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Approval, Anxiety, and Alcohol: an Exploration of Problematic Drinking with College Students

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**Abstract**

The alcohol-related behaviors of fifty-eight students at a small Midwestern liberal arts college were measured to discover possible predictors of alcohol consumption and alcohol problems. The possible predictors measured were descriptive and injunctive social norms, and social and stress-based anxiety. The sample was then evaluated based on class year, comparing seniors and first-year students. For the whole sample, both descriptive and injunctive norms were significant positive predictors of alcohol consumption and alcohol problems. Social anxiety significantly negatively predicted consumption in terms of drinks per week and binge days per week. The most noteworthy difference between class years was the seniors' significant positive trend for descriptive social norms in predicting alcohol consumption and alcohol problems, whereas the first-years showed no significant trends for these norms. These data suggest that intervention and prevention strategies should target social norms, especially the descriptive social norms of the senior class.

### Alcohol Use on College Campuses

It is estimated that approximately four out of every five college students participate in campus alcohol culture, half of which specifically engage in binge drinking (NIAAA, 2013). These statistics are not alarming on their own, but the multitude of problems related to alcohol consumption on college campuses is staggering. For example, 1,825 college students die every year in the United States due to accidental causes relating to alcohol, in addition to another 599,000 students who have been injured under similar alcohol-related circumstances (NIAAA, 2013). It is for these reasons that the predictors of dangerous alcohol-related behaviors are to be examined and scrutinized.

Alcohol-related problems can be divided into three major categories: short-term problems, long-term problems, and behavioral patterns. The first of these describes negative physical consequences of alcohol consumption that are immediate and relatively short-lasting. Such examples are hangovers, lapses in memory (“blackouts”), headaches, dizziness, vomiting, distorted vision, impaired judgment, and unconsciousness (CDC, 2014; FDFW, 2014). Although each of these symptoms can be dangerous, the short-term problems of alcohol use do not necessarily leave lasting effects. However, if dangerous drinking habits are continued, long-term problems may develop.

Long-term problems are persistent and often permanent physical consequences of alcohol abuse over time (CDC, 2014; FDFW, 2014). Examples of long-term problems are liver damage, physical dependence, withdrawal symptoms, increased tolerance, high blood pressure, stroke, heart disease, and memory problems (Fillmore, 2001; CDC, 2014; FDFW, 2014). Wechsler et al. (2000) found that in their study of more than 14,000 college students, approximately 56% of students had experienced increased tolerance and 5% had experienced withdrawal symptoms



(Wechsler et. al, 2000). In addition, The National Institute for Alcohol Abuse and Alcoholism indicates that more than 150,000 students a year develop the aforementioned long-term health problems.

The last category of alcohol-related problems is behavioral patterns. Behavioral patterns can be described as instances of actions that are directly linked to alcohol use. One such example is binge drinking, which is defined as consuming 5 or more drinks in one setting (Fillmore, 2001). This pattern of behavior often causes many of the short-term and long-term problems previously mentioned. Other examples of alcohol-related behavioral patterns are property damage, physical assault, sexual assault, sexual situations later regretted, driving while intoxicated, missing classes, and poor grades (Fillmore, 2001; Gilles et. al, 2006). Perhaps the most prevalent of these are assault. Past research has found that of college students ages 18-24, approximately 690,000 have been victims of an incident of physical assault, and 97,000 have been victims of sexual assault (NIAAA, 2013). In an additional survey of more than 14,000 college students, 22% of the 388 college freshmen surveyed admitted to partaking sexual relations that they later regretted (Wechsler et. al, 2000). Even more minor behavioral patterns, such as poor grades, missing classes, and falling behind in classwork due to alcohol are surprisingly common. According to The National Institute for Alcohol Abuse and Alcoholism, approximately 25% college students experience negative academic consequences every year due to alcohol-related patterns of behavior.

#### *Alcohol & Denison University*

The population of focus for the study will be first-year students and seniors at Denison University, a small Midwestern liberal arts college. Based on information collected from past campus surveys, Denison students mirror much of the national data, showing that within 30 days

of being surveyed, 82% of male and 85% of female students had engaged in alcohol use. A variety of alcohol-related behavioral patterns were also assessed, revealing that within the past year 41% of students reported committing an action they later regretted, 21% reported physically injuring themselves, and 14% reported engaging in unprotected sex. As for disciplinary problems, there has been an average of 264.7 cases of violating university alcohol policy within the six academic years spanning from 2007 to 2013. Between 2010 and 2013, there were 207 cases of medical amnesty, a policy which allows students to seek emergency medical help free of disciplinary action, although other educational and counseling sessions may be required. Of these 207 cases, 58.9% were first-year students, whereas only 7.2% were seniors.

### **Alcohol Problems and Consumption**

Throughout the numerous studies on alcohol use and abuse, there has been a lack of universal language. A clear distinction between alcohol consumption and alcohol problems is necessary. "Alcohol consumption" refers to the quantity and frequency of alcohol ingested, whereas "alcohol problems" refers to the negative consequences one experiences during or due to consuming alcohol (Neighbors et. al, 2007). Data relating to alcohol use differs depending on which term is being assessed. For example, alcohol consumption is found to often be predicted by social norms, whereas alcohol problems are often found to be predicted by coping motives (Neighbors et. al, 2007). These data suggest that social norms, or the pressures and expectancies of one's peers, enforce rates of alcohol consumption, but these social norms are not the primary source of alcohol-related problems. Alcohol problems arise from coping motives, or drinking to reduce or regulate negative feelings (Lewis et. al, 2008; Ham et. al, 2007).

In addition, alcohol consumption does not necessarily correlate with alcohol problems. Although it is rather intuitive to suggest that those who experience alcohol problems are those



who consume greater amounts of alcohol, contrary data has been discovered. Lewis et. al (2008) found that some college students (with high social anxiety in this case) consume significantly less alcohol, but experience more alcohol-related problems (Lewis et. al, 2008). Considering these data, alcohol consumption cannot be interchangeable with alcohol problems. These data further advocate for more precise language and measures in alcohol-related studies.

### **Social Norms**

Social norms are established within any given culture based on a general consensus on what are considered to be acceptable behaviors. Social norms are neither “inherently good nor inherently valuable;” rather, the social norms of a culture are founded solely on the acceptability of a given action (Cialdini & Trost, 1998). These acceptable behaviors are then reinforced through either repeated reward for compliance, or repeated punishment for noncompliance (Cialdini & Trost, 1998). Examples of such rewards for compliance include building and sustaining relationships, maintaining one’s self-esteem, and functioning effectively in social interactions (Cialdini & Trost, 1998).

However, social norms can often be misconstrued or distorted by members of the culture from which they originate. Discrepancies can arise from the ways in which these norms are measured. Social norms are measured by observable behaviors, direct and indirect communication, and knowledge of the self (Borsari & Carey, 2003). The first type of discrepancy stems from misjudging the observable behaviors of others through attribution error. Attribution error refers to attributing the actions of a given individual to stable dispositional patterns of regular behavior, rather than to behavior that is subject to outside situational influences (Borsari & Carey, 2003). Secondly, direct and indirect communication can easily be misunderstood, whether purposely or accidentally. Direct communication refers to words,

whereas indirect communication refers to the implied meanings of those words (Borsari & Carey, 2003). Based on what one says or what one interprets, communication can be confused. Lastly, the knowledge of oneself can alter one's perception of others, which is known as the false consensus effect. The false consensus effect asserts that an individual will often assume that others will act and think in the same manner in which he does (Borsari & Carey, 2003). This bias does not allow one to see his peers as they are, but as he believes they may be, based on their similarity to him. With each of these three measurements, one is likely to replace a peer's true disposition, words, or views with those of the perceived societal norms. Therefore, social norms are reinforced by the inconsistencies in these three types of measurements.

The types of social norms that will be examined in this study are descriptive norms and injunctive norms. Descriptive norms refer to the perceived prevalence of a certain behavior (Borsari & Carey, 2003; Neighbors et. al, 2007; Lewis & Neighbors, 2004). These norms are based on what one perceives to be the "typical" behavior concerning the subject, regardless of the accuracy of this belief. Injunctive norms refer to the perceived acceptance or approval of a given behavior (Neighbors et. al, 2007; Borsari & Carey, 2003). These norms can be useful by helping one discover what is considered appropriate behavior among a certain group of people. Injunctive norms can come from peers, friends, or family, often varying between them. Behavior will change based on the situation or value placed on whom the approval is from. This study will focus on descriptive and injunctive norms in relation to alcohol use, which have both been shown to be indicators of consumption and problem drinking (Larimer et. al, 2004; Borsari & Carey, 2003; Neighbors et. al, 2007).

#### *Descriptive Norms*

Perceived descriptive drinking norms have been related to higher alcohol consumption

and may also be a mediator for alcohol problems. Neighbors et al. (2007) conducted a study of 818 college students with possible problem drinking habits (defined by having had at least one heavy-drinking episode within the past month). To measure perceived descriptive drinking norms, participants were given the Drinking Norms Rating Form (Baer et al., 1991), which asks them to list how many drinks they estimate the average student at their university has per day of the week. The results revealed that descriptive norms had a large effect on alcohol consumption and a small, unique effect on alcohol problems (Neighbors et al., 2007). Upon further analysis, the researchers were able to determine that the effect of descriptive norms on alcohol problems was mediated by alcohol consumption. This suggests that alcohol problems arise from descriptive norms particularly when consumption is higher, or that those who experience problems due to descriptive norms, encounter these problems simply because they consume more alcohol. Larimer et al. (2004) also arrived at a similar conclusion. The 2004 longitudinal study found that among 582 undergraduate "Greek Life" members, descriptive norms significantly predicted alcohol consumption both at baseline and 1 year later. This suggests that one's perception of their peers' consumption predicted the level of their own consumption (Larimer et al., 2004). Although perceived descriptive norms did not predict long-term alcohol problems, they did predict short-term problems. However these results do not necessarily indicate that individuals drink to "match" their descriptive norm perceptions, but that perhaps they base their perceptions on their own drinking habits.

### *Injunctive Norms*

Injunctive drinking norms have been found to be indicators of both consumption and alcohol problems, but it often depends on whom the injunctive norms are based. In Neighbors et al. (2007), data revealed that of the undergraduates sampled, injunctive norms based on friends

had a medium effect on alcohol consumption, and injunctive norms based on parents had a small effect on alcohol consumption. This suggests that students' consumption is more greatly swayed by the approval of their peers than that of their parents. Although injunctive norms based on friends had a greater effect on alcohol consumption than norms based on parents, only the parent-based injunctive norms were a significant predictor of alcohol problems. These data suggest that when it comes to alcohol problems, the approval or disapproval of one's parents, rather than his peers, is a better indicator of behavior.

Larimer et al. (2004) found, like Neighbors et al. (2007), that injunctive norms from peers had a significant effect on alcohol consumption, but unlike Neighbors et al. (2007), also found that these norms were a significant predictor of long-term alcohol problems. Larimer et al. (2004) conducted a two-year longitudinal study on 582 "Greek Life" members and found that injunctive norms significantly predicted future consumption (1 year later in this case), in addition to short-term alcohol problems, long-term alcohol problems and physical dependence both at baseline and 1 year later (Larimer et al., 2004). This suggests that the approval of one's peers may influence not only consumption, but also participation problematic alcohol behavioral patterns. For example, if one's peers seem to approve of high alcohol consumption or alcohol-related problems such as blacking out, then he or she will be more likely to engage in such patterns of behavior.

#### *Gender and Social Norms*

One way to further assess drinking norms is in terms of gender. Lewis & Neighbors (2004) conducted a study on same-sex and gender-nonspecific drinking norms. They found that students typically overestimated perceived descriptive drinking norms for both their same-sex and gender-nonspecific peers (Lewis & Neighbors, 2004). Often referred to as self-other



discrepancy, the overestimation of perceived alcohol consumption (descriptive) or approval (injunctive) is thought to influence one's own habits (Borsari & Carrey, 2003). It is proposed that if one overestimates the consumption of the typical student, he may increase his consumption to "match" the norm. Alcohol consumption in women more so than men, was predicted by their perception of same-sex descriptive norms, meaning that women's consumption was more strongly based on their perception on how much other women drink (Lewis & Neighbors, 2004). Borsari & Carrey (2003) found that women tend to have higher self-other discrepancies regarding both descriptive and injunctive norms. Based on these data, it seems that consumption in women is motivated by norms that are incorrectly perceived. For both genders, alcohol problems are more strongly predicted by same-sex norms than gender-nonspecific norms, meaning that both men and women's alcohol-related problems are influenced more strongly by the norms within their own gender than those outside of specific gender norms (Lewis & Neighbors, 2004). These data advocate for distinction between genders when considering the influence of social norms on alcohol problems and consumption.

### **Anxiety**

Anxiety can manifest in many ways, and rooted in a variety of triggers and motives. Past alcohol research has had a lack of a universal definition for "anxiety," so for the purposes of this study, alcohol will be divided into two categories: social anxiety and stress. Social anxiety differs from stress in that social anxiety is in response to social interactions, whereas stress is based on "hassles" of non-social situations (Hutchinson et al., 1998).

Despite the differences in the source of the anxiety, social anxiety and stress-based anxiety have similar motives. There are four main types of motives, which include social, conformity, enhancement, and coping motives (Neighbors & Larimer, 2008; Neighbors et al.,



2007). Social motives refer to drinking to make social occasions more enjoyable, conformity motives are in response to social pressures (or norms as previously described), enhancement motives are used when one wants to increase and maintain a positive mood, and coping motives hope reduce and regulate negative emotions (Neighbors & Larimer, 2008). Enhancement and social motives are connected to higher consumption, and are positively reinforced because they can be used to combat feelings of anxiety in exchange for feelings of euphoria. Coping and conformity motives are often associated with alcohol-related problems and are negatively reinforced (Neighbors & Larimer, 2008). Coping motives are especially dangerous for anxious individuals, as it can lead to continual self-medication to reduce the negative feelings of anxiety.

The Self-Mediation Hypothesis asserts that drug use, such as alcohol, is motivated by fear-reduction and pain-reduction (Carrigan & Randall, 2003). This hypothesis rests on three assumptions: “the distressing psychiatric symptoms predate drug use, the drug relieves these symptoms, and symptom relief by a particular drug leads to excessive use of that drug” (Carrigan & Randall 2003). Those who experience regular anxiety whether through stress or through social triggers, often use self-medication as a way of deterring or escaping from these negative feelings. Because the drug relieves the negative emotions, the person is then reinforced to continue using the drug (negative reinforcement). As the drug use increases, consumption increases to maintain the original effect, which then may lead to many other negative consequences such as dependency.

Similar to the Self-Medication Hypothesis, the Tension-Reduction Hypothesis suggests that alcohol use is motivated by the anticipation or belief that it will reduce stress (Kidorf & Lang, 1999; Neighbors & Larimer, 2008; Wilson & Abrams, 1977). This hypothesis relies on two assumptions: that alcohol consumption reduces tension, and that this reduction in tension

motivates drinking (Wilson & Abrams, 1977). Like self-medication, those with anxiety are repeatedly drawn to engage in alcohol use when under stressful situations because this alleviates their anxious feelings, and is thus negatively reinforcing.

### *Social Anxiety*

Social anxiety is defined by “excessive fear of social situations and negative evaluations by others” (Gilles et. al, 2006; Book & Randall, 2002). Social anxiety affects 2-13% of the United States population, and is the fourth most common psychiatric disorder in the United States (Book & Randall, 2002; Ham et al., 2007). The diagnostic criteria for social anxiety is as follows: (1) persistent fear of one or more social situation in which a person is exposed to unfamiliar people, (2) exposure to feared social situation provokes anxiety, (3) recognition that the fear is excessive or unreasonable, (4) the feared social situation is avoided, and (5) avoidance of the social situation leads to disruptions in daily life. In addition, this social fear must not be due to or better explained by other medical conditions, medications, or mental disorders, and in individuals under 18 years old, the duration of symptoms must be at least 6 months (Book & Randall, 2002).

Social anxiety is often connected to alcohol problems, but not necessarily alcohol consumption. In fact, Neighbors & Larimer (2008) found that socially anxious individuals experienced more alcohol problems, but significantly less consumption than their non-anxious counterparts (Neighbors & Larimer, 2008). Overall, the relationship between alcohol consumption and social anxiety is unclear. However, alcohol problems have been frequently tied to social anxiety, asserting that socially anxious people typically experience more alcohol-related problems than their non-anxious counterparts and have an increased risk of receiving a diagnosis of alcohol abuse or dependence (Neighbors et. al, 2007; Neighbors & Larimer, 2008; Gilles et.

al, 2006; Book & Randall, 2002). Book & Randall (2002) estimated that about 20% of patients who are receiving treatment for social anxiety disorder, and 15% of patients who are being treated for alcoholism have been treated for both disorders (Book & Randall, 2002). Therefore it is important to investigate alcohol use within the parameters of not just anxiety, but specifically social anxiety.

The relationship between alcohol problems and social anxiety stems from drinking motives and expectancies. As mentioned earlier, socially anxious individuals tend to drink based on conformity and coping motives (Neighbors & Larimer, 2008; Neighbors et al., 2007). Positive expectancies based on these motives, tension-reduction, self-medication, and social facilitation seem to drive the socially anxious to partake in what can be dangerous alcohol practices (Gilles et al, 2006; Wilson & Abrams, 1977; Kidorf & Lang, 1999). Common expectancies among the socially-anxious and non-anxious alike are that alcohol will reduce social anxiety and will increase assertiveness (Gilles et al., 2007; Kidorf & Lang, 1999; Wilson & Abrams, 1977). These positive expectancies not only motivate drinking, but also directly influence anxiety, regardless of alcohol consumption. For example, Wilson & Abrams (1977) conducted a famous study where 32 male socially motivated drinkers were told they would receive one of two conditions: vodka and tonic, or tonic only. What the participants didn't know was that within each condition, only half of the participants were given the beverage that they had expected. The participants who had expected alcohol, regardless of whether or not they actually received alcohol, showed lower anxiety, as measured by both self-reported questionnaires and heart rate (Wilson & Abrams, 1977). The participants who received alcohol, but were led to believe that they had received tonic did not show decreased in anxiety despite actually consuming the substance. This powerful study exemplifies just how impactful one's

expectancies can be. Tension-reduction and social-facilitation expectancies seem to be held universally among those with and without a diagnosis of an anxiety disorder. Since socially anxious people tend to be motivated by social norms, they are likely to adapt this point of view (Neighbors & Larimer, 2008; Ham et al., 2007). Once this view has been taken on by a socially anxious individual, it can further motivate and reinforce him to partake in alcohol use. However, it is not necessarily the alcohol that is reducing their anxiety, but simply their own mental set regarding alcohol. As mentioned before, this can lead to a dangerous cycle of behavioral reinforcement, which may cause many other serious alcohol problems.

### *Stress*

For the purposes of this study, stress refers to anxiety or “hassles” that are not related to social settings (Hutchinson et al., 1998). Unlike social anxiety, stress is not a psychological disorder, but rather a concept that all people must encounter in day-to-day life. This is especially common among college students, who report that the top five stressors of beginning college life are changes in sleeping habits, vacations and breaks, changes in eating habits, new responsibilities, and increased workload (Ross et al., 1999). Since stress is something that all college students encounter, it is important to establish its relationship with alcohol use.

Stress-based anxiety has an unclear relationship with alcohol consumption. Conflicting evidence is found throughout the research, which is likely due to mediating variables and a lack of a universal operational definition. In relation to stress-based anxiety, consumption is thought to be mediated by social support and expectancies that alcohol will reduce stress (Perkins, 1999; Steptoe et al., 1996). The expectancy that alcohol will reduce stress is supported by the Tension-Reduction Hypothesis (Kidorf & Lang, 1999; Neighbors & Larimer, 2008; Wilson & Abrams, 1977). Steptoe et al. (1996) found that social support can have a significant effect on one's



alcohol consumption when under stress. The researchers measured the baseline and stress-state alcohol consumption of college students in two conditions: high social support and low social support. The study revealed that alcohol consumption only increased significantly with stress for the low social support group, whereas the high social support group actually decreased consumption as stress increased (Steptoe et al., 1996).

Although stress has uncertain relationship with consumption, it consistently shows a high correlation with alcohol problems (Camatta & Nagoshi, 1995; Hutchinson et al., 1998). Past research suggests that the relationship between stress and alcohol problems is mediated by irrational coping mechanisms (Camatta & Nagoshi, 1995; Hutchinson et al., 1998). By surveying 135 alcohol-using college students, Camatta & Nagoshi (1995) found that although stress did not correlate significantly with consumption, it was significantly correlated with alcohol problems. Upon further investigation, they found that the relationship between alcohol problems and stress was mediated by irrational beliefs (Camatta & Nagoshi, 1995). This suggests that those who experience significant alcohol problems due to stress also have underlying irrational coping mechanisms. Hutchinson et al. (1998) corroborated these findings, adding that irrational coping could be defined by irrational beliefs, impulsivity, and compulsivity (Hutchinson et al., 1998). While considering irrational coping as a factor, they found that it completely mediated the effect of stress on alcohol problems (Hutchinson et al., 1998).

### **Drinking Habits Among First-Year Students and Seniors**

Little substantial research has been conducted comparing the drinking habits of students at the beginning and end of their college career. Considering that most of the alcohol problems resulting on Denison University's campus (this study's sample) are with first-year students, this is a very important factor to consider. Past studies suggest that this may be related to stress



levels, showing that first-year students experience the most stress among all years of students (Ross et al., 1999). Much of this stress results from changes in routine, expectancies, and responsibilities that accompany entering college and leaving home. There is also some evidence that alcohol habits over the course of college are based on gender. Klein (1993) found that of 526 undergraduate students surveyed, women showed a significant decrease in consumption and an increase in the negative perception of alcohol use over the four years, but the men did not show any significant difference in consumption or perception (Klein, 1993). When considering post-graduate life, past studies have found that overall consumption and alcohol problems decrease with time (Perkins, 1999; Bergen-Cico, 2000). However, it is important to note that the drinking motive of stress-reduction increases in post-graduate life, and those who use this motive tend to show increased consumption and problems (Rutledge & Sher, 2001).

These findings support the first-year student trend that has been observed at Denison University, but it is unclear what motivates this trend. It may be due to increased levels of stress or social anxiety given that the first-year students are in a new environment with new people, or it could be due to social norms, since these new students may be especially vulnerable to the expectations of their peers. Therefore the class difference will be examined within the factors of anxiety and social norms.

### **Present Study**

This study focuses on the alcohol consumption and alcohol problems experienced by first-year and senior undergraduates at Denison University. The factors of social norms and anxiety are examined in the terms of descriptive social norms and injunctive social norms, and social anxiety and stress-based anxiety. First, I hypothesize that descriptive social norms will be a positive predictor for alcohol consumption and alcohol problems. I also hypothesize that

injunctive social norms will be a positive predictor for both alcohol consumption and problems. Given past findings, injunctive social norms may have a more significant impact on both of these alcohol measurements than descriptive social norms. Second, I predict that both social anxiety and stress-based anxiety will be significant positive indicators of alcohol problems, but not necessarily consumption. Considering that stress seems to be more widespread among undergraduates than social anxiety, stress-based anxiety may be a more important factor in predicting alcohol problems. Third, I hypothesize that anxiety may be a more significant indicator of alcohol problems, whereas social norms may be a more significant indicator of alcohol consumption. Lastly, I predict that compared to the seniors, first-year students' alcohol consumption and alcohol problems will be more strongly determined by social norms and anxiety.

Due to the multitude of health and psychological problems caused by alcohol misuse, it is imperative that the motivations and behavioral patterns behind alcohol consumption and problems are investigated. It is my hope that with the data gained from this study, campus intervention programs can be created to target certain factors that are specific to the student body. These factors could then also be used to foresee possible problem areas with new first-year students and intervene before serious problems occur.

## Method

### *Participants*

Fifty-eight participants completed the study questionnaire. All participants were students at Denison University, a Midwestern liberal arts college, and were recruited through randomized emails and PSYC-100 classes. The student sample was 84.5% female (n=49), and ranged in age from 18 to 22. Of the fifty-six participants, 50% were first-year students (n=29) and 46.6% were

seniors (n=27). An additional 3.4% were either sophomores (n=1) or juniors (n=1), who were not be taken into account in the data analysis comparing class year. The sample was 3.4% African American, 3.4% Asian, 3.4% Latino/Hispanic, 10.3% multiracial, and 79.3% white. 32.8% of participants indicated that they were involved in a sorority and 1.7% in a fraternity, whereas 65.5% indicated that they were unaffiliated.

### *Apparatus*

In this study, participants were asked to complete an online questionnaire that collected data regarding one's alcohol consumption and related problems due to alcohol use. The study questionnaire, composed on Qualtrics, was comprised of multiple factor-based questionnaires obtained from the literature (Appendix A). Alcohol consumption was measured by the *Daily Drinking Questionnaire*, which assesses the individual's alcohol consumption in terms of number and frequency of alcoholic drinks (Collins et. al, 1985). Participants were asked reflect on the last 30 days, and to record the number of drinks and number of hours that they typically consume on each of the days of the week. Alcohol-related problems were measured by the *Rutgers Alcohol Problem Index*, which is an 18-item questionnaire which asks how often one has experienced a given alcohol-related problem over the past three years, such as "passed out or fainted suddenly" and "noticed a change in your personality" (White & Labouvie, 1989). The responses are in the form of a 5-point Likert scale which ranges from "0 = never" to "4 = more than 10 times." This questionnaire has been shown to reliably indicate problematic drinkers at a clinical level (White & Labouvie, 1989).

Descriptive social norms were measured by the *Drinking Norms Rating Form* (Baer et al., 1991), which assesses one's perception of how much and how often a typical student drinks. The questionnaire asks the participants to reflect on various types of peers, such as "an average

college student residing in a fraternity” or “your closest friends.” The participants are then asked to indicate both the frequency and the number of drinks that he or she thinks the peer-type in question drinks on average. The frequency is based on a 7-point Likert scale that ranges from “1 = less than once a month” to “7 = once a day.” The number of drinks is based on a 6-point Likert scale that ranges from “1 = 0 drinks” to “6 = more than 8 drinks.” Injunctive norms were measured by the “injunctive norms model” used in Baer et al. (1994). The 4-item questionnaire, based on this model, assesses the perceived peer approval of a given negative alcohol-related behavior, such as “driving a car after drinking” (Baer et. al, 1994). Participants are asked to rank the approval or disapproval he or she thinks he would receive from friends if he were to engage in this behavior. The statements are scored by a 7-point Likert scale ranging from “1 = strong disapproval” to “7 = strong approval.”

Social anxiety was measured by the *Social Interaction Anxiety Scale* (Mattick & Clarke, 1998). This scale consists of 19 items that are evaluated by a 5-point Likert scale based on the degree to which the participant feels that the statement is true of him or herself. The statements regard one’s level of social anxiety; for example, some statements are “I get nervous if I have to speak to someone in authority” and “I have difficulty making eye-contact with others.” Answers range from “0 = not at all” to “4 = extremely.” This measure has been shown to have high internal consistency and test-retest reliability (Mattick & Clarke, 1998). Stress-based anxiety was measured by the *Perceived Stress Scale*, which is a 10-item questionnaire that asks how often the participant has experienced a certain stress-related feeling in the past month (Cohen et. al, 1983). Examples include “have been upset about something that happened unexpectedly” and “felt that you were unable to control important things in your life.” Answers are scored on a 5-point Likert scale ranging from “0 = never” to “4 = very often.” High scores on the *Perceived*



*Stress Scale* have been linked to increased difficulty quitting smoking and increased vulnerability to depressive symptoms.

#### *Procedure*

Before the study could begin, the study proposal was evaluated by both departmental and campus-wide IRB committees, to ensure ethical procedures. Participants were recruited through either PSYC 100 classes or randomized emails. PSYC 100 students were recruited through SONA systems, where the questionnaire link could be accessed after signing up. One hundred random emails from the senior class were selected to be invited to participate in the study. The invitation email explained the nature of the study and included the link for the questionnaire. The first page of the questionnaire provided the informed consent and required participants to confirm that they were at least 18 years old and agreed to participate before any questions could be viewed or answered (Appendix B). After completing all items, the participants were presented with the debriefing document (Appendix C). The informed consent and debriefing documents listed the contact information for the campus counseling services to assist participants who may be concerned about their alcohol use. In addition, the researcher's contact information was listed at the bottom of every survey page so that any participants who dropped out of the survey before completing and receiving the debriefing document could still access this contact information. After completion, PSYC 100 students were awarded SONA credits and the other recruited participants were given the choice to enter a prize drawing as a reward for their participation.

All questionnaires were kept entirely confidential. No names, emails, IP addresses, or other identifying information was collected, so that participants could answer the surveys honestly without fear of disciplinary or legal action. Those who chose to enter the prize drawing



were directed to a separate link to enter their email so that this identifier could not be connected to any individual questionnaire.

### *Data Analysis*

Individual linear regression analyses were conducted for each of the social norms and anxiety factors to predict alcohol consumption and alcohol problems. An additional set of linear regressions were conducted with all factors entered simultaneously. Pearson's  $r$  was calculated for the relationships between the social norms or anxiety factors, and alcohol consumption or problems. These correlations were separated by class year, to better compare the differences in alcohol behaviors between them. Independent samples  $t$ -tests were used to evaluate the differences between the class years on each of the measurements to ensure relatively equal samples.

### **Results**

The data revealed that the participants ( $n=58$ ) consumed an average of 7.26 drinks per week, over an average of 2.03 days per week. The sample showed a mean of 0.67 binge days per week, and an average consumption rate of 0.96 drinks per hour during a drinking event. It is important to note that the sample included some participants who abstained from alcohol completely.

Descriptive norms, in terms of both how much and how often the perceived peer drinks, were analyzed by five individual linear regressions. Descriptive norms positively predicted consumption in terms of total number of drinks per week,  $F(2,55)=9.52$ ,  $R^2=0.257$ ,  $p<0.001$ , total number of drinking days,  $F(2,55)=6.44$ ,  $R^2=0.190$ ,  $p=0.003$ , number of binge days,  $F(2,55)=7.99$ ,  $R^2=0.225$ ,  $p=0.001$ , and consumption rate,  $F(2,55)=4.70$ ,  $R^2=0.146$ ,  $p=0.013$ . Descriptive norms was also a positive predictor of alcohol problems,  $F(2,55)=4.37$ ,  $R^2=0.137$ ,

$p=0.017$ . Although both were significant, descriptive norms better predicted alcohol consumption than alcohol problems. The participant group predicted that their average peer consumed about 1-2 times a week, with 3-4 drinks per event. The sample revealed that the average participant drank 2.03 days per weeks, with 3.58 drinks per event. When only factoring in participants who reported drinking, the average participant drank 2.57 days per week, with 3.56 drinks per event. This shows that the sample's perceived descriptive norms were relatively accurate.

Injunctive norms also positively predicted alcohol consumption in terms of total number of drinks per week,  $F(1,56)=27.43$ ,  $R^2=0.329$ ,  $p<0.001$ , total number of drinking days,  $F(1,56)=30.58$ ,  $R^2=0.353$ ,  $p<0.001$ , number of binge days per week,  $F(1,56)=9.04$ ,  $R^2=0.139$ ,  $p=0.004$ , and consumption rate  $F(1,56)=14.69$ ,  $R^2=0.208$ ,  $p<0.001$  (Figure 1). Although injunctive norms was stronger predictor of consumption, it also positively predicted alcohol problems,  $F(1,56)=8.42$ ,  $R^2=0.131$ ,  $p=0.005$  (Figure 2).

Social anxiety negatively predicted alcohol consumption only in terms of total number of drinks per week,  $F(1,56)=27.43$ ,  $R^2=0.090$ ,  $p<0.001$ , and number of binge days,  $F(1,56)=27.43$ ,  $R^2=0.092$ ,  $p<0.001$  (Figure 3). The total number of drinking days,  $p=0.374$ , and consumption rate,  $p=0.074$ , were not significant. Social anxiety indicated a negative trend in relation alcohol problems, but this effect was not significant,  $p=0.357$ . Stress was not a significant predictor of any of the consumption factors, nor alcohol problems.

A simultaneous linear regression revealed that when descriptive norms, injunctive norms, social anxiety, and stress were considered together, these combined factors positively predicted alcohol consumption in terms of number of total number of drinks per week,  $F(5,52)=8.82$ ,  $R^2=0.459$ ,  $p<0.001$ , drinking days,  $F(5,52)=7.64$ ,  $R^2=0.424$ ,  $p<0.001$ , number of binge days,

$F(5,52)=4.80$ ,  $R^2=0.316$ ,  $p=0.001$ , and consumption rate,  $F(5,52)=4.06$ ,  $R^2=0.281$ ,  $p=0.003$ .

Although not as strong, these combined factors also predicted alcohol problems,  $F(5,52)=3.15$ ,  $R^2=0.232$ ,  $p<=0.015$ . Within these combined factors, injunctive norms contributed the most to the shared variance for total number of drinks per week, drinking days, and consumption rate.

Descriptive norms based on *how much* one drinks contributed the most to the shared variance for number of binge days, and alcohol problems.

To assure that the first-years and seniors were relatively equal group samples in terms of drinking behaviors, independent-samples t-tests were run to compare the class years on each of the factors. The two class year groups did not differ significantly from each other on any of the factor measurements (Table 1). Pearson's r statistics were determined for each of the factors with alcohol consumption and problems. Based on the descriptive norm of "how much" one drinks per drinking event, the seniors showed significant positive correlations for descriptive norms and each of the consumption factors (Figure 4). There was also a significant positive correlation for alcohol problems and the "how much" descriptive norms for seniors (Figure 5). In contrast, the first-years showed no significant correlations for the "how much" descriptive norms and alcohol consumption or problems (Table 2). For descriptive norms regarding "how often" one drinks, first-years showed significant positive correlations between this norm and number of drinks per week, and drinking days per week. The seniors showed no significant correlations for these "how often" descriptive norms. The first-years and seniors showed relatively equal correlations for injunctive norms, with significant positive relationships found for injunctive norms and number of drinks per week, total drinking days, and consumption rate. The first-years showed a significant positive relationship for injunctive norms and number of binge days, but the seniors showed no such significant relationship. Neither group showed a significant correlation for

alcohol problems and injunctive norms. For social anxiety, first-years showed a significant negative correlation for number of drinks per week and number of binge days, whereas seniors showed no significant correlations for social anxiety. Neither class year showed significant correlations for stress.

### **Discussion**

The first of the main hypotheses stated that descriptive social norms would positively predict alcohol consumption and alcohol problems. The results supported these findings, suggesting that the sample students' drinking consumption increased as their perception of their peers' drinking increased. With this increase in drinking, greater alcohol problems were also experienced. Past research has suggested that many students typically overestimate their peers drinking, which is what drives this positive relationship (Borsari & Carey, 2003; Neighbors et al., 2007; Lewis & Neighbors, 2004). However, this pattern was not observed in this study. The participants' prediction of their peers' drinking behaviors (3-4 drinks about 1-2 times a week) was quite reflective of the sample's own behaviors (3.58 drinks about 2.03 days a week). This suggests that students are well aware of the social norms and actively seek to meet these norms.

Although these descriptive norms were based on consumption, they also predicted alcohol problems. This should be especially concerning given that students seem to actively pursue the consumption norm; they might also actively pursue experiencing some of the associated problems in an effort to "fit in" or partake in the shared "college experience" (Larimer et al., 2004; Neighbors et al., 2007). Alternatively, students may not be purposely trying to pursue these alcohol problems, but are socially reinforced to continue this behavior when it does occur unintentionally. For example, if a student experiences an alcohol-related problem, such as blacking out, the knowledge that this behavior is acceptable on campus reinforces the student to



continue this dangerous pattern of behavior. This point is further exemplified by the multi-factor linear regression: out of all the factors, descriptive norms (in terms of “how much”) contributed to the most of the variance for number of binge days and alcohol problems. However, it is important to note, women have been found to be more strongly influenced by social drinking norms (Borsari & Carrey, 2003; Lewis & Neighbors, 2004). Considering that the strong majority of the sample was female, this demographic may have driven this predictive relationship.

Injunctive norms were originally hypothesized to positively predict alcohol consumption and problems, and to do so more strongly than descriptive norms. The results supported this hypothesis, suggesting that as perceived approval increased, alcohol problems and consumption also increased. Considering all factors, injunctive norms most strongly predicted total number of drinks per week, drinking days per week, and consumption rate. These findings are supported by the literature and suggest that students model their drinking behaviors after their friends’ approval or disapproval (Larimer et al., 2004; Neighbors et al., 2007). Compared to descriptive norms, injunctive norms seem to better predict consumption, whereas descriptive norms seem to better predict problems (including binge days as a problem in this case). This suggests that students more so base their consumption levels on the approval of their friends, and are reinforced for problematic drinking behaviors by the perception of this behavior as “normal.”

There may be some other limitations to this aspect of the study. Neighbors et al. (2007) found that injunctive norms had a stronger influence on alcohol problems, if the source of the approval or disapproval came from one’s parents, rather than friends. Given that this study only measured the approval of participants’ friends, perhaps injunctive norms could have been a stronger predictor of alcohol problems if the participants’ were surveyed on parental approval.



In addition, the injunctive norms questionnaire only contained 4 items, all of which would constitute as negative alcohol behaviors. Therefore the range was somewhat limited.

The second major hypothesis suggested that social anxiety and stress would both positively predict alcohol problems, but not necessarily consumption. Limited evidence was found to support this hypothesis. Social anxiety did not predict alcohol problems, but it did negatively predict consumption in terms of drinks per week and binge days. This suggests that students who have increased levels of social anxiety typically drink less. Neighbors et al. (2007) supports this finding, showing that increased anxiety is not always matched with increased consumption (Neighbors et al., 2007). Social anxiety's connection with alcohol consumption is usually determined by drinking motives and expectancies (Gilles et. al, 2006; Wilson & Abrams, 1977; Kidorf & Lang, 1999). Those who expect positive experiences from alcohol, or are motivated by coping or social facilitation will often drink more. Perhaps the study sample's more socially anxious individuals did not share these drinking motives, or had negative expectancies for alcohol use.

However, another explanation could be related to the study sample. Very few participants scored high enough on the social anxiety scale to be considered for a clinical diagnosis. Therefore, this scale more likely became a measure of extraversion, or how comfortable one is with people. Those who score low on the social anxiety scale would likely be more sociable, and thus participate more in the campus social drinking culture. Those with higher scores may not be socially anxious, but rather just more introverted. Past literature suggests that higher levels of alcohol consumption are often correlated with greater levels of extraversion and sensation-seeking (Comeau et al., 2001; Cook et. al., 1998; Grau & Ortet, 1999). Perhaps this data reflects a need for more campus social options, so that those who are

more extraverted can find methods to interact with the greater campus community in a way that is not necessarily related to alcohol.

Social anxiety was not found to predict alcohol problems, which is likely due to the sample, since very few participants could possibly be considered socially anxious in a clinical sense. Those of the sample who were considered more socially anxious reported drinking less, which decreases the opportunity for negative experiences or problems with alcohol. Stress was also not found to be a significant indicator of either alcohol consumption or problems. In relation to alcohol consumption and problems, stress is thought to be mediated by irrational coping mechanisms, social support, and expectancies that alcohol will reduce stress (Camatta & Nagoshi, 1995; Hutchinson et. al, 1998; Perkins, 1999; Steptoe et. al, 1996). It is possible that the study sample did not have a distinct trend for stress because of these unmeasured mediating factors. Alternatively, the *Perceived Stress Questionnaire* may have been too broad. Questions like "In the past month, how often have you felt that things were going your way?" may have been too ambiguous, leading to a small range of scores of middle scores. The mean score for the *Perceived Stress Questionnaire* was  $27.33 \pm 6.99$ , meaning that the majority of the sample clustered around the midpoint of "sometimes" with little range outside this point.

The third major hypothesis indicated that the two anxiety measures would be better predictors of alcohol problems, whereas the two social norms measures would be better predictors of consumption. The study found that the social norms factors better predicted both consumption and problems. Based on these findings, alcohol prevention and intervention strategies should target challenging student social norms. The sample's perception of social norms was relatively accurate, so instead of convincing students that they are misperceiving norms (as is common practice in this situation), the administration should instead try to establish

new norms. As previously mentioned, having alternative opportunities for social activity may help to form new norms (ie, students here drink only one night, and participate in “alternative activity” the other nights). Education on the benefits of decreased alcohol consumption (and therefore likely alcohol problems too) could also help to change the student alcohol norms. However this is difficult to apply in a practical sense, since it is ultimately up to the student body to change their social drinking norms.

Lastly, the fourth hypothesis predicted that first-year students would be more strongly influenced by both social norms and anxiety. For anxiety, the results indicate that although neither group was significantly affected by stress, first-year students were significantly negatively influenced by social anxiety in terms of number of drinks per week and number of binge days. Seniors showed no significant correlations with their drinking behaviors and social anxiety. As previously mentioned, the social anxiety scale used likely captured levels of introversion and extroversion. First-year students who tend to be less extraverted likely have fewer social connections, and thus decreased access to alcohol. In contrast, seniors who are less extraverted are typically of age, and thus don't require an attached social component to partake in drinking.

As for social norms, the seniors showed a surprising trend in their reported descriptive norms. Although first-year students were slightly more influenced by the social norms regarding how often one drinks, the seniors were more strongly influenced by the norms regarding how much one drinks per occasion. For these “how much” norms, the seniors showed significant positive correlations for each of the consumption factors, in addition to alcohol problems, whereas the first-years showed no significant correlations for these norms. These findings suggest that seniors' drinking behaviors are strongly influenced by that of their peers, but those

of first-years' are not. One would predict that since first-year students are new to the campus, they would likely be more influenced by the campus expectations, but this is not supported by the evidence. Without further research, one can only speculate as to why this pattern occurs. One hypothesis is that the seniors are influenced more strongly by the norms because these are the norms that they set themselves. As the oldest class on campus and the most common party hosts, the seniors likely set the norms for the classes below. If the senior class has indeed established these norms, they will certainly adhere to them more strictly. Another reason could be that as a senior, one is more assimilated to the campus culture simply based on the length of time that he or she has been a student there. During one's first year they may not feel motivated to match the expected norms, but as they continue with their time at college, they begin to be more assimilated to the general campus culture, which is likely driven by the older classes. Therefore it is quite likely that this pattern may continue in future years. Perhaps if this same study was run again when the sample's first-year students are seniors, they may show the same strong correlations with descriptive norms. Considering this pattern and the data indicating social norms as the whole sample's most significant predictor of alcohol consumption and problems, campus interventions should focus more of their attention on the seniors.

As previously mentioned, some limitations of this study include the scope of the injunctive norms, broad questionnaires, and uncollected data regarding some mediating factors. Another limitation is that the sample was very heavily female. Considering that men and women show different patterns of drinking and drinking norms, this may have led to a skewed sample (Borsari & Carrey, 2003; Lewis & Neighbors, 2004). In addition, those on campus with more extreme levels of alcohol consumption or problems may not have been willing to participate or answer honestly, leading to a skewed sample of the sample population. Future research should



focus on eradicating some of these errors, in addition to collecting data on all class years. It may be possible to see turning points in alcohol behaviors by including all class years in the study. It may also be beneficial to collect data longitudinally over several years of students at the same college to observe patterns of campus culture and norms. Future studies may also include data regarding coping strategies, drinking motivations, and expectancies. Until this additional data has been collected, campus interventions should focus on changing the social drinking norms, targeting the senior class specifically.

Table 1  
*Means, standard deviations, and t-test values for first-years and seniors for each tested variable.*

|                                  | First-Years |       | Seniors |      | T      | df    | p     |
|----------------------------------|-------------|-------|---------|------|--------|-------|-------|
|                                  | Mean        | SD    | Mean    | SD   |        |       |       |
| # of Drinks/Week                 | 6.45        | 5.81  | 8.30    | 6.47 | -1.126 | 54    | 0.265 |
| # of Drinking Days               | 1.70        | 1.26  | 2.52    | 1.70 | -2.172 | 54    | 0.034 |
| # of Binge Days                  | 0.55        | 0.83  | 0.78    | 0.97 | -0.938 | 54    | 0.352 |
| Consumption Rate                 | 0.97        | 0.71  | 0.96    | 0.56 | 0.069  | 54    | 0.945 |
| Alcohol Problems                 | 21.69       | 4.31  | 24.80   | 6.77 | -2.044 | 43.56 | 0.047 |
| Descriptive Norms<br>(How Often) | 32.20       | 3.78  | 33.07   | 3.69 | -0.867 | 54    | 0.390 |
| Descriptive Norms<br>(How Much)  | 27.50       | 4.93  | 27.07   | 6.23 | 0.296  | 54    | 0.768 |
| Injunctive Norms                 | 8.00        | 2.30  | 8.66    | 2.59 | -1.807 | 54    | 0.075 |
| Social Anxiety                   | 42.76       | 15.57 | 38.81   | 9.84 | 2.331  | 47.72 | 0.024 |
| Stress                           | 27.41       | 6.42  | 27.33   | 7.40 | 0.284  | 54    | 0.777 |

Due to the number of analyses, significance was determined based on a value of  $p < 0.005$

Table 2

*First-year and senior class correlations between alcohol consumption and problems, and measures of social norms and anxiety.*

|  | First-Years | Seniors |
|--|-------------|---------|
| <b>Descriptive Norms<br/>(How Much)</b>  |             |         |
| # of Drinks/Week                         | 0.200       | 0.613** |
| # of Drinking Days                       | 0.202       | 0.550** |
| # of Binge Days                          | 0.216       | 0.599** |
| Consumption Rate                         | 0.267       | 0.498** |
| Alcohol Problems                         | 0.203       | 0.477*  |
| <b>Descriptive Norms<br/>(How Often)</b> |             |         |
| # of Drinks/Week                         | 0.475**     | 0.370   |
| # of Drinking Days                       | 0.435*      | 0.246   |
| # of Binge Days                          | 0.362       | 0.337   |
| Consumption Rate                         | 0.278       | -0.049  |
| Alcohol Problems                         | 0.221       | -0.016  |
| <b>Injunctive Norms</b>                  |             |         |
| # of Drinks/Week                         | 0.567**     | 0.580** |
| # of Drinking Days                       | 0.714**     | 0.521** |
| # of Binge Days                          | 0.394**     | 0.276   |
| Consumption Rate                         | 0.537**     | 0.401*  |
| Alcohol Problems                         | 0.350       | 0.281   |
| <b>Social Anxiety</b>                    |             |         |
| # of Drinks/Week                         | -0.374*     | -0.093  |
| # of Drinking Days                       | -0.223      | -0.094  |
| # of Binge Days                          | -0.411*     | -0.055  |
| Consumption Rate                         | -0.193      | 0.134   |
| Alcohol Problems                         | -0.128      | 0.100   |
| <b>Stress</b>                            |             |         |
| # of Drinks/Week                         | 0.002       | 0.058   |
| # of Drinking Days                       | -0.008      | 0.078   |
| # of Binge Days                          | 0.029       | 0.082   |
| Consumption Rate                         | 0.037       | 0.152   |
| Alcohol Problems                         | -0.035      | 0.253   |

\*Indicates significance at  $p < 0.05$ , \*\* Indicates significance at  $p < 0.01$

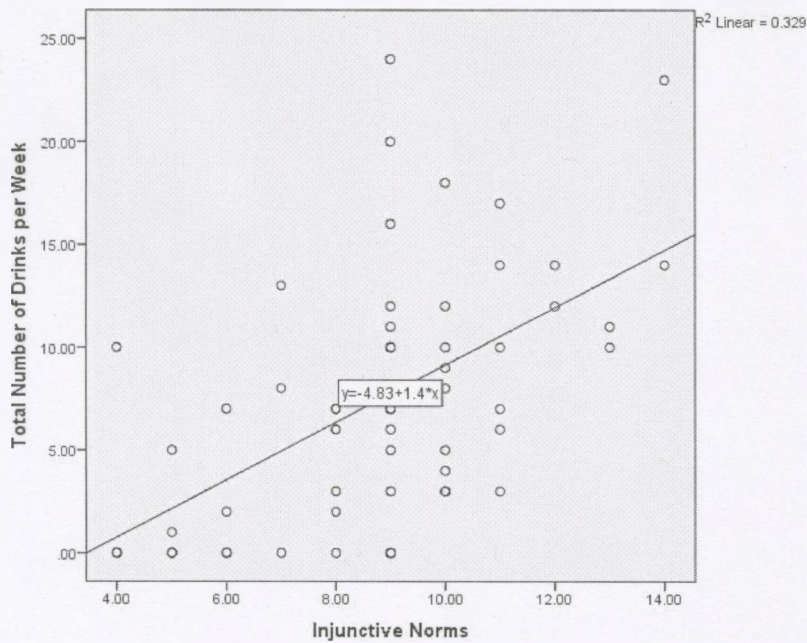


Figure 1. Linear trend for the relationship between injunctive norms and alcohol consumption in terms of total number of drinks per week (n=58).

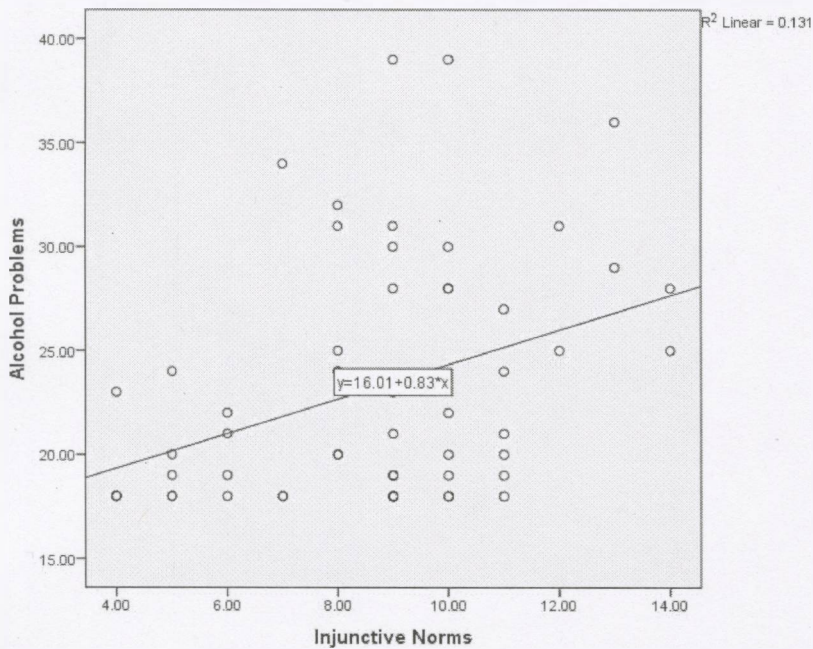


Figure 2. Linear trend for the relationship between injunctive norms and alcohol problems (n=58).



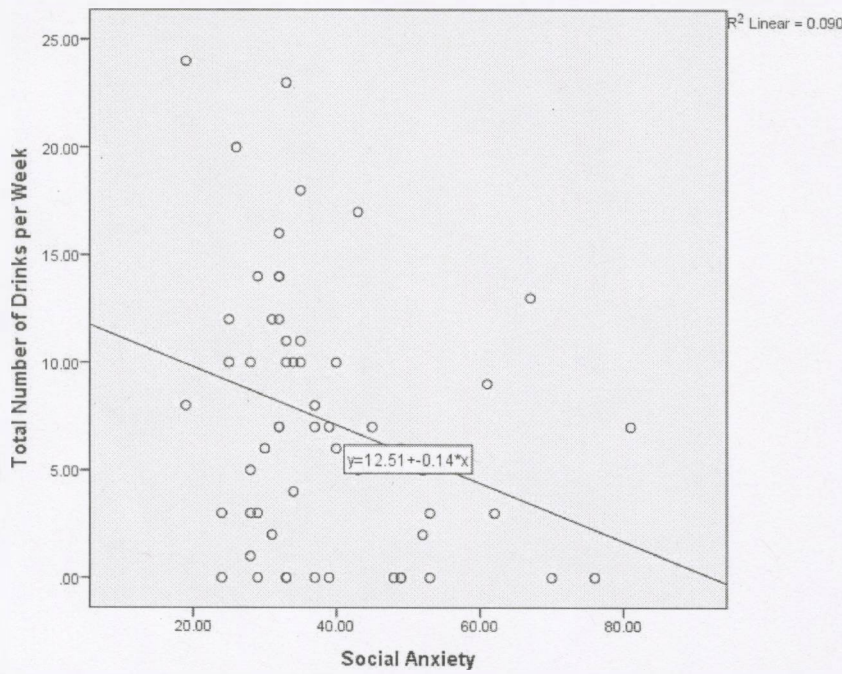


Figure 3. Linear trend for the relationship between social anxiety and alcohol consumption in terms of total number of drinks per week (n=58).

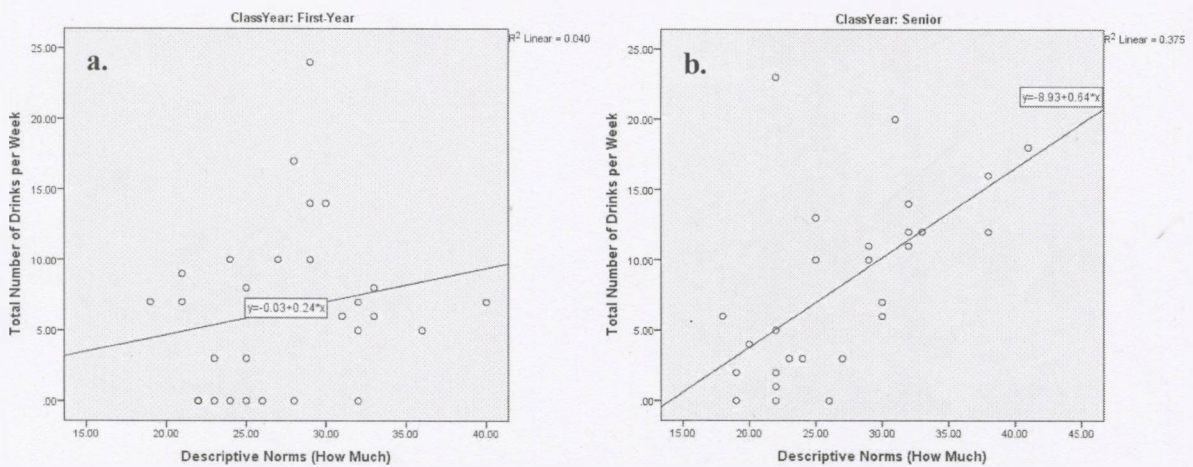


Figure 4. Linear trend for the relationship between descriptive norms, in terms of how much alcohol is consumed per drinking event, and alcohol consumption, in terms of total number of drinks per week for (4a) first-years (n=29), and (4b) seniors (n=27).

a.

b.

## Approval Anxiety and Alcohol

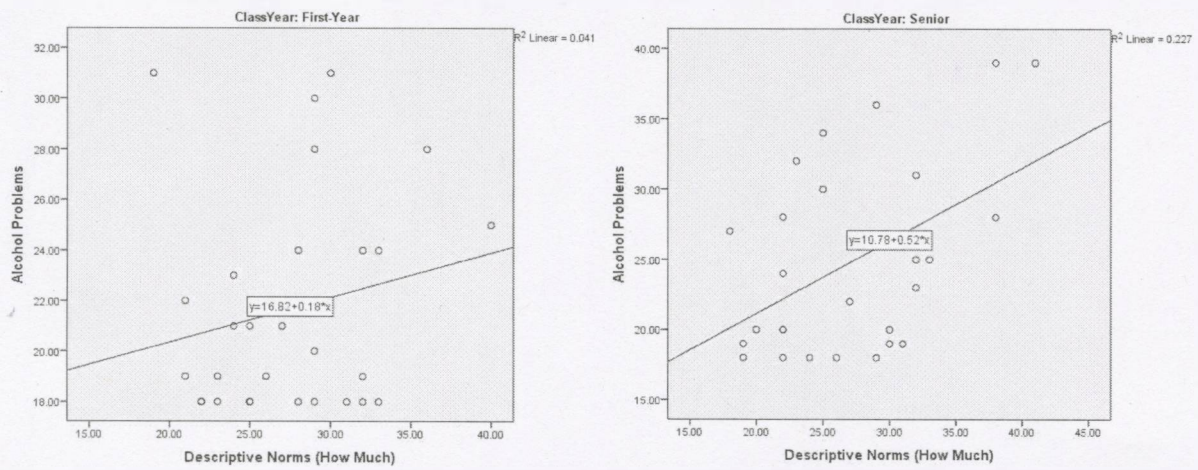


Figure 5. Linear trend for the relationship between descriptive norms, in terms of how much alcohol is consumed per drinking event, and alcohol problems for (5a) first-years (n=29), and (5b) seniors (n=27).

## References

- Baer, J.S. (1994). Effects of college residence on perceived norms for alcohol consumption: an examination of the first year in college. *Psychology of Addictive Behaviors*, 8, 43-50.
- Baer, J.S., Stacy, A., & Larimer, M. (1991). Biases in the perception of drinking norms among college students. *Journal of Studies on Alcohol*, 52, 580-586.
- Bergen-Cico, D., (2000). Patterns of substance abuse and attrition among first-year students. *Journal of the First-Year Experience*, 12, 61-75.
- Book, S.W., & Randall, C.L. (2002). Social anxiety disorder and alcohol use. *The Journal of Alcohol Research and Health*, 26, 130-135.
- Borsari, B., & Carey, K.B. (2003). Descriptive and injunctive norms in college drinking: a meta-analytic integration. *Journal of Studies on Alcohol and Drugs*, 64, 331-341.
- Camatta, C.D., & Nagoshi, C.T. (1995). Stress, depression, irrational beliefs, and alcohol use and problems in a college student sample. *Alcoholism: Clinical and Experimental Research*, 19, 142-146.
- Carrigan, M.H., & Randall, C.L. (2003). Self-medication in social phobia: a review of the alcohol literature. *Psychology of Addictive Behaviors*, 28, 269-284.
- Center for Disease Control (CDC). 2014. Alcohol Use and Your Health. Retrieved from <http://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm>
- Cialdini, R.B., & Trost, M.R., (1998). Social influence: social norms, conformity and compliance. In D.T. Gilbert, S.T. Fiske, & L. Gardner (Eds.), *The Handbook of Social Psychology* (151-192). New York, NY: McGraw-Hill.
- Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396.



- Collins, R.L., Parks, G.A., Marlatt, G.A. (1985). Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting & Clinical Psychology*, 53:189-200.
- Comeau, N., Stewart, S.H., & Loba, P. (2001). The relations of trait anxiety, anxiety sensitivity, and sensation seeking to adolescents' motivations for alcohol, cigarette, and marijuana use. *Addictive Behaviors*, 26, 803-825.
- Cook, M., Young, A., Taylor, D., and Bedford, A.P. (1998). Personality correlates of alcohol consumption. *Personality and Individual Differences*, 24, 641-647.
- Fillmore, M.T. (2001). Cognitive preoccupation with alcohol and binge drinking in college students: alcohol-induced priming of the motivation to drink. *Psychology of Addictive Behaviors*, 15, 325-332.
- Foundation for a Drug Free World (FDFW). 2014. The Truth about Alcohol. Retrieved from: <http://www.drugfreeworld.org/drugfacts/alcohol.html>
- Gilles, D.M., Turk, C.L., & Fresco, D.M. (2006). Social anxiety, alcohol expectancies, and self-efficacy as predictors of heavy drinking in college students. *Psychology of Addictive Behaviors*, 31, 388-398.
- Grau, E., & Ortet, G. (1999). Personality traits and alcohol consumption in a sample of non-alcoholic women. *Personality and Individual Differences*, 27, 1057-1066.
- Ham, L.S., Bonin, M, & Hope, D.A. (2007). The role of drinking motives in social anxiety and alcohol use. *Journal of Anxiety Disorders*, 21, 991-1003.
- Hutchinson, G.T., Patock-Peckham, J.A., Cheong, J., & Nagoshi, C.T. (1998). Irrational beliefs and behavioral misregulation in the role of alcohol abuse among college students. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 16, 61-74.



- Kidorf, M., & Lang, A.R. (1999). Effects of social anxiety and alcohol expectancies on stress-induced drinking. *Psychology of Addictive Behaviors*, 13, 134-142.
- Klein, H. (1993). Changes in college students' use and abuse of alcohol, and in their attitude toward drinking over the course of their college years. *Journal of Youth and Adolescence*, 23, 251-269.
- Larimer, M.E., Turner, A.P., Mallet, K.A., & Markman Geisner, I. (2004). Predicting drinking behavior and alcohol-related problems among fraternity and sorority members: examining the role of descriptive and injunctive norms. *Psychology of Addictive Behaviors*, 18, 203-212.
- Lewis, M.A., & Neighbors, C. (2004). Gender-specific misperceptions of college student drinking norms. *Psychology of Addictive Behaviors*, 18, 334-339.
- Lewis, M.A., Hove, M.C., Whiteside, U., Lee, C.M., Kirkeby, B.S., Oster-Aaland, L., Neighbors, C., & Larimer, M.E. (2008). Fitting in and feeling fine: conformity and coping motives as mediators of the relationship between social anxiety and problematic drinking. *Psychology of Addictive Behaviors*, 22, 58-67.
- Mattick, R.P., & Clarke, J.C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behavior Research and Therapy*, 36, 455-470.
- National Institute of Alcohol Abuse and Alcoholism (NIAAA). 2013. College Drinking [Data File]. Retrieved from <http://pubs.niaaa.nih.gov/publications/CollegeFactSheet/CollegeFactSheet.pdf>.
- Neighbors, C., Lee, C.M., Lewis, M.A., Fossos, N., & Larimer, M.E. (2007). Are social norms

- the best predictor of outcomes among heavy-drinking college students? *Journal of Studies on Alcohol and Drugs*, 68, 556-565.
- Perkins, H.W. (1999). Stress-motivated drinking in collegiate and postcollegiate young adulthood: life course and gender patterns. *Journal of Studies on Alcohol and Drugs*, 60, 219-227.
- Ross, S.E., Niebling, B.C., & Heckert, T.M. (1999). Sources of stress among college students. *College Student Journal*, 33, 312-317.
- Rutledge, P.C., & Sher, K.J., (2001). Heavy drinking from the freshman year into early young adulthood: the roles of stress, tension-reduction motives, sex, and personality. *Journal of Studies on Alcohol*, 62, 457-466.
- Steptoe, A., Wardle, J., Pollard, T.M., Canaan, L., & Davies, G.J. (1996). Stress, social support and health-related behavior: a study of smoking, alcohol consumption, and physical exercise. *Journal of Psychosomatic Research*, 41, 171-180.
- Wechsler, H., Lee, J.E., Kuo, M., & Lee, H. (2000). College binge drinking in the 1990s: a continuing problem. Results of the Harvard School of Public Health 1999 College Alcohol Study. *Journal of American College Health*, 48, 199-210.
- White, H.R., Labouvie, E.W. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol*, 50, 30-37.
- Wilson, G.T., & Abrams, D. (1977). Effects of alcohol on social anxiety and physiological arousal: cognitive versus pharmacological processes. *Cognitive Therapy and Research*, 1, 195-210.

**Appendix A**

**Daily Drinking Questionnaire**

PLEASE FILL-IN YOUR DRINKING RATE AND TIME DRINKING DURING A TYPICAL WEEK IN THE LAST 30 DAYS.

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

For each day of the week in the calendar below, fill in the number of standard drinks typically consumed on that day in the upper box and the typical number of hours you drank that day in the lower box.

| Day of Week              | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------------------------|--------|---------|-----------|----------|--------|----------|--------|
| Number of Drinks         |        |         |           |          |        |          |        |
| Number of Hours Drinking |        |         |           |          |        |          |        |

### Rutgers Alcohol Problem Index

How many times did the following things happen to you while you were drinking alcohol or because of your alcohol use during the last 3 years?

|  | Never | 1-2 times | 3-5 times | 6-10 times | More than 10 times |
|--|-------|-----------|-----------|------------|--------------------|
| 1. Got into fights, acted bad, or did mean things  | 0     | 1         | 2         | 3          | 4                  |
| 2. Went to work or school high or drunk.   | 0     | 1         | 2         | 3          | 4                  |
| 3. Caused shame or embarrassment to someone.   | 0     | 1         | 2         | 3          | 4                  |
| 4. Neglected your responsibilities.  | 0     | 1         | 2         | 3          | 4                  |
| 5. Relatives avoided you.  | 0     | 1         | 2         | 3          | 4                  |
| 6. Felt that you needed more alcohol than you used to use in order to get the same effect.           | 0     | 1         | 2         | 3          | 4                  |
| 7. Tried to control your drinking by trying to drink only at certain times of day or certain places. | 0     | 1         | 2         | 3          | 4                  |
| 8. Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking.          | 0     | 1         | 2         | 3          | 4                  |
| 9. Noticed a change in your personality.   | 0     | 1         | 2         | 3          | 4                  |
| 10. Felt that you had a problem with school.   | 0     | 1         | 2         | 3          | 4                  |
| 11. Tried to cut down on drinking.   | 0     | 1         | 2         | 3          | 4                  |
| 12. Suddenly found yourself in a place that you could not remember getting to.                       | 0     | 1         | 2         | 3          | 4                  |
| 13. Passed out or fainted suddenly.  | 0     | 1         | 2         | 3          | 4                  |
| 14. Had a fight, argument, or bad feelings with a friend.  | 0     | 1         | 2         | 3          | 4                  |
| 15. Kept drinking when you promised yourself not to.   | 0     | 1         | 2         | 3          | 4                  |
| 16. Felt you were going crazy.   | 0     | 1         | 2         | 3          | 4                  |
| 17. Felt physically or physiologically dependent on alcohol.   | 0     | 1         | 2         | 3          | 4                  |
| 18. Was told by a friend or neighbor to stop or cut down drinking.                                   | 0     | 1         | 2         | 3          | 4                  |



## Drinking Norms Rating Form

We are interested in your estimates of A) How often and B) How much different types of people drink. For the following questions, please assume whenever possible that you are rating a typical person of your same sex. In each of the following situations, please circle the corresponding number, giving one answer for (A) (1-7), and one answer for (B) (1-6).

A. How much they drink:

1. Less than once a month
2. About once a month
3. Two or three times a month
4. Once or twice a week
5. Three or four times a week.
6. Nearly every day
7. Once a day

B. How much they drink on a typical weekend evening:

1. 0 drinks
2. 1-2 drinks
3. 3-4 drinks
4. 5-6 drinks
5. 7-8 drinks
6. More than 8 drinks

|  | A. How much they drink: | B. How much they drink on a typical weekend evening |
|--|-------------------------|---|
| 1. An average college-bound senior in high school                  | 1 2 3 4 5 6 7           | 1 2 3 4 5 6   |
| 2. An average university student                                   | 1 2 3 4 5 6 7           | 1 2 3 4 5 6   |
| 3. An average college student residing in a fraternity             | 1 2 3 4 5 6 7           | 1 2 3 4 5 6   |
| 4. An average college student residing in a sorority               | 1 2 3 4 5 6 7           | 1 2 3 4 5 6   |
| 5. An average college student residing in dormitory/residence hall | 1 2 3 4 5 6 7           | 1 2 3 4 5 6   |
| 6. An average college student residing with his/her parents        | 1 2 3 4 5 6 7           | 1 2 3 4 5 6   |
| 7. An average college student residing in his/her own residence    | 1 2 3 4 5 6 7           | 1 2 3 4 5 6   |
| 8. Your closest friends  | 1 2 3 4 5 6 7           | 1 2 3 4 5 6   |

## Perceived Injunctive Drinking Norms

INSTRUCTIONS: Please answer each of the following questions with a number corresponding to the level of approval.

- 0 = strong disapproval
- 1 = moderate disapproval
- 2 = mild disapproval
- 3 = wouldn't care
- 4 = mild approval
- 5 = moderate approval
- 6 = strong approval

How would your friends respond if they knew...

1. You drank alcohol daily

0    1    2    3    4    5    6

2. You drank alcohol every weekend

0    1    2    3    4    5    6

3. You drove a car after drinking alcohol

0    1    2    3    4    5    6

4. You drank enough alcohol to pass out

0    1    2    3    4    5    6

## Social Interaction Scale

INSTRUCTIONS: Please indicate the degree to which you feel the statement is characteristic or true of you

**0 = not at all, 1 = slightly, 2 = moderately, 3 = very, 4 = extremely**

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. I get nervous if I have to speak with someone in authority (teacher, boss, etc.) | 0 | 1 | 2 | 3 | 4 |
| 2. I have difficulty making eye-contact with others                                 | 0 | 1 | 2 | 3 | 4 |
| 3. I become tense if I have to talk about myself or my feelings                     | 0 | 1 | 2 | 3 | 4 |
| 4. I find difficulty mixing comfortably with the people I work with                 | 0 | 1 | 2 | 3 | 4 |
| 5. I tense-up if I meet an acquaintance in the street                               | 0 | 1 | 2 | 3 | 4 |
| 6. When mixing socially I am uncomfortable  | 0 | 1 | 2 | 3 | 4 |
| 7. I feel tense if I am alone with just one other person                            | 0 | 1 | 2 | 3 | 4 |
| 8. I am at ease meeting people at parties, etc.                                     | 0 | 1 | 2 | 3 | 4 |
| 9. I have difficulty talking with other people                                      | 0 | 1 | 2 | 3 | 4 |
| 10. I find it easy to think of things to talk about                                 | 0 | 1 | 2 | 3 | 4 |
| 11. I worry about expressing myself in case I appear awkward                        | 0 | 1 | 2 | 3 | 4 |
| 12. I find it difficult to disagree with another's point of view                    | 0 | 1 | 2 | 3 | 4 |
| 13. I have difficulty talking to attractive persons of the opposite sex             | 0 | 1 | 2 | 3 | 4 |
| 14. I find myself worrying that I won't know what to say in social situations       | 0 | 1 | 2 | 3 | 4 |
| 15. I am nervous mixing with people I don't know well                               | 0 | 1 | 2 | 3 | 4 |
| 16. I feel I'll say something embarrassing when talking                             | 0 | 1 | 2 | 3 | 4 |
| 17. When mixing in a group I find myself worrying I will be ignored                 | 0 | 1 | 2 | 3 | 4 |
| 18. I am tense mixing in a group  | 0 | 1 | 2 | 3 | 4 |
| 19. I am unsure whether to greet someone I know only slightly                       | 0 | 1 | 2 | 3 | 4 |

## Perceived Stress Scale

INSTRUCTIONS: Please indicate *how often* you felt or thought a certain way during the past month.

**0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 =very often**

|  |   |   |   |   |   |
|--|---|---|---|---|---|
| 1. In the last month, how often have you been upset because of something that happened unexpectedly?                 | 0 | 1 | 2 | 3 | 4 |
| 2. In the last month, how often have you felt that you were unable to control the important things in your life?     | 0 | 1 | 2 | 3 | 4 |
| 3. In the last month, how often have you felt nervous and "stressed"?  | 0 | 1 | 2 | 3 | 4 |
| 4. In the last month, how often have you felt confident about your ability to handle your personal problems?         | 0 | 1 | 2 | 3 | 4 |
| 5. In the last month, how often have you felt that things were going your way?                                       | 0 | 1 | 2 | 3 | 4 |
| 6. In the last month, how often have you found that you could not cope with all the things that you had to do?       | 0 | 1 | 2 | 3 | 4 |
| 7. In the last month, how often have you been able to control irritations in your life?                              | 0 | 1 | 2 | 3 | 4 |
| 8. In the last month, how often have you felt that you were on top of things?  | 0 | 1 | 2 | 3 | 4 |
| 9. In the last month, how often have you been angered because of things that were outside of your control?           | 0 | 1 | 2 | 3 | 4 |
| 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? | 0 | 1 | 2 | 3 | 4 |



## Appendix B

### Informed Consent to Participate in Human Subject Research

This study is part of a senior research project regarding alcohol use in college students. You are being asked to complete an electronic-based questionnaire regarding your experience with alcohol and related issues.

Some questions in this study are personal in nature and may evoke past negative experiences regarding alcohol use. Participation is entirely voluntary. If you become uncomfortable during the period of the study, you can stop at any time without penalization, and any data collected to that point will be unused and entirely confidential. If you have any questions or concerns, the contact information for the researchers will be listed at the bottom of every page of the questionnaire. For those recruited through SONA systems, you will receive 2 SONA credits for participating in this study. For those recruited outside of SONA systems, you will have to opportunity to be entered into a prize drawing for a \$20 RiverRoad or Chipotle gift card.

All questionnaire answers will be confidential. Names or any other identifying information will NOT be associated with any individual questionnaire. Non-SONA recruits who wish to enter the prize drawing will be asked for their email. This email will not be associated with any individual questionnaire and will be kept entirely confidential.

The data collected from this study will only be used for research purposes and will not be used to determine the need for psychotherapy, counseling, or other intervention. The researcher will not provide any feedback to participants, the university, or anyone else regarding participants' responses. Participants who are concerned about their substance use or psychosocial functioning should contact Denison University's counseling center: The Whisler Center for Student Wellness at 740-587-6200.

This study may be able to shed light on connections between alcohol problems and certain associated factors.

Any questions or concerns about this study can be directed toward the student researcher:  
Briella Baer (baer\_b1@denison.edu).

If you have any other questions or concerns, please contact:

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Department of Psychology  
Denison University  
Granville, OH 43023  
kennedys@denison.edu  
(740) 587-6676

I am over the age of 18 years and can provide consent to this study.

I have received and read the conditions of the study and I agree to participate.

Name \_\_\_\_\_

Date \_\_\_\_\_

(Signature of participant)

## Appendix C

### Debriefing Form

Thank you for participating in this research study!

This study is aimed to assess the predictors of problem drinking on college campuses. Problem drinking is measured in terms of both alcohol consumption and alcohol-related problems. Consumption is defined as the number of alcoholic beverages that one consumes, and the frequency at which they are consumed. Alcohol problems refer to the negative experiences one encounters due to or during the consumption of alcohol. Both alcohol consumption and alcohol-related problems arise from a number of factors such as social norms, drinking motives, alcohol expectancies, and anxiety. The factors that are specifically examined in this study are social norms and anxiety.

Social norms refer to the “accepted behaviors” within a given culture. This study focuses on descriptive and injunctive norms in relation to alcohol culture. Descriptive drinking norms are norms based on the perceived prevalence of certain behaviors, such as the amount that the typical Denison student drinks per week. Injunctive drinking norms refer to the perceived approval of a given behavior, such as driving while intoxicated. Descriptive drinking norms have been found to predict alcohol consumption, and are mediated by consumption to predict alcohol problems. Injunctive drinking norms have been found to predict both alcohol consumption and problems, but the degree to which one is influenced depends on whom the norms are based.

For this study, the factor of anxiety is broken down into social anxiety and stress-based anxiety. Social anxiety is defined by “excessive fear of social situations and negative evaluations by others” whereas stress-based anxiety refers to anxiety or “hassles” that are not related to social settings. Stress-based anxiety has an unclear relationship with alcohol consumption, but consistently shows a positive correlation with alcohol problems. Social anxiety also has an unclear connection with alcohol consumption, but past studies have found that socially anxious people typically experience more alcohol-related problems than their non-anxious counterparts, and have an increased risk of receiving a diagnosis of alcohol abuse or dependence.

Participants were recruited from either the first-year or senior class. Considering that Denison, like many universities, has encountered troubling alcohol-related behavior from first-year students, the comparison between first-years and seniors may shed light on possible differences in the patterns and predictors of problem drinking. Past research indicates that consumption decreases over the four years of college for both genders, and injunctive norms become increasingly negative for females specifically. In addition, first-year students have been found to have significantly higher levels of stress compared to any other class year. Apart from these few studies, little is currently known on the matter.

This research project may be able to give insight to the predicting factors of dangerous alcohol

practices unique to Denison's student body, which can then be used to create effective intervention programs.

The data collected from this study will only be used for research purposes and will not be used to determine the need for psychotherapy, counseling, or other intervention. The researcher will not provide any feedback to participants, the university, or anyone else regarding participants' responses. Participants who are concerned about their substance use or psychosocial functioning should contact Denison University's counseling center: The Whisler Center for Student Wellness at 740-587-6200.

If you have any questions about the subject matter or execution of this study, please feel free to contact: Briella Baer (baer\_bl@denison.edu)

#### References:

Gilles, D.M., Turk, C.L., & Fresco, D.M. (2006). Social anxiety, alcohol expectancies, and self-efficacy as predictors of heavy drinking in college students. *Addictive Behaviors*, 31, 388-398.

Lewis, M.A., Hove, M.C., Whiteside, U., Lee, C.M., Kirkeby, B.S., Oster-Aaland, L., Neighbors, C., & Larimer, M.E. (2008). Fitting in and feeling fine: conformity and coping motives as mediators of the relationship between social anxiety and problematic drinking. *Psychology of Addictive Behaviors*, 22, 58-67.

Neighbors, C., Lee, C.M., Lewis, M.A., Fossos, N., & Larimer, M.E. (2007). Are social norms the best predictor of outcomes among heavy-drinking college students? *Journal of Journal of Studies on Alcohol and Drugs*, 68, 556-565.

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If you have been recruited OUTSIDE of SONA systems and would like to be entered into the prize drawing for a \$20 RiverRoad or Chipotle gift card (of your choosing) please click on the link below:

[https://qtrial2015az1.az1.qualtrics.com/SE/?SID=SV\\_e42tyBXW5wqjhfn](https://qtrial2015az1.az1.qualtrics.com/SE/?SID=SV_e42tyBXW5wqjhfn)