Alcohol Stress-Response Dampening in Social Situations

Lindsay S. Ham, Ph.D., Hilary G. Casner, B.A., Amy K. Bacon, M.A., Amanda Wells, & Chelsea Link
University of Arkansas—Fayetteville

Introduction

Drinking to cope with social anxiety is positively associated with greater alcohol-related consequences and symptoms of alcohol use disorders (AUDs; e.g., Carrigan, Ham, Thomas, & Randall, 2008; Thomas, Randall, & Carrigan, 2003), making this pattern of alcohol use an important public health concern. Social anxiety disorder (SAD; also referred to as social phobia), a condition characterized by an excessive fear of social and/or performance situations and subsequent negative evaluation (APA, 2000), is the fourth most common psychiatric disorder (lifetime prevalence = 12.1%; Kessler et al., 2005) and is highly comorbid with AUDs. According to epidemiological research, 48% of those with lifetime SAD also had a lifetime diagnosis of an AUD (Grant et al., 2005). Social anxiety, at both clinical and subclinical levels, appears to be a unique risk factor for subsequent AUDs (e.g., Buckner et al., 2008; Crum & Pratt, 2001).

According to the Stress-Response Dampening (SRD; Sher & Levenson, 1982; Sher, 1987; see Morris, Stewart, & Ham, 2005) model, individuals with social anxiety disorder develop an AUD after repeatedly experiencing a reduction in the stress response from drinking when faced with anxiety-producing social situations. Results from laboratory-based studies examining the SRD effects in social situations have been mixed; however, a significant limitation of these studies is that the social stressor manipulation consisted only of a public speaking-related task (e.g., Abrams, Kushner, & Reinertsen, 2002: Abrams, Kushner, Medina, & Voight, 2001; Himle et al., 1999). The limited research available suggests socially anxious individuals are much more likely to drink to cope with social anxiety in social interaction contexts rather than in performance situations (Thomas et al., 2003). No studies to date have examined alcohol's affects on interaction- and performance-based social stress manipulations.

Thus, the present study tests the SRD model by exploring alcohol's effects on social anxiety before and during two commonly feared social situations (i.e., public speaking and a conversation with an unfamiliar person) using behavioral analogue assessment. The study represents an initial investigation of alcohol's effects on state social anxiety across contexts among a sample of social drinking undergraduates. It is hypothesized that participants in the alcohol consumption condition will experience less anxiety prior to and during the conversation than those in the placebo or control conditions. Prior to and during the speech condition, it is expected that those in the placebo condition will report greater levels of anxiety than in alcohol or control conditions, due to concerns about alcohol impairing performance in the absence of alcohol's physiological effects.

Method

Participants were 33 undergraduate student volunteers (24% women; mean age = 22.5, *SD* = 2.1) attending the University of Arkansas. Approximately 82% of participants self-identified ethnicity and/or race as White or Caucasian (non-Hispanic), 9% as Asian or Asian American, and 9% as Black or African American (non-Hispanic).

Eligible participants were social drinkers ages 21 or older with recent alcohol consumption at the level administered in the study (target Blood Alcohol Concentration [BAC] = 0.08mg%). Exclusion criteria included current medical conditions, psychiatric conditions, or medication use for which alcohol consumption is contraindicated. Participants were randomly assigned to one of three beverage conditions (see Table 1): alcohol (BAC = .08; *n* = 9), placebo (*n* = 12), or control (*n* = 12).

Measures

State Social Anxiety. The Subjective Units of Distress rating scale (SUDS; Wolpe, 1973) was used to assess current subjective anxiety. The SUDS is a single-item rating of current distress on a 0 (*no anxiety*) to 100 (*maximal anxiety*).

Trait Social Anxiety. The Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS) are companion self-report instruments that assess both interpersonal and performance aspects of social anxiety, respectively (Mattick & Clarke, 1989).

Drinking Behavior. The Brief Michigan Alcohol Screening Test (B-MAST; Pokorny, Miller, & Kaplan, 1972) and Rutgers Alcohol Problem Index (White & Labouvie, 1989) were used as indices of alcohol-related problems.

Table 1. *Demographic Summary by Condition (N = 33).*

	Alcohol (*n* = 9)	Placebo (*n* = 12)	Control (*n* = 12)
Gender			
Women	2 (22.2%)	3 (25.0%)	3 (25.0%)
Men	7 (77.8%)	9 (75.0%)	9 (75.0%)
Race/Ethnicity			
White (non-Hispanic)	8 (88.9%)	9 (75.0%)	10 (83.3%)
Black (non-Hispanic)	1 (11.1%)	2 (16.7%)	0 (0.0%)
Asian	0 (0.0%)	1 (8.3%)	2 (16.7%)
Age	22.2 *(1.3)*	22.8 *(2.7)*	22.5 *(1.9)*

Procedures

Upon determining eligibility based on a medical screening interview conducted by trained doctoral clinical psychology students, participants completed a questionnaire battery including measures of social anxiety and drinking behaviors. Next, participants consumed three servings (based on sex and weight; cf MacDonald, Stewart, Hutson, Rhyno & Loughlin, 2001) of the randomly assigned beverage in a bar-laboratory after providing a baseline SUDS rating. After an absorption period, participants engaged in the two behavioral analogue assessment task conditions (described below) in counterbalanced order. SUDS were obtained at the beginning of a 5-min anticipation period (Anticipation 1), immediately before (Anticipation 2), and during (During) each task. Upon completing the experiment, participants were debriefed. Participants in the alcohol condition remained in the laboratory for detoxification until BAC was < 0.04 mg%.

Behavioral Analogue Assessment. The behavioral analogue assessment is a common method to assess social anxiety in treatment and research settings (e.g., Norton & Hope, 2001). For each condition, the participant was informed of the task condition, given instructions, and left alone for five "preparation" minutes to induce anticipation. In between conditions, participants completed a 10-minute neutral task. In the *conversation* condition, participants were instructed to initiate and maintain a conversation with an individual they would be meeting for the first time. The confederate was trained to act in a friendly, but reserved manner. In the *speech* condition, the participant was instructed to give a speech on a topic of their choosing for four minutes. The audience members (two confederates) were not allowed to ask or answer questions during the speech and were trained to react in a neutral manner.

Results

Preliminary Analyses

The three beverage conditions did not differ significantly in gender, $\chi 2(2) = .03$, $p = .99$, or race/ethnicity composition, $\chi 2(4) = 3.60$, $p = .46$. Further, Analysis of Variance (ANOVA) tests revealed that the beverage conditions did not vary based on age, $F(2, 30) = .30$, $p = .74$, level of alcohol problems, $F(2, 30) = .09$-$.35$, *ps* = .71-.91, or level of social anxiety, $F(2,30) = .35$-$.45$, *ps* = .64-.71. Results also suggest that the beverage manipulation was successful. When asked if they consumed alcohol in the experiment, 100% of those in the alcohol condition, 91.7% in the placebo condition, and 0% in the control condition indicated "yes," $\chi 2(2) = 28.09$, $p < .001$.

Hypothesis Driven Analyses

First, change in SUDS (ΔSUDS) was computed by subtracting baseline SUDS from the SUDS obtained at each respective time point (Anticipation 1, Anticipation 2, and During) separately for the conversation and speech conditions. Next, a series of Analysis of Covariance (ANCOVA) tests were conducted with beverage condition as the independent variable, ΔSUDS as the dependent variable, and trait social anxiety measures as covariates.

Though not statistically significant, ANCOVAs for *anticipation* ΔSUDS indicated medium-large effect sizes (see Figures 1 and 2). Planned post-hoc comparisons revealed that at the beginning of the 5-minute preparation period prior to the conversation (Anticipation 1), those in the alcohol condition had significantly lower mean ΔSUDS than controls ($p = .04$), with a trend in relation to the placebo group ($p = .08$), $F(2, 28) = 2.49$, $p = .10$, $\eta = .39$. Though not significant, the mean ΔSUDS are in the hypothesized direction for the alcohol group compared to the placebo (*ps* = .09) and control conditions (*ps* = .11-.15) immediately before the conversation (Anticipation 2), $F(2,28) = 1,86$, $p = .18$, $\eta = .34$, and for the speech condition at Anticipation 1 ΔSUDS, $F(2, 28) = 1.71$, $p = .20$, $\eta = .33$. The three groups did not differ significantly immediately before the speech, $F(2, 27) = 1.48$, $p = .25$, $\eta = .31$; however, visual inspection of means suggests ΔSUDS were in the expected direction for the placebo group compared to control ($p = .17$) and alcohol groups ($p = .13$).

Results indicated that ΔSUDS did not vary across beverage conditions *during* either the conversation ($F[2,28] = .16$, $p = .86$, $\eta = .11$) or the speech ($F[2,28] = .47$, $p = .63$, $\eta = .18$) conditions (See Figures 1 and 2).

Figure 1. *ΔSUDS by Beverage Condition for the Conversation Task.*

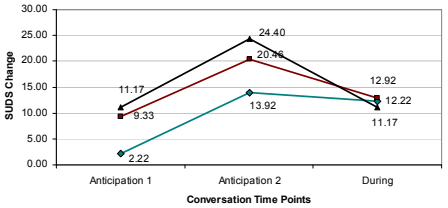
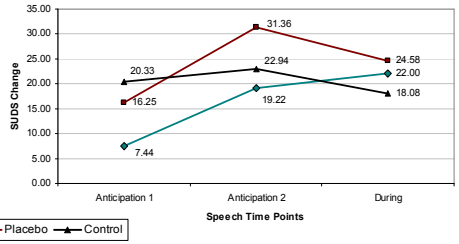


Figure 2. *ΔSUDS by Beverage Condition for the Speech Task.*



Discussion

The current study tested alcohol's SRD effects in anticipation of and during two commonly feared social contexts. Consistent with the hypotheses, participants who had consumed alcohol had the lowest ΔSUDS in anticipation of the conversation with an unfamiliar individual (both Anticipatory measurement points). Consistent with the expectation that those in the placebo condition would experience greater anxiety for speech condition time points, the results indicate that the placebo group reported more anxiety than alcohol or control groups immediately prior to beginning the speech (but findings were consistent with SRD effects five minutes prior to the speech). Contrary to expectations, participants reported similar increases in anxiety from baseline during the conversation and the speech, regardless of whether they had consumed an alcoholic, placebo, or control beverage.

Though participants did not provide information about why or why not they experienced an increase in SUDS, it may be the case that participants in the alcohol condition became increasingly more anxious due to concerns about slurring words, forgetting what they wanted to say, or otherwise appearing intoxicated. It is possible that while some socially anxious individuals may use alcohol prior to a performance situation to reduce anticipatory anxiety, the ultimate effect of an increase in anxiety (perhaps due to concerns about the negative evaluations of others) may prevent most socially anxious individuals from using alcohol before social performance situations (e.g., Thomas et al., 2003).

As the During ΔSUDS for both behavioral analogue task conditions was measured halfway through (i.e., 2 minutes) the task, it is possible that the participants (particularly those in the placebo and non-alcoholic control conditions) experience some level of habituation to anxiety by this time point. Consistent with exposure-based therapies for SAD, when faced with an anxiety-provoking social situation, social anxiety tends to increase to a peak and then dissipate (Otto & Safren, 2001). It has been acknowledged that alcohol and other anxiolytic substances interfere with the efficacy of exposures, which could explain the different patterns observed for the alcohol condition in comparison to placebo and control condition.

These preliminary findings suggest that SRD effects of alcohol might be more relevant to social interaction situations than public speaking situations. Though the current study cell sizes were small, the medium-to-large effect sizes indicate that the findings are likely to reach statistical significance with a larger sample. In addition, the current findings imply that alcohol's effects on anticipatory anxiety might play an important role in developing and maintaining drinking behavior amongst socially anxious individuals. By providing relief from anticipatory anxiety, the socially anxious individual may use alcohol as a "crutch" to approach new people or enter social gatherings. Future research with a sample of individuals with social anxiety disorder is warranted. Further, it is recommended that studies include physiological measurement of anxiety responding throughout the task, an "after" measurement point to determine if anxiety continues to increase for the alcohol condition, and consideration of participants' cognitions about alcohol's effects.

Poster presented at the 9th annual Guze Symposium on Alcoholism, St. Louis, MO, February 19, 2009. For more information, please contact Lindsay Ham at Lham@uark.edu.