

IMPLICIT ASSOCIATIONS AND DRINKING MOTIVES
IN SOCIAL ANXIETY

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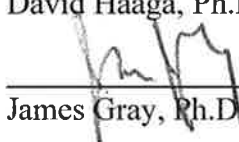
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ABSTRACT

Prior literature has used self-report measures of alcohol motivation, which are notably sensitive to response bias, in addition to either performance or social interaction threat stimuli, in order to identify circumstances under which socially anxious students are more vulnerable to problem-inducing alcohol consumption. The current study measured social anxiety, alcohol consumption, motives, and related problems, and employed an Implicit Association Task (IAT), which measures implicit cognitions through response times. IAT scores compared both performance and social interaction threat exposure to examine the impact of differing social situations on socially anxious students' implicit drinking cognitions. Results showed that the high social anxiety group responded significantly faster to pairings of images of beer and “approach” words when presented with a social interaction threat than with a performance threat. These results may demonstrate that the type of threatening situations socially anxious students are exposed to, as well as their implicit drinking cognitions, may play a key role in determining when and whether they are more likely to consume alcohol and develop problems as a result. Identifying these circumstances in the future may be useful in developing intervention strategies for socially anxious students with alcohol-related problems.

TABLE OF CONTENTS

ABSTRACT	ii
LIST OF TABLES	iii
CHAPTER 1 INTRODUCTION.....	iii
CHAPTER 2 HYPOTHESIS AND PURPOSE OF CURRENT STUDY	18
CHAPTER 3 METHODS.....	20
CHAPTER 4 RESULTS.....	25
CHAPTER 5 DISCUSSION	31
REFERENCES	37

LIST OF TABLES

Table

1.	Alcohol Motivation IAT Stimuli.....	42
2.	Demographic Information and Self-Report Data.....	43
3.	D Scores by Condition.....	44

CHAPTER 1

INTRODUCTION

Individuals with social anxiety are 2–3 times more likely to develop an alcohol use disorder than the population without social anxiety (Kushner, Sher, & Beitman, 1990). Yet despite this statistic, relevant literature shows that in an undergraduate population, while individuals high in social anxiety have more alcohol related problems, they report drinking less than their non-anxious peers (Lewis, Hove, Lee, Kirkeby, Oster-Aaland, Neighbors, & Larimer, 2008). Motivational theory of alcohol use proposes that the motives behind alcohol use are the most important determinant of drinking behavior. Thus, researchers have looked at motivation to drink as a possible explanation for this apparent discrepancy (Cooper, 1994). Some studies show that individuals high in social anxiety drink in order to cope with their anxiety or conform to those around them (Kuntche, Knibbe, Gmel, & Engles, 2005, Lewis et. al 2008, Thomas, Randall, & Carrigan, 2003), while others show they drink only for conformity motives (Buckner, Schmidt, and Eggelston 2006), and still others showed no significant relationship between drinking motives and drinking behavior (Ham, Bonin, and Hope, 2007). A common factor in these studies is their use of explicit self-report measure to look at alcohol motivation. To date, studies have not used implicit measures of motivation to drink among individuals high in social anxiety and integrated both explicit and implicit measures to examine alcohol consumption in this population. Further, to our knowledge, no study has compared this data in response to differing threat types.

The current study used an implicit measure of alcohol motivation, as well as self-reports, to tease apart the relationship among socially anxious participants reported alcohol consumption, motivation, and problems, and their implicit motivation to drink. Further, we examined individuals under a social interaction threat, performance threat, and non-threatening

circumstance to determine situational effect on individuals high in social anxiety's implicit motivation to consume alcohol.

The Construct of Social Phobia (Social Anxiety Disorder)

Social phobia is categorized as fear of social interaction and performance situations in which the individual may be embarrassed. Those individuals who meet diagnostic criteria experience "avoidance, fear, or anxious anticipation of encountering the social or performance situation" (APA, 2000, p 450). For these individuals, their social phobia interferes significantly with their day-to-day life, employment, and socialization and often causes them distress. Adults who meet diagnostic criteria also understand that this phobia is excessive or unreasonable (APA, 2000).

When involved in a social or performance situation, these individuals fear that they will be negatively judged by those around them. They further fear that others present during these situations will focus on some flaw in their person. These individuals will often avoid the anxiety provoking situations, or less frequently will endure the social situation with a high level of anxiety (APA, 2000).

In order to manage the physiological and emotional arousal associated with anxiety individuals with social phobia may engage in safety behaviors (Clark and Wells, 1995). These safety behaviors often involve actively engaging in a behavior which they believe will reduce their anxiety symptoms or the negative evaluation of others. While individuals with high levels of social phobia may see these behaviors as helpful, it is also likely that they will exacerbate a negative outcome. Over time phobics may feel as if they cannot get through the anxiety provoking situation without the safety behavior (Clark and Wells, 1995).

Models of Social Anxiety and Drinking

Anxiety Reduction Reinforcement Models of Social Anxiety and Drinking

The three leading anxiety reduction models for social anxiety and alcohol use, as noted by Morris, Stewart, and Ham (2005), are the tension reduction theory (TRT) (Conger, 1956), the stress response dampening model (SRD) (Sher & Levenson, 1982), and the self-medication hypothesis (SMH) (Khantzian, 1985, 1997). Despite the differences between the models, Morris et al. (2005) writes that the common thread amongst all these theories is that “Alcohol reduces physiological and cognitive anxiety or arousal, providing negative reinforcement of the drinking response”.

The TRT model (Conger, 1956) posits that when presented with a stressful situation, alcohol consumption reduces the amount of stress-related hormones released. Conger came to this conclusion based on his 1951 study, which examined the pharmacological effects of alcohol on rats exposed to stressful situations. He found that alcohol consumption in stressful situations reduced the amount of stress-related hormones released. Thus, the TRT model suggests that social phobics will learn to consume alcohol to relieve the tension created by social situations and come to depend on alcohol to relieve tension in future social situations (Kushner et al., 1990).

There is conflicting evidence to support the TRT model because, despite Conger’s early findings, some studies show that consumption of alcohol may actually lead to greater reported anxiety and less physiological arousal (Wilson, Abrams, & Lipscomb, 1980; Cappell & Herman, 1972). Further, Polivy, Schuenemen, and Carlson (1976) found that, when compared with a placebo, alcohol physiologically reduced anxiety, but cognitive awareness that they were

receiving alcohol served to increase anxiety. This underlines the importance of cognitive factors as mediators in alcohol's tension-reduction properties (Hartman, 1986).

The Stress-Response-Dampening (SRD) model (Sher & Levenson, 1982), which is an expansion on the TRT model, suggests that individuals consume alcohol to reduce stress reactivity to stressful situations. Sher and Levenson (1982) developed the model to address criticism that the TRT defines tension too broadly, not taking into account that alcohol affects different individuals differently, and not recognizing the various situations which can cause anxiety or stress (Cappell & Herman, 1972). They studied male non-alcoholics who were identified as heavy drinkers and found they had reduced cardio-vascular and affective response to stress after drinking alcohol when compared to their non-heavy drinking peers. They also looked at individuals who met criteria for anti-social personality disorder, a disorder that is often comorbid with alcoholism, and found that they too had reduced cardio-vascular and affective response to stress after drinking. This study expanded on the TRT by looking more specifically at heavy drinking individuals and individuals with disorders that put them at risk for alcoholism, and considered tension more specifically to be related to social situations for these populations. Further the SRD model identifies that risk factors for alcohol dependence vary amongst individuals, and specifies that social phobics may be more sensitive to SRD than other groups.

Finally, the Self-Medication Hypothesis (SMH) was developed based on a review of diagnostic findings and clinical observations (Khantzian, 1985, 1997). SMH is another extension of TRT, which proposes that the psychotropic effects of alcohol lead individuals to become dependent on it. This theory has broader implications than the previous two for understanding the comorbidity between substance use disorders and various psychological disorders. With regards to social phobia and alcohol use disorder, this theory proposes that the

individuals have painful psychological affective states or disorders prior to consumption, that the alcohol or drug provides relief of symptoms, and that this relief causes repeat usage of the alcohol or drug (Khantzian, 1985, 1997).

More recently, Bacon and Ham (2010) integrated these models with empirical evidence and developed the avoidance-coping cognitive model to explain comorbid social anxiety disorder and alcohol use disorders. This model focuses on alcohol as an agent to automatically reduce attentional bias to social threat and then serve as a negative reinforcer of the drinking response. Thus, according to this model alcohol reduces the amount of attention individuals with social anxiety pay to social threat cues, and this reduction in social threat awareness serves as a negative reinforcer. They posit that social phobics attentionally avoid threatening cues and use alcohol to cope with them. It further argues that individuals with high levels of social phobia may be more susceptible to the anxiolytic affects of alcohol than a normative population.

The similarities amongst these models make them difficult to examine separately. However, they all posit that among individuals high in social phobia, alcohol functionally reduces anxiety in socially challenging situations, causing reinforcement of alcohol consumption. This overarching principal has been examined physiologically and through self-reports, but there is a dearth of research integrating the tenets of these models and examining how linked cognitive networks of drinking and high levels of anxiety are in individuals with high levels of social anxiety.

Motivational Model of Social Anxiety and Problematic Drinking

Previous literature has focused on examining the motives behind socially anxious individual's drinking as they key to discovering why they are more likely to suffer from alcohol

related problems than their non-anxious peers. Cooper (1994) posits that there are four common motives behind drinking; enhancement motives (e.g., drinking to increase, create, or maintain a positive mood), social motives (e.g., drinking to make social events more enjoyable), conformity motives (e.g., drinking in order to “fit-in” and in response to social pressure), and coping motives (e.g., drinking to control or reduce negative emotions). Amongst a large household sample, Cooper (1994) found that all four motive types were reported, with slightly more reporting social and enhancement motives. Cooper (1994) notes that amongst these motives, coping and conformity motives are related to more alcohol-related problems, when controlling for alcohol consumption.

The current literature examining motivations to drink among socially anxious college students is conflicting. Several recent studies have found that college students with higher levels of social phobia endorse drinking in order to cope with their anxiety or for conformity motives in social situations, as compared with their less socially anxious peers, who drank for social enhancement reasons (Kuntsche et al., 2005; Lewis et al., 2008; Ham, Bonin, & Hope, 2007; Thomas et al., 2003; and Stewart et al., 2006). Lewis and colleagues (2008) found that individuals with high levels of social anxiety drank less than individuals low in social anxiety. This could be because individuals with high levels of social anxiety are avoiding social situations where alcohol is present more often than individuals low in social anxiety, and thus individuals low in social anxiety are drinking more often in these situations. However, individuals high in social anxiety, despite drinking less overall, had more alcohol related problems such as getting into fights, being unable to complete work or homework, being mean to others, and being unable to study for a test. They were also more likely to endorse coping and conformity motives for drinking than their less socially anxious peers. This may be because when highly socially

anxious individuals cannot avoid social situations where alcohol is present, they are consuming more alcohol in those particular situations than their peers in order to cope with the anxiety they experience or conform with their peers. As previously mentioned, according to Cooper (1994), individuals who drink in order to cope with their anxiety or to conform and “fit in” are at higher risk for alcohol problems. Thus one explanation for social phobics drinking less than their non phobic peers but having more alcohol related problems could be that individuals with social phobia are motivated to drink for these high risk coping and conformity reasons, whereas their non-phobic peers may be drinking for less risky reasons and thus having less alcohol-related problems. Similar findings were reported by Stewart, Morris, Mellings, and Komar, (2006), who examined undergraduate drinkers and found a significant positive relationship between both fear of negative evaluation, social avoidance, distress, and drinking to cope with negative emotions or to conform.

However, not all studies have replicated the aforementioned results. Buckner, Schmidt, and Eggleston (2006), for example, examined drinking motives and situations and found undergraduates with high levels of social anxiety endorsed drinking for enhancement, but not drinking for coping motives. But similar to Lewis et al. (2008), Buckner et al. (2006) also found that socially anxious students were drinking in situations that put them at high risk for alcohol-related problems. These situations are ones in which the individual experiences “unpleasant emotions, conflict with others, social pressure, and testing personal control”. Exposure to situations that elicit these types of emotions, coupled with alcohol, put individuals at high risk for alcohol-related problems.

In examining these findings, Lewis et al. (2008) noted that Buckner et al. (2006) did not control for alcohol consumption. This is particularly problematic because if consumption levels

are not controlled for, socially anxious individuals may have more alcohol related problems as a function of high consumption levels alone (Lewis et al., 2008). This highlights the importance of taking into account consumption levels when considering alcohol-related problems and motivations, since higher consumption levels are correlated with more alcohol-related problems (Lewis et al. 2008).

In contrast to the findings of Lewis et al. (2008), Ham, Bonin, and Hope (2007), found that social anxiety was unrelated to the four drinking motives. Their findings did indicate, however, that compared with students low in social anxiety, those who scored moderate or high were more likely to report coping motives for drinking.

This discrepancy in drinking motives in social phobics may be due to the social aspects of drinking which make the relationship between social anxiety and drinking different from anxiety-sensitivity and drinking. Further, self-report measures of drinking motives may be limited in their use with individuals who have high levels of impression management, such as individuals high in social anxiety (Leary, 2001), due to social desirability bias (Davis, Thake, and Vilhena, 2010). Regardless, it is clear that further investigation into the drinking motives of social phobics is needed.

Methods of Assessing Alcohol Consumption and Motivation

Self-Reports of Drinking and Drinking Motives

Self-reports are among the most common ways to measure alcohol consumption motives and the frequency and amount that individuals drink. Yet, in the past, these self-reports have only accounted for 40% to 60% of alcohol sales, based on tax and sales reports (Midanik, 1982). As a result of this underreporting, many researchers have adopted the idea that “more reporting is

better.” This refers to the theory that if one measure shows the same population reporting more alcohol consumption than another measure, then the measure yielding higher self-reported consumption is more accurate. The idea backing up this theory is that individuals are more likely to underreport their alcohol consumption due to social influences that are disapproving of high consumption (Midanik, 1988).

However, this assumption can be flawed in a number of circumstances. The social desirability of the drinking reported can be influenced in the immediate sense by the relationship between interviewer and interviewee or the presence of others (Del Boca & Darkes, 2003). For example, Midanik (1982) assessed the validity of self-report measures of alcohol consumption in relation to the blood alcohol concentration of 65 individuals who were entering an alcohol treatment program and were assessed by the staff. They found that over-reports in this sample (defined as over $\pm .05$) ranged from 23% to 57%. Their explanation for this phenomenon was that these individuals desired to ensure their entrance into a treatment program offered.

Other problems inherent with self-reports and calendar methods of gathering alcohol consumption data on individuals can be further exacerbated when those individuals are under the legal age of consumption. Smith, McCarthy, and Goldman (2005) investigated adolescent alcohol consumption in comparison to collateral reports completed by their peers over the course of 3 years. They found that collateral reports showed significantly higher total alcohol consumption among their sample of adolescents by nine tenths of a drink ($t = 2.24, 66 df, p < .05$). This could be due to collateral report respondents’ inability to accurately attest to the alcohol consumption of the subject, or perhaps to reluctance on the part of the subject to report illegal drinking (since they were under 21 years of age) on the self-report.

The aforementioned studies and meta-analyses highlight the complications may arise with regards to response bias in the accuracy of self-reports of drinking. Unfortunately, when sampling from a population with social anxiety, this issue can further affect accuracy of data and complicate the study outcomes. Moreover, due to the difficult nature of assessing alcohol consumption for any period longer than 24 hours, there is currently no gold standard assessment for effectively measuring it consistently. However, according to Midanik (1988) if these relevant issues are acknowledged, paid close attention to, and if the respondent feels as though their responses are anonymous, many of these issues can be mitigated. While the self-report is not a perfect measure of alcohol consumption or motivation, it can be useful to include in a study when combined with other types of measures, such as implicit measures like the IAT.

*Self-Reports of Drinking Consumption and Motives
in Individuals with Social Anxiety*

As with the normative population, alcohol consumption and motivation have almost exclusively been assessed using explicit self-report measures of consumption and motivation. In undergraduate samples, social anxiety has been found to be positively related to alcohol related problems, such as not being able to study or do homework, getting into fights, acting bad or doing mean things, or causing shame or embarrassment for someone (Rutgers Alcohol Problems Index, White & Labouvie, 1989), (Buckner et al., 2006; Stewart et al., 2006; Lewis & O'Neil, 2000; Gilles, Turk & Fresco, 2006). Yet despite this positive relationship, data on the amount of alcohol that socially anxious students consume indicates a negative relationship or no significant relationship between social anxiety and quantity/frequency of alcohol consumed (Buckner et al., 2006; Stewart et al., 2006; Ham et al., 2007; Ham and Hope, 2005, 2006).

To illustrate, Lewis et al. (2008) examined 316 heavy drinkers from a college population and found that those students who scored high on a measure of social anxiety still consumed far less alcohol than their non-socially anxious peers and yet had more alcohol related problems, and that these problems did not vary across gender. The authors stress that while these findings may indicate that socially anxious students are drinking less than their peers, their higher levels of drinking problems suggest that social anxiety is not a protective factor against problematic drinking.

One explanation for this is that socially anxious students may be avoiding social situations in which drinking is commonplace (like parties); however, when they cannot avoid these socially anxious situations, they may be drinking more to alleviate their anxiety and are then at risk for more negative consequences (Norberg, Norton, and Oliver, 2009). They may further be at risk for having alcohol-related problems, despite not necessarily drinking more than their peers, because unlike their non phobic peers, their drinking motives put them at risk for alcohol-related problems. Also, when socially anxious students find themselves in new social situations where alcohol is accessible (commonplace in a college environment) they drink to “avoid the anxiety resulting from the surrounding cues in their new social environment” (Lewis et al. 2008).

In the current study, we have attempted to integrate both explicit and implicit measures in order to gain a greater picture of HSA’s reported consumption as compared to how closely connected the concepts of “approaching/avoiding” and alcohol are in their cognitive networks. Implicit tests will be useful in our study as they may be able to parcel out how motivated social phobics are to drink when confronted with a social interaction or performance threat and the

degree to which this motivation correlates with their self-reported alcohol consumption and motivation.

Implicit Cognitive Processing Tests of the Relationship Between Alcohol and Social Anxiety

While the majority of assessments of motivation to drink in socially anxious individuals have used explicit self-report measures, Carrigan, Drobles, and Randall (2004) used an implicit measure, the emotional stroop test to, examine the attentional bias of participants who were presented with words of three types: socially threatening (such as stupid, inferior, scorn, tense, naïve), alcohol-related (such as beer, drunk, party, bar, hangover), and control music related words (such as melody, concerto, album, chord, and lyric). They presented each participant with the word in a different ink color and the participant was asked to identify the ink color of the word. They found that those participants who scored high on drinking to cope measures had longer response latencies to both social-threat and alcohol-related words. They hypothesized that this is due to the fact that these individuals use alcohol to reduce social anxiety and thus these content areas are particularly salient to them and increased the time it takes to identify the ink color of the word, thus affecting their attentional-bias. Through the integration of both explicit and implicit measures, Carrigan et al. (2004) provided a more comprehensive assessment of using alcohol to cope with social anxiety.

Implicit Association Test (IAT)

Another implicit measure, the Implicit Association Test (IAT; Greenwald, McGhee and Schwartz, 1998) enables the researcher to access to automatic thought processes through the ex matching a bipolar target (e.g., alcoholic beverages/non alcoholic beverages) with a bipolar

attribute (e.g., want/don't want) through several sorting tasks that measure response time. These response times are measured as mean response latencies and are used to show either positive or negative scores, with positive scores representing stronger association. Processing speed and response latency are measures of the degree of association between two cognitive concepts. The shorter the response time, the more connected two concepts are in one's memory (Schnabel, Asendorpf, & Greenwald, 2008). Thus, rather than measuring emotional saliency, like the emotional-stroop test, the IAT can implicitly measure how close the cognitive connections are between concepts in a variety of circumstances.

Wiers, Van Woerden, Smulders, and De Jong (2002) used explicit measures and two versions of an IAT to examine positive/negative (valence) and arousal/sedation cognitions amongst heavy and light drinkers. Their target words consisted of alcohol drink words, such as beer, whisky, and wine, and non-alcoholic drinks, such as soda. For the positive/negative dimensions they used positive words, such as sociable, good, and pleasant, and negative words, such as antisocial, bad, and unpleasant. For the arousal dimension they used words such as energetic and lively, and for sedation they used words such as relaxed and sleepy. They found that heavy drinkers demonstrated stronger associations between alcohol and arousal than non-heavy drinkers, but that the groups did not differ in their implicit valence associations. The authors explain these findings in reference to the incentive-sensitization theory of the etiology of addictive behaviors (Robinson & Berridge, 1993) in which "wanting (sensitized arousal) and liking (valence) are independent processes, and wanting rather than liking represent the motivational process behind the etiology of alcohol and drug abuse."

Ostafin and Palfai (2006) refined the methods used by Wiers et al. (2002), and used an IAT that assessed alcohol-motivation associations more directly while exploring a possible

correlation between binge episodes, quantity consumed per episode, and implicit response in heavy drinkers. Their IAT consisted of approach stimuli words (advance, hope, anticipate, approach, and closer), avoid stimuli (away, withdraw, avoid, leave, and escape), alcohol stimuli (5 pictures of glasses and pitchers of beer), and water stimuli (5 pictures of glasses and pitchers of water). They found a correlation between IAT alcohol-motivation, binge episodes, and cue reactivity, but that the IAT did not predict frequency of alcohol use. This indicates that the alcohol-motivation IAT has incremental validity with regards to motivational response to alcohol cues. They further found that the alcohol-motivation IAT also had convergent when compared to explicit measures of alcohol motivation.

To our knowledge, the alcohol-motivation IAT has yet to be used with highly socially anxious population. Its use for this population is particularly valuable as it may provide us with additional information about the alcohol consumption motivation of social anxiety and is invulnerable to response bias (Greenwald & Banaji, 1995). Using an IAT to examine alcohol-related motivation in response to a social interaction threat and correlating that data with the self-reports of alcohol motivation will allow us to assess how closely related the cognitive concepts of alcohol and approach/avoid motivation are in individuals high in social anxiety's implicit memory in comparison with what they report. It will also help us to understand whether or not those who report drinking for coping or conformity motives have shorter response latencies than those who don't, thus indicating stronger associations between alcohol and motivation to drink when presented with a social threat.

Differing Types of Social Threat Situations

Socially Anxious Individuals' Alcohol Consumption in a Performance Threat Situation

Using explicit measures, previous literature has examined the impact of performance threat circumstances on highly socially anxious individuals. In particular, Abrams, Kushner, Medina, and Voight (2002) administered two lab sessions in which participants were exposed to a social threat performance situation in one session and a control task in the second. The social threat performance task involved them engaging in a dialogue with another participant, which was observed by an audience of future participants and video taped. During each lab session, participants were given access to alcohol. They found that participants drank more following the performance task than following the control task in which they were asked to read a magazine for the same length of time as the performance task. They also found that participants chose to drink less before the performance task than before the control task, and that the participants reported that they drank less before the anxiety/performance task because they feared that the alcohol would impair their performance. The authors suggest that these results may indicate that socially anxious individuals may be using alcohol to cope with social interaction anxiety—provoking situations and not performance anxiety—producing situations.

In a related study, Thomas et al. (2003), asked both socially anxious and non-anxious individuals about their use of alcohol to cope, their avoidance of social situations where alcohol is not available, and the amount of relief they experienced from alcohol consumption. They found that while both groups reported drinking alcohol to cope with social fears, social phobics were drinking for this reason far more often. Similar to the findings of Abrams et al. (2002), social phobics reported drinking significantly more before a social situation in which they would interact with other individuals. They also reported drinking more when they anticipated feeling

uncomfortable in a social situation than non phobics, reported avoidance of social situations where alcohol was not available, and experienced greater relief from alcohol consumption than non phobics. Upon further analysis, they found that individuals with social anxiety reported using alcohol to cope with social interactions rather than performance situations.

Abrams et al. (2002) and Thomas et al. (2003) provide tentative evidence indicating that individuals with social anxiety may view performance situations and social interaction situations differently with regards to which coping strategy they use. Based on these findings, the current study examined social phobics self-reported and implicit drinking motives when exposed to a social interaction threat, when exposed to a performance threat, and when not exposed to any threat. The purpose of this will be to determine how implicitly motivated individuals with social phobia are to drink under each of these circumstances and whether they are more motivated to drink before a social threat than before a performance threat or no threat. It also may show that these socially anxious individuals believe that alcohol use is a more effective coping method for social interaction than for performance situations. Therefore, it will be useful in the current study to examine drinking motivation of social phobics when presented with a social interaction task and a performance task and measure both through self report and implicit measures.

Social Interaction Threat

Knight and Godfrey (1993) used a social interaction threat, rather than a performance threat, to examine the socially-relevant alcohol-related beliefs and drinking behaviors. More specifically they asked their subjects about their regular drinking behaviors and then told them that they would be meeting another researcher of the opposite sex with whom they would be engaging in a series of interactions, all of which would be videotaped and evaluated regarding

the subject's level of social skill in the interaction. This type of interaction threat differs from a performance threat in that the subjects are told that they will be evaluated based on the social skill shown through their ability to interact with a stranger, rather than their performance alone on a task such as a speech. Subjects were assigned to one of three conditions: optional alcohol consumption prior to the interaction, a standard dose of alcohol administered before the interaction, and no alcohol administered. They found that in the optional consumption condition, subjects believe that the alcohol would reduce tension and enhance the interaction predicted consumption. Further in the standard dose condition, decision to drink after the compulsory dose was predicted by level of anxiety. While this manipulation was not studied with regards to validity, they did find that this type of social interaction threat, successfully caused anxiety levels to rise in a non-clinical population and predicted alcohol usage based on beliefs.

This study shows that social interaction threats can be effective in creating anxiety in individuals high in social anxiety. Further, social interaction threats may be predictive of increased alcohol usage based on beliefs. Just as these types of social threat situations differ in their ability to accurately predict alcohol usage, so too do self-report and implicit measures of measuring alcohol consumption and motivation. To the best of the researcher's knowledge, to date no study has compared motivation to drink in reaction to performance threat versus interaction threat conditions.

CHAPTER 2

HYPOTHESIS AND PURPOSE OF CURRENT STUDY

The current study seeks to examine the relationship between explicit measures of alcohol consumption, related problems, and motivation to drink and the responses on an implicit measure (alcohol-motivation IAT) for individuals who are high and low in social anxiety exposed to different types of threat situations.

Hypothesis 1

I predicted that individuals high in social anxiety (HSA) would score higher in alcohol related problems than their peers who are low in social anxiety (LSA).

Hypothesis 2

I hypothesized, consistent with previous studies, that HSAs would score lower on an alcohol consumption measure than LSAs.

Hypothesis 3

I predicted that there would be a difference between individuals high and low in social anxiety with regards to their motives for consuming alcohol. More specifically, HSAs would be more likely to endorse coping and conformity motives for drinking alcohol than their LSA peers.

Hypothesis 4

Based on the results of Abrams et al. (2002) and Thomas et al. (2003), I anticipated HSAs who were exposed to a social interaction threat would demonstrate more implicit

motivation to drink alcohol on the IAT than those HSAs exposed to a performance threat, HSAs exposed to no threat, LSAs exposed to a social or performance threat, and LSAs exposed to no threat.

Hypothesis 5

Based on the results of Abrams et al. (2002), I predicted that HSAs who endorsed coping and conformity motives for drinking would have shorter response latencies the IAT than those who did not.

CHAPTER 3

METHODS

Participants

Based on the results of a power analysis, $(1-\beta)$ set at .8 and $\alpha=.05$ we recruited a total of 150 volunteers for the study based on a small-medium effect size of $f=.3$, per benchmark standards (Cohen, 1988). This included 75 HSA volunteers, 25 of which received a social threat, 25 of which received a performance threat, and 25 of which received no threat; and 75 LSA volunteers, 25 of which received a social threat, 25 of which will receive a performance threat, and 25 of which will not receive any threat. Participants were recruited from a mid-sized Mid-Atlantic University and were between the ages of 18-25.

Participants were divided into HSA and LSA groups of 61, each based on scores on the *Social Phobia Scale (SPS)* (Heimburg et al., 1992). Individuals who scored 24 (one standard deviation above the mean found by Heimburg et al., 1992) and above on the SPS were considered to be HSA, and individuals with scores of 13 (one standard deviation below the mean found by (Heimburg et al., 1992) and below were put in the LSA group. These cutoff scores were based on Heimburg et al. (1992) standard deviation (5.5) and mean score (18.5), with HSAs being one standard deviation above the Heimburg et al. (1992) mean score and LSAs being one standard deviation below Heimburg et al. (1992) mean score. Those volunteers who scored between 12 and 23 were not included in the study.

Measures

Demographics Questionnaire. The demographics questionnaire was created by the researcher to assess each participant's age, sex, education, and ethnicity.

Anxiety Rating Scale. The anxiety rating scale was created by the researcher to assess the participants' anxiety regarding how they felt about participating in a video taped social interaction.

Social Interaction Performance Scale. The social interaction performance scale was created by the researcher to assess how the participant felt they would perform in the social interaction.

Feedback Rating Scale. The feedback rating scale was created by the researcher to assess the degree to which the participant believed that they would be engaging in a speech or interaction task. Participants circled a number between 0 and 7, with zero indicating "not at all" believing and 7 indicating "completely" believing.

Social Phobia Scale (SPS). The SPS contains 20-items which measure the degree of anxiety the individual feels in situations in which they might be observed by others. The SPS has shown good reliability and validity (Mattick & Clarke, 1998) as well as sensitivity and specificity for identifying individuals high and low in social anxiety. This scale has been shown to have good internal consistency (Cronbach's alpha, .89; [Heimburg et al., 1992]). This sample also showed good internal consistency ($\alpha=.95$).

Drinking Motives Questionnaire (DMQ-R). The DMQ-R is a 20-item self-report measure used to assess the four drinking motives in relation to Cooper's model: social, enhancement, coping, and conformity, each of which were rated on a 5-point sub-scale, which included ratings from 1 ("never/almost never") to 5 ("always/almost always"). The measure has shown excellent psychometric properties including high criterion-related validity and internal consistency (Cronbach's alpha ranges from .63 to .73; [Cooper, 1994]). This sample showed good internal consistency ($\alpha=.86$).

Rutgers Alcohol Problems Index (RAPI). The RAPI is a 23-question self-report measure that assesses the frequency of problems related to alcohol in social and health functioning in the past 6 months in adolescents and young adults. These problems are rated on a scale of 0–4 with 0 being never and 4 being more than 10 times. The RAPI shows both internal consistency (Cronbach’s alpha, .92) and convergent validity (White & Labouvie, 1989). Using Neal, Corbin, and Fromme (2006), a cutoff score of 8 was used to identify clinically relevant levels of alcohol-related problems. This sample showed good internal consistency ($\alpha=.9$).

Daily Drinking Questionnaire (DDQ; Collins et al., 1985). The DDQ is a self-report measure in which typical weekly drinking is assessed through questions such as, “In the calendar below, please fill-in your drinking rate and time drinking during the last 30 days.” Response ranged from 0 (no drinks) to 25+ drinks. They were also asked to indicate the number of drinks they consumed in their heaviest week of drinking in the past month. The DDQ has frequently been used with college samples (Collins, Parks, & Marlatt, 1985) and has demonstrated good validity and retest reliability (Neighbors, Dillard, Lewis, Bergstrom, & Neil, 2006).

Implicit Association Task (IAT; Ostafin & Palfai, 2006). In accordance with the study conducted by Ostafin and Palfai (2006), this study had participants categorize the exact same stimuli from target categories (pictures of beer and water) and attribute categories (approach words and avoid words) by pressing response keys. The target and attribute categories, words, and pictures used in this study are the exact words used by Ostafin and Palfai (2006). During each block, each response key was partnered with a target and attribute category. Over the course of the 4 blocks, each target was matched with each attribute category (Ostafin & Palfai, 2006). D scores for the IAT were calculated by dividing the difference between test block means

by the standard deviation of all of the response latencies in the blocks, as defined in Greenwald, Nosek, and Banaji (2 IAT Stimuli, 2003)

Procedures

Participants were recruited through undergraduate psychology courses at American University and fliers were posted outside the psychology department office. Those who were interested in participating contacted the experimenter through email or telephone. They were then asked to fill out the SPS online through www.surveymonkey.com. Using their scores on these measures, the experimenter divided them into HSA and LSA.

Once participants arrived at the anxiety disorders lab they were asked to read and sign the informed consent form if they decided they were willing to participate in the study. The informed consent explicitly stated that the participant was free to withdraw from the study at any time and would regardless receive credit towards their undergraduate course, if applicable. If the participant agreed to participate and signed the informed consent form, they then were asked to fill out the demographics questionnaire, DMQ-R, DDQ, and RAPI.

Prior to completing the questionnaires in the lab, those qualified participants were randomly sorted into groups using random.com. and assigned to either the social interaction threat, performance threat, or the control group. The social phobic–social threat and non phobic–social threat groups were then told that they would be meeting a research assistant of the opposite sex for a series of brief interactions that would be recorded on a video camera that would be set up in the lab. They were further told that the tape would later be evaluated for level of social skill demonstrated (identical to Knight & Godfrey, 1993). They were then told that before the researcher entered the room they would need to complete the Anxiety Rating Scale

and the Performance Rating Scale, followed by the IAT. After completing the IAT the participant completed another Anxiety Rating Scale and Performance Rating Scale.

Participants in the social phobic–performance threat and non phobics–performance threat were told that they would be giving a three-minute speech on any aspect of their body that they chose and that the speech would be rated by a panel of judges who would give them feedback. This manipulation was chosen based on its success in raising anxiety levels in Carter, Sbrocco, Riley, & Mitchell (2012). They were then told that before they entered the room where they would give the speech, they would need to complete the Anxiety Rating Scale and the Performance Rating Scale, followed by the IAT. After completing the IAT the participant would complete another Anxiety Rating Scale and Performance Rating Scale.

Participants in the social phobic–non social threat group and non phobic–non social threat group were only asked to complete the IAT.

Once they completed the final task (the IAT, anxiety rating scale, or social interaction rating scale) the participants were then debriefed as to the purpose of the study. They were given a copy of the debriefing form, class credit for their participation, and the contact information for the experimenter and the counseling center at American University, should they have trouble with the anxiety they felt during the study or after their participation was completed.

CHAPTER 4

RESULTS

Upon analysis, several subjects were removed from the data set for the following reasons: incomplete questionnaires, suspected over reporting (for example, reporting consuming 100 drinks in one week), and finally debriefing rating scores under 3 (see p.27). Our final data set included 61 HSA volunteers, 21 of which received a social threat, 19 of which received a performance threat, and 21 of which received no threat; and 61 LSA volunteers, 20 of which received a social threat, 21 of which will receive a performance threat, and 20 of which will not receive any threat.

All participants were American University students (see Table 2). The majority of participants identified themselves as Caucasian (88.3%), female (76.7%), and were approximately 20 years old. An independent samples t-test on age indicated no significant difference between HSAs and LSAs, $t(120)=.601, p=.549$.

A chi-square test was run to determine whether or not there was a significant difference in gender distribution between HSA and LSA individuals. There was a significant difference in gender distribution between HSA and LSA individuals, $\chi^2(1)=4.30, p=.038$. Another chi-square test was run to determine whether or not there was a significant difference in distribution of ethnicities/races between LSA's and HSA's. As there was not significant power to run this statistic for each individual ethnicity, two categories (Caucasian and non-Caucasian) were created to compare the distribution between HSAs and LSAs. There was no significant difference in ethnicity distribution between HSA and LSA participants, $\chi^2(1, N=150)=.94, p=.33$.

Significant gender differences were found in SPS, $F(1,121)=6.60, p=.011$, with female students scoring significantly higher in social anxiety than males. Significant gender differences

were also found in DDQ number of drinks/typical week $F(1,121)= 5.62, p=.02$, with males reporting drinking significantly more in a typical week than females. Differences in scores based on ethnicity were not examined, as there was not significant power in each ethnic group to make such comparisons.

Manipulation check

All participants in the exposure groups were administered a feedback rating form after being debriefed as to the deception used in the study. All participants on a rating scale from 0-7 how much they believed the deception with 0 indicating disbelief and 7 indicating complete belief. All participants indicated that prior to debriefing, they believed that they would have to either give a speech or engage in a video taped interaction with a stranger of the opposite sex by rating a 3 or higher on the feedback scale. A one-way ANOVA found that there was not a significant difference in feedback rating scores between groups $F(1,79)=3.12, p=.08$. The mean score for feedback rating scales across challenge conditions was $\bar{x} = 5.93, sd= 1.66$.

Hypothesis 1

Based on previous literature, it was expected that individuals in the HSA group would score higher in alcohol-related-problems than those in the LSA group. An ANOVA was computed to determine whether or not there was a significant difference in RAPI scores between the HSA group and the LSA group and found there was not a significant difference between groups, $F(1, 120)=.15, p=.70$. Using a criteria cutoff score of 8 (Neal, Corbin, & Fromme, 2006), 20 out of 61 HSAs met criteria for a clinically relevant number of alcohol related problems, and 22 out of 61 LSAs met criteria for a clinically relevant number of alcohol related

problems. When those participants who had clinically significant RAPI scores were removed from analysis, no significant difference was found in any measures between HSAs and LSAs that was not found when they were included in analysis, RAPI, $F(1, 79)=1.88, p=.18$; DMQ-enhancement $F(1, 79)=7.46, p=.008$, social $F(1, 79)=.057, p=.81$, coping $F(1, 79)=.71, p=.40$, conformity $F(1, 79)=.06, p=.80$; IAT D-Score $F(1, 79)=.32, p=.57$; DDQ, typical week- number of drinks $F(1, 79)=.06, p=.80$, hours spent drinking $F(1, 79)=1.07, p=.30$, heavy drinking week- number of drinks $F(1, 79)=.01, p=.90$, hours spent drinking $F(1, 79)=.0, p=.99$.

A regression was run confirming that level of social anxiety did not predict clinically significant RAPI scores (over 8), $\beta=.012, t(11.61)=.139, p=.89$.

Hypothesis 2

It was predicted that HSA's would report consuming less alcohol than their LSA peers. Due to the skewed nature of the DDQ data and the violation of the ANOVA assumption of normal distribution, non-parametrics were run with independent samples Mann-Whitney U tests. The results indicated that the distribution of the numbers of alcoholic drinks consumed in a typical week drinking did not differ significantly between HSA's and LSA's, $U(1)=.637, z=.472$, the distribution of number of hours spent drinking in a typical week between HSA's and LSA's did not differ significantly, $U(1)=.781, z=.278$, the distribution of the number of alcoholic drinks consumed in a week of heavy drinking between HSA's and LSA's did not differ significantly, $U(1)=.917, z=.104$, and number of hours spent drinking in a heavy week of drinking between HSA's and LSA's did not differ significantly, $U(1)=.967, z=.042$.

When only looking at those participants who had consumed at least one alcoholic beverage in the past month (50 phobics and 52 non-phobics), as recorded on the DDQ-R,

according to Levene's test of equality of error variance, data for the number of drinks consumed in a typical week did not violate the assumptions for the ANOVA. As a results, we conducted an ANOVA to determine if there was a significant difference between groups for the number of drinks consumed in a typical week, with LSA's drinking more in a typical week than HSA's, $F(1, 100)=4.28, p=.042$. These results mirror those of Lewis and colleagues (2008), who found that when they only included individuals who had at least 1 drink within the previous month, individuals high in social anxiety reported drinking less than their non-socially anxious peers, when they controlled for alcohol consumption by only including those participants who reported having at least one drink in the past month.

Hypothesis 3

In accordance with previous studies, it was predicted that individuals in the HSA group would be more likely to endorse drinking for coping and conformity reasons than the LSA group. Individual ANOVA's were computed to determine whether or not there was a significant difference between groups (HSAs and LSAs) on the DMQR-social, coping, and conformity (listed respectively), which indicated there was no significant difference between groups, $F(1)=.244, p=.62, F(1)=.32, p=.57, , F(1)=.007, p=.933$ for those motives.

However, there was a significant difference found between groups on enhancement, $F(3)= 4.77, p=.031$. This indicates that the LSAs were significantly more likely to endorse enhancement motives (drinking to increase, create, or maintain positive mood) (Cooper, 1994) for drinking than HSAs.

Hypothesis 4

It was expected that the HSA group exposed to a social interaction threat would have shorter IAT response latencies than the HSA group exposed to a performance threat, and that HSAs exposed to a performance threat would have shorter IAT response latencies than those not exposed to a threat. D scores for the IAT were calculated using the formula identified in Greenwald, Nosek, and Banaji (2003).

A one-way ANOVA was performed to examine whether or not there was a significant difference in D scores between HSAs and LSAs (see Table 3). Results showed that there was not a significant difference in D scores between HSAs and LSAs, $f(1, 120) = .208, p = .65$.

An ANOVA was run to examine differences between groups based on threat exposure. There was one significant difference found among groups (LSAs exposed to a performance threat, LSAs exposed to a interaction threat, HSAs exposed to no threat, HSAs exposed to a performance threat, and HSAs exposed to a interaction threat), $t(5, 120) = 2.78, p = .021$.

Post hoc results using the Tukey test showed that the significant difference in D scores between groups was between HSAs exposed to an interaction threat and HSAs exposed to a performance/speech threat, with a mean difference (I-J) = -.49, STD error = .16, $p = .04$. These results indicate that HSAs responded significantly faster to pairings of images of beer and “approach” words when presented with a social interaction threat than with a performance threat.

Hypothesis 5

It was predicted that HSAs who endorse coping and conforming would have shorter response times on IAT. Regressions were conducted indicating no main effects for coping and D scores in

the HSA group, $t(1,53)=.14$, $p=.71$ and no main effects for conformity and D scores in the HSA group $t(1,53)=.69$, $p=.41$.

CHAPTER 5

DISCUSSION

Alcohol Consumption and Problems

Support was not found for the first hypothesis (HSAs would report more alcohol related problems than their LSA peers), as roughly 1/3 of both LSAs and HSAs reported clinically significant alcohol-related problems. The lack of support for this hypothesis could be due to the higher levels of reported consumption in a heavy drinking week with this sample as compared with other samples. Our sample HSAs reported a mean number of drinks consumed in a heavy week of 10.55, SD of 10.25, and LSAs reported a mean of 11.77, SD of 13.43. These levels appear to be high when compared to previous literature using college samples, such as Buckner and Heimberg (2012) which reported an HSA mean of 3.33 in their heaviest week of drinking in the past month, SD of 1.88, and an LSA mean in a heavy week of 3.72 and SD of 2.10. As a result of these high consumption levels in our sample, our data should be interpreted with caution.

However, when excluding those subjects who had not consumed alcohol in the past month (per Lewis et al., 2008), we did find that HSA subjects drank significantly less than their LSA peers. These results may indicate that when looking at just those students who consume alcohol, HSAs report drinking less than their LSA peers but also report the same amount of alcohol-related problems. Thus, when HSA alcohol problem levels do not exceed those of less anxious individuals, they may still be of concern due to a lower degree of intoxication or consumption creating a similar problem level. See Chart 1 for regression fit line of this distribution.

Another explanation for the lack of difference between groups in their alcohol-related problems may be due to their similarly high levels of endorsement of coping motives or conformity motives for drinking. Since coping motives have been most closely linked to alcohol-related problems (Stewart, et al., 2006), the high levels of coping motives reported for both groups may contribute to the high levels of problems reported.

Previous literature using college samples (Norberg et al., 2010; 2011; Buckner et al., 2006; Neighbors, et al. 2006) has pointed to the role that gender differences in reported alcohol consumption may play in social anxiety. Neighbors et al. (2006) examined gender and social anxiety in a student population with regards to perceived drinking norms and found that those men higher in social anxiety had higher perceived drinking norms than women and men lower in social anxiety. Unfortunately, we did not have enough statistical power to examine differences between LSA and HSA males and females. Future research is needed to examine how alcohol consumption levels in collegiate HSA's may differ across gender, and whether in accordance with Neighbors et al. (2006), these differences are due to differences in perceived drinking norms.

Motivation to Drink

Although there was not a significant difference between groups with regards to coping and conformity motives, both groups reported being more motivated to drink for coping motives than any other drinking motive. Further, our sample reported higher levels of drinking to cope than the college samples described in previous literature. Norberg et al. (2010), using a normative college sample, found a mean of 10.67 for men and 12.67 for women in endorsement of coping motives for drinking; by comparison, our sample of HSA subjects had a mean score of

14.94 and LSAs a mean of 14.60 for coping motives. This could indicate that this sample may have been more likely to drink as a method of dealing with negative affect than a typical college sample. As such, this data should be interpreted with caution as this difference could have had a broad impact on their scores on all of the measures administered.

In addition to high levels of drinking to cope, we also found that LSAs were more likely to drink in order to enhance a situation, a motive not linked to significant alcohol-related problems. Enhancement motives are considered to be positively rewarding and to come from one's internal desire to increase an already positive emotional state (Cooper, 1994). The high likelihood of drinking to enhance a situation amongst LSAs may explain their low levels of alcohol-related problems as compared to previous samples (Lewis et al. 2008; Ham et al. 2007). LSAs' drinking to enhance a situation may have led them to have fewer alcohol problems, despite heavy drinking. This may explain why we did not see significant differences in the problem levels of LSAs who drink more but drink to cope or enhance, versus HSAs who reported drinking less, but are more likely to drink to cope.

In light of our results, the lack of differences between HSAs and LSAs coping and conformity motivations may also be related to the very high levels of alcohol consumption and problems reported in the entire sample. Given the high rates of consumption observed in HSA and LSA college samples, the conflicting findings between ours and prior researchers may be attributed to the very high global consumption levels of students enrolled in college, rather than levels of anxiety reported.

In 2006, the Substance Abuse and Mental Health Services Advisory found that 18-22-year-olds enrolled in college were more likely to consume alcohol in the previous month (64.4% as compared to 53.2%), engage in heavy drinking (19.5% vs. 13%), and engage in binge drinking

(44.8% vs. 38.3%) than their non-college-enrolled peers. Thus, enrollment in college is a high risk factor for high levels of alcohol consumption and problems, regardless of anxiety levels, and future research may need to focus on the overall public health concern with college populations. Colby, Swanton, and Colby (2012), found that when presented with vignettes of heavy drinking, college students were less judgmental of individuals in vignettes that described the person as “in college” than when the person was not described as being enrolled in college. This may indicate that college students view enrollment in college as unique factor and time period in which the physical and social consequences of problematic drinking are judged or experienced less harshly.

Implicit Association Task

In terms of implicit associations regarding approaching or avoiding alcohol, we did not find a significant difference between the scores of LSAs and HSAs in the three exposure groups. Further, we did not find a significant difference in D scores between HSAs exposed to a no challenge vs. an interaction challenge, however, we did find that the difference approached significance at .10 significance level, $f(2, 52) = 4.53, p = .015$, which may indicate that with increased power, significance differences might be evident. As our study was the first to compare Knight and Godfrey (1993) social interaction threat and Thomas et al (2003) performance threat, it is also possible that the strength of these manipulations may not have been equal, and that one created more anxiety in subjects relative to the other.

When looking only at the high social anxiety group, significant differences were found between their implicit associations regarding approaching alcohol when confronted with a performance threat as opposed to a social interaction. This may support emerging data (Abrams et al., 2002; Cludius, Stevens, Bantin, Gerlach, & Herman, 2013; Buckner & Heimberg, 2010)

showing that HSAs may have situation specific outcome expectancies, particularly with regards to consuming alcohol before giving a performance or speech. While socially anxious individuals may see alcohol as a hindrance to a performance (Abrams et al., 2002; Cludius et al., 2013), in contrast, they may associate drinking alcohol in anticipation of a social interaction as leading to positive outcome in a social interaction.

Cludius et al. (2013) found that socially anxious students' expectations regarding social interaction after alcohol consumption were in line with the Stress-Response-Dampening (SRD) model (Sher & Levenson, 1982), in that they were motivated to consume alcohol for its anxiolytic effects. They further found that stress-reduction in combination with students' beliefs that alcohol could enhance their ability to interact socially, served as a motivator for consumption in anticipation of interactions. However, this motivation was not found to generalize to other types of social threat situations, such as performance. Similar findings by Buckner and Heimberg (2010), suggest that HSAs endorse drinking to cope with social interactions more often than drinking to cope with performance situations.

This emerging data—suggesting that HSAs' expectations may be related to the idea that alcohol is socially acceptable to drink in social interactions but less acceptable in performance situations (Cludius et al., 2013) and that alcohol is expected to help reduce anxiety in social interactions more than in performances (Buckner & Heimberg, 2010)—is supported by our findings that HSAs' cognitive networks more closely associate approaching alcohol in social interaction situations than in performance situations.

Summary

When considering the data on college students' reduced judgment of problematic drinking while enrolled in University (Colby et al., 2012), HSAs in college samples, such as ours, may not recognize problematic drinking behavior as problematic. If HSA students do perceive the social acceptability of consuming alcohol in a social interaction as opposed to a performance differently, this may impact may impact their expectations of positive outcome of drinking in those respective situations (Cludus et al. 2013; Buckner & Heimberg, 2010). These differences in perceptions and outcome expectancies may account for our findings that HSAs in a university population, when confronted with a social interaction as opposed to a performance, more closely associate alcohol with the concept of approach than avoid in their cognitive networks. Given the emerging literature on college student drinking and cognitions (Colby et al., 2012), further research is needed to explore whether, among non-university students high in social anxiety, these associated networks are equally closely associated, or if these findings are specific to university populations.

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Table 1

Alcohol Motivation IAT Stimuli

<u>Alcohol Stimuli</u>	<u>Water Stimuli</u>
Picture of standard glass of beer	Picture of standard glass of water
Picture of pint glass of beer	Picture of pint glass of water
Picture of pitcher of beer	Picture of pitcher of water
Picture of pitcher beer and standard glass of beer	Picture of pitcher of water and standard glass of water
Picture of pitcher of beer and pint glass of beer	Picture of pitcher of water and pint glass of water
<u>Approach Stimuli</u>	<u>Avoid Stimuli</u>
Approach	Avoid
Advance	Away
Hope	Withdraw
Anticipate	Leave
Closer	Escape

Table 2

Demographic Information and Self-Report Data

	HSA		LSA	
Gender				
Male	8 ^a		14 ^b	
Female	53 ^a		47 ^b	
Ethnicity				
Caucasian	44		40	
African-American	3		3	
Asian/Pacific Islander	8		6	
Hispanic	2		5	
Other	4		7	
	<u>\bar{x}</u>	<u>sd</u>	<u>\bar{x}</u>	<u>sd</u>
SPS	36.23 ^a	10.82	7.86 ^b	5.06
Age	19.7	1.77	19.52	1.53
RAPI	7.38	6.83	6.87	7.49
DMQR				
social	12.37	4.97	12.99	4.40
coping	14.94	4.98	14.60	5.18
enhancement	12.12	4.27	10.45	4.10
conformity	12.94	4.13	13.21	4.71
DDQ				
-all participants				
number of drinks/typical week	5.97	6.72	7.84	10.57
hours drinking/typical week	4.84	4.23	6.28	7.19
number of drinks/ heavy week	10.55	10.25	11.77	13.43
hours drinking/heavy week	8.08	9.63	8.25	9.58
-participants who drink				
number of drinks/typical week	6.57 ^a	6.76	9.63 ^b	10.98
Feedback Rating Scale				
Interaction Challenge	6.44	.92	6.68	.67
Speech Challenge	5.11	2.14	5.52	1.97

Note. Different superscripts indicate significant difference between groups.

Table 3

D Scores by Condition

	HSAs		LSAs	
	\bar{x}	sd	\bar{x}	sd
No Threat	-.50	.46	-.78	.51
Interaction Threat	-.90 _a	.53	-.50	.52
Performance Threat	-.40 _b	.34	-.60	.51

Note. D scores were calculated by dividing the difference between the overall test block mean by the standard deviation of all of the response latencies in the block.

Subscripts denote a significant difference in reaction times.

