The relationship between social anxiety and alcohol consumption in college students: Scale development, construct validation, and testing of a social cognitive model

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ABSTRACT

Heavy drinking has been consistently associated with negative legal, academic, and health problems in college students and recent studies suggest that the frequency of undergraduates experiencing alcohol related problems may be increasing. Research aimed at lowering rates of consumption has begun to focus on individual differences in motivations for heavy alcohol use. The following study used a social-cognitive based model to prospectively examine heavy drinking among socially anxious college students. It was hypothesized that alcohol expectancies of social facilitation/anxiety reduction and self-efficacy for avoiding heavy drinking in socially anxious situations would be predictive of drinking in socially anxious college students.

Using group testing and individual interview formats questionnaires assessing alcohol expectancies of improved sociability and self-efficacy were developed and shown to have adequate levels of reliability and construct validity. These questionnaires, along with measures of dispositional social anxiety, and a quantity-frequency index of alcohol use were then administered to 372 undergraduates. Seventy-one participants, identified as dispositionally socially anxious, were followed-up six-weeks later and completed both a time-line-follow-back assessment of their alcohol use over the six week interval and a semi-structured interview that assessed the types of situations in which they drank.

Results of the study provided partial support for the hypothesized model as the expectancy X efficacy interaction accounted for a significant percentage of the variance in the quantity and frequency of alcohol use after controlling for the main effects of alcohol expectancies and self-efficacy. At the six-week follow-up however, the expectancy X efficacy interaction failed to account for significant variance beyond that accounted for by the expectancy and efficacy effects. Further examination of the follow-up data did provide partial support for the model, as it was found that the main effects of expectancy and efficacy were significant predictors of drinking behavior, but only in situations that were likely to elicit feelings of social anxiety. Results are discussed in terms of the relationship between social

anxiety, outcome expectancies and self-efficacy and implications for developing alcohol intervention programs with high-risk college student drinkers.

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Despite an increased awareness of the detrimental and potentially lethal consequences of heavy alcohol use, excessive college student drinking continues to occur on many university campuses. Current estimates suggest that over 40% of college students drink excessively (Harvard School of Public Health, 1995) and that a considerable number of these individuals experience academic (Perkins, 1992; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994), interpersonal (O'Hare, 1990a; Presley & Meilman, 1992) health (Harvard School of Public Health, 1995), and legal (Lloyd & Atkins, 1993; Schuckit, Klein, Twitchell, & Springer, 1994) difficulties as a result of their heavy alcohol use. The negative impact of heavy alcohol use by college students has also resulted in a steady increase in research aimed at identifying the reasons for excessive drinking and attempting to lower the frequency of its occurrence.

Initially, the majority of this research was based primarily on educational models with intervention programs being "restricted to providing information about the negative effects of alcohol abuse, emphasizing a disease model of alcoholism, or using a more affective-based 'values-clarification' approach" (Kivlahan, Marlatt, Fromme, Coppel, & Williams, 1990, p. 805). Unfortunately, the effectiveness of these programs was limited. Although the students who participated demonstrated an increased knowledge of the problems associated with heavy drinking, they typically did not lower their levels of consumption and/or the number of alcohol related problems they experienced (Goodstat, 1986; Kraft, 1984; Mills & McCarty, 1983; Moskowitz, 1989).

In the hope of identifying more effective interventions, more recent efforts have been directed at gaining an increased understanding of the factors that motivate college students to drink excessively. Of these, one which has begun to generate increasing amounts of research and appears to have promise for improving our understanding of the reasons for heavy drinking in college students is Bandura's (1986; 1997) social cognitive theory.

A Social Cognitive Conceptualization of Motivation

According to social cognitive theory (Bandura, 1977; 1986; 1997), motivation to engage or not engage in a given behavior is based on both self-efficacy and outcome expectancies for performing a specific behavior in a specific situation. A high sense of self-efficacy or confidence for successfully performing a given behavior, along with expectations of valued and desired

outcomes, will likely result in a high level of motivation for engaging in the behavior. Conversely, a lower sense of self-efficacy along with expectations of undesirable and/or negative outcomes will likely result in a lowered sense of motivation. Further, as noted by Bandura (1986; 1997), the behavioral and situational specificity of efficacy and expectancy judgments allows for substantial variation across behaviors and situations.

Unlike traditional definitions of efficacy judgments, however, the relationship between self-efficacy and substance use is "operationalized most often as a judgment about one's ability to avoid or reduce substance use in a number of specific situations that tempt use" (Stephens, Wertz, & Roffman, 1995, p. 1022). As applied to college students' motivation to drink heavily, therefore, social cognitive theory posits that in situations where there is low self-efficacy for avoiding heavy drinking and where valued and desired outcomes are expected from consuming alcohol, there will be considerable motivation to drink excessively.

Importantly, while the above conceptualization allows for a general understanding of what motivates heavy drinking, it does not address individual differences that may serve to moderate efficacy and expectancy judgments. Individual difference factors, such as anxiety and depression, are likely to influence perceptions of drinking situations and the expected effects from drinking. To better understand and predict motivation from drinking, therefore, it is necessary to incorporate these individual differences into the assessment of efficacy and expectancy judgments. Of the many potentially relevant individual difference factors, one that appears likely to moderate efficacy and expectancy judgments is social anxiety.

Social Anxiety as a Factor in Excessive College Student Drinking

In an early study of social and dating anxiety in college students, Arkowitz, Hinton, Perl, & Himadi (1978) found that up to 37% of undergraduates reported feeling nervous or anxious when interacting with members of the opposite sex. More recently, several researchers have replicated and extended Arkowitz et al.'s (1978) results with findings indicating that in college student populations, drinking most frequently occurs in the context of small mixed-sex groups (Carey, 1993; Goodwin, 1990) and that the reasons most often cited for drinking are to relieve tension, feel more comfortable with the opposite sex, be sociable, and meet new people (Goree, 1995; McCarty & Kaye, 1984; O'Hare, 1990a). Further, several studies (e.g., Burke & Stephens, 1997; Leonard & Blane, 1988; O'Hare, 1990b) have found significant relationships between

college students' self-reports of social anxiety and both their alcohol expectancies of social facilitation and self-efficacy for avoiding heavy drinking.

Third, college is a highly social environment with a strong emphasis on "fitting-in" with others, and where drinking is often expected and encouraged at social gatherings (Johnson, Springer, & Sternglanz, 1982; Nathan, 1994). Thus, for students who experience anxiety when interacting with others, hold expectancies that alcohol will result in improved sociability (i.e., reduce social anxiety, act as a socially facilitating agent) and have a low sense of self-efficacy for avoiding heavy drinking, excessive drinking may be seen as the only means of negotiating and managing these social demands.

Evidence For a Relationship Between Social Anxiety and Alcohol Consumption

Results from several studies suggest that a relationship between social anxiety and drinking exists and is moderated by both alcohol expectancies and efficacy judgments. In particular, two lines of evidence which support this relationship are studies of social anxiety and alcohol consumption in both clinical populations and college students.

Social anxiety and alcohol abuse problems in clinical populations

Over the past two decades several studies of alcohol abusing populations have provided support for a relationship between social anxiety and alcohol use. As a whole, findings from these studies have shown that a significant percentage (16 to 39%) of patients seeking treatment for alcohol dependence also met diagnostic criteria for social phobia (Chambless, Cherney, Caouto, & Rheinstein, 1987; Page & Andrews, 1996; Schneier, Martin, Liebowitz, Gorman, & Fyer, 1989; Smail, Stockwell, Canter, & Hodgson, 1984; Stravynski, Lamontagne, & Lavallée, 1986). Similarly, in a review of studies examining alcohol problems in outpatients with anxiety disorders, Kushner, Sher, and Beitman (1990) concluded that individuals diagnosed with social phobia are "slightly more than twice as likely to have had alcohol problems than are individuals from the community" (p. 687). Further, several of the above studies have noted that the majority of these subjects reported experiencing symptoms of social phobia prior to their difficulties with alcohol and indicated that they used alcohol to cope with their social phobia symptomatology. It is important to note, however, that the retrospective nature of these interviews does not allow for an examination of the predictive validity of this relationship.

Social Anxiety and Alcohol Use in College Student Populations

      To date, only five empirical studies have examined the relationship between social anxiety, and drinking in college student populations. Consistent with above findings, these studies provide support for a relationship between social anxiety and heavy drinking. These latter studies have also attempted to increase our understanding of the factors that may moderate this relationship by including measures of alcohol expectancies and self-efficacy for avoiding heavy drinking.

      For example, in a study of social phobia and alcohol abuse Kushner and Sher (1993) administered the Diagnostic Interview Schedule (DIS; Robins, Helzer, Croughan, & Ratcliff, 1981) to 489 male and female freshman, and then computed odds ratios for the risk of having an alcohol abuse or dependence disorder co-occur with a DIS diagnosis of social phobia. Results indicated that having a DIS diagnosis of social phobia increased the risk of also having a diagnosis of alcohol abuse or dependence diagnosis by a factor of 1.7.

      In a cross-sectional study of the relationship between alcohol expectancies and social anxiety, Leonard and Blane (1988) had 86 male college students complete the Alcohol Expectancy Questionnaire (AEQ; Brown, Goldman, Inn, & Anderson, 1980), a measure of alcohol related expectancies, and several measures of interpersonal anxiety. Significant positive correlations (rs = .27 to .46; ps < .05) were found between participants' alcohol expectancies for general positive change (e.g., alcohol makes me more interesting; drinking makes the future seem brighter) and social assertiveness (e.g., A few drinks makes me less shy; a few drinks makes it easier to talk to people), and their scores on all four of the social anxiety measures used in the study. The higher the participants' level of social anxiety and concern over interpersonal evaluation, the greater the expectancy that drinking alcohol would reduce those concerns. Similar findings were also obtained by Brown and Munson (1987).

      Fourth, in a study of 606 male and female undergraduates, O'Hare (1990b) found that participants' reports of social anxiety significantly predicted alcohol expectancies of tension reduction and social assertiveness as measured by the AEQ. In addition, O'Hare found that self-reported alcohol consumption was a significant predictor of expectancies of tension reduction, social assertion, and social/physical pleasure. Stronger feelings of social anxiety were associated with higher alcohol expectancies of tension reduction and social assertiveness, as well as greater levels of alcohol consumption.

Finally, in what is apparently the only study to examine the effect of anxious affect on drinking self-efficacy in college students, Burke and Stephens (1997) found a significant relationship between dispositional social anxiety and self-efficacy for avoiding heavy drinking. Compared to participants low in dispositional social anxiety, those who were high reported significantly lower levels of self-efficacy for avoiding heavy drinking in situations characterized by negative affect (e.g., if someone criticized me; if other people made me tense). A similar effect, that approached significance ($p < .07$), was also found for situations characterized by social anxiety (e.g., if I were talking to an attractive member of the opposite sex; if I were at a party where I didn't know anyone). These authors also found a significant relationship ($r = .38$; $p < .001$) between participants' level of dispositional social anxiety and their alcohol expectancies of social facilitation. Higher levels of social anxiety were associated with stronger expectancies of socially facilitation effects from drinking.

Taken together, the above research findings suggest that in college student populations social anxiety is relatively prevalent and, in relation to heavy drinking, is likely moderated by alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking. As noted by Evans and Dunn (1995), however, "studies that incorporate multiple components of social cognitive theory models of alcohol use have been lacking" (p. 187). This current lack of integration limits our understanding of how these constructs contribute to excessive drinking. As pointed out by Cooper and colleagues (Cooper, Russell, & George, 1988) a "failure to simultaneously consider the contributions of these factors potentially sacrifices parsimony and runs the risk of generating spurious findings due to the overlap among these constructs" (p. 220). As a way of starting to address these limitations, the following model is offered.

A Social Cognitive Model of the Relationship between Social Anxiety and Heavy Drinking in College Students.

According to the proposed model (see Figure 1), feelings of social anxiety will occur in individuals who are highly motivated to make a good impression in social interactions but have doubts about their ability to do so (Leary, 1983; Leary & Kowalski, 1995). For interactions taking place in settings where drinking is normative and/or encouraged (e.g., dorm parties, dances) these feelings of social anxiety may also serve to activate alcohol expectancies of improved sociability (e.g., It is easier for me to socialize, I think less about myself and how I am feeling). These expectancies then moderate the relationship between social anxiety and heavy

drinking. For those with weak alcohol expectancies of social facilitation and social anxiety reduction, heavy drinking is less likely to occur in social settings because alcohol is not perceived to lead to desired outcomes. College students who hold strong alcohol expectancies of improved sociability are more likely to use alcohol in social settings as a way of achieving these effects.

Although expectancies of improved sociability increase the likelihood of heavy drinking, the relationship is further moderated by their self-efficacy for avoiding heavy drinking in socially anxious situations. Students with a high sense of self-efficacy for avoiding heavy drinking are likely quite confident in their abilities to cope with feelings of social anxiety and utilize moderate drinking skills. Thus, despite holding high alcohol expectancies for social facilitation and social anxiety reduction, they are able to utilize other coping strategies and moderate drinking skills to avoid drinking heavily. Alternatively, those with a low sense of self-efficacy for avoiding heavy drinking have little confidence in their ability to utilize alternative coping and/or moderate drinking skills and consequently, have an increased probability of engaging in excessive rates of consumption.

In brief, in social situations involving drinking, feelings of social anxiety serve to activate alcohol expectancies of social facilitation and social anxiety reduction. These expectancies in turn moderate the relationship between social anxiety and drinking with weaker expectancies resulting in a decreased probability of heavy drinking and stronger expectancies being further moderated by self-efficacy for avoiding heavy drinking in socially anxious situations. College students with a high sense of self-efficacy for avoiding heavy drinking possess alternative anxiety reduction and/or moderate drinking skills thus, decreasing the probability of their drinking heavily. Conversely, those with a low sense of self-efficacy for avoiding heavy drinking lack alternative anxiety reduction techniques and/or moderate drinking skills. As a result, there is an increased probability that they will drink heavily to achieve the expected and/or desired social facilitation and social anxiety reduction effects.

<div align="center">Aims and Hypotheses of the Present Research</div>

Although the proposed model appears to have empirical support as suggested by the above literature review, it is apparently only the second study to simultaneously assess expectancy and efficacy judgments, and the first to do so prospectively. As a result, the

predictive validity of the proposed model and its potential utility for developing effective interventions for socially anxious heavy drinkers is unknown.

Thus, the primary aim of the present study was to test the predictive validity of the proposed social cognitive model of social anxiety and alcohol use in college students. It was hypothesized that for college students who experience high levels of dispositional social anxiety alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations will be significantly related to levels of alcohol consumption. For alcohol expectancies it is hypothesized that greater alcohol expectancies of improved sociability will be related to greater levels of drinking. Conversely, lower levels of self-efficacy for avoiding heavy drinking in socially anxious situations will be associated with higher levels of drinking. Lastly, because self-efficacy is proposed to moderate the relationship between alcohol expectancies and drinking, it was hypothesized that the interaction between these constructs would be significant. Specifically, the interaction between alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations was hypothesized to account for a significant amount of the variability in alcohol consumption above and beyond that accounted for by the main expectancy and efficacy effects.

To achieve this aim, an initial study was conducted to develop alcohol expectancy and self-efficacy measures that were specific to socially anxious individuals. Consistent with findings from similar studies (e.g., Burke & Stephens, 1997; Leonard & Blane, 1988), it was hypothesized that social anxiety would be positively related to alcohol expectancies of improved sociability and negatively related to self-efficacy for avoiding heavy drinking in socially anxious situations.

<div align="center">Method</div>

<div align="center">Study 1: Scale Development</div>

The goal of this study was to identify and pilot test questionnaire items that could be used to create measures of alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations. The study involved two phases and used both questionnaire and interview techniques.

Participants

Questionnaire Phase. Two hundred twenty nine participants took part in the questionnaire phase of the research and were tested in groups of 10 to 35. All participants were

undergraduate college students who were recruited via the Psychology Department subject pool at Virginia Tech. They received course credit for their participation. Participants were mostly female (70.7%), had a mean age of 19.36 years ($\underline{SD}$ = 1.48) and were typically in their Freshman (33.2%) or Sophomore (29.7%) year in college.

       <u>Interview phase</u>. From the initial pool of 229 participants who completed the questionnaires, 26 were eligible for participation in the interview phase and 15 elected to take part in the interview phase. Eligibility criteria included drinking at least 17.5 drinks in the past month and drinking five or more drinks in one sitting (i.e., a 4-hour period) on at least one occasion during that month. Similar drinking criteria have been used by other researchers (e.g., Cahalan, Cissin, & Crossley, 1969; O'Hare, 1990a) for selecting moderate to heavy drinkers. In addition, from the pool of participants who met the alcohol consumption criteria (n = 156), the distribution of scores on the Interaction Anxiousness Scale, a measure of social anxiety, was divided into thirds and eligible participants were selected from the upper third (i.e., high social anxiety) of the distribution.

       As in the questionnaire phase, interview phase participants were mostly female (80%), and were in either their Freshman (46.7%) or Sophomore (33.3%) year in college. Consistent with the aim of identifying heavy drinking college students, interview phase participants reported consuming an average of 76 drinks in the past month (SD = 75.00) and engaging in drinking approximately 2-3 times a week. Relatedly, these participants had a mean social anxiety score of 52.13 ($\underline{SD}$ = 6.25). This score is significantly higher than that of participants ($\underline{n}$ = 214) who did not take part in the interview phase ($\underline{M}$ = 38.72; $\underline{SD}$ = 10.78, $\underline{p}$ < .001) and is similar to scores obtained in earlier studies (Burke & Stephens, 1997; Leary, 1983) that selected individuals high in social anxiety. Lastly, univariate analyses of variance (ANOVAs) did not reveal any significant differences between interview phase participants and the remainder of the sample (n = 214) in terms of age, gender, or year in college (p > .05).

<u>Procedure</u>

       <u>Questionnaire phase.</u> Upon arrival, participants were presented with an informed consent form and were told that the purpose of the study was to obtain background information on personality variables and health behaviors for use in future studies related to these topics. The experimenter obtained the informed consent documents and then distributed a packet of measures to each participant. After completing the measures, the experimenter collected the

packets from the participants, and informed them that they may be selected to participate in another study designed to examine some of the personality variables, just assessed, in more depth. All participants were verbally debriefed about the questionnaire phase of the research and thanked for their participation. The total time required by the participants was approximately one hour.

Interview phase. Approximately two to three weeks following the completion of the questionnaire phase, participants selected for inclusion in the interview phase were contacted, by phone, and asked to participate in a study examining social anxiety in college students. Participants who agreed to take part were scheduled for an individual appointment and told that as compensation for their participation they would receive their choice of either one extra credit point or three dollars.

Upon arrival at the research office, the participant was greeted by the experimenter (either Randy Burke or an advanced undergraduate) and presented with an informed consent form. The experimenter obtained the signed informed consent form, provided the participant with a copy for his or her records, and administered a semi-structured interview designed to assess the participant's experience with social anxiety in college. After completing the interview the experimenter presented the participant with modified versions of alcohol expectancy and self-efficacy measures and explained that part of the research also involved the development of questionnaires that assessed alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations. Participants were asked to fill out these measures and to provide the experimenter with feedback regarding potential additions, deletions or rewordings of items.

After completing the interview and discussing their suggestions for further refining the questionnaires with the experimenter, participants were verbally debriefed and provided with a written debriefing form that reiterated the purpose of the research. Total time to complete the interview phase was approximately one hour.

Measures

Questionnaire phase. A 19-item health behaviors questionnaire was used to assess participants' quantity, frequency, and volume of alcohol use and to identify eligible participants for participation in the interview phase of the study. The self-report format used to obtain this information was similar to that used by other researchers (e.g., Cahalan et al., 1969; Stacy,

Widaman, Hays, & DiMatteo, 1985). Participants were asked a question regarding the frequency of their drinking occasions (i.e., Please indicate how many times in the past month you have drank alcohol) and several questions regarding the quantity of alcohol they consumed (e.g., How many times in the past month did you have 5 to 6 drinks, but no more, on a single occasion?; How many times in the past month did you have 7 to 8 drinks, but no more, on a single occasion?). To compute an index that provided an approximation of the total number of drinks consumed in the past month, the number reported for each quantity question was multiplied by the lower end of the range of each question. Each of the products obtained from the quantity questions was then summed to yield an estimate of the total number of drinks consumed in the past month. Similar quantity-frequency measures have been employed by other researchers (O'Hare, 1991; M.B. Sobell & L.C. Sobell, 1990) and have produced highly reliable findings in terms of obtaining both quantity and frequency of alcohol consumption data in college student populations. Participants were also asked several questions about their dietary habits, smoking, and medical status in order to reduce their ability to discern the true purpose of the questionnaire.

The Interaction Anxiousness Scale (IAS; Leary, 1991) is a 15-item self-report measure of "the tendency to experience subjective social anxiety independently of accompanying behaviors" (p. 168). Participants respond to the items (e.g., I am usually at ease when speaking to a member of the opposite sex; parties often make me feel anxious and uncomfortable) using a five-point scale ranging from 1 (not at all characteristic of me) to 5 (extremely characteristic of me). The items are then summed to yield an overall social anxiousness score ranging from 15 to 75, with higher scores indicating greater levels of social anxiousness (i.e., the dispositional tendency to experience feelings of anxiety in social or evaluative situations). The IAS shows good internal consistency reliability (Cronbach's alpha > .87) and has an eight-week test-retest reliability of .80. Leary (1983) provided evidence for the convergent and discriminant validity in relation to standard measures of social avoidance, fear of negative evaluation, and social desirability. In the present study, the IAS was used as a screening device to select individuals who are dispositionally high in social anxiousness for inclusion in the interview phase of the study.

The Alcohol Outcome Expectancies Scale (AOES; Leigh & Stacy, 1993) is a 34-item measure that assesses the positive and negative expectancies that respondents may experience as

a result of drinking alcohol. Each of the items is preceded by the stem "When I drink alcohol" and is rated on a six-point scale ranging from 1 (no chance) to 6 (certain to happen). The AOES is composed of two primary subscales that assess both the positive and negative expectancies of drinking alcohol, and these subscales are further broken down into four positive (i.e., Positive Social Effects, Fun Effects, Tension Reduction Effects, and Sexual Effects) and four negative (Negative Emotional Effects, Cognitive Impairment Effects, Physical Impairment Effects, and Negative Social Effects) subscales. Participants' responses are summed by subscale to yield total subscale scores, with higher scores indicating stronger expectancies for the given subscale. All subscales show good internal consistency (alphas = .79 - .93) with the exception of the Tension Reduction/Negative Reinforcement subscale (alpha = .65).

In the current study, a modified version of the AOES was used to pilot test items assessing the alcohol expectancy of social anxiety reduction. Based on a review of the social anxiety literature (Bruch, Mattia, Heimberg, & Holt, 1993; Leary & Kowalski, 1995; Mahone, Bruch, & Heimberg, 1993) items were created that assessed the expectancy that drinking alcohol will result in a reduction in the cognitive (e.g., feeling self-conscious, thinking about one's personal appearance), physiological (e.g., racing heartbeat, feeling "butterflies in one's stomach"), and emotional (e.g., feeling less anxious, feeling less depressed) reactions which typically accompany feelings of social anxiety. In addition, the Physical, Negative Cognitive Performance, and Negative Emotional effects subscales of the AOES were removed because they were not considered germane to the study's aim of pilot testing items for a measure of improved sociability, and would have made the measure overly lengthy. Thus, the alcohol expectancy measure used in the questionnaire phase consisted of 30-items that assessed alcohol expectancies of social anxiety reduction (e.g., I feel calmer or less anxious; It makes the "butterflies in my stomach" go away), social facilitation (e.g., I am more accepted socially; I am able to talk more freely), negative social effects (I become aggressive; I get mean), tension reduction (I feel less stressed; I am able to take my mind off my problems), fun (I have a good time; it is fun), and sexual desire or activity (e.g., I have more desire for sex; I become more sexually active) subscales.

In the present study, four items were added to a 26-item situational confidence questionnaire (SCQ) used in an earlier study of social anxiety and alcohol use in college students (Burke & Stephens, 1997) to form a 30-item measure that assessed self-efficacy for avoiding

heavy drinking in positive (10 items; alpha = .95), negative (10 items; alpha = .90) and socially anxious (10 items; alpha = .86) situations. As with the alcohol expectancy measures, this 30-item SCQ was used to pilot test items designed to assess respondents' confidence in their ability to avoid heavy drinking when experiencing feelings of social anxiety.

Participants responded to the SCQ items using a six-point scale labeled in percentage point increments of twenty (0% = not at all confident) 100% = very confident), that was then transformed into a scale ranging from 1 to 6 for data analysis. Participant responses on each subscale were summed and divided by the total number of items in order to yield mean efficacy scores that could range from 1 to 6, with higher scores indicating greater confidence in one's ability to avoid drinking five or more drinks in a four hour period.

Interview Phase. The primary measure used in this part of the study was a semi-structured interview divided into three parts. First, following a brief description of social anxiety, the experimenter asked participants to describe situations in which they experienced feelings of social anxiety. Second, participants were asked about the cognitive, physiological, and emotional reactions they have experienced when feeling socially anxious. Third, the experimenter asked participants, what they typically do to cope with and/or alleviate these feelings. Finally, participants were asked if they drank alcohol in these situations, how it effected their anxiety, and to provide a recent example of a situation in which they were socially anxious. All participant responses were recorded by the experimenter and the total time required to complete the interview was about 30 minutes.

A modified version of the alcohol expectancy scale administered during the questionnaire phase was used to provide an opportunity for participants to make suggestions about item additions, deletions, or re-wordings that would result in further refinement and improvement of the expectancy measure to be used in the main study. This 13-item revised measure consisted of the improved sociability items presented in the questionnaire phase ($\underline{n}$ = 12; e.g., I feel more social; I feel less self-conscious) along with one additional item that was developed during the course of the pilot testing (i.e., I think less about myself and how I am feeling).

Similar to the alcohol expectancy measure, a modified SCQ was presented to participants in order to allow them to provide feedback on item additions, deletions, or re-wordings that would result in a more refined and improved measure for use in the main study. This 21-item

measure consisted of 15 items drawn from the social anxiety items pilot tested in the questionnaire phase (e.g., if someone criticized me; if I was talking to an attractive member of the opposite sex) and 6 items which were developed during the course of the pilot testing (e.g., if I was blushing; if I felt unsure of myself).

Participant responses to the structured interview and their feedback on the scale items were transcribed and systematically reviewed by two trained undergraduates. The data from the reviews were then compared to the existing expectancy and efficacy scale items with the appropriate additions, deletions, or rewordings being made.

<center>Results</center>

Principal Components Analyses of Expectancy and Efficacy Items

The primary aim of the scale development study was to identify items that could be used to construct measures of alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations. To evaluate the success of this aim, principal component analyses were run on the expectancy and efficacy items tested in the questionnaire phase.

For the expectancy items, examination of the scree plot revealed a five-component solution that accounted for 66.7% of the variance and had components that corresponded to alcohol expectancies of social facilitation (e.g., I am more accepted socially; I become more talkative), social anxiety reduction (e.g., I feel less self-conscious; I make a better impression with others at a party), sexual effects (e.g., I am more sexually active; I am more sexually responsive), physiological changes (e.g., my palms become sweaty or cold; it makes my heart stops racing), and negative social (e.g., I become aggressive; I get mean) effects. The social facilitation and social anxiety reduction components accounted for 49.7% of the variance and examination of the zero-order correlations between the five components revealed a significant positive correlation between the components of social facilitation and social anxiety reduction ($\underline{r}$ = .78; $\underline{p}$ < .001). Combining the items on these two components produced a scale with a high level of internal consistency (Cronbach's alpha = .94). Thus, it was decided to merge the two components into a single scale.

For the 30 self-efficacy items examination of the scree plot from the principal components analysis revealed a three component solution that accounted for 70.3% of the variance and had components associated with self-efficacy for avoiding heavy drinking in

positive situations (e.g., if I were at a bar and people were laughing and dancing; if I were at a restaurant and the people with me ordered pitchers of beer and mixed drinks), negative situations (e.g., if pressure built up because of the demands of my professors, if I were angry at the way something had turned out) and socially anxious situations (e.g., if I was at a party where I didn't know many people; if I had an argument with a friend). The social anxiety component accounted for 6.7% of the variance and reliability analysis indicated a high level of internal consistency as evidenced by a Cronbach's alpha coefficient of .96.

Contributions from the interviews

In conjunction with the principal components analysis, the data and feedback obtained from the clinical interviews were quite helpful in modifying and improving the expectancy and efficacy scales. Specifically, of the 30 expectancy items pilot tested, six were retained in their original form, seven were re-worded on the basis of participant feedback, and 17 were dropped due to poor component loading or lack of specificity for socially anxious individuals. This resulted in 13 expectancy items to which two were added, on the basis of information from clinical interviews to produce a 15-item scale that assessed alcohol expectancies of improved sociability.

Similarly, of the 30, pilot tested, efficacy items, eight were retained in their original format, seven were re-worded to form a total of nine items, and 15 were dropped due to low component loadings or lack of specificity to socially anxious heavy drinking college students. This resulted in a 17-item scale to which three items were added, on the basis of clinical interview data, to produce a 20-item scale that assessed self-efficacy for avoiding heavy drinking in socially anxious situations.

<center>Study 2: Model Testing</center>

As described above, the use of pilot testing and clinical interviews with socially anxious heavy drinking college students resulted in the development of two scales that were designed to assess alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations. More importantly, the use of these measures in conjunction with a prospective assessment of alcohol use and drinking situations also afforded the opportunity to test the proposed model of social anxiety and drinking in college students. Specifically, these measures and assessments would provide a test of the moderating effects of alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in

socially anxious situations on the relationship between social anxiety and alcohol use. Relatedly, this second study also provided a test of the hypothesis that the interaction between alcohol expectancies and self-efficacy would account for a significant amount of the variance in predicting drinking behavior, above and beyond that accounted for by the main expectancy and efficacy effects.

<div align="center">Method</div>

Participants

Screening Phase. Three hundred seventy two participants took part in the screening phase and were tested in groups of 10 to 25. All participants were undergraduate college students who were recruited via the Psychology Department subject pool at Virginia Tech. For their participation, they received their choice of either course credit or having their names entered into a lottery where they could win one of two $150 cash prizes. Participants in the screening phase were mostly female (61.8%), had a mean age of 19.24 years ($\underline{SD} = 2.15$), and were typically in their Freshman (53.8%) or Sophomore (28.0%) year in college.

Follow-Up Phase. From the initial pool of 372 participants who took part in the screening phase, 84 were eligible for participation in the study. To be eligible for participation, participants had to have IAS scores one standard deviation or higher above the mean obtained with college student samples ($\underline{M} = 38.9$; $\underline{SD} \pm 9.7$; i.e., a score of 48 or above). Similar criteria have been used by Leary (1983; 1991) to identify participants high in social anxiety and who reported experiencing clinically significant difficulties as a result of the anxiety they experienced in social situations. A one way analysis of variance run on participant social anxiety scores revealed that participants eligible for the follow-up phase had significantly higher IAS scores ($\underline{M} = 54.57$; $\underline{SD} = 5.98$) that those that were not eligible ($\underline{M} = 34.71$; $\underline{SD} = 7.68$) $\underline{F}(1,371) = 476.80$, $p < .001$.

All eligible participants were contacted by phone and invited to participate in the second phase of the research. Of the 84 participants contacted 13 either declined the offer to participate or failed to keep their appointments leaving a total of 71 participants who took part in the follow-up phase of the study. Analyses of variance (ANOVAs) were run on relevant demographic, drinking, and social cognitive variables (i.e., sex, age, year in school, quantity and frequency of alcohol consumed, IAS, SA-AOES, and SA-SCQ average scores) and no significant differences were found between eligible participants who did not take part in the

follow-up phase and those that did ($\underline{ps} > .05$). As in the screening phase, participants were mostly female (70.4%), had an average age of 19.08 years ($\underline{SD} = 1.14$) and were in either their Freshman (54.9%) or Sophomore (28.2%) year in college.

<u>Procedure</u>

      <u>Screening Phase</u>. Upon arrival, participants were presented with an informed consent form and were told that the purpose of the study was to examine the relationship between social anxiety and health behaviors in college students. The experimenter obtained the informed consent documents and then distributed a packet of measures to each participant. Seating was previously arranged so that participants could not see the responses of others, and all participants were instructed not to talk to each other while completing the measures to control for participant interaction effects. Instructions for each questionnaire were read aloud and explained by the experimenter to enhance participant comprehension. After completing the measures, the experimenter collected the packets from the participants, and informed them that they may be selected to participate in another study designed to examine some of the personality variables, just assessed, in more depth. All participants were debriefed by receiving written feedback about the screening phase and thanked for their participation. The total time required to complete the measures was approximately one hour.

      <u>Follow-Up Phase.</u> Approximately six-weeks following their completion of the screening phase of the study, eligible participants were contacted by phone and asked to participate in a follow-up study in which they would be asked to complete a brief measure of their alcohol consumption. Scheduling was done in an individual format, and the experimenter in this part of the study was Randy Burke, a graduate student in clinical psychology, or an advanced undergraduate student supervised by Dr. Robert Stephens and Randy Burke.

      Upon arrival, participants were presented with an informed consent form and told that this was the second part of a two-part study examining the relationship between social anxiety and alcohol use in college students. The experimenter obtained the informed consent form and then presented a calendar measure of alcohol consumption. Instructions for the calendar measure were read aloud and explained by the experimenter to enhance participant comprehension. Participants were also provided with a list of strategies designed to assist their recall of alcohol use over the past six weeks.

After completing the calendar, the experimenter asked participants a series of questions relating to the situational and interpersonal aspects of each drinking episode reported on the calendar. Each participant was then thanked for his or her participation, and debriefed both verbally and via written feedback about the study itself and the theoretical assumptions from which the hypotheses were drawn. The total time required by participants in this part of the study was approximately one hour.

Measures

Screening Phase. The IAS was again used to identify eligible participants for inclusion in the follow-up phase of the study (alpha = .90). The 19-item health behaviors questionnaire that was administered in Study 1 was also administered to all participants in the screening phase of Study 2 as a baseline assessment of the quantity and frequency of their alcohol use. The inclusion of a baseline assessment of drinking behavior also allowed for an examination of the reliability and validity of participants reports of drinking when compared with the Time Line Follow-Back assessment in terms of quantity and frequency of alcohol use.

The 15-item social anxiety alcohol expectancy measure (SA-AOES) developed in Study 1 was used as an assessment of participants alcohol expectancies of improved sociability. The instructions for the SA-AOES stress the importance of considering each of the expectancy items in the context of a social setting such as a party or dance, and each of the items (e.g., I am able to talk more freely; I worry less about making a good impression) is preceded by the stem "When I drink alcohol in social situations (e.g., parties, dance clubs)." As with the original AOES, respondents rate each of the items on a six point scale ranging from 1 (No chance) to 6 (Certain to happen). These responses are then summed and divided by the total number of items to yield an average expectancy score ranging from 1 to 6 with higher scores indicating stronger alcohol expectancies of improved sociability. Examination of the scree plot from a principal components analysis of the expectancy items revealed a single component solution that accounted for 55.6% of the variance and demonstrated a high level of internal consistency (Cronbach's alpha = .94).

The 20-item social anxiety situational confidence questionnaire (SA-SCQ) developed in Study 1 was used as an assessment of participants' confidence in their ability to avoid drinking heavily in socially anxious situations. The directions for the SA-SCQ stress the importance of rating the items in the context of a social situation, such as a party or social gathering, and each

of the items is preceded by the stem "If at a party or social get-together, I would be able to avoid drinking heavily." Participants respond to each of the items using a 6-point scale labeled in percentage point increments of 20 (0% = Not at all confident, 100% = Very confident) and these ratings are then transformed into a scale ranging from 1 to 6 for data analysis. Responses to the scale items are summed and divided by the total number of items to yield an average efficacy score ranging from 1 to 6 with higher scores indicating greater confidence in one's ability to avoid heavy drinking in socially anxious situations. As with the expectancy measure, an examination of the scree plot produced by a principal components analysis of participants' responses to the SCQ items also revealed a single component solution that accounted for 69.9% of the variance and had a high level of internal consistency, as suggested by a Cronbach's alpha of .98.

Follow-Up Phase. The Time Line Follow-Back Method (TLFB; M.B. Sobell, L.C. Sobell, Klajner, Pavan, & Basian, 1986) is a continuous measure of alcohol use, which provides a reliable account of both the quantity and frequency of the respondents' alcohol consumption over the past six-weeks. Using this method, participants are provided with blank calendar pages for the past six weeks and are asked to provide daily reports of the amount of alcohol consumed. Zero-order correlations computed between follow-up phase participants ($\underline{n}$ = 71) quantity and frequency indices obtained during the screening phase and those computed from the TLFB data revealed significant positive correlations between screening and follow-up indices of quantity ($\underline{r}$ = .82; $\underline{p}$ < .001) and frequency ($\underline{r}$ = .75 $\underline{p}$ < .001) of alcohol consumption. These correlations are similar to those obtained in other studies which have used the TLFB method to assess college student drinking (e.g., M.B. Sobell et al., 1986; L.C. Sobell & M.B. Sobell, 1994) and provide evidence for the reliability of participants' self-reports of their drinking behaviors. In the follow-up phase of the study, the TLFB was used as a measure of the quantity and frequency with which participants have consumed alcohol over the six weeks between initial screening and follow-up.

In conjunction with their completion of the calendar, participants also took part in a semi-structured interview that involved asking a series of questions about the situational and interpersonal factors related to each drinking episode recorded on the TLFB calendar. Specifically, for each day on which drinking took place, the participants were asked to describe the location where they drank, the familiarity of that location/setting, the number of others

present, how familiar those others were to the participant, and their goals for the situation (e.g., to celebrate, meet new people, watch a band, have fun).

The information obtained from the semi-structured interview was then coded to determine the degree to which the drinking situations were likely to elicit feelings of social anxiety in the respondent. In making this determination the following coding criteria were used: First, participants were asked about the number of people present in a drinking situation, how many they knew, and how well they knew them. Situations were considered likely to elicit feelings of social anxiety if the person reported knowing less than 25% of the people in a situation and/or did not know the people in a situation very well (e.g., acquaintances, friends of friends).

Second, the participants were asked about what goals they had for each drinking situation (e.g., meeting new people, trying to form an intimate relationship). Situations were considered to be likely to elicit feelings of social anxiety if participants reported having a goal or goals related to meeting new people and/or trying to form an intimate relationship. Situations were also considered likely to elicit feelings of social anxiety if the person reported interacting with someone they didn't know well regardless of whether or not they reported a goal of wanting to meet new people.

Finally, situations were considered to be likely to elicit feelings of social anxiety if participants reported being: shy, self-conscious, concerned about what others were thinking about them, or concerned about the type of impression they are making during the interaction. As suggested by Leary (Personal Communication April 27, 1997; 1991; Leary and Kowalski, 1995) and others (e.g., Hartman, 1986; Heimberg & Barlow, 1991; Heimberg & Juster, 1994), these intrapersonal and situational elements are likely to elicit feelings of social anxiety because individuals are motivated to achieve specific interaction goals but, due to the unfamiliarity with the others in the situation, have doubts about their ability to do so.

Using the above criteria, two undergraduate coders rated each drinking situation as being likely or unlikely to elicit feelings of social anxiety. In the event of a discrepancy between coders the data was reviewed by the experimenter who then made a final decision that resolved the discrepancy. Inter-rater reliability for the coding of situations was high as evidenced by a Kappa coefficient of .88. Counts of the number of drinks in relation to type of situation were also

performed so as to provide quantity and frequency indices of alcohol consumption in situations that were likely or unlikely to elicit feelings of social anxiety.

<div align="center">Results</div>

<u>Comparisons of Socially Anxious and Non-Socially Anxious Participants</u>

In order to compare the socially anxious and non-socially anxious participants, multivariate analyses of variance (MANOVAs) were run on the groups of demographic, and drinking/drinking related (i.e., alcohol expectancies and self-efficacy) variables assessed during the screening phase of the study. For the demographic variables (i.e., age, sex, year in school) the multivariate results were not significant ($\underline{ps} > .05$).

For the drinking related variables, however, a multivariate analysis of variance did reveal significant between group differences $\underline{F}(8,359) = 3.89$, $\underline{p} < .001$. As shown in Table 1, socially anxious participants drank significantly less than non-socially anxious participants both in terms of total number of drinks consumed $\underline{F}(1,366) = 3.87$, $\underline{p} < .05$ and frequency of drinking episodes $\underline{F}(1,366) = 6.69$ $\underline{p} < .05$. Further, a significant between group difference was found in relation to alcohol expectancy scores, $\underline{F}(1,366) = 13.87$, $\underline{p} < .001$. As compared to non-socially anxious participants ($\underline{M} = 3.89$; $\underline{SD} = .83$), socially anxious participants had significantly higher alcohol expectancy scores ($\underline{M} = 4.28$; $\underline{SD} = .82$). No significant between group differences were found with regard to participants self-efficacy scores ($\underline{p} > .05$).

Examination of the rates of abstinence revealed that a greater percentage of socially anxious participants reported no drinking (39.3%) as compared to non-socially anxious participants (25.8%). Restricting the above multivariate analysis to only those participants who were not abstainers ($\underline{n} = 265$) again produced a significant multivariate effect $\underline{F}(8,254)$, $\underline{p} < .01$. Examination of the univariate tests, however, indicated that no significant differences existed between socially anxious and non-socially anxious drinkers in terms of the quantity and frequency of alcohol consumption ($\underline{ps} > .05$). Thus, differences in drinking in the full sample appeared to be related to a higher percentage of abstainers in the socially anxious group.

Further, for participants who reported drinking, univariate tests revealed significant differences on the expectancy and efficacy scales. Compared to non-socially anxious participants ($\underline{M} = 3.99$; $\underline{SD} = .78$), socially anxious participants had significantly higher ($\underline{M} = 4.50$; $\underline{SD} = .63$) average alcohol expectancy scores. Conversely, socially anxious participants had significantly lower average self-efficacy scores ($\underline{M} = 3.85$; $\underline{SD} = 1.28$) compared to non-

socially anxious participants ($\underline{M}$ = 4.23; $\underline{SD}$ = 1.19). These findings indicated that among participants who drink, socially anxious individuals had significantly higher expectations of social facilitation from drinking and significantly lower levels of self-efficacy for avoiding heavy drinking in socially anxious situations.

Concurrent prediction of quantity and frequency indices of drinking

To assess the concurrent validity of the revised expectancy and efficacy measures, zero-order correlations were computed between average expectancy (SA-AOES) and efficacy (SA-SCQ) scale scores and the quantity and frequency indices of alcohol consumption collected during the screening phase. As shown in Table 2, a significant, but modest, positive relationship was found between participants ($\underline{N}$ = 372) average alcohol expectancy score and the total frequency of drinking episodes. This indicates that greater expectancies of improved sociability from drinking were associated with a higher frequency of drinking episodes. A zero-order correlation computed between average expectancy score and total number of drinks consumed was not significant.

Regarding self-efficacy judgments, significant negative relationships (see Table 2) were found between participants' average self-efficacy scores and their quantity and frequency indices of drinking. Lower levels of self-efficacy for avoiding heavy drinking in socially anxious situations were associated with greater quantities of alcohol consumption and a higher frequency of drinking episodes.

Intercorrelations between social cognitive variables

To examine the concurrent relationships of the expectancy and efficacy measures and social anxiety, zero-order correlations were computed between participants ($\underline{N}$ = 372) social anxiety, alcohol expectancy, and self-efficacy scores. Examination of these correlations revealed a significant positive relationship between social anxiety and expectancy scores ($\underline{r}$ = .25, $\underline{p}$ < .001) and a significant negative relationship between social anxiety and self-efficacy scores ($\underline{r}$ = -.14, $\underline{p}$ < .01). This indicates that higher levels of social anxiety were associated with greater expectancies of improved sociability from drinking, as well as lower levels of self-efficacy for avoiding heavy drinking in socially anxious situations.

Lastly, a zero-order correlation computed between expectancy and efficacy scores revealed a significant negative relationship ($\underline{r}$ = -.23, $\underline{p}$ < .001). Higher expectancies of improved

sociability from drinking are associated with lower levels of self-efficacy for avoiding heavy drinking in socially anxious situations.

Validity of the hypothesized model in predicting drinking behavior

Table 3 presents the means and standard deviations for screening phase ($\underline{N} = 372$) participants scores on the social anxiety, alcohol expectancy, and self-efficacy measures. To assess the concurrent validity of the hypothesized model, the quantity and frequency indices of alcohol consumption, obtained during the screening phase, were regressed on the concurrently assessed expectancy and efficacy measures using multiple hierarchical regression. Feelings of social anxiety experienced in social settings where drinking is normative or encouraged were predicted to elicit alcohol expectancies related to improved sociability. The effect of these expectancies on drinking was hypothesized to be moderated by self-efficacy for avoiding heavy drinking in socially anxious situations. Consistent with this model, alcohol expectancies of improved sociability was entered first, followed by self-efficacy for avoiding heavy drinking in socially anxious situations. The interaction term was entered last in order to test the hypothesis that the interaction between expectancies and efficacy would predict variance in drinking behavior above and beyond that accounted for by the main effects of the expectancy and efficacy variables.

For the total number of drinks consumed, the final model, with all three predictors (see Table 4), accounted for 11.2% of the variance $\underline{F}$ (3, 364) = 15.30, $\underline{p} < .001$. Alcohol expectancies of improved sociability did not account for a significant percentage of the variance on the first step ($\underline{p} < .05$). After controlling for the expectancy variable, self-efficacy for avoiding heavy drinking in socially anxious situations was a significant predictor $\underline{F}$ (2, 365) = 30.48, $\underline{p} < .001$ accounting for 7.7% of the variance. Lastly, after controlling for the expectancy and efficacy variables the expectancy X efficacy interaction was also a significant predictor $\underline{F}$ (3, 364) = 12.07, $\underline{p} < .01$ accounting for an additional 2.9% of the variance in the total number of drinks consumed.

To further examine the nature of the interaction, a median split of the distribution of expectancy and efficacy scores was performed and a 2 (Expectancy: Weak vs. Strong) X 2 (Efficacy: Low vs. High) analysis of variance was run on the total number of drinks consumed. As shown in Figure 2, the relationship between alcohol expectancies of improved sociability and drinking is stronger when participants have lower self-efficacy for avoiding heavy drinking in

socially anxious situations. In other words, self-efficacy moderates the relationship between alcohol expectancies and drinking. Contrary to expectations however, the direction of the relationship is such that for participants with a low sense of self-efficacy for avoiding heavy drinking, stronger alcohol expectancies of improved sociability are associated with lower amounts of drinking.

For the total frequency of drinking episodes, the final model, with all three predictors, accounted for 17.1% of the variance $F (3,364) = 25.09$, $p < .001$. On the first step, alcohol expectancies of improved sociability was a significant predictor $F (1,366) = 21.22$, $p < .001$, accounting for 5.5% of the variation. After controlling for the expectancy variable, self-efficacy for avoiding heavy drinking in socially anxious situations was also significant $F (2,365) = 37.42$, $p < .001$, and accounted for an additional 8.8% of the variance. Finally, after controlling for the expectancy and efficacy variables, the interaction term was also a significant predictor of the total frequency of drinking episodes $F (3, 364) = 12.59$, $p < .001$, accounting for an additional 2.9% of the variation.

To further examine the nature of the interaction, a median split of the distribution of expectancy and efficacy scores was performed and a 2 (Expectancy: Weak vs. Strong) X 2 (Efficacy: Low vs. High) analysis of variance was run on the frequency of drinking episodes. As shown in Figure 3, the relationship between alcohol expectancies and drinking is stronger when participants have higher levels of self-efficacy for avoiding heavy drinking in socially anxious situations. In other words, self-efficacy moderates the relationship between alcohol expectancies and drinking. Unexpectedly, however, this moderation is strongest for participants with a high sense of self-efficacy for avoiding heavy drinking.

Validity of the hypothesized model in predicting future drinking behavior of socially anxious participants.

In order to examine the predictive validity of the hypothesized model, the six-week follow-up quantity and frequency indices of alcohol consumption of follow-up phase participants ($n = 71$) were regressed on the expectancy and efficacy measures obtained during the questionnaire phase using hierarchical multiple regression. A summary of the means and standard deviations for the quantity and frequency of alcohol consumption, as well as the hypothesized predictors is presented in Table 5. Relatedly, Table 2 presents the zero-order

correlations between the alcohol expectancy and self-efficacy measures, and the quantity and frequency indices of alcohol consumption obtained during the follow-up phase.

For the total number of drinks consumed at follow-up, the final model, with all three predictors (see Table 6), accounted for 18% of the variance, F (3,67) = 4.81, $p < .01$. Alcohol expectancies of improved sociability did not account for a significant percentage of the variance on the first step ($p > .05$). After controlling for the expectancy variable, self-efficacy for avoiding heavy drinking in socially anxious situations was a significant predictor F (2,68) = 6.56, $p < .05$ accounting for 13% of the variance in the total number of drinks consumed at follow-up. Contrary to expectations, however, after controlling for the expectancy and efficacy variables, the interaction term was not a significant predictor ($p > .05$).

For the total frequency of drinking episodes at the six-week follow-up, the final model, with all three predictors (see Table 6), accounted for 17% of the variance F (3,67) = 4.48, $p < .01$. Alcohol expectancies of improved sociability did not account for a significant percentage of the variation on the fist step ($p > .05$). After controlling for the expectancy variable, however, self-efficacy for avoiding heavy drinking in socially anxious situations was significant F (2,68) = 7.06, $p \geq .05$ and accounted for 9.1% of the variance in total frequency of drinking episodes at follow-up. After controlling for the expectancy and efficacy variables, the interaction term approached, but did not achieve, significance ($p < .09$).

Prediction of follow-up quantity and frequency of alcohol consumption in relation to type of drinking situation.

In order to examine whether prediction of drinking was specific to socially anxious drinking situations, the total number of drinks consumed and total frequency of drinking episodes at the six-week follow-up were partitioned into drinking which occurred in situations that were likely to elicit social anxiety (e.g., being at a party where you do not know many people; talking to someone you do not know well) versus those that were unlikely to elicit social anxiety (e.g., sitting by oneself watching television; having dinner with a close friend). Results of these analyses indicated differential effects of situation type on the predictive validity of the model.

Table 7 presents the zero-order correlations between the alcohol expectancy and self-efficacy measures, and the quantity and frequency indices of drinking in both socially anxious and non-socially anxious situations. Relatedly, the means and standard deviations of the

quantity and frequency of alcohol consumption for socially anxious and non-socially anxious situations are presented in Table 8. For the total number of drinks consumed in situations that were likely to elicit feelings of social anxiety, the final model, with all three predictors (see Table 9), accounted for 21% of the variance F (3,67) = 6.05, p < .001. Alcohol expectancies of improved sociability did not account for a significant percentage of the variance on the fist step (p > .05). After controlling for the expectancy variable, however, self-efficacy for avoiding heavy drinking in socially anxious situations was a significant predictor F (2,68) = 14.71, p < .001 accounting for 17.2 percent of the variance. Lastly, consistent with earlier findings, after controlling for the expectancy and efficacy variables the expectancy X efficacy interaction did not account for a significant percentage of additional variance (p > .05).

For situations that were unlikely to elicit feelings of social anxiety, the final model, with all three predictors (see Table 9), was not significant F (3,67) = 2.39, p > .05. None of the three predictors were able to account for a significant percentage of the variance in predicting the total number of drinks consumed in situations unlikely to elicit feelings of social anxiety.

Regarding the total frequency of alcohol consumption in situations likely to elicit feelings of social anxiety, the final model, with all three predictors (see Table 10), accounted for 20% of the variance F (3,67) = 5.58, p < .01. Alcohol expectancies of improved sociability was a significant predictor F (1,69) = 3.87, p < .05 and accounted for 5.3 percent of the variation on the first step. After controlling for the expectancy variable, self-efficacy for avoiding heavy drinking in socially anxious situations was also a significant predictor F (2,68) = 11.10, p < .001 accounting for an additional 13.2 percent of the variance in the total frequency of drinking episodes in situations likely to elicit feelings of social anxiety. However, after controlling for the expectancy and efficacy variables, the expectancy X efficacy interaction did not account for a significant percentage of the variance (p > .05).

For situations that were unlikely to elicit feelings of social anxiety, the final model, with all three predictors (see Table 10), accounted for 11% of the variance F (3,67) = 2.76, p < .05. Alcohol expectancies of improved sociability and efficacy did not account for a significant percentage of the variance on the first and second steps respectively (p > .05). Unexpectedly, however, after controlling for the expectancy and efficacy variables the expectancy X efficacy interaction was a significant predictor F (1,67) = 4.13, p < .05 accounting for 5.5% of the

variation in total frequency of drinking episodes in situations that were unlikely to elicit feelings of social anxiety.

To further examine the nature of the interaction, a median split of the distribution of expectancy and efficacy scores was performed and a 2 (Expectancy: Weak vs. Strong) X 2 (Efficacy: Low vs. High) analysis of variance was run on the frequency of drinking episodes in non-socially anxious situations. As shown in Figure 4, the relationship between alcohol expectancies of improved sociability and frequency of drinking in non-socially anxious situations appears to be marginally stronger for individuals with a high level of self-efficacy for avoiding heavy drinking in socially anxious situations. In other words, self-efficacy appears to moderate the relationship between alcohol expectancies and drinking in situations that are unlikely to elicit feelings of social anxiety.

<div align="center">Discussion</div>

The primary aim of the present study was to test the hypothesized model of social anxiety and alcohol use in college students. It was hypothesized that alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations would be significantly related to the quantity and frequency of alcohol consumption. It was further hypothesized that the interaction between the expectancy and efficacy constructs would account for a significant amount of the variability in drinking above and beyond that accounted for by the main expectancy and efficacy effects. Results provided partial support for the hypotheses as the main effects of alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations predicted a significant amount of the variability in the quantity and frequency of alcohol consumption. Significant interaction effects were found for concurrently assessed quantity and frequency of drinking, but the direction of the interaction effects were inconsistent with the proposed model in that stronger alcohol expectancies were associated with lower levels of drinking. Relatedly, for prospectively assessed drinking, the expectancy X efficacy interaction failed to account for significant variation. Results did, however, reveal a contextual effect such that the main expectancy and efficacy variables accounted for a greater percentage of the variance of drinking in situations that were likely to elicit feelings of social anxiety.

For the concurrently assessed quantity of alcohol consumption, alcohol expectancies of improved sociability failed to account for a significant percentage of the variance. After

controlling for the expectancy variable, however, self-efficacy for avoiding heavy drinking in socially anxious situations did account for a significant percentage of the variance. For the total frequency of drinking episodes, both alcohol expectancies and self-efficacy accounted for a significant percentage of the variation.

Although initially unexpected, the failure of alcohol expectancies to account for a significant variation in relation to the total number of drinks consumed is consistent with findings from earlier studies suggesting that alcohol expectancies are differentially related to quantity and frequency indices of alcohol consumption (Lee & Oei, 1993; Johnson, 1994). As suggested by Lee and Oei (1993) self-efficacy expectancies are typically assessed in terms of perceived confidence in one's ability to avoid drinking heavily in specific situational contexts, and are thus likely to be related to both the quantity and frequency of drinking episodes. Alcohol expectancies, in contrast, are commonly assessed at a more general level and do not include references to quantity of alcohol to be consumed or the context of the drinking situations. As a result, alcohol expectancies may be more predictive of drinking frequency as opposed to quantity per se.

The present findings are consistent with this interpretation, but it is important to note that other studies have failed to find this differential relationship or have found the opposite relationship (Baldwin et al, 1993; Chen, Grube, and Madden, 1994). The equivocal and sometimes contradictory findings from these studies suggests the need for additional research efforts using better specified measures of alcohol expectancies so as to improve our understanding of this potentially differential relationship. For example, future measures of alcohol expectancies should assess alcohol expectancies within the context of light, moderate, or heavy drinking. As suggested by Southwick and others (e.g., Leigh, 1989; Southwick, Steele, Marlatt, & Lindell, 1981) alcohol expectancies are likely to vary both in anticipation of and in relation to level of intoxication. Assessing alcohol expectancies within the context of anticipated level of intoxication, therefore, is likely to result in an improved understanding of the relationship between expectancies and drinking.

Results from the concurrently assessed quantity and frequency of alcohol consumption also provided some support for the hypothesized interaction effect. Specifically, for both the total number of drinks consumed and frequency of drinking episodes the interaction between alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in

socially anxious situations accounted significant variability above and beyond that accounted for by the main expectancy and efficacy effects. The nature of these interactions however, was contrary to that of the hypothesized model. For the total number of drinks consumed, self-efficacy appeared to moderate the relationship between alcohol expectancies and drinking. The direction of the relationship however was such that for individuals with low levels of self-efficacy for avoiding heavy drinking in socially anxious situations, stronger expectations of improved sociability from drinking were associated with lower levels of consumption. Relatedly, for overall frequency of drinking episodes, the moderating effect of self–efficacy on alcohol expectancies appeared to be stronger for high, as opposed to low, levels of self-efficacy for avoiding heavy drinking in socially anxious situations.

As noted by Knight and Godfrey (1993), a potential explanation for these findings is that for individuals who experience strong feelings of social anxiety, limiting one's drinking may serve a socially protective function. Specifically, individuals who have strong expectancies of improved sociability and a low sense of self-efficacy for avoiding heavy drinking in socially anxious situations are likely to feel that they will have little control over their drinking at social functions. Although these effects may be desirable for some socially anxious individuals, their limited sense of control over their drinking may also make them aware of the impairing social and physical effects of excessive consumption. (c.f., Knight & Godfrey, 1993). Thus, to avoid being placed in a position of social embarrassment or compromise, these individuals intentionally avoid or limit the frequency with which they attend social functions involving drinking. In turn this lowered frequency of drinking episodes results in an overall reduction in the number of drinks consumed. It is important to note, however, that the findings from the present study are inconsistent with those obtained in previous studies examining the relationship between expectancies and drinking and thus it is also possible that these inconsistencies are due to spurious results. Given this latter possibility, additional research is needed to attempt to establish the reliability of these findings.

Regarding the prospective prediction of drinking behavior, self-efficacy for avoiding heavy drinking in socially anxious situations was a significant predictor of the variability in the quantity and frequency of alcohol consumption assessed at a six-week follow-up. These findings are consistent with the results obtained from the concurrent assessment of drinking and serve to further substantiate the validity of the relationship between self-efficacy and drinking. These

results also extend findings from previous studies (e.g., Burke, & Stephens, 1997; Evans & Dunn, 1995) by demonstrating that, at least in socially anxious individuals, self-efficacy for avoiding heavy drinking in socially anxious situations can be predictive of small, but significant, variability of future drinking.

Results from the presents study failed to find support for the hypothesized interaction, as the expectancy X efficacy interaction term did not account for a significant percentage of the variance in total number of drinks consumed after controlling for the main effects of expectancy and efficacy. Further, alcohol expectancies of improved sociability failed to account for a significant percentage of the variance in the quantity and frequency of drinking at follow-up.

These latter findings are inconsistent with earlier studies (e.g., Brown, 1985; O'Hare, 1990b) that have shown alcohol expectancies of social facilitation to significantly predict college student alcohol use, as well as with recent formulations of social cognitive theory (Bandura, 1997). Bandura (1977; 1986) initially claimed that outcome expectancies were fully determined by self-efficacy judgments. Kirsch (1982; 1985; 1995), however, presented evidence demonstrating that in situations where outcomes are not fully contingent on performance, outcome expectancies can significantly contribute to the prediction of behavior. In light of this evidence, Bandura (1989; 1995; 1997) modified his views on the relationship between efficacy and expectancy judgments and currently states that "expected outcomes contribute to motivation independently of self-efficacy beliefs when outcomes are not completely controlled by the quality of performance" (1989, p. 1180). This re-formulation would appear to apply to the present study as participants alcohol expectancies are not fully contingent on how skillfully they perform behaviors related to the avoidance of heavy drinking (e.g., self-monitoring alcohol consumption; refusing unwanted drinks). Stated differently, the pharmacological and social cognitive effects one expects from drinking are not fully contingent on how well one actually consumes alcohol (Stephens et al., 1995). Given this formulation, it is somewhat unclear as to why participants' alcohol expectancies of improved sociability did not account for a significant percentage of the variation in their drinking behavior.

One potential explanation for this failure relates to the limited variability in participants' scores on the expectancy measure. Compared to non-socially anxious participants, those considered to be high in social anxiety had significantly higher average alcohol expectancy scores, as well as a relatively restricted range of scores. As a result, the variability of responses

on the expectancy measure would be limited relative to the variability of the quantity and frequency indices of alcohol consumption and in turn, would reduce the ability of expectancy scores to account for a significant amount of the variance in drinking behavior. The range restriction in expectancy scores would also lower the variability observed in the expectancy X efficacy interaction term and would consequently, reduce its ability to account for a significant percentage of the variation.

The findings from the concurrently assessed quantity and frequency indices of drinking provide support for this explanation. The greater variability in expectancies afforded by the larger and more heterogeneous sample resulted in the interaction term accounting for a significant percentage of the variation in the total number of drinks consumed and frequency of drinking behavior.

A second explanation for the failure of alcohol expectancies of improved sociability to significantly predict drinking behavior relates to the drinking characteristics of the sample. Compared to participants considered to be low in social anxiety, socially anxious participants evidenced higher rates of abstinence and significantly lower levels of drinking in terms of the total number of drinks consumed and the overall frequency of drinking episodes. The lower levels of drinking observed in this sample, resulted in a smaller number of total drinks and fewer drinking episodes being available for prediction. When combined with the low variability of the SA-AOES, these lower levels of drinking would result in a reduced ability to account for a significant percentage of the variance in the total quantity and frequency of alcohol consumption.

Taken together these explanations suggest that future research should attempt to increase participant heterogeneity with regard to alcohol expectancies of improved sociability and total level of drinking. A potential avenue for achieving these goals is to recruit a larger sample size with approximately equal numbers of heavy and light drinkers. Relatedly, in order to obtain greater variability in the number of drinking episodes and the number of drinks consumed, future studies may wish to conduct follow-up assessments of drinking behavior over a longer time period. Studies of college student drinking that have shown a relationship between expectancies and alcohol consumption (e.g., Goldman, Greenbaum, & Darkes, 1997) have typically used an assessment window of at least 90-days. A longer window may also enhance

reliability of the drinking measures by reducing the proportion of variability related to situational factors rather than interpersonal characteristics.

Further examination of the follow-up data revealed a significant effect of drinking context on the total number of drinks consumed and the overall frequency of drinking episodes. For situations likely to elicit feelings of social anxiety, alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations were significant predictors of the total number of drinks consumed and the frequency of drinking episodes. In contrast, for situations that were unlikely to elicit feelings of social anxiety, neither social cognitive variable accounted for a significant amount of the variation in the total number of drinks consumed or the frequency of drinking episodes. This differential prediction occurred despite comparable levels of quantity and frequency of alcohol consumption, and suggests that this finding is not an artifact of reduced variability in non-socially anxious situations. Further, consistent with the hypothesized model, the social cognitive variables specific to social anxiety were better able to account for drinking in socially anxious situations than in non-socially anxious situations. This suggests that other expectancies and efficacy beliefs, as well as situational variables account for drinking in non-socially anxious situations.

These findings also provide support for the need to include a situational context in the assessment of efficacy and expectancy judgments. Unlike assessments of self-efficacy for avoiding heavy drinking, which routinely ask about drinking situations, measures of alcohol expectancies rarely include a situational context (Frone, Russell, & Cooper, 1993). The findings from the present study provide some support for the hypothesis that, at least for socially anxious individuals, different effects from alcohol are expected depending on the context of the drinking situation. Although the reliability of these findings must be substantiated via replication, they do suggest that situational contexts be included in future measures of alcohol expectancies.

Contrary to the predictions of the hypothesized model, the expectancy X efficacy interaction did account for a significant percentage of the variation of frequency of drinking episodes in situations considered unlikely to elicit feelings of social anxiety. One possible explanation for this inconsistent finding is that when completing the efficacy and expectancy measures, other expectancies related to, but not assessed by the current measures (e.g., fun) were also activated (Rather & Goldman, 1994; Rather, Goldman, Roehrich, & Brannick, 1992) and partially influenced participants' responses. The nature of the interaction (i.e., participants with

strong alcohol expectancies tended to drink more frequently in non-socially anxious situations regardless of level of efficacy) is consistent with this explanation. This interpretation, however, is inconsistent with the more robust finding of greater prediction in socially anxious situations, and thus it is also possible that the significant interaction represents a spurious finding. Additional research is needed, therefore, to establish the reliability of this unexpected finding.

<u>Implications for Scale Development</u>

In order to test the hypothesized model, more specific measures of alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations were developed in an initial study. The results from the present study suggest that the development of these measures was successful. Principal component and reliability analyses yielded single component expectancy and efficacy scales that had high levels of internal consistency. Moreover, zero-order correlations indicated significant relationships between these measures and the quantity and frequency of alcohol consumption.

For the expectancy measure, a significant positive relationship was found between participants' expectancy scores and the total frequency of drinking episodes, assessed during the screening phase of the study, indicating that higher expectancies of improved sociability from drinking were associated with a greater frequency of drinking episodes. Similarly, significant negative relationships were found between self-efficacy scores and the quantity and frequency indices of drinking. This indicates that lower levels of self-efficacy for avoiding heavy drinking in socially anxious situations are associated with greater quantities of alcohol consumption and a higher frequency of drinking episodes. Finally, consistent with earlier findings (Burke & Stephens, 1997), a significant negative relationship was found between participants' alcohol expectancy and self-efficacy scores. Higher expectancies of improved sociability from drinking were associated with lower levels of confidence in perceived abilities to avoid drinking heavily in situations likely to elicit feelings of social anxiety. This latter finding suggests that alcohol expectancies and self-efficacy expectancies are related (c.f., Stephens et al., 1995), but it remains to be determined whether alcohol expectancies directly influence self-efficacy judgments.

Regarding the relationship of these measures to social anxiety, zero-order correlations revealed significant relationships existed between feelings of social anxiety and their expectancy and efficacy scores. Specifically, higher levels of social anxiety were associated with greater

expectancies of improved sociability from drinking, as well as lower levels of confidence in perceived ability to avoid heavy drinking in socially anxious situations.

Taken together, these results are consistent with findings from previous studies and further substantiate the increasing literature that has identified relationships between alcohol and self-efficacy expectancies, and patterns of drinking in socially anxious college students. Moreover, these findings are consistent with Bandura's (1997) current conceptualization of the independent and additive nature of the relationship between outcome and self-efficacy expectancies and thus provide additional support for the validity of the expectancy and efficacy measures

A second implication of these findings is related to the issue of specificity in the assessment of alcohol expectancies. A relatively consistent and somewhat problematic finding for research involving socially anxious drinkers has been the failure to find a significant relationship between social anxiety and alcohol expectancies of tension reduction (Brown & Munson, 1987; Burke & Stephens, 1997). The failure to obtain this finding is inconsistent with tension reduction theories of alcohol use (Cappell 1975; Levenson, Sher, Grossman, Newman, & Newlin, 1980) which suggest that socially anxious individuals should have strong alcohol expectancies of tension reduction and should drink to obtain this effect. Leonard and Blane (1988) purport that alcohol expectancies of tension reduction (e.g., I feel less stressed; I am able to take my mind off my problems) are not specific to socially anxious drinkers, but rather tap more general expectancies of alcohol on anxiety. The findings from the present study support this contention, but as noted by Lee and Oei (1993) additional research using more specified measures of alcohol expectancies and "more specific populations of drinkers [is needed] in order to be able to maximally utilize expectancy measures in practice" (p. 388). It is important to note, however, that, although significant, the effect sizes of these findings were in the small to moderate range, suggesting that there are other factors, not assessed in the present study, that influence the drinking behaviors of college students.

Finally, when considered as a whole, an implication of the above findings is that there are several potential avenues for developing more effective interventions with high-risk drinkers. For example, future research efforts should be directed towards identifying effective interventions to reduce social anxiety in college students. Cognitive-Behavioral Group Therapy has been shown to be effective in reducing symptoms of social phobia in outpatient populations

(Heimberg & Barlow, 1991; Heimberg & Juster, 1994), and is an example of a cost-effective intervention that could be easily implemented at a university counseling center. Further, consistent with the integrative focus of the model, interventions for high-risk drinkers should also incorporate components designed to challenge students' alcohol expectancies of improved sociability (Darkes & Goldman, 1993) and increase their self-efficacy for avoiding heavy drinking in socially anxious situations (Baer et al., 1992; Kivlahan, Marlatt, Fromme, Coppel, & Williams, 1990). Ideally, this integration will result in a more comprehensive approach to treatment that will not only reduce feelings of social anxiety, but will also lower expectations of improved sociability from drinking and increase moderate drinking skills.

This study is one of only a few to use multiple constructs from social cognitive theory to concurrently and prospectively examine the relationship between social anxiety and alcohol use in college students. Findings from the study from the study supported the hypotheses that the main effects of alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations would be significant predictors of drinking assessed both concurrently and at a six-week follow-up. Further, for drinking behaviors assessed at follow-up, a contextual effect was found such that the main expectancy and efficacy effects accounted for a greater percentage of the variability in drinking situations that were likely to elicit feelings of social anxiety. Significant interaction effects were found for concurrently assessed quantity and frequency of drinking, but contrary to expectations the moderating effects of self-efficacy were such that stronger expectancies of social facilitation were associated with lower levels of drinking.
Finally, a significant negative relationship was found between alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations suggesting that both of these variables make independent contributions to the prediction of college student drinking.

Although the above findings provide some support for the hypothesized model, there were several limitations to the analyses. First, the size of the follow-up sample was relatively small thus reducing the amount of variability in drinking behaviors and both alcohol and efficacy expectancies. Relatedly, the follow-up assessment window was relatively brief, which may have further reduced the variability in drinking behavior and potentially provided a non-representative sample of participants' typical drinking patterns. Lastly, the finding of interaction

effects that were inconsistent and contradictory with previous research, suggest that these findings may be spurious and indicates the need for a replication with more representative samples.

As this is apparently the first study to prospectively examine the relationship between social anxiety and alcohol use in college students, as well as one of only a few studies to simultaneously examine the role of both self-efficacy and outcome expectancies, the reliability and validity of the results are unknown and require replication. These preliminary results are encouraging however, and suggest that in college student populations social anxiety is related to heavy drinking and that this relationship is moderated by both alcohol expectancies and self-efficacy judgments. Ideally it is hoped that research efforts in this area will continue and ultimately result in the development of cost-effective interventions that successfully lower rates of consumption and the number of problems currently associated with excessive drinking.

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Table 1.

Means and Standard Deviations of Drinking and Social Cognitive Variables Assessed During

the Screening Phase of Study 2

Variable	Non-Socially Anxious ($\underline{n} = 285$)		Socially Anxious ($\underline{n} = 84$)	
	M	SD	M	SD
Total number of drinks consumed in past month	29.84	40.55	20.40†	30.26
Total frequency of drinking episodes in past month	2.25	1.40	1.80†	1.46
Frequency of having 3 to 4 drinks	2.02	2.58	1.36†	1.85
Frequency of having 5 to 6 drinks	1.81	2.43	1.24†	1.93
Frequency of having 7 to 8 drinks	1.14	2.00	.78	1.82
Frequency of having 9 or more drinks	.75	2.21	.49	1.53
Average SA-AOES score	3.90	.83	4.28†	.82
Average SA-SCQ score	4.45	1.28	4.29	1.32

Note. For total frequency of drinking episodes in past month 1 = Once, 2 = 2 to 3 times, 3 = once or twice a week 4 = 3 to 4 times a week.

† = Significant difference between socially anxious and non-socially anxious participants.

Table 2

Correlations Between Hypothesized Predictors and Drinking at Screening and Six-Week
Follow-Up

	Screening (N = 372)		Follow-Up (n = 71)	
Variable	Quantity	Frequency	Quantity	Frequency
Expectancies	.05	.18***	.18	.19
Efficacy	-.28***	-.36***	-.40***	-.35**

Note. * = p < .05   ** = p < .01   *** = p < .001

Table 3

Means and Standard Deviations of Screening Phase Quantity and Frequency of Alcohol

Consumption with Hypothesized Predictors

Source	M	SD
Quantity	27.71	38.63
Frequency	2.15	1.42
Expectancy	3.98	.85
Efficacy	4.41	1.29

Note. N = 372.

For total frequency of drinking episodes in past month 1 = Once, 2 = 2 to3 times, 3 = once or twice a week 4 = 3 to 4 times a week.

Table 4

Multivariate Prediction of Screening Phase Quantity and Frequency of Alcohol Consumption
from the Hypothesized Model

Dependent Variable: Total number of drinks consumed

Step	Variable	ß	$\triangle R^2$	Adj. R^2
1.	Expectancies	-.62**	.01	.003
2.	Efficacy	-1.10***	.08***	.08
3.	Interaction	.85**	.03***	.11
	Full Model	--	.11***	.11

Dependent variable: Total frequency of drinking episodes

Step	Variable	ß	$\triangle R^2$	Adj. R^2
1.	Expectancies	-2.65**	.06***	.05
2.	Efficacy	-4.82***	.09***	.14
3.	Interaction	3.55***	.03***	.17
	Full Model	--	.17***	.17

Note. $\underline{N}$ = 372. ßs are for the full model. R^2 indicates increment in variance explained at each successive step.

* = $\underline{p}$ < .05   ** = $\underline{p}$ < .01   *** = $\underline{p}$ < .001

Table 5

Means and Standard Deviations of Six-Week Follow-Up Quantity and Frequency of Alcohol
Consumption with Hypothesized Predictors

Source	M	SD
Quantity	33.28	44.60
Frequency	9.54	7.27
Expectancy	4.28	.76
Efficacy	4.27	1.43

Table 6

Multivariate Prediction of Six-Week Follow-Up Quantity of Alcohol Consumption From the

Hypothesized Model

Dependent Variable: Total number of drinks consumed at follow-up

Step	Variable	ß	$\triangle R^2$	Adj. R^2
1.	Expectancies	-1.06	.03	.02
2.	Efficacy	-1.65	.13**	.14
3.	Interaction	-1.13	.02	.14
	Full Model	--	.18**	.14

Dependent variable: Total frequency of drinking episodes at follow-up

Step	Variable	ß	$\triangle R^2$	Adj. R^2
1.	Expectancies	-.67	.04	.02
2.	Efficacy	-1.63*	.09*	.10
3.	Interaction	1.20	.04	.13
	Full Model	--	.17**	.13

Note. $\underline{n}$ = 71. ßs are for the full model. R^2 indicates increment in variance explained at each successive step.

* = $p < .05$ ** = $p < .01$ *** = $p < .001$

Table 7

Correlations Between Hypothesized Predictors and Drinking for Socially Anxious and
Non-Socially Anxious Situations

	Socially Anxious Situations		Non-Socially Anxious Situations	
Variable	Quantity	Frequency	Quantity	Frequency
Expectancies	.18	.23*	.14	.18
Efficacy	-.45***	-.43***	-.27*	-.21*

Note. $\underline{n}$ = 71.

* = p < .05   ** = p < .01   *** = p < .001

Table 8

Comparison of Means and Standard Deviations of Quantity and Frequency of Alcohol

Consumption in Relation to Type of Drinking Situation

Source Variable	Socially Anxious Situations		Non-Socially Anxious Situations	
	M	SD	M	SD
Quantity	19.59	28.17	13.69	19.40
Frequency	3.38	3.95	3.49	3.88

Table 9

Comparison of Multivariate Prediction of Six-Week Follow-Up Quantity of Alcohol Consumption From the Hypothesized Model in Relation to Type of Drinking Situation

Step	Variable	Socially Anxious Situations			Non-Socially Anxious Situations		
		ß	$\triangle R^2$	Adj. R^2	ß	$\triangle R^2$	Adj. R^2
1.	Expectancies	-.35	.03	.02	-.53	.02	.01
2.	Efficacy	-1.06	.18***	.18	-1.27	.05	.05
3.	Interaction	.55	.01	.18	.94	.02	.06
	Full Model	--	.21***	.18	--	.10	.06

Note. $\underline{n}$ = 71. ßs are for the full model. R^2 indicates increment in variance explained at each successive step.

* = $\underline{p}$ < .05   ** = $\underline{p}$ < .01   *** = $\underline{p}$ < .001

Table 10

Comparison of Multivariate Prediction of Six-Week Follow-Up Frequency of Alcohol Consumption From the Hypothesized Model in

Relation to Type of Drinking Situation

		Socially Anxious Situations			Non-Socially Anxious Situations		
Step	Variable	ß	$\triangle R^2$	Adj. R^2	ß	$\triangle R^2$	Adj. R^2
1.	Expectancies	-.38	.05*	.04	-.73	.04	.02
2.	Efficacy	-1.19	.13***	.16	-1.69*	.02	.03
3.	Interaction	.73	.02	.16	1.42*	.06*	.07
	Full Model	--	.20**	.16	--	.11*	.07

Note. $\underline{n} = 71$. ßs are for the full model. R^2 indicates increment in variance explained at each successive step.

* = $\underline{p} < .05$ ** = $\underline{p} < .01$ *** = $\underline{p} < .001$
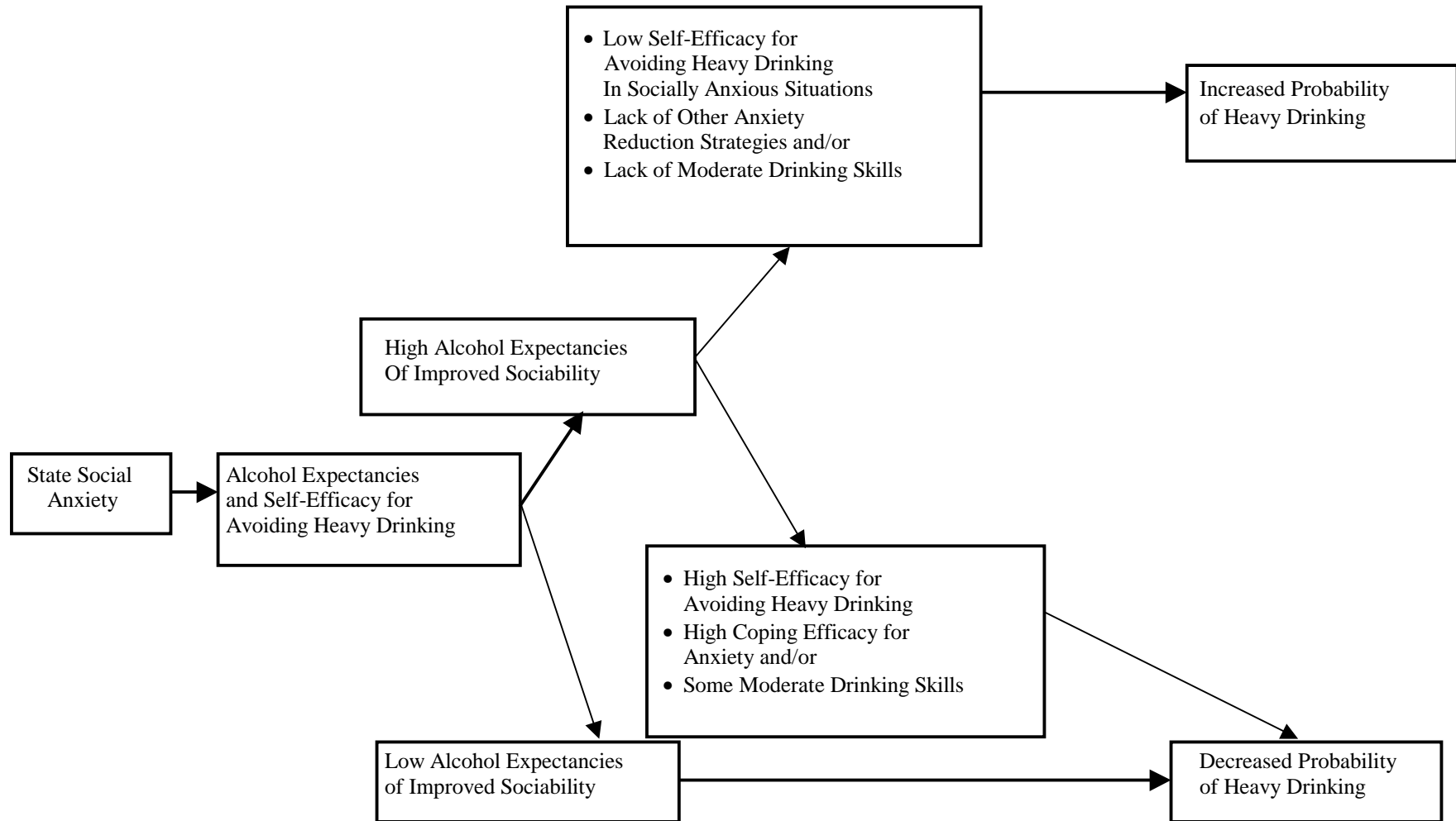
Figure 1: Hypothesized model of heavy drinking in socially anxious college students as moderated by alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations.

Total Number of Drinks Consumed Per Month

Figure 2:   Interaction between alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations in the prediction of total number of drinks consumed in the past month.

Figure 3:   Interaction between alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations in the prediction of total frequency of drinking episodes in the past month.

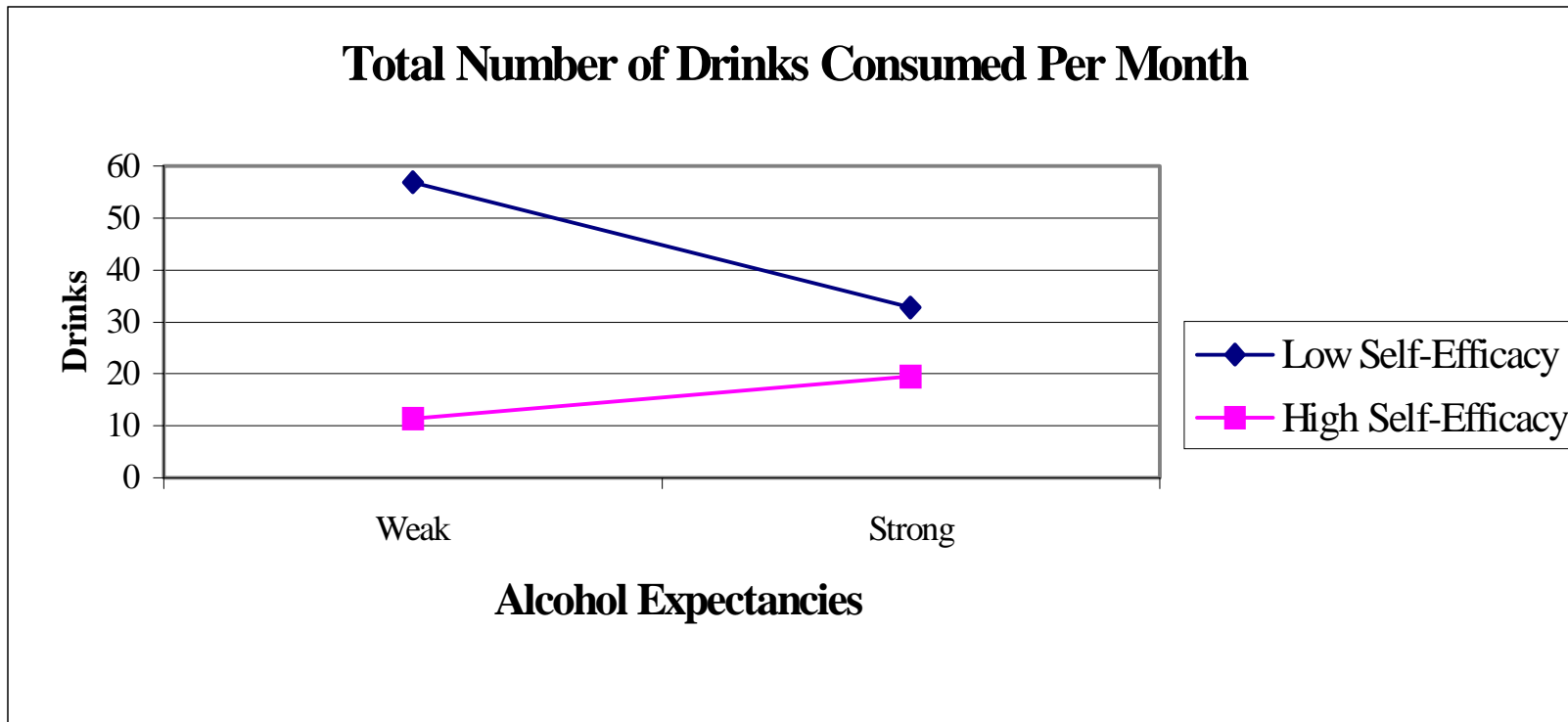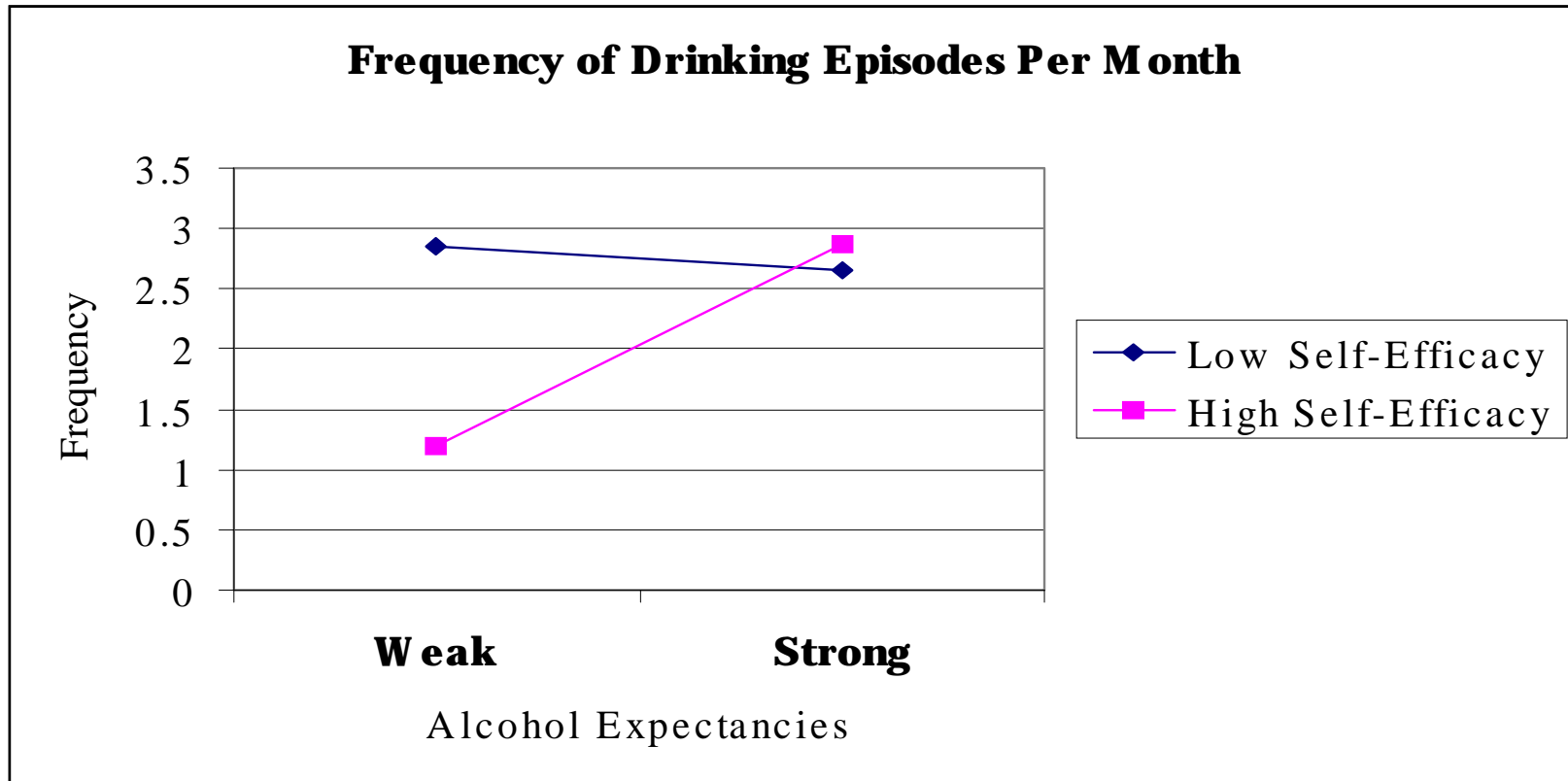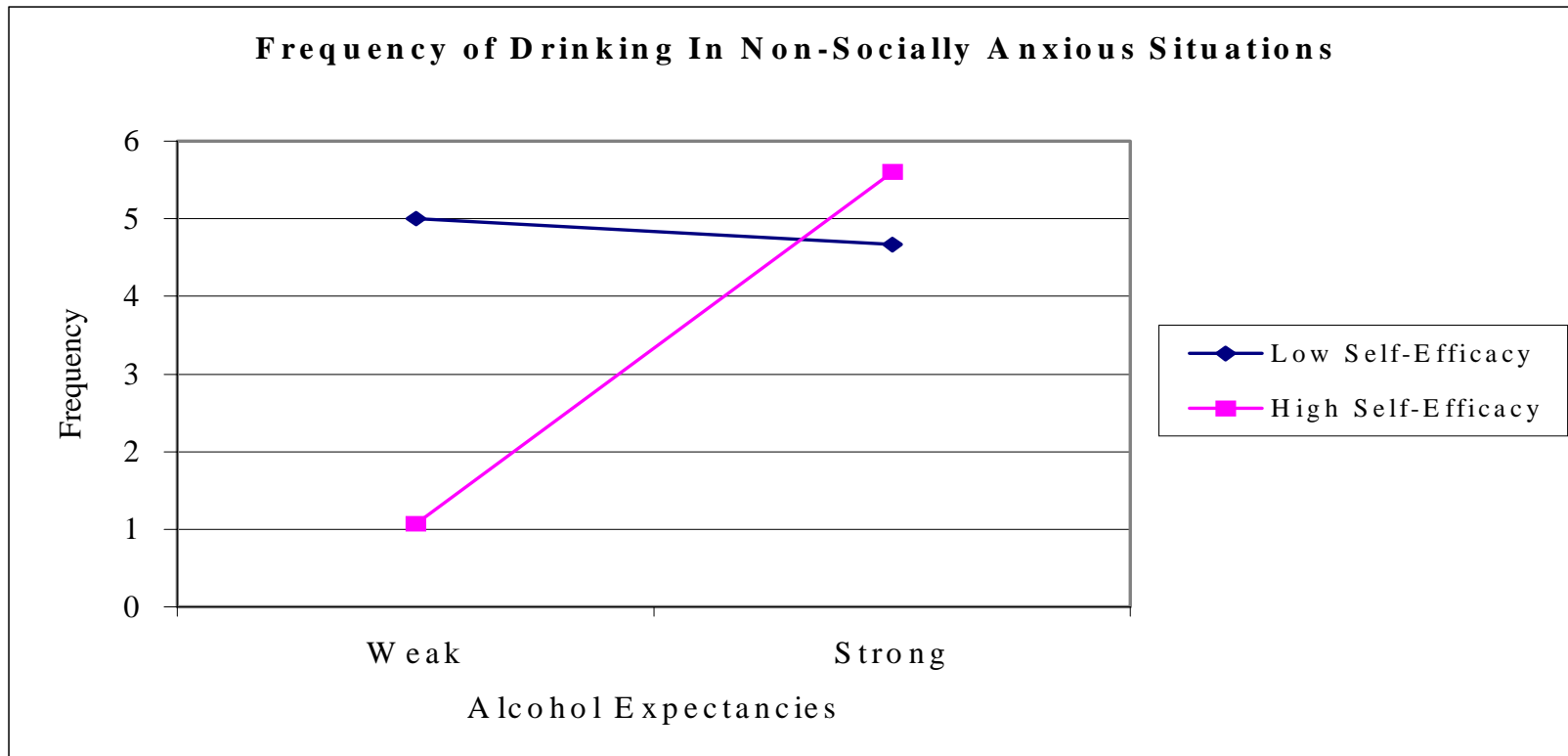**Frequency of Drinking In Non-Socially Anxious Situations**

Figure 4:   Interaction between alcohol expectancies of improved sociability and self-efficacy for avoiding heavy drinking in socially anxious situations in the prediction of frequency of drinking episodes in situations unlikely to elicit feelings of social anxiety.

Randy S. Burke, M.S.
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Date of Birth: June 8, 1970; New Bedford Massachusetts

Professional
Affiliations: American Psychological Association
Student Member

Association for the Advancement of Behavior Therapy
Student Member

Education:

1996-present   Virginia Polytechnic Institute and State University,
Blacksburg, Virginia.
Degree Expected: Doctor of Philosophy
Program: Clinical Psychology
Specialization: Clinical-Adult Psychology

1993-1995   Virginia Polytechnic Institute and State University,
Blacksburg, Virginia.
Master of Science in Psychology

1988-1992   University of Massachusetts at Amherst.
Bachelor of Science in Psychology with a Spanish Minor
Overall G.P.A. 3.73, Psychology G.P.A. 3.98.

Awards and Honors:

1997   Research assistantship, Tuition waiver
1993-1996   Graduate assistantship, Tuition waiver

1992   Nu Chapter of Phi Beta Kappa Honor Society
Phi Kappa Phi Honor Society
Graduated Cum Laude

1990   Golden Key National Honor Society
1989   Psi Chi (Psychology Honor Society)
1988   D.W. Field Park Scholarship

Clinical Positions:

5/97-8/97   Veterans Affairs Medical Center, Martinsburg, West Virginia.
Doctoral Trainee. Duties: Attend weekly supervision meetings,
attend and conduct monthly staff trainings, and conduct therapy as
part of clinical training. Specific rotations included:

Medicine/Geriatrics. Duties: Participate in didactic presentations in the areas of pain control and bioethics. Conduct health, legal, and financial competency evaluations for patients in intermediate and Nursing Home Care Units. Conduct psychological assessments on patients applying for transplant procedures. Also responsible for attending weekly supervision meetings and conducting therapy with palliative care patients.

Supervision: Bruce V. Corsino, Psy.D., Licensed Clinical Psychologist, Psychology Director of Training, 1 hour weekly.

Inpatient Psychiatry/Mental Hygiene. Duties: Conduct psychological evaluation and differential diagnosis assessments on both inpatients and outpatients referred to the mental hygiene clinic. Participate in multidisciplinary evaluation and management of patients. Attend weekly supervision meetings and conduct therapy as part of clinical training.

Supervision: Anne Hedges, Psy. D., and Roger Steenland, Ph.D., 3 hours weekly.

Comprehensive Addictions Treatment. Duties: Assist in the development and implementation of individualized treatment plans, conduct biopsychosocial, psychological, and Addiction Severity Index assessments of new patients and make recommendations for treatment. Lead didactic group lectures in the areas of anger management and assertiveness training. Participate in multi-disciplinary treatment team meetings to evaluate patient progress. Also responsible for attending weekly supervision meetings and conducting therapy with dual diagnosis patients as part of clinical training.

Supervision: Bruce Jennings, Ph.D., 1 hour weekly.

8/96-5/97   Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Graduate Clinician. Duties: Attend weekly supervision meetings and conduct therapy as part of clinical training. Special assignments included:
Student supervisor for first and second year graduate clinicians (n = 3) on assessment and psychotherapy cases.

Supervision: Robert S. Stephens, Ph.D., Licensed Clinical Psychologist, 5 hours weekly.

5/96-8/96   Mount Regis Changes, Roanoke, Virginia. Adolescent Counselor and co-therapist for adolescent substance abuse treatment groups. Duties: conduct initial assessments of client referrals and make appropriate recommendations for treatment, develop and implement

individualized treatment plans, co-lead abstinence oriented group therapy sessions for substance abusing and/or dependent adolescents in an intensive outpatient or continued care treatment program. Also responsible for co-leading a parent-focus group, conducting random urine screens and breathalyzers, coordinating treatment efforts with juvenile court and school systems, and providing crisis counseling to adolescents and their families on an as needed basis.

Received several hours of in-service training in many aspects of client care including: dual relationships, formulating treatment plans, infection control, and maintaining client safety in emergency situations.

Supervision: Himanshu Patel, M.D., Psychiatrist, Medical Director; Pamela Melton, Ph.D., Licensed Clinical Psychologist; Charles Finn, LPC; and Robert Lynn, CSAC, 6 hours weekly.

5/95-5/96   Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Co-Therapist for a Men's Anger Control Group. Duties: Conduct individual intake interviews to determine the appropriateness of potential new members, plan and present didactic instruction on antecedents, consequences, and alternatives to anger, facilitate group discussions of various aspects of men's anger, document progress of individual group members, andattend weekly supervision meetings.

Supervision: Richard M. Eisler, Ph.D., Director of the Psychological Services Center, Licensed Clinical Psychologist 1 hour weekly.

5/95-9/95   Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Graduate Clinician. Duties: Attend weekly supervision meetings and conduct therapy as part of clinical training

Supervision: Richard M. Eisler, Ph.D., Director of the Psychological Services Center, Licensed Clinical Psychologist 3 hours weekly.

9/94-9/95   Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Graduate Clinician. Duties: Administer, interpret, and write psychoeducational assessments as part of a research project examining anxiety, depression, Attention-Deficit/Hyperactivity, and learning disabilities in children aged 7-18. Duties also included providing oral feedback to the parents and children who were assessed and attending weekly treatment team meetings.

Supervision: Thomas H. Ollendick, Ph.D., Director of Clinical Training, Licensed Clinical Psychologist, 1.5 hours weekly.

Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Graduate Clinician. Duties: Attend   weekly supervision meetings and conduct therapy as part of clinical training.

Supervision: Robert S. Stephens, Ph.D., Licensed Clinical Psychologist, Jack W. Finney, Ph.D., Licensed Clinical Psychologist, Curtis K. Greaves, M.S., and Lisa Curtin, M.S., 6 hours weekly.

5/94-8/94   Germaine Lawrence Intensive, Marlboro, Massachusetts. Awake Overnight Supervisor. Duties: Assign staff to the responsibilities of the shift, meet with awake overnight counselors (n=4) for one hour each week to provide individual supervision, train all awake overnight staff in the use of mechanical restraints, design and implement individual treatment plans, modify and improve overnight staff policies and procedures as needed, write and present semiannual performance evaluations to Awake Overnight Counselors, and attend weekly staff meetings and in-service trainings.

Supervision David Halloran and Christine Ryan, Residential Directors 2 hours weekly.

8/93-5/94   Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Graduate Clinician. Duties: Attend weekly supervision meetings and conduct therapy as part of clinical training.

Supervision: Thomas H. Ollendick, Ph.D, Director of Clinical Training, Licensed Clinical Psychologist; Ellie T. Sturgis, Ph.D., Licensed Clinical Psychologist; and Kerri Augusto, M.S., 4 hours weekly.

3/93-7/93   Germaine Lawrence Intensive, Marlboro, Massachusetts. Assistant Residential Supervisor. Duties: Assist the Residential Supervisor in coordinating the shift, supervise the shift in the absence of the Residential Supervisor, assign staff to the responsibilities of the shift, oversee the required documentation of the shift, all duties of a Milieu Therapist (described below). Supervision: Lisa Lauretano, Residential Director and Jeannie Differ, Residential Supervisor 2 hours weekly.

6/92-2/93   Germaine Lawrence Intensive, Marlboro, Massachusetts. Milieu
               Therapist. Duties: Write and implement cognitive-behavioral
               contracts; implement individual treatment plans; provide crisis
               counseling, behavior management (limit setting) and life skill
               education to severely emotionally disturbed adolescent females in a
               long term locked intensive residential treatment program.

               Received several hours of in service training in many aspects of
               client treatment and care including: transference and counter-
               transference, first aid, CPR, activities planning, and processing
               maladaptive behaviors. Also responsible for maintaining building
               safety and security, menu planning, and meal preparation.

               Supervision: Lisa Lauretano, Residential Director and Jeannie
               Differ, Residential Supervisor 2 hours weekly.

Research Positions:

11/97-Present   Graduate Student Reviewer for the Journal of Personality and
               Social Psychology: Personality Processes and Individual
               Differences

11/96-5/98   Virginia Tech Health Partnership, Montgomery County, Virginia.
               Project assistant. Duties: Work as part of a multi-disciplinary team
               to develop a motivational enhancement intervention aimed at
               lowering levels of alcohol use in individuals who attend HIV
               anonymous testing clinics for the purposes of having their blood
               drawn to test for the presence of HIV.

               Primary responsibilities include: developing survey measures to
               assess client interest in participating in the project, communicating
               findings to other team members, and assisting in the writing of a
               NIAAA grant which may be submitted pending the outcome of
               pilot data.

               Supervisor, Robert S. Stephens, Ph.D.

8/97-Present   Department of Psychology, Virginia Polytechnic Institute and State
               University, Blacksburg, Virginia. Graduate Research Assistant.
               Duties: Assist in the development of written protocols for the study
               design, intervention, and assessment procedures for a NIDA funded
               study examining the effectiveness of motivational interviewing as a
               brief intervention for marijuana dependent adults. Also responsible
               for assisting with data entry, data reduction and analysis, coding of
               audiotaped counseling sessions and co-authoring manuscripts for
               publication and presentation. Participate in weekly research
               meeting and conference calls related to the development and
               implementation of the study.

Supervisor, Robert S. Stephens, Ph.D.

8/96-5/98   Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Doctoral Dissertation: The relationship between social anxiety and alcohol consumption in college students: Scale development, construct validation, and testing of a social-cognitive model. Duties: Propose, design, and run an original project, defend before an ethics committee, data input and analysis using SPSS (Statistical Program for the Social Sciences), train and supervise undergraduate assistants (N = 7) in data entry and running of subjects.

8/95-4/96   Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Graduate Assistant. Duties: Administer, score, and provide feedback to female college students about their use of alcohol, provide subjects with a goal for reducing their current levels of consumption, and schedule one, two, and six month follow-up meetings to evaluate progress.

The above procedures are part of a NIAAA funded study examining the effects of goal setting on reducing levels of alcohol consumption in heavy drinking female college students, and are performed according to an established research protocol.

5/94-5/95   Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Masters Thesis: The Effect of Anxious Affect on Drinking Self-Efficacy in College Students. Duties: Propose, design, and run an original project, defend before an ethics committee, data input and analysis using SPSS (Statistical Program for the Social Sciences), train and supervise three undergraduate assistants in data entry and running of subjects.

12/94-8/95   Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Graduate Assistant. Duties: Administer, interpret and assist in the write-up of psychoeducational assessments as part of a research study examining the presence of Attention-Deficit/Hyperactivity Disorder in college students

8/94-5/95   Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg Virginia. Graduate Student. Duties: Attend and participate in biweekly research team meetings used to modify instruments for use in a future study assessing self-efficacy, coping efficacy, and outcome expectancies for avoiding heavy drinking in college students. Responsible for the training and supervision of five undergraduates in library research and data entry.

1992   University of Massachusetts at Amherst with Dr. Morton Harmatz, Ph.D. Honors thesis: Grade point average and self-concept in

college undergraduates: Does a relationship exist? Duties: Propose, design, and run an original project, defend before an ethics committee,
data input and analysis using SPSS, oral defense.

1990-1992   University of Massachusetts at Amherst with Dr. Morton Harmatz, Ph.D. Research area: The development of psychotherapists. Duties: Assist in library research and designing instruments for use
    in a future study involving the training and psychological development of psychotherapists. Responsible for the training of undergraduates (n = 7) in library research and data entry.

Teaching Positions:

8/97-12/97   Randolph-Macon Woman's College, Lynchburg, Virginia. Instructor for courses Cognitive Psychology and Lab in Cognitive Psychology. Duties: Prepare and deliver lectures, prepare and facilitate lab sessions, hold office hours, develop, administer, and grade course examinations and lab assignments.

8/96-5/97   Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Instructor for the course: Psychology of Learning. Duties: Prepare and deliver lectures, hold office hours, develop, administer, and grade course examinations.

8/94-5/95   Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Teaching assistant for the classes: Research Methods in Personality and Advanced Learning. Duties: Place material on reserve in the library, assist with grading of test and essays, provide written feedback to students regarding oral class presentations.

8/93-5/94   Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Teaching Assistant for the class: Introductory Psychology. Duties: Present material and facilitate discussions in 4 recitation sections, proctor exams, develop and administer weekly quizzes, graded assigned essays, assign a letter grade to each student based upon quiz and essay grades.

1/91-5/91   University of Massachusetts at Amherst. Teaching assistant for the class: The Psychology of Aging. Duties: Attend lectures, lead 15 undergraduates in a weekly discussion section of topics related to the psychology of aging, assist students with weekly group presentations, assign a letter grade to each student based upon their presentation, group participation and attendance. Supervision: Derek McEntee, M.A., 1 hour weekly

8/90-5/91   University of Massachusetts at Amherst. Computer consultant for the class: Methods of Inquiry in Psychology. Duties: Provide assistance to students in experimental design and data analysis using NCSS (Number Crunching Statistical System). Supervision: Jeannie Watt, M.A. 1 hour weekly.

Special Skills: Working knowledge of written and spoken Spanish, certified in Adult Cardiopulmonary Resuscitation (CPR), certified in Applied Nonviolence Restraint training, certified in Nonviolent Crisis Intervention.

Computer Skills: Working knowledge of several Macintosh and IBM DOS software packages including: Microsoft word, Microsoft Excel, Word perfect 8.0, and SPSSPC+(Windows and DOS versions)

Papers and Presentations:

Moore, T.M., Burke, R.S., & Eisler, R.M. (1998, May). Propensity for abuse and conflict tactics: An examination of cardiovascular reactivity and cognitive attributions to intimate partner behavior. Poster to be presented at the annual meeting of the American Psychological Society, Washington, D.C.

Burke, R.S., & Stephens, R.S. (1998, March). Expectancy and efficacy judgments in the prediction of heavy drinking in socially anxious college students. Poster submitted to the annual meeting of the Society of Behavioral Medicine, New Orleans, LA.

Curtin, L., Stephens, R.S., Campe, D., James, F.L., & Burke, R.S. (1996, November). Effects of assessment goal-setting and feedback, and frequent prompting in the reduction of heavy drinking in female college students. Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, New York, NY

Burke R.S., Stephens, R.S., May, A., Clifford, M., & Sherman, M. (1995, November). The effect of anxious affect on drinking self-efficacy in college students. Poster presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Washington, D.C.

Greaves C.K., Stephens, R.S., & Burke R.S. (1995, November). evaluation of two approaches to drinking risk reduction with college students: Cognitive-Behavioral skills training and motivational feedback. Poster presented at the Association for the Advancement of Behavior Therapy, Washington, D.C.

Publications:

Burke, R.S., & Stephens, R.S. (under review). Social anxiety and college student drinking: A social-learning analysis.

Butcher, A.T., Ollendick, T.H., Conners, C.K., Seligman, L.D., & Burke, R.S. (in preparation). Laboratory tasks in the diagnosis of ADHD in adults: A theoretical and empirical analysis.

Burke R.S. & Stephens R.S. (1997). Effect of anxious affect drinking self-efficacy in college students. Psychology of Addictive Behaviors, 11, 65-75.

References:

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