that regretting one’s first involvement in sexual intercourse was associated with pressuring one’s sexual partner to comply among boys. In contrast, among girls, regretted sex was associated with higher levels of parental monitoring, exerting pressure, being pressured, and not having planned the experience.

Conceptualizing a sexual experience as regretted may also have different consequences for men, especially among peers. Workman (2001) revealed that college men often describe regretted sexual encounters as foolish sexual choice that would not have otherwise happened unless they were drinking. By excusing the event to be the result of drinking, college men also report that discussing regretted sexual experiences with their peers then serves to promote male bonding (Workman, 2001). In light of these gender differences, it may be useful to discuss these varying definitions of regretted sex in the context of intervention studies as well as when assessing regretted sexual experiences among college students.

The current data may be utilized to inform current intervention approaches with college students. There are now numerous studies documenting efficacious interventions to reduce heavy drinking in young adults (Larimer & Cronce, 2007), and many of these approaches include the provision of feedback regarding alcohol-related consequences (Dimeff, Baer, Kivlahan, & Marlatt, 1999). Data indicated that alcohol-related regretted sex was common among college students, regardless of whether the student was mandated to intervention or volunteered for an intervention study. Generally, when an individual has regret about an action, they focus on the actions they should have evaded in order to maintain their status quo (i.e., "I shouldn't have been drinking"; see Roese, Hur, & Pennington, 1999). As such, alcohol-related regretted sex may be a particularly useful topic for discussion in motivational interventions. Interestingly, college students tend to overestimate the number of drinks they would need to consume in order to be at risk for experiencing regretted alcohol-related sex (Mallett et al., 2006). Although interventions addressing alcohol use have had little specific focus on sexual consequences, interventions that address multiple problem behaviors may be particularly salient. According to Cooper (2002), interventions designed to reduce alcohol consumptions in social and dating situations that may lead to sexual experiences may be especially effective in lowering alcohol-related sexual risk behavior. That said, as mandated students reported more severe consequences than volunteer students (e.g., blacking out, low grades, the shakes), this may shift focus away from sexual-related consequences during interventions with this population. Since sexual experiences are often a sensitive topic for discussion, interventionists may also require special training to confidently and candidly address issues related to sexuality within a structured intervention protocol. To date, there is little understanding of the nature and delivery of this area of intervention. Research focused on the way in which interventionists engage in topics of discussion regarding regretted sexual experiences, and the resulting response of clients may lend important information that can influence training and supervision approaches for efficacious delivery of brief interventions.

Whereas the present data add to the literature in several ways, the study is limited through the use of a primarily Caucasian sample. Further, because the current study combined two sets of study data, the array of assessments common to both studies was limited. Additionally, the overall sample was comprised mainly of first-year students, and Study 2 only included only first-year voluntary students. Findings may not generalize to older college student populations; therefore future studies should examine similar correlates of regretted sex with a wider age range of students. The present study also did not assess how college students appraised alcohol-related regretted sex. The dichotomous nature of assessing regretted sexual experiences may omit vital information that will help us contextualize such events. Since college students do not uniformly perceive all forms of alcohol-related consequences as negative (Mallett et al., 2008), further quantitative and qualitative research is necessary to better understand characteristics associated with college students' conceptualizations of such events. Specifically, future studies would benefit from a more detailed assessment of why college students label an alcohol-related sexual experience as regretted. In addition, the present research did not differentiate between whether or not an alcohol-related regretted sexual experience was consensual, and it is possible that

experiences that are endorsed as regretted alcohol-related sex occurred when an individual was too intoxicated to consent (see Hingson, Hereen, Winter, & Wechsler, 2005). Notably, Oswalt and colleagues (2005) suggest that approximately 28% of college students cite the realization that they did not want the same form of sexual experience as their partner as a reason for a regretted sexual experience, and 23% cite feeling pressured by their partner as a reason for regretted sex. College women also report high rates of sexual victimization (Gidycz, Orchowski, King, & Rich, 2008), and 28.5% of college women report sexual victimization as a result of a man's use of force or incapacitation due to alcohol (Krebs, Lindquist, Warner, Fisher, & Martin, 2009). In addition, ascertaining whether the individual was too intoxicated to give consent will be an important consideration. Since individuals also report consenting to sexual experiences they describe as regretted (Impett & Peplau, 2002; O'Sullivan & Allgeier, 1998; Walker, 1997), questionnaires surveying alcohol-related regretted sex may be improved by ascertaining consent and by also allowing participants to describe why they regret a particular sexual experience.

In sum, alcohol increases risk for experiencing a number of sexual consequences, including regretted sexual encounters. The present data underscore that alcohol-related sexual regret is not uncommon among college students, regardless of whether they report heavy drinking and volunteer for research or are mandated to a formal alcohol intervention. It is important for researchers and health professionals working with college students to acknowledge that students who believe they will have "liquid courage" when consuming alcohol may drink in order to pursue sexual partnerships which may be later regretted. Ideally, refined intervention efforts will be able to prevent such events from occurring or help convert regretted sexual experiences into intrinsic and sustained motivation to avoid future risk.

Acknowledgments

Lindsay Orchowski's contribution to this manuscript was supported by the National Institute on Alcohol Abuse and Alcoholism grant T32 AA07459. Nadine Mastroleo's contribution to this manuscript was supported by the National Institute on Alcohol Abuse and Alcoholism grant F31 AA 017012. Brian Borsari's contribution to this manuscript was supported by National Institute on Alcohol Abuse and Alcoholism Grants R01-AA015518 and R01-AA017874. The contents of this manuscript do not represent the views of the National Institute on Alcohol Abuse and Alcoholism, the Department of Veterans Affairs or the United States Government.

References

- Abbey, A. Harrisburg, PA: VAWnet, a project of the National Resource Center on Domestic Violence/ Pennsylvania Coalition Against Domestic Violence; 2008 Dec. Alcohol and Sexual Violence Perpetration. Retrieved from <http://www.vawnet.org>
- Armstrong EA, Hamilton L, England P. Is hooking up bad for young women? Compared to what?". *Contexts*. 2010; 9:22–27.
- Baer JS, Kivlahan DR, Marlatt GA. High risk drinking across the transition from high school to college. *Alcoholism: Clinical & Experimental Research*. 1995; 19:54–61.
- Baer JS, Stacy A, Larimer M. Biases in the perception of drinking norms among college students. *Journal of Studies on Alcohol*. 1991; 52:580–586. [PubMed: 1758185]
- Bagnall G, Plant M, Warwick W. Alcohol, drugs and AIDS-related risks: Results from a prospective study. *AIDS Care*. 1990; 2:309–317. [PubMed: 2090201]
- Baumeister RF, Catanese KR, Vohs KD. Is there a gender difference in strength of sex drive? Theoretical views, conceptual distinctions, and a review of relevant evidence. *Personality and Social Psychology Review*. 2001; 5:242–273.
- Bonomo Y, Coffey C, Wolfe R, Lynskey M, Bowes G, Patton G. Adverse outcomes of alcohol use in adolescents. *Addiction*. 2001; 96:1485–1496. [PubMed: 11571067]
- Buss DM, Schmitt DP. Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*. 1993; 100:204–232. [PubMed: 8483982]

- Collins R, Parks GA, Marlatt GA. Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology*. 1985; 53:189–200. [PubMed: 3998247]
- Connolly T, Zeelenberg M. Regret in decision making. *Current Directions in Psychological Science*. 2002; 11:212–216.
- Cooper ML. Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*. 1994; 6:117–128.
- Cooper ML. Alcohol use and risky sexual behavior among college students and youth: Evaluating the evidence. *Journal of Studies on Alcohol*. 2002; (Supplement No. 14):101–117.
- Cooper ML, Orcutt HK. Drinking and sexual experience on first dates among adolescents. *Journal of Abnormal Psychology*. 1997; 106:191–202. [PubMed: 9131839]
- Corbin WR, Bernat JA, Calhoun KS, McNair LD, Seals KL. The role of alcohol expectancies and alcohol consumption among sexually victimized and nonvictimized college women. *Journal of Interpersonal Violence*. 2001; 16:297–311.
- Crawford M, Popp D. Sexual double standards: A review and methodological critique of two decades of research. *Journal of Sex Research*. 2003; 40:13–26. [PubMed: 12806528]
- Dermen KH, Cooper ML, Agocha VB. Sex-related alcohol expectancies as moderators of the relationship between alcohol use and risky sex in adolescents. *Journal of Studies on Alcohol*. 1998; 59:71–77.
- Dickson N, Paul C, Herbison P, Silva P. First sexual intercourse: Age, coercion, and later regrets reported by a birth cohort. *British Medical Journal*. 1998; 316:29–33. [PubMed: 9451263]
- Dimeff, LA.; Baer, JS.; Kivlahan, DR.; Marlatt, GA. Brief alcohol screening and intervention for college students: A harm reduction approach. Guilford Press; 1999.
- Eshbaugh EM, Gute G. Hookups and sexual regret among college women. *The Journal of Social Psychology*. 2008; 148:77–89. [PubMed: 18476484]
- Fromme K, D'Amico E. Measuring adolescent alcohol outcome expectancies. *Psychology of Addictive Behaviors*. 2000; 14:206–212. [PubMed: 10860120]
- Fromme K, D'Amico EJ, Katz EC. Intoxicated sexual risk taking: An expectancy or cognitive impairment explanation? *Journal of Studies on Alcohol*. 1999; 6:54–63. [PubMed: 10096309]
- Fromme K, Stroot EA, Kaplan D. Comprehensive effects of alcohol: Development and psychometric assessment of a new expectancy questionnaire. *Psychological Assessment*. 1993; 5:19–26.
- George WH, Stoner SA. Understanding acute alcohol effects on sexual behavior. *Annual Review of Sex Research*. 2000; 11:92–124.
- Gidycz CA, Orchowski LM, King CR, Rich CL. Sexual victimization and health-risk behaviors: A prospective analysis of college women. *Journal of Interpersonal Violence*. 2008; 23:744–763. [PubMed: 18272723]
- Gilovich T, Medvec VH. The experience of regret: What, when, and why. *Psychological Review*. 1995; 102:379–395. [PubMed: 7740094]
- Ham LS, Stewart SH, Norton PJ, Hope DA. Psychometric assessment of the Comprehensive Effects of Alcohol Questionnaire: Comparing a brief version to the original full scale. *Journal of Psychopathology and Behavioral Assessment*. 2005; 27:141–158.
- Hamilton L, Armstrong EA. Gendered sexuality in young adulthood: Double binds and flawed options. *Gender & Society*. 2009; 23:589–616.
- Herold ES, Mewhinney DMK. Gender differences in casual sex and AIDS prevention: A survey of dating bars. *Journal of Sex Research*. 1993; 30:36–42.
- Hingson R, Heeren T, Winter M, Wechsler H. Magnitude of alcohol related mortality and morbidity among U.S. college students ages 18–24: changes from 1998 to 2001. *Annual Review of Public Health*. 2005; 26:259–279.
- Hurlbut SC, Sher KJ. Assessing alcohol problems in college students. *Journal of American College Health*. 1992; 41:49–58. [PubMed: 1460173]
- Impett EA, Peplau LA. Why some women consent to unwanted sex with a dating partner: Insights from attachment theory. *Psychology of Women Quarterly*. 2002; 26:360–370.

- Jessor R, Jessor SL. Adolescent development and the onset of drinking. *Journal of Studies on Alcohol*. 1975; 36:27–51. [PubMed: 238077]
- Kahler CW, Strong DR, Read JP. Toward efficient and comprehensive measurement of the alcohol problems continuum in college students: The brief young adult alcohol consequences questionnaire. *Alcohol Clinical and Experimental Research*. 2005; 29:1180–1189.
- Klassen, AD.; Williams, CJ.; Levitt, EE. *Sex and morality in the U.S.* Middletown, CT: Wesleyan University Press; 1989.
- Kotchick BA, Shaffer A, Forehand R, Miller KS. Adolescent sexual risk behavior: A multi-system perspective. *Clinical Psychology Review*. 2001; 21:493–519. [PubMed: 11413865]
- Krebs CP, Lindquist CH, Warner TD, Fisher BS, Martin SL. College women's experiences with physically forced, alcohol- or other drug-enabled and drug facilitated sexual assault before and since entering college. *Journal of American College Health*. 2009; 57:639–647. [PubMed: 19433402]
- Kypri K, Paschall MJ, Langley J, Cashell-Smith M, Bourdeau B. Drinking and alcohol-related harm among New Zealand university students: Findings from a National web-based survey. *Alcoholism: Clinical and Experimental Research*. 2009; 33:307–314.
- Larimer ME, Cronce JM. Identification, prevention, and treatment revisited: individual-focused college drinking prevention strategies 1999–2006. *Addictive Behaviors*. 2007; 32:2439–2468. [PubMed: 17604915]
- Lewis MA, Rees M, Logan DE, Kaysen DL, Kilmer JR. Use of drinking protective behavioral strategies in association to sex-related alcohol negative consequences: The mediating role of alcohol consumption. *Psychology of Addictive Behaviors*. 2010; 24:229–238. [PubMed: 20565149]
- Maisto SA, Carey MP, Carey KB, Gordon CM, Schum JL, Lynch KG. The relationship between alcohol and individual differences variables on attitudes and behavioral skills relevant to sexual health among heterosexual young adult men. *Archives of Sexual Behavior*. 2004; 33:571–584. [PubMed: 15483371]
- Mallett KA, Bachrach RL, Turrissi R. Are all negative consequences truly negative? Assessing variations among college students' perceptions of alcohol related consequences. *Addictive Behaviors*. 2008; 33:1375–1381. [PubMed: 18639384]
- Mallett KA, Lee CM, Neighbors C, Larimer ME, Turrissi R. Do we learn from our mistakes? An examination of the impact of negative alcohol-related consequences on college students' drinking patterns and perceptions. *Journal of Studies on Alcohol*. 2006; 67:269–276. [PubMed: 16562409]
- Martin CM, Hoffman MA. Alcohol expectancies, living environment, peer influence, and gender: A model of college-student drinking. *Journal of College Student Development*. 1993; 34:206–211.
- Mastroleo NR, Turrissi R, Carney JV, Ray AE, Larimer ME. Examination of posttraining supervision of peer counselors in a motivational enhancement intervention to reduce drinking in a sample of heavy-drinking college students. *Journal of Substance Abuse Treatment*. 2010; 39:289–297. [PubMed: 20673621]
- McCormick NB, Brannigan GG, LaPlante MN. Social desirability in the bedroom: Role of approval motivation in sexual relationships. *Sex Roles*. 1984; 11:303–314.
- Morojele NK, Kachieng'a MA, Nkoko MA, Moshia KM, Mokoko E, Parry CDH, Nkowane AM, Saxena S. Perceived effects of alcohol use on sexual encounters among adults in South Africa. *African Journal of Drug and Alcohol Studies*. 2004; 3:1–20.
- Mohler-Kuo M, Dowdall GW, Koss MP, Wechsler H. Correlates of rape while intoxicated in a national sample of college women. *Journal of Studies on Alcohol*. 2004; 65:37–45. [PubMed: 15000502]
- O'Sullivan LR, Allgeier ER. Feigning sexual desire: Consenting to unwanted sexual activity in heterosexual dating relationships. *Journal of Sex Research*. 1998; 35:234–243.
- Oswalt S, Cameron K, Koob J. Sexual regret in college students. *Archives of Sexual Behavior*. 2005; 34:663–669. [PubMed: 16362250]
- Paul EL, Hayes KA. The casualties of 'casual' sex: A qualitative exploration of the phenomenology of college students' hookups. *Journal of Social and Personal Relationships*. 2002; 19:639–661.

- Paul EL, McManus B, Hayes A. "Hookups": Characteristics and correlates of college students' spontaneous and anonymous sexual experiences. *Journal of Sex Research*. 2000; 37:76–88.
- Risman BJ, Schwartz P. After the sexual revolution: Gender politics in teen dating. *Contexts*. 2002; 1:16–24.
- Roese NJ, Hur T, Pennington GL. Counterfactual thinking and regulatory focus: Implications for action versus inaction and sufficiency versus necessity. *Journal of Personality and Social Psychology*. 1999; 77:1109–1120. [PubMed: 10626366]
- Roese NJ, Pennington GL, Coleman J, Janicki M, Li NP, Kenrick D. Sex differences in regret: All for love or some for lust? *Personality and Social Psychology Bulletin*. 2006; 32:770–780. [PubMed: 16648202]
- Steele CM, Josephs RA. Alcohol myopia: Its prized and dangerous effects. *American Psychologist*. 1990; 45:921–933. [PubMed: 2221564]
- Stoner SA, George WH, Peters LM, Norris J. Liquid courage: Alcohol fosters risky sexual decision-making in individuals with sexual fears. *AIDS Behavior*. 2007; 11:227–237.
- Taylor, SP.; Leonard, KE. Alcohol and human physical aggression. In: Green, RG.; Donnerstein, EJ., editors. *Aggression: Theoretical and empirical reviews: Issues in research*. Vol. 2. New York: Harper Collins; 1983. p. 77-101.
- Testa M, Parks KA. The role of women's alcohol consumption in sexual victimization. *Aggression and Violent Behavior*. 1996; 1:217–234.
- Ullman SE, Karabatsos G, Koss MP. Alcohol and sexual assault in a national sample of college women. *Journal of Interpersonal Violence*. 1999; 14:603–625.
- Walker SJ. When "no" becomes "yes": Why girls and women consent to unwanted sex. *Applied and Preventive Psychology*. 1997; 6:157–166.
- Wechsler H, Davenport A, Dowdall G, Moeykens B, Castillo S. Health and behavioral consequences of binge drinking in college: A national survey of students at 140 campuses. *Journal of the American Medical Association*. 1994; 272:1672–1677. [PubMed: 7966895]
- Wechsler H, Dowdall GW, Maenner G, Gledhill-Hoyt J, Lee H. Changes in binge drinking and related problems among American college students between 1993 and 1997: Results of the Harvard School of Public Health College Alcohol Study. *Journal of American College Health*. 1998; 47:57–68. [PubMed: 9782661]
- Workman T. Finding the meaning of college drinking: An analysis of fraternity drinking stories. *Health Communication*. 2001; 13(4):427–447. [PubMed: 11771805]
- Wright D, Henderson M, Raab G, Abraham C, Buston K, Scott S, Hart G. Extent of regretted sexual intercourse among young teenagers in Scotland: A cross sectional survey. *British Medical Journal*. 2000; 320:1243–1244. [PubMed: 10797033]
- Zeelenberg M, van den Bos K, van Dijk E, Pieters R. The inaction effect in the psychology of regret. *Journal of Personality and Social Psychology*. 2002; 82:314–327. [PubMed: 11902619]
- Zeelenberg M. The use of crying over spilled milk: A note on the rationality and functionality of regret. *Philosophical Psychology*. 1999; 12:325–340.

Table 1

Consequences between Men and Women Within the Volunteer and Mandated Student Samples

	Volunteer Sample (N = 415; 44.3%)		Mandated Sample (N = 522; 55.7%)	
	Male (N = 198) (47.7%)	Female (N = 217) (52.3%)	Male (N = 349) (66.9%)	Female (N = 173) (33.1%)
Damaged property or set off fire alarm	32 (16.2)	13 (6.0)	70 (20.1)	12(6.9)
Driven a car after having too much to drink	32 (16.2)	18 (8.3)	60 (17.2)	18 (25.9)
Neglected to use birth control/STD protection	14 (7.1)	16 (7.4)	17 (4.9)	6 (7.6)
Experienced a headache or hangover	133 (67.2)	146 (67.3)	246 (70.5)	126 (72.8)
Needed a drink in the morning	4 (2.0)	6 (2.8)	9 (2.6)	3 (1.7)
Felt guilty about drinking	47 (23.7)	76 (35.0)	52 (14.9)	29 (16.8)
Felt sick to your stomach or thrown up	126 (63.6)	133 (61.3)	150 (43.0)	83 (48.0)
Become rude, obnoxious or insulting	61 (30.8)	54 (24.9)	81 (23.2)	24 (13.9)
Received a low grade because of drinking	5 (2.5)	7(3.2)	51 (14.6)	15 (8.7)
Regretted sexual situation	43 (21.7)	63 (29.0)	95 (27.2)	31 (17.9)
Blackout	98 (49.5)	87 (40.1)	203 (58.2)	98 (56.6)
Experienced the “shakes”	2 (1.0)	1 (0.5)	18 (5.2)	7 (2.3)

Note: Comparison between male and female respondents where $p < .004$ indicated in **bold**.

Table 2

Consequences between Volunteer and Mandated Students

	Volunteer Sample (<i>N</i> = 415; 44.3%)	Mandated Sample (<i>N</i> = 522; 55.7%)
Damaged property or set off fire alarm	45 (10.8)	82 (15.7)
Driven a car after having too much to drink	50 (12.0)	78 (14.9)
Neglected to use birth control/STD protection	30 (7.2)	23 (4.4)
Experienced a headache or hangover	279 (67.2)	372 (71.3)
Needed a drink in the morning	10 (2.4)	12(2.3)
Felt guilty about drinking	123 (29.6)	81 (15.5)
Felt sick to your stomach or thrown up	259 (62.4)	233 (44.6)
Become rude, obnoxious or insulting	115 (27.7)	105 (20.1)
Received a low grade because of drinking	12 (2.9)	66 (12.6)
Regretted sexual situation	106 (25.5)	126 (24.1)
Blackout	185 (44.6)	301(57.7)
Experienced the “shakes”	3 (0.7)	22 (4.2)

Note: Comparison between samples where $p < .004$ indicated in **bold**.

Table 3

Correlations between Study Variables

	2	3	4	5	6	7	8	9	10	11	12	13
1. Drinks per week	.57**	.50**	.21**	.08	.26**	-.24**	.23**	.25**	-.05	.09**	.26**	.28**
2. Peer Alcohol Use	—	.29**	.15**	.11*	.19**	-.07	.17**	.13**	.01	.05	.20**	.18**
3. Problem Drinking		—	.07	.04	.24**	.06	.27**	.29**	.15**	.02	.37**	.45**
4. Marijuana Use			—	.07	.07	-.01	.07	.08	-.01	.08	.08	.08
5. Amphetamine Use				—	.10*	-.01	.09*	.03	-.01	-.03	.08	.09
6. Exp.—Sexuality					—	.13**	.30**	.24**	.10*	.15**	.35**	.17**
7. Exp.—Self-Perception						—	.11*	-.01	.25**	.02	.31**	.04
8. Exp.—Liquid Courage							—	.35**	.20**	.19**	.56**	.19**
9. Exp.—Sociability								—	.26**	.21**	.37**	.14**
10. Exp.—Cognitive Behavioral Impairment									—	.10*	.34**	.06
11. Exp.—Tension Reduction										—	.01	-.02
12. Exp.—Risk and Aggression											—	.19**
13. Alcohol-Related Regretted Sex												—

Note:

**
 $p < .004$;*
 $p < .01$; $N = 917$ to $N = 937$

Table 4
Multivariate Relationships between Alcohol-Related Regretted Sex and Risk Factor Variables

Risk Factors	B	Wald	OR	95% CI	ΔG	p
<i>Block 1: Demographic Characteristics</i>						
Age	−0.15	1.03	0.86	0.64–1.15	1.90	.310
Gender	0.48	5.68	1.62	1.09–2.40		.017
Race	0.14	0.14	1.15	0.54–2.47		.713
Mandated vs. Volunteer	0.24	1.25	1.27	0.83–1.94		.264
<i>Block 2: Risk Factors</i>						
Drinks per week	0.27	10.26	1.31	1.11–1.54	211.50***	.001
Peer drinks per week	−0.03	0.12	0.97	0.82–1.15		.725
Problem Drinking	0.52	76.08	1.68	1.50–1.89		.0001
Marijuana Use	0.01	1.31	1.01	1.00–1.01		.252
Amphetamine Use	0.38	2.78	1.46	0.94–2.29		.095
<i>Block 3: Expectancies</i>						
Sexuality	0.08	2.14	1.08	0.97–1.20	9.23	.114
Self-Perception	0.03	0.17	1.03	0.91–1.16		.681
Liquid Courage	0.14	5.68	1.15	1.03–1.29		.017
Sociability	0.01	0.01	1.00	0.87–1.16		.965
C–B Impairment	−0.04	0.45	0.96	0.85–1.08		.501
Tension Reduction	−0.05	0.95	0.95	0.86–1.05		.331
Risk – Aggression	−0.06	1.14	0.94	0.85–1.05		.285

Note. OR = odds ratio; CI = confidence interval.

* $p < .05$.

** $p < .01$.

*** $p < .001$.