College Student Drinking: The Role of University Identity, Alcohol Related Problems, and Harm Reduction Strategies

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Abstract

College student drinking is linked to an array of related outcomes, such as missing class or work, problems with the law, and attrition from the university. Due to the high rates of college student drinking on American campuses, it is imperative to identify what drives this phenomenon. Using self-report measures, the present study aimed to identify predictors of alcohol consumption by examining the relationships of positive expectancies, past alcohol problems, university identity, need to belong, and harm reduction strategies to future alcohol use. The study found that identifying with the university and problems related to alcohol predicted increased alcohol use, while skill-based harm reduction strategies negatively predicted alcohol use. Lastly, expectancies and need to belong failed to predict alcohol use, and it was found that the relationship between university identification and alcohol use depends on one's need to belong. Much work remains to be done on why university identification may contribute to drinking, but it is recommended that university officials implement skill-based harm reduction strategy workshops to reduce the amount of student drinking and related consequences.

Key words: college drinking, expectancies, alcohol problems, identity, belonging, alcohol reduction strategies

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College students are more likely to be abuse alcohol than their non-student peers (O'Malley & Johnston, 2002; Slutske, 2005), and many college freshman are drinking beyond the binge threshold, defined as consuming 5 or more standard alcoholic drinks over a 2 hour setting for men, or 4 or more drinks for women (White, Kraus, & Swartzelder, 2006). College student drinking has been linked to an array of issues such as academic impairment, "blacking out", and trouble with the law (Perkins, 2002). Problems that arise from the use of alcohol are associated with increased alcohol use in the future (Carey, 1995), suggesting a persistence to drink despite knowledge of negative consequences. It is thus unsurprising that educational strategies to mitigate the risky drinking patterns of college students have shown little success (Larimer & Cronce, 2002). Considering this, many studies have investigated different motivational constructs that may influence college students' drinking behavior. The current study seeks to further understand the relationship between college student drinking and related variables like expectancies of use, past problems from drinking, harm reduction strategies and peer influence. Due to the relevance and empirical support for these variables' role in alcohol use among college students, I wanted to investigate how each of these uniquely contributes to future alcohol use, and additionally expand upon the role of peer influence. By better identifying predictors of alcohol use among students, university officials can be better equipped to address and reduce the impact of college student alcohol consumption and related problems.

There are different motivating factors for why people may drink alcohol, and expectancy theory posits that alcohol use is reinforced or deterred by particular outcomes elicited from drinking (Jones, Corbin & Fromme, 2001). Whether accurate or not, an expectancy is a future prediction one makes about the outcome of one's behavior, such as the outcomes related to consuming alcohol (e.g., increased sociability, feeling relaxed, acting aggressively). To address the continuum of possible outcomes that may constitute alcohol expectancies, questionnaires have been developed to identify and group the different facets of expectancies. The Brief Comprehensive Effects of Alcohol (B-CEOA), developed by Ham, Stewart, Norton & Hope (2005), groups expectancies into varying subscales with positive or negative valence. Their study found that positive socially-related outcomes were associated with more alcohol use whereas negative self-impairment outcomes were associated with less alcohol use. Furthermore, heavy student drinkers and clinical alcoholics report higher endorsement of global positive expectancies than moderate or light student drinkers in another alcohol expectancy questionnaire (Brown, Goldman, & Christiansen, 1985), underpinning the important role expectancies play in drinking and problem drinking in particular.

Peer influence has long been considered a major influence on college student drinking (*For review, see* Borsari & Carey, 2001). College is a unique environment where there are new freedoms and with that comes new social pressures, such as the pressure to consume alcohol. Indeed, alcohol consumption significantly rises for individuals upon entrance into college (Leibsohn, 1994), which isn't the case for their non-student peers (Johnston, O'Malley, & Bachman, 2000). There are many ways in which peer influence can interact with alcohol consumption. For instance, students often report drinking in

concordance with the group on campus they most identify with (i.e., same-gender, same-race, or Greek status) (Thombs, Wolcott, & Farkash, 1997; Neighbors et al., 2010). This finding could be particularly problematic because students often overestimate other students' alcohol consumption (Perkins, Meilman, Leichliter, Cashin & Presley, 1999). This suggests that alcohol consumption is overall increased if students are (incorrectly) attempting to match their peers' alcohol intake, highlighting the significant role peers play in drinking behavior.

Different aspects of peer influence are well validated in contributing to personal alcohol consumption, but the role of identity in college drinking remains to be fully elucidated. Although there are many different groups and identities students can align themselves with on campus, there also exists a more encompassing identity of being a university student that is available to any student. Other studies have looked at specific group identities that exist on campus, but there is a gap in research examining how one's identity as a "university student" shapes alcohol consumption. It is thus important to parse the different layers of identity that may exist among students to more fully address the role identity plays in college student drinking.

There is minimal research in the literature addressing socially-based constructs that may vary from individual to individual, such as one's need to belong, and how this might influence personal alcohol consumption. Need to belong, or one's desire to be included and emotionally attached to others, is considered to underpin social bonding theory (Baumeister & Leary, 1995). Borsari and Carey (2001) posit that peer influence can affect alcohol consumption indirectly by reinforcing that drinking will lead to social acceptance and recognition. Due to the salient influence of peers in college drinking, the need to belong

may have an important role in alcohol consumption. A study examining this finds that need to belong moderates the relationship between willingness to drink alcohol and perceptions of a friend's alcohol use, such that those with a high need to belong report more willingness to drink if they perceived their friend as a heavier drinker (Litt, Stock & Lewis, 2012). Identity and need to belong both appear to be important factors in shaping one's drinking patterns and suggest that there are differences in the way peer influence can affect individuals' propensity to drink alcohol.

There are many negative consequences related to alcohol use among college students such as damage to self (e.g., hangover), others (e.g., sexual violence), and the institution (e.g., student attrition) (Perkins, 2002; Berkowitz & Perkins, 2010). Models examining alcohol use show positive associations of past alcohol problems to current use (Read, Wood, Kahler, Maddok, & Palfai, 2003), indicating that problematic consequences don't necessarily deter future drinking. It is thus useful for universities to develop strategies to reduce rates of drinking among students to deter these problematic outcomes. Larimer and Cronce's (2002) review of various strategies used by universities to reduce drinking found that personalized interventions and skill based alcohol reduction training (i.e., education on how to moderate alcohol use to reduce certain negative outcomes) are associated with decreased future alcohol use. Skill-based alcohol reduction training involves a mosaic of different strategies to reduce the quantity of alcohol consumed, and these include self-monitoring of drinks consumed, practicing refusals to alcohol offers, and pre-determining the amount of alcohol one will drink. In light of the success of these strategies, it is imperative to investigate the role of skill based alcohol reduction strategies in predicting future drinking behavior in college students.

The Current Study

The current study seeks to expand upon past predictors of alcohol use in college students to further uncover other related constructs that may predict alcohol consumption. Other studies have suggested the important associations of positive expectancies, past problems with alcohol, and lack of alcohol avoidance skills, to increased alcohol use. But there is little research that has directly addressed the relationship of need to belong and university identity to alcohol use. This study seeks to synthesize and validate these different strands of research to better understand the major influences on college student drinking. Once the relevant influences on college student drinking are identified, university officials can work towards developing more comprehensive strategies to reduce problematic college student drinking. To answer these questions, I analyzed data from a prior study on incentive salience of university-related alcohol marketing cues. The study procedures are described in Bartholow et al. (2017) and will be summarized in the methods below. I hypothesized that positive expectancies, past reported problems, need to belong, and university identification would be predictive of alcohol use, and that skill-based harm reduction strategies would predict less alcohol use. Additionally, any possible moderating effects of need to belong on university identification's relationship to alcohol use were examined post-hoc.

Method

Participants

The study data were originally collected by Bartholow et al. (2017). In brief, a mass email was sent to university students' emails eliciting participation in the study in exchange for course credit (if enrolled in an introductory psychology course) or monetary

compensation ($15/hour), and potential participants responded if they were interested. Participants were screened via phone interview for eligibility - only current university students who had drank alcohol in the last year and reported consuming less than 24 drinks per week on average were considered (i.e., to rule out problem drinkers). Additionally, potential participants were deemed ineligible if they had a history of head trauma or were using psychoactive medications (e.g., anti-depressants, mood stabilizers, etc.). Participants were further offered more course credit or monetary compensation ($20) to complete the follow up questionnaires one month later.

Four-hundred and forty-nine undergraduate students (214 male, 234 female; See *Table 1*) from University of Missouri and University of Colorado Boulder participated in the complete study. Participants were predominantly White (86%) and most were 19 years old (M = 19.05, SD = ± 0.99). Almost all participants were not of legal drinking age (98%).

Laboratory Session Measures

Assessment of Alcohol Use. Participant's self reported alcohol use was assessed using three items from the National Institute on Alcohol Abuse and Alcoholism questionnaire (NIAAA, 2003). The three items consist of the following questions: "*During the last 12 months, how often did you usually have any kind of drink containing alcohol?*" (i.e., frequency), "*During the last 12 months, how many alcoholic drinks did you have on a typical day when you drank alcohol?*" (i.e., quantity) and *"During the last 12 months, how often did you have 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period?*" (i.e., binge drinking). A standard drink was defined as "*a 12 ounce can or glass of beer or cooler, a 5 ounce glass of wine, or a drink containing 1 shot of liquor*". These three measures of alcohol consumption, frequency, quantity and binging,

were particularly of interest because they establish typical patterns of consumption. The recommended NIAAA response options were utilized for the study, which are detailed in Appendix A.

Rutgers Alcohol Problem Index (RAPI). The 23-item RAPI (White & Labouvie, 1988) measures an array of problems arising from the use of alcohol. Participants were given a preface of *"Different things happen to people while they are drinking alcohol or because of their alcohol drinking. Several of these things are listed below. Indicate how many times each of these things have happened to you within the past year"* before the administration of the RAPI. The RAPI asks about the frequency of behavioral problems such as "*neglecting responsibility", "missing… school or work",* and getting into "*fights with other people (friends, relatives, strangers)".* The responses were scored on a 4-point scale (0 = none, 1 = 1-2 times, 2 = 3-5 times, and 3 = more than 5 times). The RAPI was then averaged into one score (α = .95 in this sample) for analysis.

Brief Comprehensive Effects of Alcohol (B-CEOA). Fourteen items that measured expectancies from the B-CEOA (Ham et al., 2005) were used to measure participant's expectancy of different outcomes from consuming alcohol.

Fromme's (1993) development of the Comprehensive Effects of Alcohol (CEOA) scale identified seven major subsets of alcohol expectancies: Sociability (Soc), Tension Reduction (TR), Enhanced Sexuality (ES), Liquid Courage (LC), Risk & Aggression (RA), Self Perception (SP) and Behavioral & Cognitive Impairment (BCI). The CEOA has demonstrated positive associations to alcohol use in past research, specifically BCI, Soc, and SP expectancies (Fromme & D'Amico, 2000). A brief version of the CEOA (B-CEOA) was developed by Ham et al. (2005) for more pragmatic data collection in non-clinical settings,

which reduced the seventy-five question CEOA down to fifteen questions. The B-CEOA reduces the number of factors down from seven to four factors that differ on a positive-negative valence. Expectancies of the B-CEOA is associated to alcohol use in homogenous to diverse college samples (Ham, Wang, Kim, & Zamboga, 2012; Kormin, Iwamoto, & Fromme, 2011; Corbin, Morean, & Benedict, 2008).

Ham et al.'s (2005) factor analysis produced a four factor solution that was used for our study, which yielded fair to good internal consistency. The four subscales consisted of Enhanced Sexuality (ES) (α = .51 in this sample), Liquid Courage/Risk & Aggression/Sociability (LC/Ra/Soc) (α = .75), Tension Reduction (TR) (α = .73), and Self Perception/Behavior & Cognitive Impairment (SP/BCI) (α = .58). ES and LC/RA/Soc are considered positive outcomes, while TR and SP/BCI are considered negative outcomes (Ham et al., 2005). After the preface of "*If I was under the influence of alcohol…*", participants were asked to agree or disagree on a 4-point scale (-2 = Disagree, 2 = Agree) on the likelihood of the outcome described. Example outcomes were "*I would enjoy sex more",* "*It would be easier to talk to people", "I would feel calm",* and *"I would feel guilty",* respectively.

University Identification. A 9-item measure of universityidentification (Loersch & Arbuckle, 2013) was administered that measured participant's identification with their respective university of either University of Colorado or University of Missouri. Participants were asked to respond on a 7-point scale (1 = *not all; nothing*, 7 = *very much; alot*) to statements/questions such as *"When I interact with others, I tend to think of myself as a student from my university"* and "*How much does being a student at your university say*

about who you really are?". This measure was averaged into a single measure of University Identification (α = .79 in this sample) for analysis.

Need to Belong. A 10-item item measure of need to belong (Leary, Kelly, Cottrell & Schreindorfer, 2012) assessed participant's need for social inclusion and cohesion with others. Participants were asked to answer on a 5-point scale (-2 = *Strongly Disagree,* 0 = *Neither,* 2 = *Strongly Agree*) to statements such as "*I want other people to accept me"* and "*My feelings are easily hurt when I feel that others do not accept me".* This measure was condensed into a single measure of Need to Belong for analysis (α = .76 in this sample).

Harm Reduction Strategies. A 6-item measure of different skill-based harm reduction strategies while drinking was administered to participant's that was developed by the original researchers, and is detailed in Appendix B. The items assessed participant's likelihood to engage with active, skill-based strategies to mitigate the harms of drinking such as excess intoxication and hangover. Participants were asked on 7-point scale (1 = *not at all,* 7 = *very much*) the likelihood to engage in different strategies such as "*[alternating] alcohol and non-alcoholic drinks*" and "*[keeping] track of the number of drinks [you] consume".* These items were then averaged into an index of Harm Reduction Strategies (α = .70 in this sample) for analysis.

Follow Up Measures

Assessment of Alcohol Use. The same three NIAAA measures were administered thirty days later, except this version specified alcohol use in the one month time period since the laboratory session. The exact questions and responses are detailed in Appendix A.

Procedure

Upon arrival to the laboratory, participants were given informed consent forms and were asked to the sign them before participating in the study. Afterwards, participants filled out a questionnaire that assessed demographics and the above measures. One month after the initial session, an additional follow up questionnaire was emailed to the participants to complete.

Results

Data Analytics Strategy. There were three alcohol measures, as described above, that assessed participant's frequency of drinking, average quantity of drinks consumed in a typical drinking session, and the frequency of binge drinking (i.e., 5 or more drinks in a two hour period for men, or 4 or more for women). These items were assessed at two time points: during the lab session, which asked about alcohol use in the last year; and again one month later, which asked about alcohol use in the 30 day period since the lab session occurred. As a result, there are two data points for each of the alcohol consumption measures. Alcohol expectancies, problems, need to belong, university identity, and other measures were only administered once, in the lab session.

Each question battery administered in the lab session was averaged into one representative score for each participant. These representative scores and alcohol use measures were used in the following analysis. Of particular interest was understanding the predictors of future alcohol use. Thus, multiple regressions were performed using the question battery scores from the lab session to predict scores on the alcohol consumption measures assessed in the follow-up. Further, the alcohol measures from the lab session were considered in the multiple regressions in order to build the best model to predict future alcohol consumption (i.e., controlling for past behavior). Gender is also considered in

the multiple regressions due to the significant differences that are often seen between male and females in alcohol consumption generally (Nolen-Hoeksema, 2004).

Need to belong and university identification were also submitted to a regression to test any interactional effects and their relationship to drinking. Particularly, I examined the moderating role of need to belong on university identification's relationship to alcohol consumption. To test this, I examined the simple effects of low (i.e., one standard deviation below the mean), average, and high (i.e., one standard deviation above the mean) scores of need to belong on university identification's relationship to alcohol consumption measures that demonstrated a significant interaction of need to belong and university identification.

Descriptive Statistics. Participant's average reported alcohol consumption at the time of the laboratory session and the follow up is detailed in *Table 2.* In the lab session, participants reported an average of drinking about once a week (M = 5.32), and in the follow up reported an average of drinking 2 to 3 times per week (M = 4.17). The reported average quantity of drinks consumed in one drinking occasion was 5 to 6 drinks (M = 3.98) at the lab session, and the same at follow up (M = 3.67). Additionally, participants reported an average of binge drinking 2 to 3 days a month (M = 3.80) at the lab session, and an average of 2 to 3 days in the last month at follow up (M = 1.98).

Due to the high number of white participants, race was analyzed as two groups: white and non-white. White participants reported drinking more frequently on average than non-white participants in the lab session, $t(444) = -3.08$, $p < .01$, and in the follow up $t(430) = -3.46$, $p < .01$. Additionally, white participants reported consuming the highest quantity of drinks on average at the lab session, $t(444) = -3.43$, $p < .01$ and in the follow up

$t(430) = -3.20$, $p < .01$. White participants also reported more frequent binge drinking at the follow up, $t(427) = -2.78$, $p < .01$, but there was no significant difference at the lab session.

Age and the alcohol consumption measures from both time points were submitted to a Pearson correlation. Binge drinking frequency at the follow up was negatively correlated with age, $r(431) = -.106$, $p < .05$, suggesting that younger participants were binge drinking more frequently at the follow up than older participants. There were no other significant correlations to age.

There was a main effect of gender on average quantity of drinks consumed, such that men reported drinking more than women at the lab session, $t(446) = 2.36$, $p < .05$, and at the follow up $t(432) = 5.76$, $p < .000$. There was also a main effect of gender on average binge drinking frequency in the follow up, with men reporting binge drinking more than women, $t(429) = 2.43$, $p < .05$.

Average scores for each combined scale are presented in *Table 3*. Overall, participants reported few alcohol-related problems ($M = 0.41$), and were fairly likely to engage in harm reduction strategies ($M = 4.19$). Participants additionally were about neutral on their need to belong ($M = 0.40$), and reported fair identification with their university ($M = 4.43$). Lastly, participants expected more socially related outcomes (LC/RA/Sociability) ($M = 1.25$) from alcohol use and were more neutral on self impairment outcomes (SP/BCI) ($M = 0.08$) and tension reduction (TR) ($M = -0.11$). Participant's least expected enhanced sexuality (ES) ($M = -0.46$) effects from alcohol consumption.

Correlations of Behavioral Measures and Alcohol Use. Alcohol use measures taken at the follow up were submitted to a Pearson's correlation with the RAPI, the four B-CEOA expectancy subscales, university identification, need to belong, and harm reduction

strategies scales (See *Table 4*). ES from the B-CEOA was positively correlated to quantity of alcohol consumed, $r(433) = .16$, $p < .001$, as well as frequency of alcohol consumption, $r(433) = .15$, $p < .01$ and binge drinking frequency, $r(430) = .17$, $p < .001$. University Identification was also positively correlated with binge drinking frequency, $r(430) = .11$, $p < .05$. Harm Reduction Strategies was negatively correlated with quantity of alcohol consumed, $r(433) = -.25$, $p < .001$, frequency of alcohol consumption, $r(433) = -.27$, $p < .001$, and binge drinking frequency, $r(430) = -.27$, $p < .001$.

Predicting Alcohol Use at Follow Up Using Behavioral Measures. A multiple linear regression was conducted to predict quantity of drinks consumed at follow up using the following predictors: problems (RAPI), expectations (B-CEOA), university identification, need to belong, harm reduction strategies, gender and past-year alcohol use (i.e., quantity, frequency, and binge) (see *Table 5*). A significant regression equation was found ($F(12, 420) = 15.14$, $p < .000$) with an R^2 of .282. University identification positively predicted quantity of drinks consumed, b = .165, $t(420) = 2.102$, $p < .05$, while likelihood to engage in skill-based harm reduction strategies negatively predicted quantity of drinks, b = -0.235, $t(420) = -3.202$, $p < .01$. Gender negatively predicted quantity of drinks, b = -.738, $t(420) = -1.098$, $p < .001$, indicating that men consume a higher quantity of drinks.

Another multiple linear regression was conducted to test these same variables' ability to predict frequency of alcohol use (see *Table 6*). A significant regression equation was found ($F(12, 420) = 23.55$, $p < .000$) with an R^2 of .385. The RAPI positively predicted frequency of use, b = .446, $t(420) = 2.446$, $p < .05$ and skill-based harm reduction strategies negatively predicted frequency of use, b = -.174, $t(420) = -3.007$, $p < .01$.

Again, a multiple linear regression was conducted to test these same variables' ability to predict binge drinking frequency (see *Table 7*). A significant regression equation was found ($F(12, 417) = 17.63$, $p < .000$) with an R^2 of .318. The RAPI positively predicted binge drinking, $b = .849$, $t(417) = 4.061$, $p < .001$, whereas skill-based harm reduction strategies negatively predicted binge drinking, $b = -.206$, $t(417) = -3.047$, $p < .01$. Additionally, university identification positively predicted binge drinking, $b = .171$, $t(417) = 2.363$, $p < .05$.

Moderating Role of Need to Belong. Need to belong and university identification were submitted to a multiple regression to test any interactional effects of these variables on alcohol consumption. There was a significant interaction of need to belong and university identity on frequency of alcohol use, $b = .343$, $t(430) = 2.675$, $p < .01$, as well as quantity of alcohol use, $b = .406$, $t(2.709)$, $p < .01$. There was no significant interaction for the binge drinking measure. To test how the relationship between alcohol use (frequency and quantity) and university identification depend on need to belong, the simple effects of low, average, and high need to belong were examined. For participants high on need to belong, there is a positive association of university identification to alcohol use frequency, $b = .245$, $t(430) = 2.325$, $p < .05$ (See *Figure 1*) as well as alcohol quantity, $b = .361$, $t(430) = 2.942$, $p < .01$ (See *Figure 2*). University identification's relationship to frequency of use did not depend on need to belong for average scores of need to belong, $b = .050$, $t(430) = .652$, $p = .51$ or for low scores, $b = -.146$, $t(430) = -1.388$, $p = .17$. Again, university identification's relationship to alcohol quantity did not depend on need to belong for average scores, $b = .130$, $t(430) = 1.476$, $p = .14$, or low scores, $b = -.100$, $t(430) = -.818$, $p = .41$.

Discussion

College student drinking is particularly problematic for universities, with consequences ranging from illegal under-age drinking to student attrition. There are many important factors that have been established to contribute to alcohol use. In particular, it is thought that positive expectancies are related to drinking (Ham et al., 2005), as well as the occurrences of alcohol related problems (Read, Wood, Kahler, Maddok, & Palfai, 2003). Peer influence is also considered a relevant factor in college student drinking (Borsari & Carey, 2001), and there is some evidence for the role of identity and need to belong in relation to alcohol use patterns (Neighbors et al., 2010; Thombs, Wolcott, & Farkash, 1997; Litt, Stock & Lewis, 2012). Additionally, certain harm reduction strategies, such as those focused on more active and skill-based moderation of drinking, have been shown to reduce alcohol consumption among college students (Larimer & Cronce, 2002). In the current study, I synthesized these relevant constructs to comprise a model that assessed the predictors of alcohol consumption. Understanding the underpinning motivators or deterrents of drinking is important in developing strategies aimed at reducing college student drinking and harmful drinking consequences. Using self report measures, participants' scores on various questionnaires were assessed that included: alcohol consumption (at two time points), problems related to drinking (RAPI), expectancies (B-CEOA), need to belong, university identification, and engagement with skill-based harm reduction strategies.

Unsurprisingly, men reported drinking a larger quantity of alcohol than women at both time points, and more frequent binge drinking at the follow up. Additionally, gender was a significant predictor of quantity of drinks consumed at follow up. This is largely

consistent with prior research that shows men in general report more drinking than women (Wilsnack, Vogeltanz, Wilsnack, & Harris, 2000; Nolen-Hoeksema, 2004).

Problematic outcomes resulting from drinking, measured with the RAPI, were predictive of frequency of drinking and binge drinking. These findings are in line with my hypothesis and with previous research suggesting that increased drinking is associated with more alcohol related problems (Read, Wood, Kahler, Maddok, & Palfai, 2003; Wechsler, Lee, Kuo, & Lee, 2010). This also further reinforces that problematic outcomes, such as missing class or experiencing a hangover, aren't sufficient deterrents to drinking alcohol for college students. Universities seeking to reduce drinking behavior among college students thus shouldn't necessarily focus on the problems students report from drinking, as the occurrence of these problems doesn't seem to decrease future drinking. However, these results highlight the priority of identifying strategies that mitigate the consequences and harms of drinking.

Interestingly, the four B-CEOA (expectancies) subscales failed to predict any measure of alcohol consumption in the regression models, which was not consistent with my hypothesis. This is possibly because of the factor structure of the B-CEOA, which questionably lumps together distinguishable constructs such as Sociability with Risk & Aggression. When I submitted the B-CEOA items to my own exploratory factor analysis, it revealed fair to moderate loadings for the suggested factors and some cross loadings. Thus, it's possible that the true influences of expectancies are diluted by a poor factor structure. Further, the utility of expectancy theory in alcohol use has been scrutinized in past research, and there are at times conflicting results of negative versus positive expectancies and their association to alcohol (Leigh, 1989; Jones, Corbin, Fromme, 2001). Other research

has also found that expectancies don't predict future drinking and that other constructs, such as attitudes, are actually better predictors of future use (Burden, Maisto, 2000). Likewise, universities should shy away from strategies aimed at challenging and changing expectancies of alcohol outcomes due to mixed success of this strategy (Larimer & Cronce, 2002). In light of these findings, universities shouldn't prioritize methods that are focused on changing alcohol expectancies due to the uncertain role they play in future drinking behavior and the mixed success of this strategy.

Alignment with the university student identity predicted future binge drinking frequency and quantity of drinks consumed. This was in line with my hypothesis that more identification with the university would predict future drinking. Past research has established the associations with specific identities that exist on campus, such as Greek status and gender, and their role in college student drinking (Neighbors et al., 2010). However, these results provide evidence for the role of a broader identity (i.e., alignment with the university student identity) and its' role in alcohol consumption. In tandem with past findings that peer drinking norms predict one's own drinking (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007), and that university students drink more than non-students (Johnston, O'Malley, & Bachman, 2000), it makes sense that students who see themselves distinctly as college students will have a higher propensity to drink. Breaking down and understanding what it means to be a university student, and why this contributes to drinking, will be an important first step for university officials to address how identity contributes to future drinking.

Need to belong failed to predict any measure of alcohol consumption and no significant correlations were found either, which contradicts my hypothesis that higher

need to belong scores would predict future drinking. These findings suggest that one's need to belong with people does not play a direct role in college student drinking. This is possibly due to past findings that suggest need to belong moderates the effect of norms on drinking (Litt, Stock, & Lewis, 2012) rather than uniquely predicting drinking. Because of this, I tested the moderating role of need to belong on university identification and alcohol consumption. The results demonstrated that the relationship between university identification and alcohol use depends on one's need to belong. In particular, university identification is more positively associated to alcohol quantity and frequency of use for those who are high on need to belong. These results further provide support for the moderating effects that need to belong exerts on variables directly related to alcohol consumption. University officials should not completely ignore the role of social bonding factors like need to belong in developing strategies to reduce drinking, but should focus on the broader role of peer influence in general.

The study also tested the efficacy of skill based harm reduction strategies and their relationship to alcohol consumption. Across all three regressions predicting either quantity of alcohol, frequency of consumption, and binge drinking frequency, one's likelihood to engage with skill-based harm reduction strategies negatively predicted future alcohol consumption. This provides further evidence for the utility of these types of strategies to reduce student drinking. Younger populations, like college students, have less experience with developing strategies to reduce the impact of alcohol (Saunders & Baily, 2003). Because of this, university officials need to work with students to aid in the development of useful strategies that will not only help the student, but the university as well. Universities should thus focus on these skill-based strategies that involve tracking the number of drinks

one consumes and alternating alcoholic and non-alcohol drinks. Additionally, students that continue to drink problematically and encounter alcohol related issues should be singled out for individualized intervention strategies, which have proven useful in past research in reducing drinking for high risk drinkers (Walters & Neighbors, 2005).

There were several limitations to my study that should be addressed. The B-CEOA's factor structure was only fairly supported in our analysis, which possibly obscured the predictive utility of positive expectancies that are often seen as predictors of alcohol consumption. In addition, it is thought that certain alcohol outcome expectancies hold different value for different drinkers, and that the valuation of the expectancy is more predictive than assessing expectancies in general (Leigh, 1989). Merely assessing what someone expects from drinking alcohol neglects to address if this expectancy is sought out or avoided. Furthermore, almost all of our participants were underage drinkers, and it's uncertain how the act of illegal drinking may influence alcohol consumption itself. Lastly, the data from the study were collected from two separate universities, and university location was not accounted for in the analysis due to the goal of addressing college student drinking generally. However, it's possible that the separate universities foster different perceptions of college student identity that may be distinct from one another, and that this should be accounted for in future research aggregating data from multiple universities when examining university identity.

Future studies should investigate what exactly it is about identifying as a university student that predicts future drinking, and what aspects of university student culture propagate increased drinking. Additionally, future studies should taken into account the evaluations of certain expectancies in order to gain a fuller picture of the role expectancies

play in drinking. Lastly, the role of need to belong should be examined in other alcohol contexts that center around peer influence; one suggestion is examining the moderating or direct relationship of need to belong in one's propensity to play alcohol drinking games.

In all, the study demonstrated the utility of skill based harm reduction strategies and their relationship to decreased future alcohol use. Additionally, the study showed that problems related to drinking is an important predictor of future alcohol use. Different facets of peer influence were investigated in my study as well. Aligning oneself with the college student identity is predictive of future alcohol use, but it remains uncertain what part of this identity drives alcohol use. Need to belong didn't appear relevant in any direct association to alcohol consumption, but played a moderating role in university identification's relationship to alcohol use. Lastly, the role of expectancies was not an important predictor of future alcohol use, and should continue to be investigated to further uncover what utility it may have in predicting college student drinking. Ultimately, university officials should implement skill-based alcohol reduction strategy workshops for incoming freshman to mitigate the problematic consequences of excess student drinking and to attempt to reduce overall alcohol consumption on campuses.

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Tables

Table 1. Participant Demographics

Gender (*n* = 448, *missing* = 1)	
Males	214 (48%)
Females	234 (52%)
Age (*n* = 448, *missing = 1*)	**M** = 19.05
	SD = ± 0.99
Race (*n* = 446, *missing* = 3)	
White	86%
Black/African American	5.3%
Multiracial	4.7%
Asian	2%
Other	1.7%

Table 2. Participant's Average Reported Alcohol Use During Study and Follow Up

	Mean (Std. Dev.)	
Measure	**Lab Session**	**Follow Up[1]**
Frequency of Consumption	5.32 (± 1.37)	4.18 (± 1.34)
Quantity of Alcohol	3.98 (± 1.26)	3.67 (± 1.57)
Binge Drinking Frequency	3.80 (± 1.80)	1.98 (± 1.49)

1 The lab session and follow up used different scales for measuring frequency of drinking and binge drinking frequency; The full response options are detailed in Appendix A.

Table 3. Descriptive Statistics for Variables

Measure	Mean (Std. Dev.)
Problems (RAPI)	0.41 (± 0.34)
Expectations (B-CEOA)	
ES	-0.46 (± 1.00)
LC/RA/Soc	1.25 (± 0.68)
SP/BCI	0.08 (± 0.82)
TR	-0.11 (± 1.16)
University Identification	4.43 (± 0.86)
Need to Belong	0.40 (± 0.57)
Harm Reduction Strategies	4.19 (± 0.95)

Table Note: ES = Enhanced Sexuality, LC/RA/Soc = Liquid Courage/Risk & Aggression/Sociability, SP/BCI = Self Perception/Behavioral & Cognitive Impairment, TR = Tension Reduction

Table 4. Correlations of Each Variable and Follow Up Alcohol Measures

Variable	1	2	3	4	5	6	7	8	9	10
1. **Problems (RAPI)**	-									
2. B-CEOA – ES	0.347***	-								
3. B-CEOA – LC/RA/Soc	0.249***	0.356***	-							
4. B-CEOA – SP/BCI	0.195***	0.247***	0.318***	-						
5. B-CEOA – TR	0.001	0.088	0.095*	0.003	-					
6. University Identification	0.127**	0.148**	0.071	0.037	0.027	-				
7. Need to Belong	0.185***	0.028	0.206***	0.165***	-0.082	0.149**	-			
8. Harm Reduction Strategies	-0.294***	-0.197***	-0.194***	-0.010	0.066	0.066	-0.091	-		
9. Quantity of Alcohol	0.241***	0.160***	0.109	-0.061	0.014	0.067	-0.009	-0.247***	-	
10. Frequency of Alcohol Consumption	0.340***	0.151**	0.092	-0.088	-0.034	0.031	0.004	-0.265***	0.491***	-
11. Binge Drinking Frequency	0.377***	0.173***	0.140	-0.041	-0.017	0.113*	-0.011	-0.270***	0.665***	0.649***

Table Note: *** p < .001, ** p < .01 , * p < .05. ES = Enhanced Sexuality, LC/RA/Soc = Liquid Courage/Risk & Aggression/Sociability, SP/BCI = Self Perception/Behavioral & Cognitive Impairment, TR = Tension Reduction

Table 5. Multiple Regression Predicting Quantity of Alcohol Use at Follow Up

	Estimate	Standard Error	t-value
Problems (RAPI)	0.282	0.226	1.250
Expectations (B-CEOA)			
ES	0.005	0.076	0.061
LC/RA/Soc	0.080	0.107	0.750
SP/BCI	-0.048	0.087	-0.533
TR	-0.037	0.057	-0.652
University Identification	0.165	0.079	2.102*
Need to Belong	-0.053	0.120	-0.437
Harm Reduction Strategies	-0.235	0.073	-3.202**
Gender	-0.783	0.137	-5.737***
Quantity of Alcohol – Lab	0.335	0.063	5.345***
Frequency of Alcohol – Lab	0.182	0.065	2.780**
Binge Drinking Frequency - Lab	0.009	0.047	0.184

Table Note: *** p < .001, ** p < .01 , * p < .05. ES = Enhanced Sexuality, LC/RA/Soc = Liquid Courage/Risk & Aggression/Sociability, SP/BCI = Self Perception/Behavioral & Cognitive Impairment, TR = Tension Reduction

Table 6. Multiple Regression Predicting Frequency of Alcohol Use at Follow Up

	Estimate	Standard Error	t-value
Problems (RAPI)	0.446	0.178	2.446*
Expectations (B-CEOA)			
ES	0.007	0.060	0.117
LC/RA/Soc	0.073	0.085	0.862
SP/BCI	-0.096	0.067	-1.397
TR	-0.072	0.045	-1.614
University Identification	-0.037	0.062	-0.575
Need to Belong	-0.001	0.095	0.014
Harm Reduction Strategies	-0.174	0.058	-3.007**
Gender	-0.118	0.108	-1.098
Quantity of Alcohol – Lab	0.016	0.050	0.332
Frequency of Alcohol – Lab	0.429	0.052	8.318***
Binge Drinking Frequency - Lab	0.096	0.037	2.564*

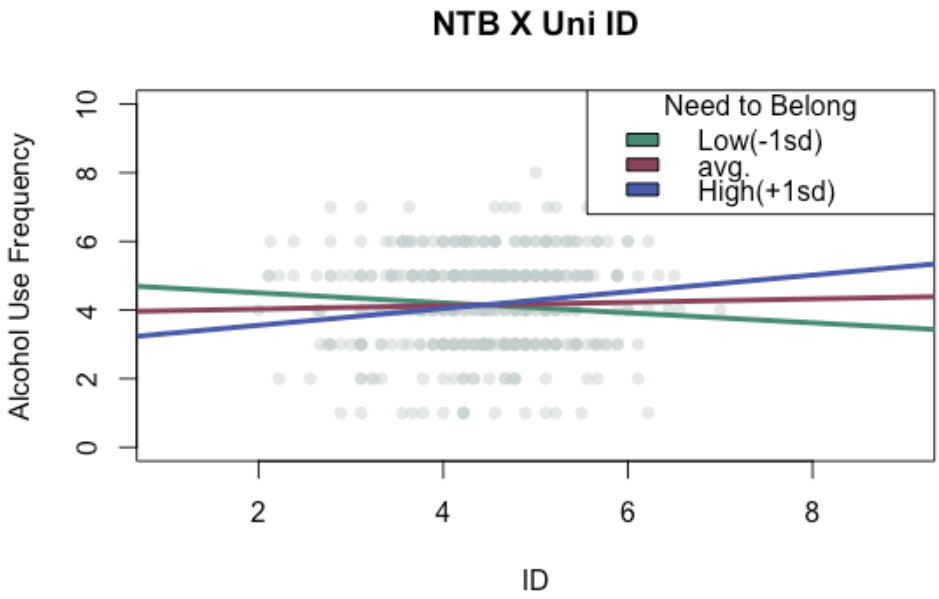
Table Note: *** p < .001, ** p < .01 , * p < .05. ES = Enhanced Sexuality, LC/RA/Soc = Liquid Courage/Risk & Aggression/Sociability, SP/BCI = Self Perception/Behavioral & Cognitive Impairment, TR = Tension Reduction

Table 7. Multiple Regression Predicting Binge Drinking Frequency at Follow Up

	Estimate	Standard Error	t-value
Problems (RAPI)	0.849	0.209	4.061***
Expectations (B-CEOA)			
ES	-0.055	0.070	-0.785
LC/RA/Soc	0.122	0.099	1.230
SP/BCI	-0.085	0.080	-1.060
TR	-0.060	0.052	-1.148
University Identification	0.171	0.072	2.363*
Need to Belong	-0.133	0.110	-1.202
Harm Reduction Strategies	-0.206	0.067	-3.047**
Gender	-0.366	0.126	-2.908**
Quantity of Alcohol – Lab	0.147	0.058	2.549*
Frequency of Alcohol – Lab	0.151	0.060	2.501*
Binge Drinking Frequency - Lab	0.168	0.044	3.842***

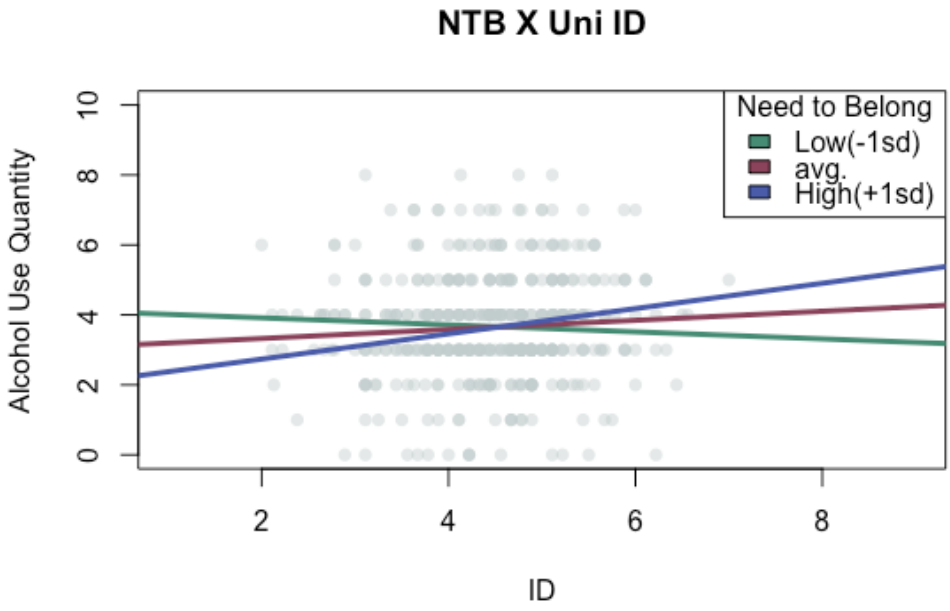
Table Note: *** p < .001, ** p < .01 , * p < .05. ES = Enhanced Sexuality, LC/RA/Soc = Liquid Courage/Risk & Aggression/Sociability, SP/BCI = Self Perception/Behavioral & Cognitive Impairment, TR = Tension Reduction

Figure 1. Moderating Role of Need to Belong on University Identification's Relationship to Frequency of Alcohol Use.



Note: Relationship between frequency of alcohol use and university identification only depended on need to belong for high scores of need to belong, b = .245, $t(430) = 2.325$, p < .05. NTB = Need to Belong, ID = University Identification.

Figure 2. Moderating Role of Need to Belong on University Identification's Relationship to Quantity of Alcohol.



Note: Relationship between alcohol use quantity and university identification only depended on need to belong for high scores of need to belong, b = .361, $t(430) = 2.942$, $p < .01$. NTB = Need to Belong, ID = University Identification.

Appendix A

The following items were assessed during the lab session and the follow up to measure alcohol consumption (i.e., frequency of consumption, average quantity consumed, binge drinking frequency).

Lab Session:

1. During the last 12 months, how often did you usually have any kind of drink containing alcohol? By a drink we mean a 12 ounce can or glass of beer or cooler, a 5 ounce glass of wine, or a drink containing 1 shot of liquor.

Responses:
Every Day = 9
5 to 6 times a week = 8
3 to 4 times a week 7
Once a week = 5
2 to 3 times a month = 4
Once a month = 3
3 to 11 times in a year = 2
1 or 2 times in the past year = 1

2. During the last 12 months, how many alcoholic drinks did you have on a typical day when you drank alcohol?

Responses:
25 or more drinks = 10
19 to 24 drinks = 9
16 to 18 drinks = 8
12 to 15 drinks = 7
9 to 11 drinks = 6
7 to 8 drinks = 5
5 to 6 drinks = 4
3 to 4 drinks = 3
2 drinks = 1
1 drink = 1

3. During the last 12 months, how often did you have 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period? [That would be the equivalence of at least 5 (4) 12-ounce cans or bottles of beer, 5 (4) five ounce glasses of wine, 5 (4) drinks each containing one shot of liquor or spirits].

Responses:
Every day = 9
5 to 6 days a week = 8
3 to 4 days a week = 7
Two days a week = 6
One day a week = 5
2 to 3 days a month = 4
Once a month = 3
3 to 11 days in the past year = 2
1 or 2 days in the past year = 1

Follow Up

1. Since the laboratory session about a month ago, how often did you usually have any kind of drink containing alcohol? By a drink we mean a 12 ounce can or glass of beer or cooler, a 5 ounce glass of wine, or a drink containing 1 shot of liquor.

Responses:
Every day = 8
5 to 6 times a week = 7
3 to 4 times a week = 6
Twice a week = 5
Once a week = 4
2 to 3 times = 3
1 time = 2
I did not drink any alcohol in the past month = 1

2. Since the laboratory session about a month ago, how many alcoholic drinks did you have on a typical day when you drank alcohol?

Responses:
25 or more drinks = 10
19 to 24 drinks = 9
16 to 18 drinks = 8
12 to 15 drinks = 7
9 to 11 drinks = 6
7 to 8 drinks = 5
5 to 6 drinks = 4
3 to 4 drinks = 3
2 drinks = 2
1 drink = 1

3. Since the laboratory session about a month ago, how often did you have 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period? [That would be the equivalence of at least 5 (4) 12-ounce cans or bottles of beer, 5 (4) five ounce glasses of wine, 5 (4) drinks each containing once shot of liquor or spirits].

Responses:
Every day = 7
5 to 6 days a week = 6
3 to 4 days a week = 5
Two days a week = 4
One day a week = 3
2 to 3 days = 2
1 day = 1
I did not have 5 or more/4 or more drinks containing alcohol within a 2-hour period in the past month = 0

Appendix B

The following questions were used to assess participant's likelihood to engage in alcohol harm reduction strategies.

1. How likely are you to use a partying "buddy system" in which you and a friend keep track of one another during a party, helping each other avoid risky situations?
2. How likely are you to purposefully keep track of the total number of drinks you consume during a drinking session?
3. How likely are you to decide the approximate time when you'll come home before going out on a socializing or "party" night?
4. How likely are you to choose a designated driver before going out?
5. How likely are you to carry a condom with you while drinking?
6. How likely are you to alternate alcoholic and non-alcoholic drinks?

Responses:

1 = Not at all
2
3
4
5
6
7 = Very Much