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Effects of Presenting Normative Alcohol Data on Perceptions of College Drinking Behavior

by

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DISSERTATION

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Abstract

Alcohol abuse, often in the form of binge drinking, is a problem that every college campus faces. Many researchers suggest that students believe that their peers drink more alcohol than is actually true, and use such a perception as a justification to drink more alcohol than should be consumed (Perkins, Haines, & Rice, 2005). The purpose of this study is to understand whether presenting normative information on drinking behavior among college students in two different ways (focus on heavy drinking or focus on abstinence) has an effect on the perceptions of drinking behavior.

Keywords: misperceptions, alcohol abuse, college drinking, social influence

Effects of Presenting Normative Alcohol Data on Perceptions of College Drinking Behaviors

Introduction

Varying images of college students drinking are prevalent in popular media today, with one of the most common images being students drinking excessive amounts of alcohol in a party atmosphere. Films such as *Animal House, Road Trip, Old School,* and *Neighbors* depict binge drinking. Binge drinking is defined as a single drinking session in which males consume five or more drinks and females consume four or more drinks (Jung, 2003). The excessive drinking portrayed in these films, as though it is a normal element of the college landscape, gives some students the impression and misperception that excessive drinking is the national norm.

Binge drinking, along with other types of alcohol abuse, comes with a wide array of associated negative consequences (Hingson, Heeren, Winter, & Wechsler, 2005; Wechsler, Lee, Kuo, & Lee, 2000). The misuse of alcohol on college campuses is a significant problem best viewed within a social context (Hingson & White, 2012; Turrisi & Mallet, 2010). Many students think the majority of their peers drink large quantities of alcohol on a regular basis (Perkins, 1997). Such misperception of drinking norms are thought to increase the prevalence of drinking amongst college students who ascribe to this belief (Perkins, Haines, & Rice, 2005). Correcting student misperceptions of drinking norms, through information and education, is thought to promulgate a decline in student drinking rates (Jung, 2003). The Literature Review that follows first explores the prevalence of alcohol abuse on college campuses and the effects of alcohol abuse on students, their peers, and their universities. The literature review then discusses the different misperceptions that students have about social norms and some of the steps universities are taking to correct these norms.

College Alcohol Abuse and Its Effects

A survey conducted by the Harvard University School of Public Health, called the *College Alcohol Survey*, found that 44% of students reportedly engaged in either binge drinking or heavy episodic drinking at least once (Weschler & Nelson, 2008). This problem drinking has numerous potential repercussions, and universities are constantly seeking to reduce the incidence of this behavior. These consequences pose both physical and emotional risks to students that drink, including poor academic performance, date rape, suicide, property damage, physical injuries, damaged relationships, legal problems, and death (Perkins, 1997).

Research shows that students who drank heavily during their college years, in volume and over time, later display drinking problems after college (Rohsenow et al., 2012). Even the consumption of small amounts of alcohol has been associated with difficulties, such as decreased academic performance, slower cognitive processing, strained social relationships, and strained familial relationships (Gruenewald, Johnson, Ponicki, & LaScala, 2010).

Additionally, alcohol abuse has an impact on the abuser's friends and the university the student attends. College drinking can negatively impact campus and student safety and student productivity (Cyders, Flory, Rainer, & Smith, 2009). Universities with high rates of alcohol abuse struggle with political and public relations problems in the media sphere. The general public is largely negative when considering the factor of excessive college student drinking and this leads to the public having negative perceptions of college students (Jung, 2003). One element that potentially adds to the high rate of alcohol abuse amongst university campuses is that students have significant misperceptions about social drinking norms, overestimating what is statistically typical drinking behavior amongst their peers. These are discussed in the next section.

Misperceptions of Drinking Norms

Perkins (1997) found that existing research pertaining to alcohol and drug abuse amongst college students commonly lacks a realistic foundation. In their study of 15 colleges and universities (with a total participating population of 4,258 students), Perkins and Craig (2006) found extensive misperceptions related to peer drinking norms. Students had a tendency to overestimate the amount of alcohol actually consumed. Additionally, the amount or personal quantity of alcohol consumed was largely misunderstood. Hingson and White (2012) noted that many college students have inaccurate perceptions and understandings related to both the drinking behavior of their peers and the consequences that follow heavy drinking. Students do not realize the impact their drinking has on other students and the world around them. Students who assume their peers are consuming large quantities of alcohol are more likely to increase their own consumption to "fit in" (Hingson & White, 2012). With the multitude of alcohol-related problems present at universities all over the world, there is a great demand for effective and feasible interventions that can help clarify these misperceptions with the goal of reducing problematic drinking behavior.

Many studies have been conducted on the impact of various interventions, although consistency is lacking. Education programs produced inconsistent changes in behavior, indicating that the variable of peer influence was not being effectively addressed (Perkins, 1997). Even prior to their entry into college, youths generally hold incorrect assumptions about their peers' use of drugs and alcohol, often overestimating their rates of consumption (Juvonen, Martino, Ellickson, & Longshore, 2007). When students misperceive the level of drinking among their peers in turn leading to an increase in consumption, the consequences become more severe (Perkins, 2012).

Perkins (2012) found that individuals misjudge their own drinking behaviors by assuming they are engaging in typical, average college drinking behavior. Thus, individuals who are heavy drinkers may misperceive high rates of peer drinking and assume their own behavior is not abnormal, nor are the difficulties they encounter (Perkins, 2012).

Misperceptions related to proximal reference groups influence drinking behavior more so than do misperceptions of distal reference groups (Borsari & Carey, 2003; Lewis & Neighbors, 2006). The group itself also influences its members' perception of peer drinking. For example, members of Greek organizations on college campuses have higher rates of drinking than do their peers. Because of this, members of Greek organizations generally overestimate the drinking of their peers within their organization (Baer, 1994). This correlation is present within non-Greek members as well; groups of students that socialize and live together tend to have similar misperceptions related to the levels of peer drinking (Bourgeois & Bowen, 2001). Without clarifying information about their abnormal drinking habits, these students are at a greater risk of continuing their problematic drinking throughout college and after college.

Peer influence. Peer influence has a significant effect on drinking behavior of college students and the application of *attribution theory* and *peer socialization theory* are relevant to issues of substance abuse (Perkins, 1997). Attribution theory and peer socialization theory are discussed in detail below. In a study of 76,145 college students, Perkins et al. (2005) discovered that students consistently communicated exaggerated perceptions of school drinking norms no matter what the actual norm is. Students often hold misperceptions related to their peers' drinking rates, creating a sense that heavy drinking is the norm within a given environment, thereby reducing barriers to participating in such behavior because the perception is that it is both acceptable and common (Perkins, 1997). Social influences are some of the strongest and

most consistent predictors of heavy drinking in college, while misperceptions also significantly influence behavior (Borsari & Carey, 2003; Perkins, 2002; Perkins & Berkowitz, 1986).

Pluralistic ignorance. The term *pluralistic ignorance* refers to a condition that may exert a particularly negative impact. Under pluralistic ignorance, there are conditions in which individuals perceive it acceptable to remain ignorant (Hendricks, 2010). Pluralistic ignorance, in regard to peer-to-peer relationships, occurs when a majority of individuals assume that most of their peers behave or think in a particular way. When peers have gathered together, the *degree of influence* significantly increases due to the fact that members of a group tend not to discuss their perspectives and ultimate concerns when in a large group. The underlying reasons for these individuals' behavior are: (a) a worry that they may be seen as different, or (b) an assumption that they are the same. In either situation, the behavior of the individual is significantly influenced by the assumptions, beliefs, and behaviors of the peer group (Grant, O'Neil, & Stephens, 2009). This concept is highly relevant to college alcohol use and abuse because students who engage in harmful alcohol consumption behavior are less likely to question their actions or voice personal concerns about their behavior, thus perpetuating the problematic drinking. It is easier to "fit in" and "tow the line" than to be seen as an outsider and possibly be bullied for being different.

Attribution theory. The *attribution theory* states that when students attribute a particular behavior to their peers, it becomes more acceptable to them. Individuals tend to make strong and confident dispositional inferences when observing persons acting under conditions of high choice (Jones & Davis, 1965). Perkins (1997) applied attribution theory in an effort to explain the drinking behavior of college students. This theory illustrates the impact that perceptions have on behavior and choice. Young people, in particular, are more likely to adopt peer attitudes and

behaviors, even on college and university campuses where students are encouraged toward individuality (Perkins, 1997). With the prevalent misperceptions about student drinking behavior, attribution theory states that students will continue to drink in excess if these misperceptions aren't clarified. If a student thinks his peers are drinking in excess, the student has a greater chance of drinking in excess.

Research findings indicate that drug and alcohol use among adolescents is greatly influenced by peer behavior. During the adolescent and young adult years, peer influence is stronger than both parental influence and sibling influence combined. The use of drugs and alcohol, as well as behaviors related to their use, is particularly susceptible to peer influence. The perceived norm among peers is influential on the behavior of the individual and, in relation to alcohol, is an important determinant of the level of consumption (Perkins, 1997) due to adolescents and young adults being particularly susceptible to peer influence. The assumption that peers use more alcohol or drugs than they actually do encourages the individual to adhere to the group perception and practice, thereby increasing their own use of alcohol or drugs. This directly applies to attribution theory due to the fact that there is a great desire to "fit in" and adopt normal behavior. Students who think normal behavior is to consume large quantities of alcohol are more likely to engage in risky drinking behavior. The filter of thinking their behavior is abnormal is effectively gone.

Sample Size and Dispositional Attributions

When exploring the subject of attribution theory, research has sought to determine whether *dispositional attributions* are sensitive to the sample size of the evidence and whether they can be capitalized on to determine a given level of covariation between person and behavior. Dispositional attributions are explanations of individual behavior caused by internal

characteristics that reside within the individual, as opposed to external influences that stem from the environment or culture in which that individual is found. The principle of *covariation* predicts that attributions made to a condition while an effect is present are not the same as those that exist when the effect is not present. The sample size of the evidence presented determines the manner in which the subject is susceptible to dispositional attribution (Overwalle, 2003).

Overwalle (2003) found that different types of covariation information contribute to different dispositional attributions. To test this, Overwalle studied the impact of covariation evidence within the confines of differing sample sizes and found that, as more covariate information was provided to participants who agreed with their initial judgments, the participants made progressively more extreme dispositions. This indicates that, with each additional piece of information that seemingly advances the beliefs of college students related to peer drinking, their conviction that excessive peer drinking happens often increases and is strengthened. This is in concert with the concept of pluralistic ignorance because these incorrect pieces of information are used to reinforce the incorrect perceptions of the individual toward the group (Grant et al., 2009). The researchers believe that, a student watching *Animal House, Old School, Neighbors, Road Trip* and *American Pie* may be left with the perception that excessive drinking is the norm and, to fit in and have lots of friends, you must adhere to this norm.

College Alcohol Prevention

Colleges are currently constructing intervention programs and implementing punitive measures, while also exploring the efficacy of prevention using measures such as Social Norms Marketing, Computer Administered Preventative Measures, and others. These efforts endeavor to reduce problematic drinking behaviors of students and, in turn, the preconceived ideas about what their own abuse will promulgate. To effectively prevent alcohol abuse in the college

environment, it is necessary to educate students about what behavior is expected and, moreover, what *normal* behavior is meant to be (Glazer, Smith, Atkin, & Hamel, 2010).

Social norms marketing. One strategy instituted by colleges and universities to help prevent alcohol abuse is referred to as the "social norms marketing approach" (SNMA; Glazer et al., 2010). Because misperceptions related to peer drinking may increase the prevalence of alcohol abuse among college students, a few universities have begun SNMA programs to dilute these incorrect perceptions. These programs endeavor to inform and educate college students about the real rates of alcohol use and abuse with the goal of reducing this assumption (Jung, 2003). SNMA programs are often comprised of expansive and comprehensive efforts such as campus-wide mass media campaigns that include flyers, posters, college newspaper ads, and other marketing methods. These media depict stereotypical students alongside salient facts about drinking (i.e., deaths *per annum*, risk of alcohol poisoning, etc.) in an attempt to dispel the myths related to college alcohol abuse and in order to replace misperceptions with realistic understandings. Advocates of this particular strategy argue that by presenting the idea that most students do not drink heavily, student drinking in general may be successfully lowered (Jung, 2003). Given that research on SNMA is limited, I intend to expand upon this research information to hopefully identify a simple and effective intervention to help clarify students' misperceptions about college drinking norms.

Mandated alcohol interventions. At schools across the country, drinking violations incur mandated participation in alcohol-related interventions by the college or university. These interventions take on varying forms, whether through face-to-face counseling, group counseling, or computer-delivered courses **(**Carey, Carey, Henson, Maisto, & DeMartini, 2010). Cary and DeMarini (2010) found that interventions to reduce drinking on college campuses are only

marginally effective and when individuals are mandated to receive interventions, the subsequent change in drinking habits is highly inconsistent and varies from student to student.

Face-to-face vs. computer-delivered interventions. Carey et al. (2010) studied which interventions were more effective in reducing collegiate drinking. They examined: (a) whether a brief motivational intervention was more effective than two computer-delivered interventions, and (b) whether genders were impacted differently by varying interventions. Carey et al.'s research studied students sanctioned to participate in a drinking risk reduction program.

A randomized controlled trial was undertaken with four conditions to test participants in the study: (a) brief motivation *interventions* called "Alcohol 101 Plus™" and "Alcohol Edu® for Sanctions"; (b) *delayed control*, representing face-to-face counseling; (c) one of two *computer programs*; and, (d) *control*. Drinking behavior was assessed at four points in time: (a) at baseline, (b) at one month out, (c) at six months out, and (d) at 12 months out. Carey et al. (2010) found that face-to-face counseling was more effective than computer-based programs in achieving an immediate reduction in drinking. However, the drinking behavior generally returned over the long term (Carey et al., 2010).

Environmental strategies. Another strategy used to combat excessive alcohol use is the *environmental strategy,* which endeavors to alter the environment related to drinking. Environmental strategies include broad efforts, from enforcing minimum legal drinking age laws to initiating anti-drinking publicity campaigns. Keg registration programs have been found to be also helpful in keeping alcohol off of college campuses as they make administration officials aware of which students are bringing kegs onto campus for parties—and generally students do not want to draw this kind of attention to themselves. The use of *social norming campaigns* is also environmental in nature (Ringwalt, Paschall, & Gitelman, 2011). Social norming campaigns

address the overall environment pertaining to drinking, although more individualized efforts are often necessary to address the many influences on college drinking.

Differences in Motivation

The motivation of students to change their drinking habits was largely variable when mandated to enroll in a drinking intervention program. Motivational variables of students who had abused alcohol or who had violated their school's drinking policy revealed higher motivation to change among females as compared to males. The level and degree of motivation of the student proved highly influential on their receptivity and response to intervention efforts. To most effectively tailor intervention efforts, the incorporation of student personalities and perspectives toward drinking may be an effective means of improving receptivity and the success of such interventions (Carey & DeMartini, 2010).

Gender Differences

Lewis and Neighbors (2004) discovered that there are gender specific drinking norms and these norms affect perceptions of drinking behavior. With men overestimating the drinking of their male peers and females overestimating the drinking of their female peers, there is a climate of exaggerated perceptions with both males and females. These perceptions of same-gender norms are also associated more strongly with drinking behavior (Lewis & Neighbors, 2004).

Of note in the Carey et al. (2010) study was the substantial difference between genders in the outcome of drinking interventions. Even within the control condition of the study, female participants reduced their levels and frequency of drinking following both the face-to-face counseling and the computer-delivered interventions, although the latter intervention was less successful. Females maintained their progress relative to baseline one year later. Males reduced their levels and frequency of drinking following each intervention, however their gains were not

maintained over a one-year period. The study concluded that differing forms of interventions work for each gender in varying ways, although the long-term effects of all interventions decreased over time more so for males than for females **(**Carey et al., 2010). No explanation was given on the difference in decreasing effects and colleges continue to utilize a "one size fits all" approach due to cost-effectiveness and logistics.

Concluding Discussion

It is clear that there is a culture of alcohol abuse present within the college environment. The prevalence of alcohol abuse has resulted in significant negative consequences for both students and universities, ranging from physical and emotional issues for students, to negative media pressure for the public and political environments around universities. Alcohol use and abuse has been the subject of substantial research and action, and universities have focused on both prevention and intervention efforts. The literature shows that the influence of peers upon alcohol use and abuse in college is significant and may be based upon the unrealistic assumptions that the majority of college students engage in heavy drinking behavior.

In accordance with peer influence and the attribution theory, some college students have a tendency to drink more because they assume their peers drink to excess (over 5 drinks in one night). Students who perceive heavy drinking as typical are more likely to engage in heavy drinking behavior, regardless of the facts behind such this belief. I hypothesize that, with misperceptions about drinking behavior clarified, college students who drink more than the average student will reduce their drinking behavior due to the fact that they will no longer perceive the majority of students as excessive drinkers. Their behavior will have a greater chance of normalizing with this information. Peer influence dictates that students may perceive heavy drinking as more typical behavior among their peers as opposed to their typical local college or

colleges nationally due to the fact that proximal reference groups have more of an impact on perceptions and behavior as compared to distal reference groups (Borsari & Carey, 2003; Lewis & Neighbors, 2006). With data from national colleges presented which states that almost half (49%) of all college students do not drink on a regular basis and 88% consume 10 or fewer drinks per week, students may still perceive heavy peer drinking behaviors as typical while rating local and national heavy drinking behaviors as atypical.

As attribution theory is concerned with the assumption or projection that one individual places upon the choices and behavior of others, it is often assumed that others use and abuse alcohol more often than they actually do. This inaccurate assumption, in concert with the realities of peer influence, likely increases the rate of drinking among some individuals.

To effectively combat college alcohol use and abuse, I hypothesized that it is necessary to inform college students of the dangers of alcohol and explain the reality of alcohol use among their fellow college students. This research studied whether presenting college students with normative information about drinking behavior has an effect on college students' perceptions of drinking scenarios. According to attribution theory, students with clarified misperceptions about drinking behavior will be more likely to reduce their overall alcohol consumption because these students will now accurately perceive the drinking behavior of the overall college population.

Methodology

Research Questions

For this research, I proposed the following questions:

1. Does the presenting data on national drinking statistics have an effect on the respondents' perception of drinking scenarios and is there an effect caused by covariates (gender and class year)?

2. Does the reference point of national drinking statistics influence participants' perceptions of drinking (i.e., 80% do *not* drink heavily *vs.* 20% do drink heavily)?

Research Design

This research utilized an experimental design and used surveys to collect relevant data. Students were randomly assigned into three groups using Survey Monkey's random assignment tool. The Scenario Questionnaire 1 (SQ1), Scenario Questionnaire 2 (SQ2), or Scenario Questionnaire 3 (SQ3) were administered to the students using the procedure described in the Research Procedures and Protocol section. Students were first instructed to complete the Informed Consent Form (ICF) and a brief student demographic questionnaire (SDQ).

One third of the participants was randomly assigned to the control group and administered the SQ1, which did not provide any information on national drinking statistics. Another third of the participants was randomly assigned to the first experimental group, which received the SQ2; the SQ2 (drinking condition) presented the national drinking statistics using *excessive drinking* (drinking condition) as the reference point (i.e., 69% consume five or more drinks per week). The final third of the participants was assigned to the second experimental condition, whereby they were administered the SQ3 (abstinence condition); the SQ3 presented national drinking statistics using *not drinking/moderately drinking* as a reference point (i.e., 31% consume fewer than five drinks per week). All participants rated their perceptions of three alcohol consumption scenarios.

Research Procedures and Protocols

After Institutional Review Board (IRB) approval was granted by the IRB of Antioch University New England, I utilized Survey Monkey's "Audience" service, which allowed me to specifically target participants that fit into the demographic necessary for this study. Survey

Monkey's Audience service recruits participants via email who match the required demographic from their network of over 30 million members to complete the surveys constructed for this study. Data was collected over a period of 15 days and a total of 327 surveys were fully completed.

After receiving the recruitment email from Survey Monkey, participants clicked a web link and were taken to the survey where they were first presented with an informed consent letter that explains the survey and its focus. Students who provided their consent continued to the survey questions. A short demographic questionnaire followed the informed consent to gather college information on gender and class year. Participants were then randomly assigned by Survey Monkey to one of three research groups (a control group and two experimental groups).

Completed surveys and ICFs were archived in an encrypted online data storage facility held by Survey Monkey. The survey was structured so that, without completing the ICF, a respondent was not able to continue and complete the SQ1, SQ2, or SQ3. This increased the likelihood that all answers were completed. Upon completion of the data collection, the data was compiled and coded for statistical analysis.

Participants of the Study/Research Subjects

This study focused on 18- to 24-year-old college students from across the United States. Participation in the study was strictly voluntary and completely confidential, and the selection criteria for the study included: (a) college students aged 18–24 years (the age of a traditional college student), and (b) full-time students enrolled in undergraduate programs.

A power analysis utilizing Cohen's (1992) "Power Primer" was conducted. In order to detect a medium effect size at $\alpha = .05$, I attempted to gather 250 completed responses to the randomly assigned surveys.

Research Instruments

The study included the use of the following research and data collection instruments:

1. the *Scenario Questionnaire 1* (SQ1)
2. the *Scenario Questionnaire 2* (SQ2)
3. the *Scenario Questionnaire 3* (SQ3)
4. the *Short Demographic Questionnaire* (SDQ)
5. an *Informed Consent Form* (ICF)

The SQ was presented in three forms, SQ1, SQ2, and SQ3 and was scored on a Likert-type scale from 1–3 (see the Appendix section). The SQ1 contained exactly the same scenarios and questions as the SQ2 and SQ3; however, the SQ2 and SQ3 present the respondents with information about the national drinking averages of college students. The SQ1, SQ2, and SQ3 were constructed to present three different drinking scenarios involving college students. The SQ2 and SQ3 differ in how each presents the national drinking statistics. For example, the SQ2 presents the statistics with *drinking* as the reference point (i.e., 69% consume five or more drinks per week), while SQ3 presents the statistics with *not drinking* as the reference point (i.e., 31% consume fewer than 5 drinks per week). The main research function of the SDQ is to account for the possible effects of two variables in this study: (a) gender and (b) class year.

Specific research instruments used in the study can be found in Appendix A. All research instruments were completed and compiled through Survey Monkey and the Statistical Package for the Social Sciences (SPSS version 20) was utilized to conduct the data analyses.

Reliability and Validity of the Instruments

A number of literature sources point to the validity of self-reporting alcohol studies

(Cooper, Sobell, Sobell, & Maisto, 1981; Kupitz, Klagsbrun, Wisoff, LaRosa, & Davis, 1979; Rachal et al., 1980). A valid concern for the current study was that subjects tend to underreport their drinking habits in administered surveys. However, it is noted that subjects tend to report higher levels of alcohol use when the survey is administered by computer and is fully anonymous, thus making computer-based surveys more accurate than print or verbal surveys (Cooper et al., 1981; Kupitz et al., 1979; Rachal et al., 1980). Overall, studies have confirmed that using self-reporting alcohol use perception measurements is valid to be used in experimental studies (Cooper et al., 1981; Kupitz et al., 1979; Rachal et al., 1980). In this study, the students rated alcohol consumption scenarios based on their perceptions of this behavior relating to their friends, their local college, and colleges at the national level. These three levels were chosen to further explore whether peer perceptions differ significantly from local and national perceptions.

Results

A variety of tests were used to analyze and test the hypothesis. All tests had a statistical significance threshold set at $\alpha = .05$ (two tailed). Data was analyzed using SPSS software.

Descriptive Statistics

A total of 336 surveys were completed, with 327 completed fully, yielding an attrition rate of about 2.7% 9 (with the inclusion criteria being completion of at least 80% of the questionnaire items). All participants reported gender information and 334 reported their academic year. The gender data revealed an almost equal number of male and female participants (173 males and 163 females). Table 12 illustrates the respective percentages of each gender followed by a presentation of the gender proportions in Figure 1.

The data gathered from the respondents regarding their academic year revealed the highest percentage of respondents to be college Seniors ($n = 90$) and Juniors ($n = 90$), followed

by Sophomores (n = 89), Freshman (n = 40) and 5+ Year Seniors (n = 17). Table 13 presents a breakdown of the reported frequency of participants in relation to each college year, followed by a visual illustration of the resulting proportions in each category in Figure 2.

Statistical Analyses

Use of parametric statistical testing was deemed inappropriate due to the fact that the dependent variable was ordinal and not continuous. In addition, distribution of this ordinal variable was not approximately normal. There were only three response options which resulted in a low-resolution scale not suitable for parametric testing.

It has been suggested that ordinal data can be treated as interval data without concern for wrong conclusions (Norman, 2010), particularly when violations of parametric test assumptions are mild to moderate. However, the present study had ordinal data with only three levels, and distributions of scores severely violated the assumption of normality for some variables. In cases of very non-normal data, using nonparametric tests may actually increase power (Rasmussen, 1989). In the present study significant correlations were detected with nonparametric tests that were not significant with the parametric equivalent (correlation between gender and light drinking perceptions regarding friends).

While Likert-type scales commonly have 5 or more response options, there is evidence that fewer options can be equivalent or yield even superior results (Jones & Loe, 2013). Responses on Likert scales are also very likely to cluster at the middle or extremes of the scale, particularly when the underlying question is not easily understood on a meaningful scale (Gardner & Martin, 2007). When asking about a particular drinking scenario compared to one's perception, it is difficult to imagine that participants could consistently rate some sort of distance between the two.

Because the dependent variable was ordinal and all independent variables were categorical, the statistical test employed was *ordinal logistic regression*. Binomial logistic regression was also considered, but rejected because dichotomizing the ordinal dependent variable would result in losing some of the meaning in the data. Variables were recoded to determine reference groups. For gender, female was set as the reference group. As a result the statistical analyses indicate the difference for males compared to females. For condition, the control group that received no information regarding the statistics on drinking (SQ1) was set as the comparison (control) group, such that dummy-coded variables for the drinking (SQ2) and abstaining conditions (SQ3) were analyzed for their differences from the control group.

When the current study was designed, three potentially significant independent variables were identified: (a) experimental condition, (b) gender, and (c) class year (e.g., Freshman, Sophomore). Spearman's rank-order correlations revealed that college year was not related to the dependent variable and was excluded from regression analyses for hypothesis testing because college year did not significantly correlate with any of the other measures, indicating that perceptions of drinking are somewhat consistent across college class years. Two ordinal logistic regressions were performed: (a) the first with gender and experimental condition as independent variables predicting perceptions, and (b) the second was identical to the first regression except for the addition of an interaction term *gender*condition*.

The first ordinal logistic regression analysis yielded a significant finding. Results for the overall regression models yielded mild yet significant relationships. The model for perceptions of heavy drinking nationally was significant ($\chi^2 = 6.097$, $p = .014$). In omnibus tests of the independent variables, experimental condition was a significant predictor of heavy drinking perceptions at the national level (Wald $\chi^2 = 12.146$, $p = .002$), moderate drinking perceptions for

college (Wald $\chi^2 = 37.745$, $p < .001$) and national (Wald $\chi^2 = 47.196$, $p < .001$) levels, and light drinking perceptions for friends (Wald χ^2=15.880, p<.001), college (Wald $\chi^2 = 22.116$, $p <$ .001), and national (Wald $\chi^2 = 34.425$, $p < .001$) levels. This indicates that the manipulation was successful, and the statistics displayed to the research participant had an effect on their reported perceptions. Upon further inspection, the source of significant differences based on experimental condition was typically the abstaining statistics experimental condition. As one example, for moderate drinking perceptions at the college level, the drinking condition did not differ significantly (Wald $\chi^2 = .004$, $p = .947$) from the control group, but the abstaining condition did (Wald $\chi^2 = 5.843$, $p = .016$). This trend of significance for abstaining held true for all other scenarios with the exception of moderate drinking among friends, where neither condition's variable was significantly different from the control. Gender was also a significant predictor of two of the nine dependent variables: (a) heavy drinking among friends (Wald $\chi^2 = 17.11$, $p <$ .001) and (b) light drinking among friends (Wald $\chi^2 = 4.799$, $p < .028$). The results indicate that males reported heavy drinking was more typical among their friends and that light drinking was less typical, consistent with our previous correlation finding.

The second ordinal logistic regression retained gender and experimental condition as predictors and included an interaction term for gender*condition. Results changed considerably indicating that the effects of the experimental conditions were not the same for both genders. All nine model fits improved (lower p-values, higher pseudo $R^{2)}$. In the omnibus tests for condition and gender*condition, results indicated that the interaction was very important. The interaction term was a significant predictor of five of the nine dependent variables. For many of the dependent variables, where the omnibus test for experimental condition was significant, it was no longer significant after the addition of the interaction term. As examples of this change in

significance when the interaction term was added, for moderate drinking at the college level, condition was highly significant (Wald $\chi^2 = 37.745$, $p < .001$) in the first model, but not significant (Wald $\chi^2 = 3.949$, $p = .139$) in the second, while the interaction term was a strong predictor (Wald $\chi^2 = 13.748$, $p < .001$). Similarly, condition was a significant predictor for all three levels of light drinking in the first model, but none of them in the second. The interaction term was significant for two of the three. By examining cell counts (see Table 5), it appears that experimental conditions had much more influence on the scores of males than females.

Discussion

The purpose of this study was to determine (a) if presenting normative data to college students could clarify misperceptions about drinking behavior, and (b) whether participants' perceptions about drinking behavior would more closely align with the normative data following the presentation of these data.

Participants were assigned to one of three groups. The first group (SQ3) received information on typical drinking behavior with the data anchored in abstinence/low drinking (i.e., 55% of students consume 1 drink or less per week). The second group (SQ2) was given data anchored in heavy drinking (i.e., 45% of students drink heavily). Finally, the third group (SQ1), the control group, did not receive any normative data.

Grouping the participants in such a manner allowed me to determine (a) whether the presentation of normative data had any effect on college students' misperceptions of drinking behavior, and (b) if the way in which the data were presented had an effect on these misperceptions. It was anticipated that the study findings could be used to formulate a strategy to present information to college students regarding alcohol consumption that would be most effective in curtailing alcohol abuse. Information could be disseminated to these students in one

of two groups: (a) the majority of students who do not engage in problematic drinking or (b) only the minority of students who do engage in problematic drinking.

Utilizing a low-cost, minimally invasive intervention to clarify misperceptions about drinking behavior could be useful in helping colleges across the United States to reduce the incidence of problematic drinking. If students realized that heavy drinking was not the norm, they might be less likely to engage in excessive drinking behavior. This study attempted to clarify misperceptions about college drinking so students would realize that problematic drinking is not the norm. The research is summarized below and the implications of the findings are discussed.

Results Summary

The information and statistics presented to the participants had an effect on their reported perceptions and this study found that the abstaining set of statistics produced the greatest effect on perceptions. The only scenario where the abstaining condition did not have an effect on reported perceptions was with moderate drinking among friends. Other than moderate drinking among friends, the abstaining condition produced reported perceptions that viewed heavy, moderate, and light drinking as more atypical than the control and the drinking conditions. Analyzing the results further showed that the effects were not the same for both genders and the experimental conditions had much more influence on the scores of males than females (see Figure 3 and 4*)*. Both the results from the experimental conditions on perception and the interaction of gender and condition are further discussed below.

Impact of the Experimental Conditions on Perception

In the first segment of analysis, omnibus tests for the independent variables revealed that the experimental condition was, indeed, a statistically significant predictor at several levels: (a)

all levels for light drinking perceptions, (b) the college and national levels for moderate drinking, and (c) the national level for predicting heavy drinking. These findings indicate that the use of different conditions in the experimental groups did have a moderate effect on the respondents' perceptions.

The significant outcomes produced by the experimental condition focusing on abstinence were far more influential than I originally hypothesized and responsible for the majority of the differences realized. The focus on drinking condition did not vary significantly from the control group, but the focus on abstaining from drinking condition did, thereby presenting as the prominent influence in predicting outcomes. In the scenario in which the abstaining condition was not responsible for a statistically significant variation, there was no significant effect present from any condition.

While an effect was found during the first segment of analysis, an even greater effect was discovered when using the interaction term gender*condition. Many of the above significant effects were no longer significant when implementing this interaction term and these results are discussed below.

Gender as an Influencing Factor

When examining the aforementioned experimental conditions and their role in predicting perceptions in the drinking scenarios, gender played an important role in the respondents' answers. Specifically, male participants reported substantially higher scores pertaining to how typical heavy drinking was perceived among their friends as compared to their female counterparts. Further analysis revealed that among the three possible perception response categories for the heavy drinking scenario (*not at all accurately describes my friends*, *accurately describes some of my friends*, or *accurately describes all of my friends*), males were 2.887 times more likely to respond one level higher than females, meaning that males saw heavy drinking as

more typical among their friends than females. This indicates that where females perceived heavy drinking as less than typical among their peers, males frequently perceived it as typical. This finding confirms previous assumptions that some college students exaggerate how much their friends drink which could lead to behavior that reproduces this belief. These outcomes also partially substantiate the work of Borsari and Carey (2003) as well that of as Lewis and Neighbors (2006), all of whom purport that distal reference groups may not result in as significant an impact on the perception of the individual as do proximal reference groups, such as friends. With same-gender dorms and groups being common in the college setting, this makes sense.

In the findings above, the strong perception of drinking among friends (as opposed to other groups) for the male participants validates the influence of peers and those in close proximity. These findings are also in agreement with the much earlier conclusions of Perkins (1997) and Perkins et al. (2005), who stated that a student's perception of drinking among peers is often exaggerated and that heavy drinking is often considered typical among peers, regardless of the actual level of drinking that occurs. Of particular relevance is the recognition of gender as an influencing factor.

When examining gender as an influencing variable, it was found that among the nine dependent variables, gender was a statistically significant predictor of perception of alcohol use in heavy and light drinking among friends. Although the underlying cause for this outcome was not analyzed in this study, this result may be associated with the general perception on college campuses that males drink more and, as such, males find it typical to drink more. However, this also may render males less responsive to change if this stereotype is perceived as a "rite of passage" or a positive attribute. Carey and DeMartini (2010) clearly identified a gender variation

in perceptions of drinking and also recognized the subsequent gender gap in students' receptivity to change. Ultimately, the motivation and associated attitudes of males who abused alcohol were not conducive to change, while females, in contrast, were more likely to take part in interventions to reduce drinking and invest the effort necessary to succeed (Carey & DeMartini, 2010).

The Interaction between Gender and Condition

To further explore the role of gender, another ordinal logistic regression analysis was performed for the purpose of assessing the potential impact of this interaction term (*Gender*Condition*) on the results. The results of this analysis suggest that the role of gender influenced outcomes of the experimental condition, and that the experimental conditions had a different impact on females versus males. Gender*Condition was found to be a statistically significant predictor of five out of the nine dependent variables compared to the two dependent variables that were significantly predicted by gender, alone.

Beginning significant results no longer met the requirement for significance when reevaluated with the interaction term (Gender*Condition). For example, the significance of the experimental conditions with regard to many of the dependent variables in the omnibus test was no longer significant when instituting the interaction term. Ultimately, this implied that the experimental conditions could serve as a predictor, but gender presented an even greater impact in this regard.

Results of this study support the hypothesis that normative data affect perceptions due to the fact that the experimental conditions could serve as a predictor, but the stronger predictor was condition with gender. While measuring the levels of drinking or drinking behaviors as a result of the experimental condition was not an objective of this study, a potential change in perception as a function of the experimental condition (drinking vs. abstaining) was examined. The

abstaining condition, and its influence in predicting the outcomes, served to confirm this hypothesis that, when presented with data leaning towards abstinence, perceptions of heavy drinking were seen as more atypical. When students are exposed to accurate normative data, their misperceptions regarding drinking behavior are corrected. As a result, they will shift their perception of normative drinking behavior. The fact that males present as more susceptible to the perceived behaviors of peers and are more likely to overestimate what they perceive to be typical drinking behavior among their peers helped inform this study of a difference between male and female perceptions which means that females may not be as easily influenced by perceptions of their peers.

With the differences between how males and females perceive drinking behaviors and react to differing data presentation, one could conclude that "one size fits all" interventions are not as effective on college campuses and the implications of the gender differences will be discussed below. Future efforts to combat problematic drinking and clarify misperceptions should take gender differences of perception into account and further research could explore in more detail the gender differences and the reasons for such differences.

Implications

There are multiple implications from the data that can be applied to colleges across the country to help deter the prevalence of problematic drinking. This research confirmed two factors that may promote excessive drinking on college campuses and, therefore, should be taken into account when trying to formulate a strategy to ameliorate heavy drinking. First, as discussed by Borsari and Carey (2003), Perkins (2002), and Perkins and Berkowitz (1986), among others, *peer influence* appears to be highly correlated with college students' perceptions of drinking behavior and possibly their actual drinking behavior. If the impact of proximal peer groups and

perception of peer drinking was identified as a contributing factor to heavy drinking decades ago, yet why is this issue not adequately addressed on college campuses?

The influence of peers works in conjunction with the power of perception (or misperception) and gender roles. An individual's desire to belong and be accepted may prompt students to behave in ways that are consistent with their peers, making peer behavior a potential powerful influence on the individual; future research could further expand on this implication. It is the misperception of what this behavior is, when it comes to the drinking behavior of peers that may dictate the individual's drinking behavior. Universities that wish to address problem drinking may not recognize these influential factors or understand the relationship between them.

As hypothesized, educating students on normative perceptions of drinking through the provision of normative information that emphasized the lower levels of drinking served as a viable way to correct misperceptions and align perceptions of drinking behavior more towards the norm. The results also suggest an approach that could be utilized when educating students about the roles of peer influence and misperceptions. As indicated, focusing information on an abstinence/moderation drinking perspective was proven to be a significant tool for transforming former misperceptions to more normative perceptions, which may deter excessive drinking. These findings also reconfirm the prior assertions of Hingson and White (2012), as well as Perkins et al. (2005), and Jung (2003) that the prevalence of heavy drinking is, at times, exaggerated and accepted by students. In addition, the insights derived from this study support Jung's position for the use of social norms marketing as a chosen strategy. This approach is preferable to current strategies that may be implemented by universities, including use of computer-delivered interventions and face-to-face interventions, which were both demonstrated

as having only short-term effects and did not adequately apply an effective approach or the necessary elements for inclusion (Carey et al., 2010).

Another implication of this research was the finding that normative data anchored in abstinence had an effect on drinking behavior perceptions with respondents viewing heavy drinking as less typical when presented with the abstaining data. Colleges can use this finding to maximize the impact of such data. For example, colleges wanting to implement an education strategy to help reduce problematic drinking could present this data in an online forum setting (Buttliere, 2004). Colleges could possibly poll their student body on how they view drinking and their perceptions on drinking behavior around them. The goal would be to shock students when many answer the survey believing that heavy drinking is the norm and then present the actual data. This would help prevent shaming and allow the students to feel like a part of the sophisticated group (Buttliere, 2004), all while dispelling the myth for a large group at once, which may lead to word of mouth dissemination.

With the results showing differences between how males and females respond to data presentation, this research can inform alcohol intervention programs on college campuses. With most anti-drinking programs being tailored to both males and females as a combined group, a greater effect could be achieved if, instead, gender differences were taken into account and programs were specifically geared toward each gender by presenting information that leans towards abstinence and focuses on immediate peer groups to males and presenting more national and collegiate level abstinence leaning statistics to females. Many orientation programs on college campuses are separated by gender and this would be an opportunity to enact tailored intervention programs. This supports the previous assertion by Lewis and Neighbors (2004) that same-gender interventions may have greater success than non-gender specific interventions.

While the findings discussed within the context of this research have implications pertaining to helping to effectively reduce drinking on college campuses, there are also implications related to the many side effects and indirect effects associated with excessive drinking. It is likely that a reduction in excessive drinking on college campuses will lead to a decreased risk for date rape, domestic incidents, physical injuries, suicide, damage to property, and death. Such a change could thereby improve the campus environment as well as enhance the image of the university in the public eye.

The results of this study can assist in creating prevention programs at colleges across the country by disseminating information that can have a positive impact on its students. For example, orientation pamphlets, distributed to students and parents can communicate that the majority of students do not drink instead of placing emphasis on the percentage of students who do drink, making the heavier drinkers appear less normative. In addition, clinicians could use the same strategy when implementing psychoeducation during sessions. As clinicians utilize psychoeducation around the issue of drinking, substance abuse, and alcoholism, they can present the information in a way that is anchored in abstinence so it has the greatest impact on patients. These strategies allow recipients to feel like a part of the majority as they hear that the majority of students do not engage in the type of heavy drinking that many students perceive as typical behavior.

The effects of reducing excessive drinking on an individual level include the increased safety and decreased negative consequences. This may lead to improved grades and an increased quality of life. Rohsenow et al. (2012) discussed how heavy drinking and its effects do not end with graduation. Persistent problems after the student leaves college decreases one's quality of life and interaction with the world around them. Data from this study may also extend into the

field of addiction and addiction treatment in that the predictors and approaches identified within this study may improve existing treatment strategy for some clients. However, further research may be necessary before arriving at definitive conclusions.

Limitations

Because data for this study was based on student self-report, some limitations exist. Subjects may have exaggerated their responses, not answered honestly, or were affected by the *social desirability bias* (i.e., the tendency to answer in a manner that will be viewed favorably). To counter this, participants were informed at the outset of the study that their responses were not linked to identifying information such as an IP address, name, or email address.

Additionally, selection bias was a concern. Because this study was based on the perceived drinking habits of college students, I could not specifically select students to participate. Thus, there was a risk that students who responded to the survey were students who did not accurately reflect the college population. For example, students who responded may have been students whose drinking behavior deviated from the college norm (either above or below); this could have potentially skewed the results. To counter this, I specifically stressed the anonymity of the survey.

Another limitation is that participants were not resurveyed at a later date. This hindered the ability to examine the long-term effects of presenting the respondents with the national averages of college drinking habits.

Future Studies

The purpose of this study was to answer two questions: (a) Does presenting college students with normative information about college drinking behaviors affect their perceptions of college drinking behavior? and (b) Does the manner in which this information is presented to students affect their perceptions of drinking behavior? While this study analyzed changes in

perception, the gender findings indicate that a follow up study designed to specifically test gender differences could further expand on those finding. Instead of inquiring about one's perception of drinking behavior, an investigation that measured gender-specific perception could be conducted. In addition, studying changes in people's attitudes and perceptions caused by differing data presentation is another avenue for study. More future research could focus on measuring actual changes in alcohol consumption behavior associated with these perceptions. In addition, because this study found a gender variation, future research could examine the underlying mechanisms that facilitated this gender discrepancy. Further research should be aimed at examining the pluralistic ignorance in this regard as well.

Finally, future studies could expand on the findings presented in this research by analyzing additional outcome variables that support the need to correct misperceptions, decrease alcohol consumption, and identify the benefits (i.e., improved grades, improved quality of relationships) derived from avoiding heavy drinking. Further research of this type will reinforce the credibility and validity of the findings presented within this study. Additional research could provide data to serve as a motivating force for adherence to future interventions designed within the institutional environment to target issues with alcohol consumption on the college campus.

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Appendix A

Short Demographic Questionnaire (SDQ)

Gender: M F

College Year: Freshman Sophomore Junior Senior 5th Year+

Appendix B

Randomly Assigned Questionnaires:

Scenario Questionnaire 1 (SQ1)

Please read each scenario and rate them according to the following questions.

Scenario 1 – A college student goes out with friends to a local hangout. The student consumes 16 drinks during a 4 hour period, goes back to the dorm and passes out in bed as happens 3–4 times per week during the semester.

Please rate this scenario in accordance with the values below.

This scenario does not at all accurately describe my friends.	**This scenario accurately describes some of my friends.**	**This scenario accurately describes all of my friends.**

This scenario describes drinking behavior well below the typical behavior at my college.	**This scenario describes drinking behavior in line with typical behavior at my college.**	**This scenario describes drinking behavior that is well above typical behavior at my college.**

This scenario describes drinking behavior well below the typical college student behavior nationally.	**This scenario describes drinking behavior in line with typical college student behavior nationally.**	**This scenario describes drinking behavior well above typical college student behavior nationally.**

Scenario 2 – A college student decides to attend a local party and have a few drinks with friends. This student consumes 4 drinks during a 5 hour period and this happens, on average, twice a week.

Please rate this scenario in accordance with the values below.

This scenario does not at all accurately describe my friends.	**This scenario accurately describes some of my friends.**	**This scenario accurately describes all of my friends.**

This scenario describes drinking behavior well below the typical behavior at my college.	**This scenario describes drinking behavior in line with typical behavior at my college.**	**This scenario describes drinking behavior that is well above typical behavior at my college.**

This scenario describes drinking behavior well below the typical college student behavior nationally.	**This scenario describes drinking behavior in line with typical college student behavior nationally.**	**This scenario describes drinking behavior well above typical college student behavior nationally.**

Scenario 3 – A college student watches a sporting event on a Saturday and consumes 1 drink throughout the night. On average, this happens twice a month.

Please rate this scenario in accordance with the values below.

This scenario does not at all accurately describe my friends.	**This scenario accurately describes some of my friends.**	**This scenario accurately describes all of my friends.**

This scenario describes drinking behavior well below the typical behavior at my college.	**This scenario describes drinking behavior in line with typical behavior at my college.**	**This scenario describes drinking behavior that is well above typical behavior at my college.**

This scenario describes drinking behavior well below the typical college student behavior nationally.	**This scenario describes drinking behavior in line with typical college student behavior nationally.**	**This scenario describes drinking behavior well above typical college student behavior nationally.**

Scenario Questionnaire 2 (SQ2)

PLEASE READ BOLD PARAGRAPHS BEFORE ANSWERING THE 9 QUESTIONS

38% of underage college freshmen drink alcohol. Between 2006 and 2010, the proportion of drinkers dropped from 62% down to 38%.

About half (51%) of American college students drink alcohol on a regular basis.

69% consume five or more drinks per week. 12% consume ten or more drinks per week.

A nation-wide survey of students at 168 U. S. colleges and universities found that:

- **98% have never been in trouble with a college administrator because of behavior resulting from drinking too much**
- **93% have never received a lower grade because of drinking too much**
- **93% have never come to class after having had several drinks**
- **90% have never damaged property, pulled a false alarm, or engaged in similar inappropriate behavior because of drinking**

Please read each scenario and rate them according to the following questions.

Scenario 1 – A college student goes out with friends to a local hangout. The student consumes 16 drinks during a 4 hour period, goes back to the dorm and passes out in bed as happens 3–4 times per week during the semester.

Please rate this scenario in accordance with the values below.

This scenario does not at all accurately describe my friends.	**This scenario accurately describes some of my friends.**	**This scenario accurately describes all of my friends.**

This scenario describes drinking behavior well below the typical behavior at my college.	**This scenario describes drinking behavior in line with typical behavior at my college.**	**This scenario describes drinking behavior that is well above typical behavior at my college.**

This scenario describes drinking behavior well below the typical college student behavior nationally.	**This scenario describes drinking behavior in line with typical college student behavior nationally.**	**This scenario describes drinking behavior well above typical college student behavior nationally.**

Scenario 2 – A college student decides to attend a local party and have a few drinks with friends. This student consumes 4 drinks during a 5 hour period and this happens, on average, twice a week.

Please rate this scenario in accordance with the values below.

This scenario does not at all accurately describe my friends.	**This scenario accurately describes some of my friends.**	**This scenario accurately describes all of my friends.**

This scenario describes drinking behavior well below the typical behavior at my college.	**This scenario describes drinking behavior in line with typical behavior at my college.**	**This scenario describes drinking behavior that is well above typical behavior at my college.**

This scenario describes drinking behavior well below the typical college student behavior nationally.	**This scenario describes drinking behavior in line with typical college student behavior nationally.**	**This scenario describes drinking behavior well above typical college student behavior nationally.**

Scenario 3 – A college student watches a sporting event on a Saturday and consumes 1 drink throughout the night. On average, this happens twice a month.

Please rate this scenario in accordance with the values below.

This scenario does not at all accurately describe my friends.	**This scenario accurately describes some of my friends.**	**This scenario accurately describes all of my friends.**

This scenario describes drinking behavior well below the typical behavior at my college.	**This scenario describes drinking behavior in line with typical behavior at my college.**	**This scenario describes drinking behavior that is well above typical behavior at my college.**

This scenario describes drinking behavior well below the typical college student behavior nationally.	**This scenario describes drinking behavior in line with typical college student behavior nationally.**	**This scenario describes drinking behavior well above typical college student behavior nationally.**

Scenario Questionnaire 3 (SQ3)

PLEASE READ BOLD PARAGRAPHS BEFORE ANSWERING THE 9 QUESTIONS

The proportion of college freshmen who abstain from alcohol continues to rise. Between 2006 and 2010, the proportion of abstainers rose from 38% to 62%. That is a new historic high.

About half (49%) of American college students don't drink alcohol on a regular basis.

88% (almost 9 in 10) consume ten or fewer drinks per week.

The average (median) number of drinks consumed by college students is 1.5 per week, according to the Harvard School of Public Health College Alcohol Study's survey of 17,592 students at 140 colleges and universities across the United States.

The continuing Harvard Studies have documented an increase in the proportion of college student abstainers and a decrease in the average number of drinks consumed by those who do drink.

A nation-wide survey of students at 168 U. S. colleges and universities found that:

- **98% have never been in trouble with a college administrator because of behavior resulting from drinking too much**
- **93% have never received a lower grade because of drinking too much**
- **93% have never come to class after having had several drinks**
- **90% have never damaged property, pulled a false alarm, or engaged in similar inappropriate behavior because of drinking**

Please read each scenario and rate them according to the following questions.

Scenario 1 – A college student goes out with friends to a local hangout. The student consumes 16 drinks during a 4 hour period, goes back to the dorm and passes out in bed as happens 3–4 times per week during the semester.

Please rate this scenario in accordance with the values below.

This scenario does not at all accurately describe my friends.	**This scenario accurately describes some of my friends.**	**This scenario accurately describes all of my friends.**

This scenario describes drinking behavior well below the typical behavior at my college.	**This scenario describes drinking behavior in line with typical behavior at my college.**	**This scenario describes drinking behavior that is well above typical behavior at my college.**

This scenario describes drinking behavior well below the typical college student behavior nationally.	**This scenario describes drinking behavior in line with typical college student behavior nationally.**	**This scenario describes drinking behavior well above typical college student behavior nationally.**

Scenario 2 – A college student decides to attend a local party and have a few drinks with friends. This student consumes 4 drinks during a 5 hour period and this happens, on average, twice a week.

Please rate this scenario in accordance with the values below.

This scenario does not at all accurately describe my friends.	**This scenario accurately describes some of my friends.**	**This scenario accurately describes all of my friends.**

This scenario describes drinking behavior well below the typical behavior at my college.	**This scenario describes drinking behavior in line with typical behavior at my college.**	**This scenario describes drinking behavior that is well above typical behavior at my college.**

This scenario describes drinking behavior well below the typical college student behavior nationally.	**This scenario describes drinking behavior in line with typical college student behavior nationally.**	**This scenario describes drinking behavior well above typical college student behavior nationally.**

Scenario 3 – A college student watches a sporting event on a Saturday and consumes 1 drink throughout the night. On average, this happens twice a month.

Please rate this scenario in accordance with the values below.

This scenario does not at all accurately describe my friends.	**This scenario accurately describes some of my friends.**	**This scenario accurately describes all of my friends.**

This scenario describes drinking behavior well below the typical behavior at my college.	**This scenario describes drinking behavior in line with typical behavior at my college.**	**This scenario describes drinking behavior that is well above typical behavior at my college.**

This scenario describes drinking behavior well below the typical college student behavior nationally.	**This scenario describes drinking behavior in line with typical college student behavior nationally.**	**This scenario describes drinking behavior well above typical college student behavior nationally.**

Appendix C

Informed Consent Form (ICF)

My name is Cullen Hardy, and I am a doctoral student in Clinical Psychology at Antioch University New England. I'm inviting you to take part in a brief survey as part of my dissertation research. The purpose of this research is to examine college student perceptions of what is considered normative drinking behavior.

You are being invited to participate in this research project because Survey Monkey has recorded you as a full-time undergraduate student.

If you decide to participate in this study, you will be asked to identify your gender and class year. You will be presented with three drinking-related scenarios and asked to answer questions based on each scenario. I estimate that the survey will take about 10 minutes of your time.

Your participation in this research study is voluntary. You may decline to answer any question, and you may withdraw at any time, simply by leaving the survey webpage.

We do not foresee any risks to participants in this study.

Your privacy will be protected; I have no way to know who provided which survey responses. The survey will not collect identifying information such as your name, email address or IP address.

If you have any questions about this study, please contact Cullen Hardy at chardy@antioch.edu or xxx-xxx-xxxx. This research has been reviewed according to Antioch New England University IRB procedures for research involving human subjects.

If you have questions about your rights as a research participant, you may contact Don Woodhouse, Chair of the Antioch University New England IRB at 603-357-3122.

ELECTRONIC CONSENT: Please select your choice below.

Clicking on the "agree" button below indicates that:
• you have read and agreed to the above information
• you voluntarily agree to participate
• you are at least 18 years of age

If you do not wish to participate in the research study, please decline participation by clicking on the "disagree" button.

X AGREE

X DISAGREE

Appendix D

Graphs and Tables

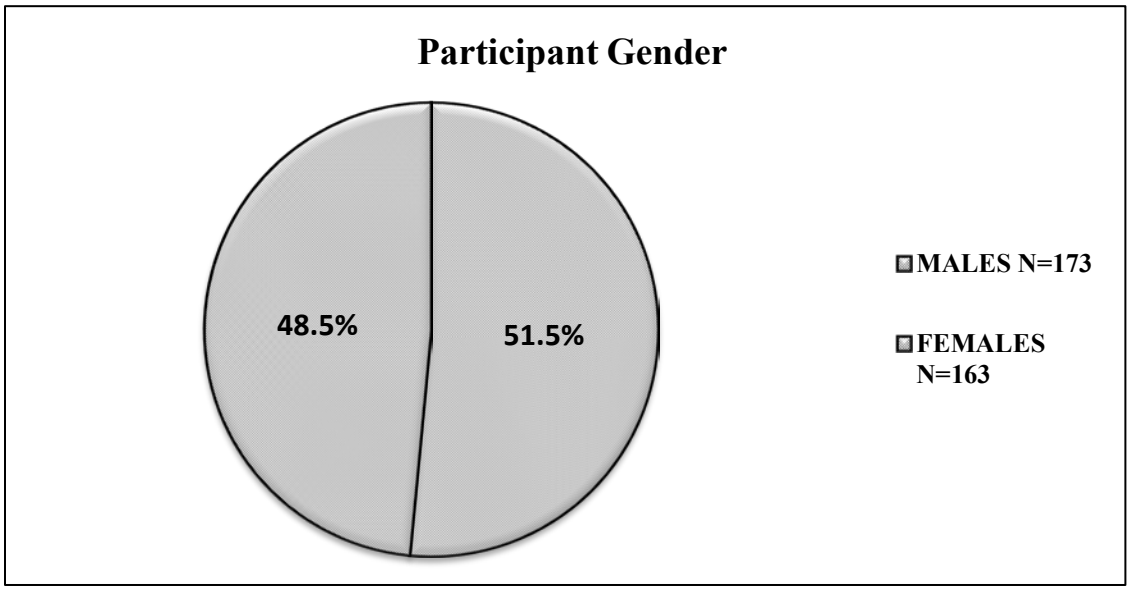

Figure 1. Percentage of participants delineated by gender

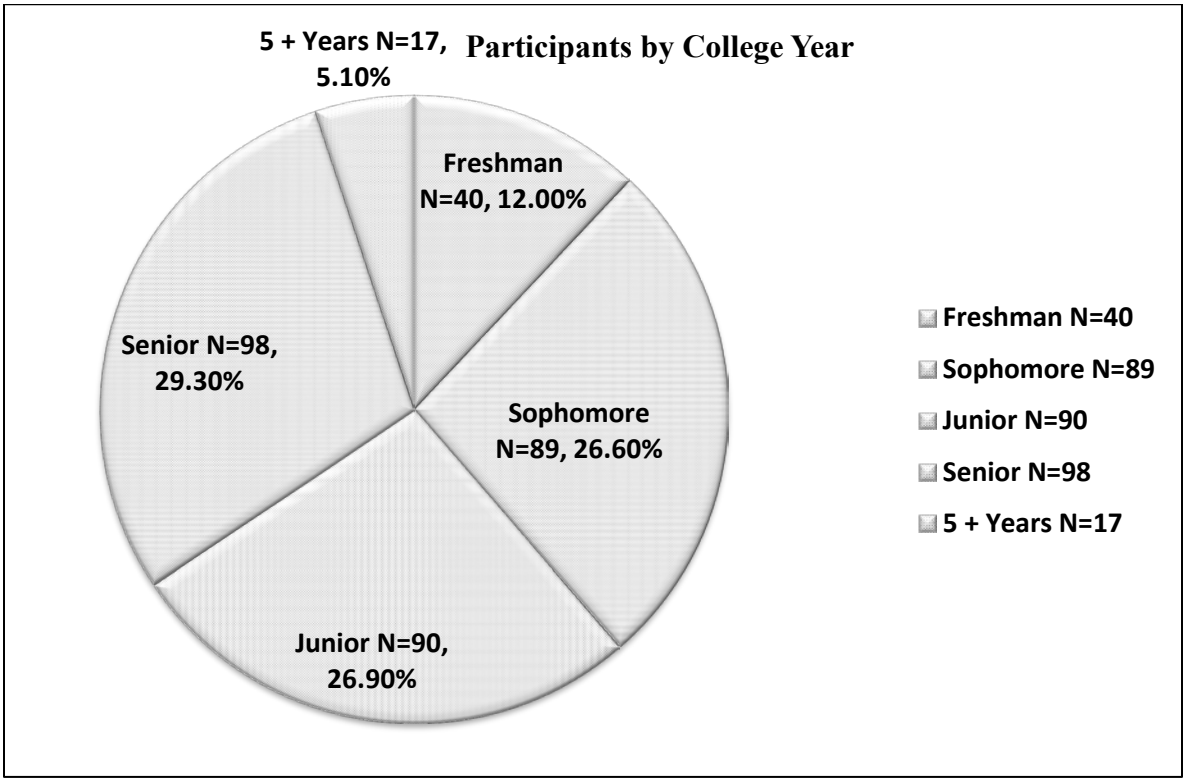

Figure 2. Percentage of students delineated by class year.

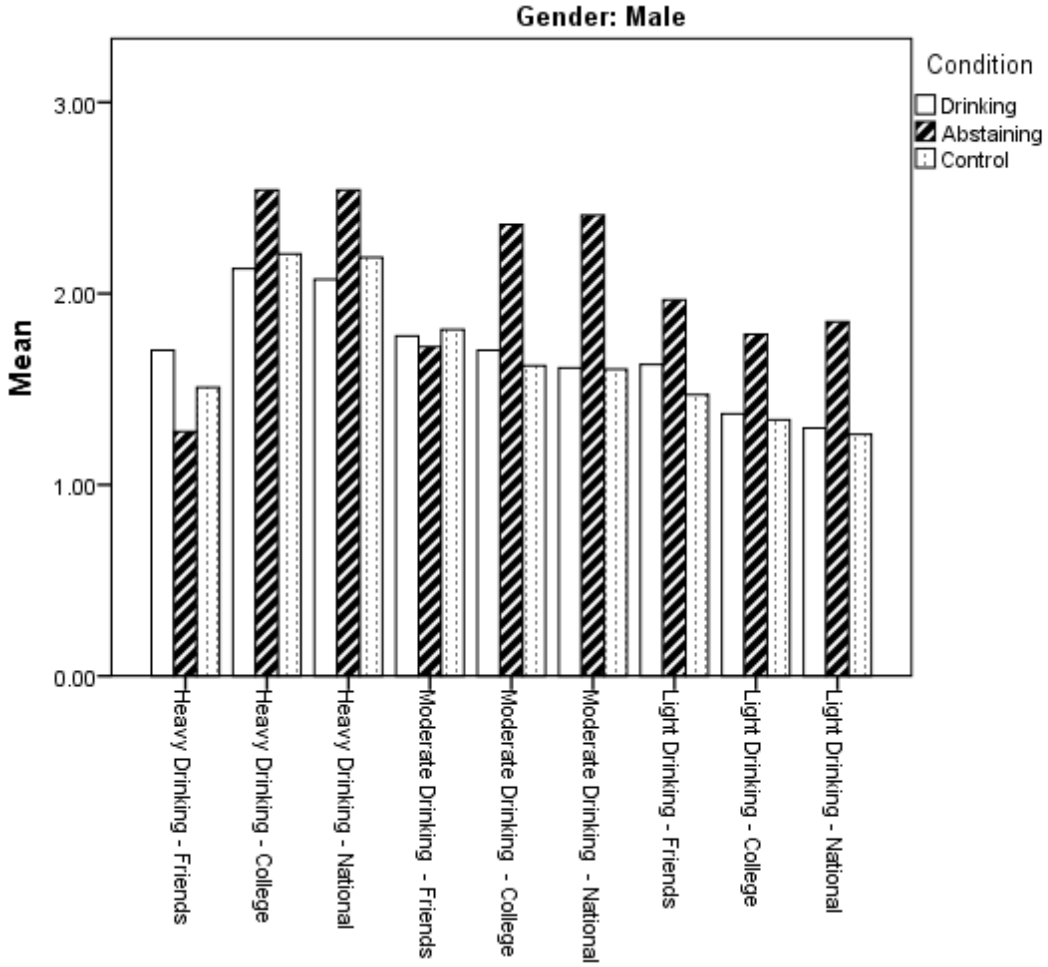

Figure 3. Means for Males.

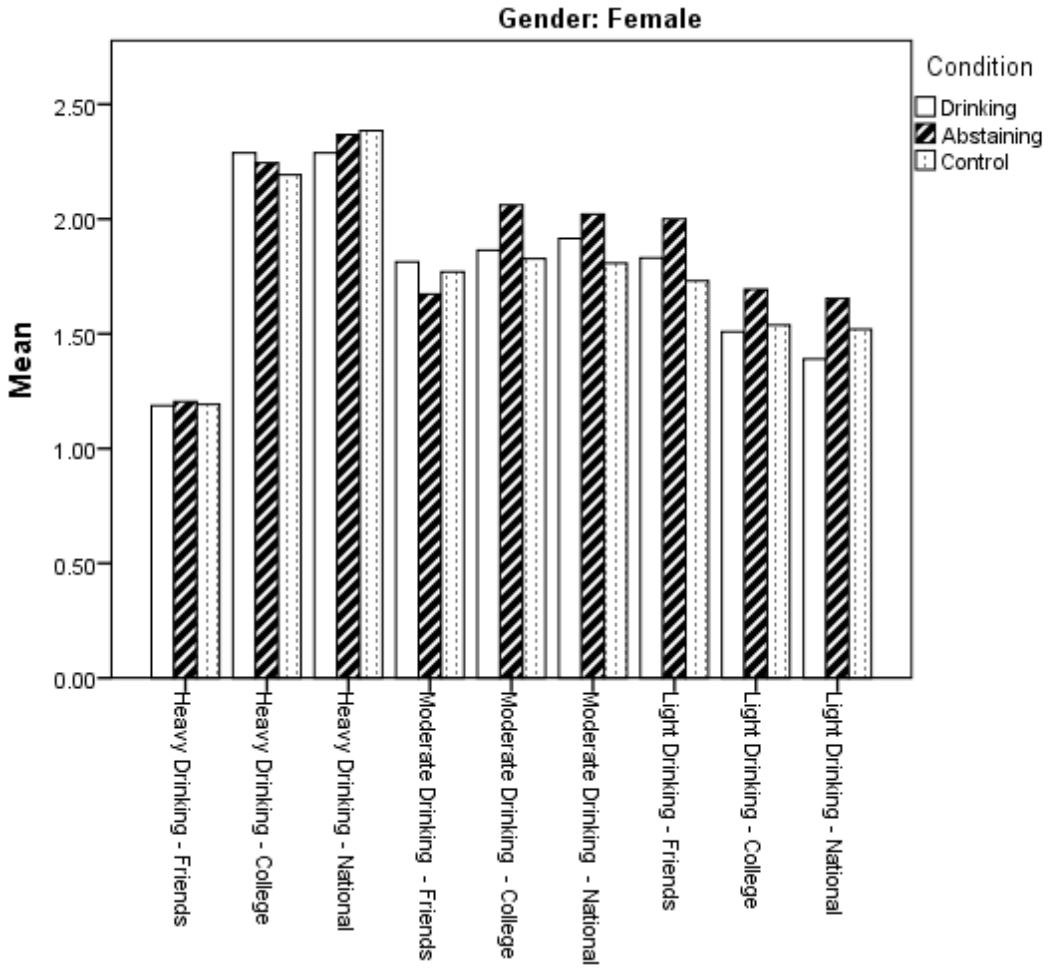

Figure 4. Means for Females.

Definitions for scores of 1, 2 and 3 for each scenario:

Friends:
1- This scenario does not at all accurately describe my friends.
2- This scenario accurately describes some of my friends.
3- This scenario accurately describes all of my friends.

College:
1- This scenario describes drinking behavior well below the typical behavior at my college.
2- This scenario describes drinking behavior in line with typical behavior at my college.
3- This scenario describes drinking behavior that is well above typical behavior at my college.

National
1- This scenario describes drinking behavior well below the typical college student behavior nationally.
2- This scenario describes drinking behavior in line with typical college student behavior nationally.
3- This scenario describes drinking behavior well above typical college student behavior nationally.

Table 1

Descriptive Statistics for the Control Condition

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Heavy Drinking – Friends	109	1.00	3.00	1.3761	.05798	.60536
Heavy Drinking – College	109	1.00	3.00	2.2018	.07231	.75498
Heavy Drinking – National	109	1.00	3.00	2.2569	.06698	.69925
Moderate Drinking – Friends	108	1.00	3.00	1.7963	.05848	.60773
Moderate Drinking – College	107	1.00	3.00	1.7290	.05722	.59193
Moderate Drinking – National	108	1.00	3.00	1.6944	.05337	.55465
Light Drinking – Friends	107	1.00	3.00	1.6075	.06194	.64071
Light Drinking – College	109	1.00	3.00	1.4220	.06555	.68440
Light Drinking – National	109	1.00	3.00	1.3853	.06373	.66539
Valid N (listwise)	105					

Table 2

Descriptive Statistics for the Drinking Condition

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Heavy Drinking – Friends	114	1.00	3.00	1.4298	.06471	.69089
Heavy Drinking – College	114	1.00	3.00	2.2018	.07390	.78908
Heavy Drinking – National	114	1.00	3.00	2.1754	.06965	.74365
Moderate Drinking – Friends	114	1.00	3.00	1.7895	.05209	.55612
Moderate Drinking – College	114	1.00	3.00	1.7807	.05251	.56064
Moderate Drinking – National	114	1.00	3.00	1.7632	.04874	.52043
Light Drinking – Friends	113	1.00	3.00	1.7345	.06654	.70733
Light Drinking – College	114	1.00	3.00	1.4386	.06234	.66566
Light Drinking – National	114	1.00	3.00	1.3421	.05687	.60717
Valid N (listwise)	113					

Table 3

Descriptive Statistics for the Abstaining Condition

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Heavy Drinking – Friends	113	1.00	3.00	1.2389	.04404	.46817
Heavy Drinking – College	112	1.00	3.00	2.4018	.07967	.84320
Heavy Drinking – National	113	1.00	3.00	2.4602	.07225	.76806
Moderate Drinking – Friends	113	1.00	3.00	1.6903	.04717	.50142
Moderate Drinking – College	113	1.00	3.00	2.2212	.06500	.69094
Moderate Drinking – National	113	1.00	3.00	2.2301	.05762	.61250
Light Drinking – Friends	112	1.00	3.00	1.9643	.06333	.67020
Light Drinking – College	112	1.00	3.00	1.7321	.05670	.60003
Light Drinking – National	113	1.00	3.00	1.7611	.05798	.61636
Valid N (listwise)	110					

Table 4

Experimental Condition as a Predictor of Drinking Perceptions

	Wald x^2	*df*	*Sig.*
Heavy Drinking			
Friends	5.585	2	.061
College	7.493	2	.024
National	12.146	2	.002
Moderate Drinking			
Friends	1.946	2	.378
College	37.745	2	<.001
National	47.196	2	<.001
Light Drinking			
Friends	15.880	2	<.001
College	22.116	2	<.001
National	34.425	2	<.001

Table 5

*Experimental Condition and Condition*Gender Interaction as Predictors of Drinking Perceptions*

	Condition			**Condition*Gender**		
	Wald x^2	*df*	*Sig.*	Wald x^2	*df*	*Sig.*
Heavy Drinking						
Friends	.207	2	.902	4.719	2	.094
College	.480	2	.787	6.125	2	.047
National	.561	2	.755	5.643	2	.060
Moderate Drinking						
Friends	1.866	2	.393	.417	2	.812
College	3.949	2	.139	13.748	2	.001
National	4.732	2	.094	26.761	2	<.001
Light Drinking						
Friends	3.390	2	.184	1.748	2	.417
College	2.045	2	.360	6.754	2	.034
National	4.156	2	.125	10.032	2	.007

Table 6

Predictors of Heavy Drinking Scenario Perceptions

	Estimate (*SE*)	Wald χ^2	*df*	Sig.	Odds Ratio	95% CI Lower	95% CI Upper
Friends							
Male	1.06 (.256)	17.11	1	<.001	2.887	1.747	4.771
Drinking	.139 (.289)	.231	1	.630	1.149	0.652	2.027
Abstaining	-.563 (.313)	3.243	1	.072	0.57	0.309	1.051
College							
Male	.007(.208)	.001	1	.975	1.007	0.67	1.512
Drinking	.017(.249)	.004	1	.947	1.017	0.624	1.657
Abstaining	.625(.259)	5.843	1	.016	1.869	1.126	3.104
National							
Male	-.249 (.209)	1.425	1	.233	0.779	0.518	1.173
Drinking	-.180 (.250)	.517	1	.472	0.835	0.512	1.364
Abstaining	.683 (.260)	6.87	1	.009	1.979	1.188	3.298

Note. Males reported higher heavy drinking scores than females. Specifically males were 2.887 times more likely to respond one level higher (of the 3 levels available for rating perceptions) Heavy drinking college: students in the abstaining condition gave higher ratings meaning they perceived heavy drinking as less typical when getting the abstaining stats. They were 1.869 times more likely to report a one-level increase in the perception score (from less than typical to typical, or typical to more than typical).

Table 7

Predictors of Moderate Drinking Scenario Perceptions

	Estimate (*SE*)	Wald χ^2	*df*	Sig.	Odds Ratio	95% CI Lower	95% CI Upper
Friends							
Male	.054 (.224)	.058	1	.810	1.055	0.68	1.637
Drinking	.003 (.278)	.000	1	.991	1.003	0.582	1.728
Abstaining	-.327 (.275)	1.412	1	.235	0.721	0.421	1.237
College							
Male	-.089 (.215)	.172	1	.679	0.915	0 0.6	1.394
Drinking	.176 (.264)	.446	1	.504	1.193	0.711	2.002
Abstaining	1.621 (.286)	32.08	1	<.001	5.059	2.887	8.866
National							
Male	-.148 (.222)	.444	1	.505	0.862	0.558	1.333
Drinking	.257 (.272)	.891	1	.345	1.293	0.759	2.202
Abstaining	2.057 (.317)	42.122	1	<.001	7.822	4.203	14.557

Table 8

Predictors of Light Drinking Scenario Perceptions

	Estimate (*SE*)	Wald χ^2	*df*	Sig.	Odds Ratio	95% CI Lower	95% CI Upper
Friends							
Male	-.464(.212)	4.799	1	.028	0.629	0.415	0.952
Drinking	.320(.260)	1.522	1	.217	1.377	0.828	2.291
Abstaining	1.028(.265)	15.072	1	<.001	2.795	1.663	4.695
College							
Male	-.260(.220)	1.396	1	.237	0.771	0.5	1.187
Drinking	.101(.280)	.131	1	.718	1.106	0.64	1.913
Abstaining	1.131(.272)	17.264	1	<.001	3.098	1.817	5.281
National							
Male	-.104(.226)	.212	1	.645	0.901	0.578	1.187
Drinking	-.108(.293)	.136	1	.712	0.897	0.505	1.913
Abstaining	1.322(.277)	22.858	1	<.001	3.751	2.182	5.281

Table 9

Predictors of Heavy Drinking Scenario Perceptions with Interaction

	Estimate (*SE)*	Wald χ^2	*df*	Sig.	Odds Ratio	95% CI Lower	95% CI Upper
Friends							
Male	1.068(0.432)	6.097	1	.014	2.909	1.246	6.791
Drinking	-0.218(0.488)	.199	1	.656	.804	.309	2.094
Abstaining	-0.067(0.494)	.019	1	.891	.935	.355	2.463
Male*Drinking	0.604(0.611)	.975	1	.323	1.829	.552	6.059
Male*Abstaining	-0.775(0.634)	1.494	1	.222	.461	.133	1.596
College							
Male	-0.08(0.356)	.050	1	.823	.923	.460	1.856
Drinking	0.238(0.355)	.448	1	.503	1.269	.632	2.546
Abstaining	0.181(0.37)	.240	1	.624	1.198	.581	2.473
Male*Drinking	-0.413(0.5)	.685	1	.408	.661	.248	1.761
Male*Abstaining	0.849(0.52)	2.670	1	.102	2.338	.844	6.474
National							
Male	-0.485(0.361)	1.811	1	.178	.616	.304	1.248
Drinking	-0.108(0.358)	.091	1	.763	.897	.445	1.811
Abstaining	0.165(0.376)	.192	1	.661	1.179	.565	2.461
Male*Drinking	-0.14(0.502)	.078	1	.780	.869	.325	2.325
Male*Abstaining	1(0.522)	3.667	1	.056	2.719	.977	7.571

Table 10

Predictors of Moderate Drinking Scenario Perceptions with Interaction

	Estimate (*SE*)	Wald χ^2	*df*	Sig.	Odds Ratio	95% CI Lower	95% CI Upper
Friends							
Male	0.087(0.398)	.048	1	.827	1.091	.500	2.379
Drinking	0.117(0.392)	.089	1	.765	1.124	.522	2.423
Abstaining	-0.395(0.398)	.983	1	.321	.674	.309	1.470
Male*Drinking	-0.227(0.556)	.167	1	.683	.797	.268	2.368
Male*Abstaining	0.119(0.55)	.047	1	.828	1.127	.383	3.312
College							
Male							
Drinking	-0.7(0.383)	3.339	1	.068	.497	.235	1.052
Abstaining	0.118(0.379)	.097	1	.755	1.125	.536	2.363
Male*Drinking	0.738(0.398)	3.438	1	.064	2.091	.959	4.562
Male*Abstaining	0.103(0.532)	.037	1	.847	1.108	.391	3.145
	1.794(0.544)	10.879	1	.001	6.014	2.071	17.467
National							
Male							
Drinking	-0.734(0.394)	3.463	1	.063	.480	.222	1.040
Abstaining	0.514(0.409)	1.581	1	.209	1.673	.750	3.729
Male*Drinking	0.939(0.434)	4.681	1	.030	2.558	1.092	5.991
Male*Abstaining	-0.514(0.557)	.854	1	.356	.598	.201	1.780
	2.36(0.577)	16.698	1	<.001	10.589	3.414	32.839

Note. Being male and in the abstaining group led to being 6 and 10.6 times more likely to give a higher score.

Table 11

Predictors of Light Drinking Scenario Perceptions with Interaction

	Estimate (*SE)*	Wald χ^2	*df*	Sig.	Odds Ratio	95% CI Lower	95% CI Upper
Friends							
Male	-0.716(0.376)	3.618	1	.057	.489	.234	1.022
Drinking	0.268(0.363)	.545	1	.460	1.307	.642	2.660
Abstaining	0.694(0.38)	3.339	1	.068	2.002	.951	4.214
Male*Drinking	0.096(0.521)	.034	1	.854	1.100	.397	3.053
Male*Abstaining	0.635(0.522)	1.477	1	.224	1.887	.678	5.252
College							
Male	-0.914(0.416)	4.829	1	.028	.401	.177	.906
Drinking	-0.05(0.374)	.018	1	.893	.951	.457	1.980
Abstaining	0.438(0.38)	1.325	1	.250	1.549	.735	3.264
Male*Drinking	0.336(0.572)	.344	1	.557	1.399	.456	4.291
Male*Abstaining	1.343(0.551)	5.944	1	.015	3.829	1.301	11.268
National							
Male	-0.961(0.429)	5.008	1	.025	.383	.165	.888
Drinking	-0.329(0.388)	.720	1	.396	.719	.336	1.540
Abstaining	0.45(0.384)	1.374	1	.241	1.569	.739	3.330
Male*Drinking	0.46(0.602)	.584	1	.445	1.584	.487	5.153
Male*Abstaining	1.683(0.562)	8.960	1	.003	5.384	1.788	16.212

Table 12

Participant Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	173	51.5	51.5	51.5
	Female	163	48.5	48.5	100.0
	Total	336	100.0	100.0	

Table 13

Participants by College Year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Freshman	40	11.9	12.0	12.0
	Sophomore	89	26.5	26.6	38.6
	Junior	90	26.8	26.9	65.6
	Senior	98	29.2	29.3	94.9
	5th year +	17	5.1	5.1	100.0
	Total	334	99.4	100.0	
Missing	System	2	.6		
Total		336	100.0		