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SOCIAL ANXIETY AND RUMINATION: THE EFFECTS OF ALCOHOL

by

Susan Reed Battista
Hons. B.A., University of Western Ontario, 2004

THESIS

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Abstract

Previous research has found a positive relationship between social anxiety and rumination. A positive relationship has also been found between social anxiety and alcohol use in clinical samples. The current study investigated how alcohol affected levels of rumination in socially anxious and non-socially anxious individuals. It was expected that consuming alcohol would decrease levels of rumination in socially anxious individuals. Eighty male participants were recruited (38 high in social anxiety and 42 low in social anxiety). Most participants were White (86%), students (78%), who ranged in age from 19 to 69 ($M = 22$ years). Individuals were randomly assigned to an alcohol or no alcohol condition, and then took part in an anxiety-provoking social interaction with a confederate. One week later, their levels of rumination were measured in response to the social interaction. Results indicated that those high in social anxiety had similar levels of typical alcohol consumption to those low in social anxiety. Main effects were found for anxiety condition, indicating that those high in anxiety had higher levels of state social anxiety during the social interaction and higher levels of rumination after the social interaction. However, no main effects were found for alcohol condition, indicating that alcohol did not have an effect on state social anxiety as most theories would predict and alcohol did not affect levels of rumination as was hypothesized. This research is applicable to treatment programs aimed at helping individuals with social anxiety and/or alcohol use problems.

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Social Anxiety

Social anxiety is characterized by pervasive negative self-judgments about one's own social behaviours with a strong fear of negative evaluation from others (Rowa & Antony, 2005). Often, people with social anxiety are distressed when they are in a social situation or they avoid social interactions altogether. Experiencing some symptoms of social anxiety is common among university students (Purdon, Antony, Monteiro, & Swinson, 2001), and among the general population (Hofmann & Roth, 1996). Clinically, the lifetime prevalence of social anxiety disorder (previously referred to as social phobia) as defined by the Diagnostic and Statistical Manual of Mental Disorders- Fourth Edition (DSM-IV; American Psychiatric Association [APA], 1994), is approximately 13% (Kessler et al., 1997). This makes social anxiety disorder the third most common psychological disorder, next to depression and alcohol use disorder (Stein, Torgrud, & Walker, 2000).

Cognitive models of social anxiety have been well described and supported in the literature (Clark & Wells, 1995; Rapee & Heimberg, 1997). The key components of cognitive models of social anxiety include; beliefs about the self, anticipatory and post-event processing, self-focused attention, and safety behaviours. In regards to beliefs about the self, individuals with social anxiety often hold negative beliefs about their worth and about their abilities. Some research suggests that these negative beliefs are specific to situations where the individual feels that others are evaluating them (Anderson & Arnoult, 1985). For example, socially anxious individuals can have a positive self-view when they are alone or with close friends, but when they are in a crowd of strangers, they feel inadequate. On the contrary, there is also evidence to suggest that socially anxious

individuals hold a self-view that is more negative overall than non-socially anxious individuals (Mansell & Clark, 1999). Similarly, increased social anxiety may be associated with decreased general self-esteem (Kocovski & Endler, 2000). It may be the case that those with social anxiety have a less stable self-concept and that it is this instability that may lead to lower self-esteem or a more negative global self evaluation. Wilson and Rapee (2006) tested this concept and found that socially anxious individuals were less confident in ratings of their own personality compared to non-socially anxious individuals. In addition, socially anxious participants had slower reaction times when they judged self-descriptive attributes, as compared to self-irrelevant attributes. These researchers suggested that *uncertainty* in one's self-concept may lead one to be more influenced by the reactions and beliefs of others. Hence, socially anxious people may be more inclined to attribute an uncomfortable social situation to their own personal failures and inadequacies.

Another factor that contributes to social anxiety is anticipatory processing, which refers to the thoughts and feelings that occur before a social event takes place. It has been found that individuals with social anxiety often conduct a detailed review of what they think will happen at the social event (Mellings & Alden, 2000). This review is often dominated by recollections of past failures, and brings on feelings of anxiety and doubt (Eckman & Shean, 1997). In a study conducted by Vassilopoulos (2005), participants were instructed to either engage in anticipatory processing or complete a distraction task before giving a speech. Results showed that engaging in anticipatory processing led to increased anxiety in highly anxious participants. As well, these participants predicted that they would perform worse in the upcoming speech task when they were instructed to think about what could go wrong during the speech. Anticipatory processing primes an

individual to expect social failure and biases attention such that one is more likely to notice signs of inadequacy and failure. In some cases, anticipatory processing may be so anxiety-provoking that it may lead the individual to avoid the upcoming event all together.

A related cognitive process is post-event processing, which may occur after a social event. Clark and Wells (1995) described post-event processing as a "postmortem" of the event or a cognitive review of the perceived inadequacies and social imperfections that the individual believes occurred during the event. A number of recent studies (e.g., Mellings & Alden, 2000; Rachman, Gruter-Andrew, & Shafran, 2000) found that individuals who were socially anxious were more likely to engage in post-event processing than less socially anxious individuals. Post-event processing appears to be particularly biased towards negative thoughts. For example, Field and Morgan (2004) had participants describe a social event and then engage in post-event processing. One group was told to focus on the negative aspects of the event and another group was told to focus on the positive aspects of the event. After participants engaged in post-event processing, they were given a memory recall task. Results indicated that the group to which participants were assigned did not affect the types of memories that they recalled. Rather, those who were high in social anxiety recalled more negative memories than those who were low in social anxiety. Clark and Wells (1995) point out that individuals with social anxiety process social events with great detail and therefore, aspects of the event remain strongly encoded in memory. Often, the individual will be able to easily recall many instances of how they behaved in social situations and will focus on times when they believe they were socially inadequate. Consequently, post-event processing actually serves to confirm the individual's insecurities and maintains social anxiety. In a student

sample, using a diary method, Lundh and Sperling (2002) found that social anxiety was positively correlated with post-event processing specific to negative-evaluational social events. They did not, however, find social anxiety to be positively correlated with overall post-event processing related to socially distressing events. This highlights the need to further examine what types of situations socially anxious individuals are likely to dwell on. There may also be differences in how clinical and non-clinical samples engage in post-event processing. For example, Kocovski and Rector (in press) found that in a sample of patients with social anxiety disorder, anxiety was predictive of post-event processing related to both a common task (attending a group therapy session) and an individualized task (an exposure exercise specific to the participant). It may be the case that clinical samples are more sensitive to all types of social situations and therefore, more likely to engage in post-event processing afterwards. On the other hand, non-clinical samples may vary more than clinical samples in the types of situations that elicit post-event processing.

When those with social anxiety are actually in a social situation, they often bias their attention to become self-focused and devoted to observing and monitoring their own thoughts and actions (Melchior & Cheek, 1990). Self-focused attention is problematic because it is associated with increased anxiety and negative thoughts about the self (Woody, 1996). This shift in attention is also troublesome because it interferes with the processing of other aspects of the situation (e.g., other peoples' actions, environmental cues, etc.). A study conducted by Hope, Heimberg, and Klein (1990) found that individuals with high levels of anxiety recalled less information about their partner when they engaged in a social interaction than individuals with low levels of anxiety. It appears that socially anxious individuals are primarily concerned with how they are presenting

themselves and the focus of the encounter is on impression maintenance. However, the impression that the socially anxious individual makes is based on his or her own feelings and not necessarily on what is actually happening in the situation. There have been mixed findings regarding how socially anxious individuals actually perform during social interactions. Some researchers have found that socially anxious participants perform worse during social interactions on objective measures of behaviour (e.g., Twentyman & McFall, 1975), whereas, other researchers have found no performance differences between high and low socially anxious participants (e.g., Rapee & Lim, 1992). Furthermore, socially anxious individuals often overestimate the visibility of their anxiety (e.g., Alden & Wallace, 1995). Socially anxious individuals are so focused on their own feelings that they assume that because they feel anxious, they must be acting in a way that conveys their anxiety to others. So, they further direct their attention inward to try and control their anxiety and do not process cues from other people that would give them a better understanding of how they are actually being perceived in the situation.

Socially anxious individuals often engage in safety behaviours to try and control or hide their anxiety. Some examples of safety behaviours include: avoiding eye contact, talking quickly, and pretending not to see someone. Although people use safety behaviours with the intention of controlling their anxiety, research has found that decreasing the use of safety behaviours actually reduces levels of anxiety (Wells, Clark, Salkovskis, & Ludgate, 1995). More specifically, researchers (e.g., Kim, 2005) have suggested that decreasing the use of safety behaviours reduces anxiety because it allows individuals to disconfirm their negative thoughts related to the situation (e.g., those who fear that their shaking will be obvious if they do not put their hands in their pockets can observe that they don't shake when they intentionally drop the use of putting their hands

in their pockets as a safety behaviour). It has also been found that people are more likely to use safety behaviors when they are viewing a situation from an outside observer's perspective, rather than their own perspective (Spurr & Stopa, 2003). Alcohol consumption is often thought of as safety behaviour that socially anxious individuals use to try and reduce anxiety during social situations (Clark & Wells, 1995).

Alcohol Use

Alcohol use disorders (AUDs) as defined by the DSM-IV (APA, 1994) are divided into two separate diagnoses: alcohol dependence and alcohol abuse. Alcohol dependence is defined as a physiological and/or psychological need for alcohol, even when it produces negative psychological and physical consequences for the individual. The lifetime prevalence of alcohol dependence in the United States is approximately 20% in men and 8% in women (Kessler et al., 1997). Alcohol abuse is considered less severe than alcohol dependence and occurs when an individual continues to use alcohol despite social, occupational, family or interpersonal problems. Kessler and colleagues reported the lifetime prevalence of alcohol abuse in the United States to be approximately 13% in men and 6% in women. In Canada, Ross (1995) reported the lifetime prevalence of alcohol abuse as approximately 6.7% in males and 4.4% in females aged 15-24. These numbers rise to 12.1% in males and 8.0% in females aged 25-44. In an Ontario survey, Offord and colleagues (1996), found the one year prevalence rate for alcohol abuse and dependence combined to be at 10.4% for males, and 2.7% for females aged 15 to 24.

Rates of alcohol consumption are particularly high among college/university students. Wechsler, Dowdall, Maenner, Gledhill-Hoyt, and Lee (1998) gathered data from a number of U.S. colleges to examine the drinking habits of students. The researchers defined binge drinking as consuming five or more drinks consecutively for

men and four or more drinks for women, on a single occasion. Approximately 20% of the students who were surveyed were classified as frequent binge drinkers, defined as having binged three or more times within a two week period. A similar percentage of students were classified as occasional binge drinkers who binged one or two times within a two week period. As well, 38% of the sample was classified as non-binge drinkers and 20% of students reported abstaining completely from alcohol in the past year. Similar percentages have been found in Canadian samples of university students. For example, Kuo and colleagues (2002) found that 57% of males and 51% of females reported drinking at least once within the past week. Of those respondents, 41% of males and 44% of females reported heavy alcohol use (defined as five or more drinks on one occasion for males and four or more drinks on one occasion for females). These percentages are relatively high and suggest that rates of drinking may be significantly higher among university and college students than among the general population.

Dawson, Grant, Stinson, and Chou (2005) compared rates of drinking among a large sample of college students aged 18-29, non-college individuals aged 18-29 and adults aged 30 and older. It was found that college students were more likely to meet criteria for alcohol dependence (11%) than both the non-college group (8%) and the adult group (2%). It was also found that binge drinking was much more common in college and non-college individuals than in adults (25% in both college and non-college individuals versus 14% in adults). Based on these findings, it may not be the case that attending college/university is responsible for increased drinking rates *per se*, but perhaps, young adulthood (ages 18-29) is associated with risk factors that render one more likely to engage in drinking.

High rates of drinking in young adulthood are worrisome because frequent alcohol use has been linked to a number of adverse consequences. Students participating in the study conducted by Wechsler et al. (1998) were asked if they experienced any of 12 alcohol-related problems. The most common problems reported were; doing something you regretted (37%), drinking and driving (36%), missing class (30%), forgetting what you did (27%) and arguing with friends (24%). Approximately 20% of students reported that they had experienced five or more of the 12 alcohol-related problems that were listed. Many other studies have reported similar findings regarding problems associated with alcohol use (e.g., Gruenewald, Johnson, Light, Lipton, & Saltz, 2003; Kuntsche & Gmel, 2004). Interventions that limit heavy alcohol use in young adults would be beneficial in helping to reduce these various problems. However, for interventions to be effective, researchers must first understand *why* young adults drink.

Young adults cite a number of reasons for drinking alcohol. In a large meta-analysis, Kuntsche, Knibbe, Gmel, and Engels (2005) examined various motivational factors that contributed to one's decision to drink. These researchers divided motivational reasons into three categories. The first were termed "social motives" and included reasons such as; peer acceptance, to be polite, to celebrate and to have a good time. The second set of factors was termed "enhancement motives" and included reasons such as: to get high, to feel good and to get drunk. The final category was termed "coping motives" and included reasons such as; to deal with stress, to reduce tension, and to escape negative emotions. Overall, it was found that most young individuals reported drinking due to social motives and that coping motives were not particularly common among young adults. However, it was found that coping motives were more often associated with heavy drinking and alcohol-related problems (e.g., low academic achievement and

delinquency), whereas social motives were associated with moderate alcohol use. This suggests that alcohol may be more of a problem for individuals who are using alcohol as a means of coping. Research in the area of social anxiety has found that individuals report drinking alcohol as a coping mechanism for anxious symptoms (Thomas, Randall, & Carrigan, 2003).

Social Anxiety and Alcohol Use

Many researchers have examined the relationship between social anxiety and alcohol consumption (e.g., see Morris, Stewart & Ham, 2005 for a review). There have been mixed findings regarding the direction of this relationship. In clinical samples, many studies have found high co-morbidity between AUDs and social anxiety disorder (e.g., Grant et al., 2004; Kessler et al., 1997). Individuals diagnosed with social anxiety disorder are more likely to have an AUD than would be expected by chance (Himle & Hill, 1991). In a Canadian sample, Ross (1995) found that Canadians with a lifetime history of AUD had a 2.2 times greater likelihood of also having an anxiety disorder. Similarly, Kushner and Sher (1993) examined a sample of undergraduate students and found that the likelihood of meeting criteria for an AUD was significantly higher for those who also met criteria for an anxiety disorder (39%) compared to those who did not meet criteria for an anxiety disorder (21%). Based on findings of this nature, clinical levels of social anxiety and alcohol use appear to be positively related. However, in student and community samples, examining anxiety and alcohol use on a continuum, a negative relationship is often found such that those who are more socially anxious tend to drink less frequently than those who are less socially anxious (e.g., Eggleston, Wolaway-Bickel, & Shmidt, 2004; Ham & Hope, 2005; Myers et al., 2003). For example, Eggleston and colleagues investigated levels of social anxiety and drinking habits in a

large undergraduate sample. Results revealed that social anxiety was negatively correlated with average number of days per week that one consumed alcohol. Similarly, social anxiety was negatively correlated with number of binge drinking episodes per week in this student sample.

Theories to explain the connection between social anxiety and alcohol use

Tension-Reduction Theory, Self-Medication Hypothesis, and Stress Response Dampening Model

The Tension Reduction Theory (TRT) was first proposed by Conger (1951) who found that alcohol consumption reduced the release of stress-related hormones in animals. TRT has been widely used as an explanation for why socially anxious individuals are motivated to drink (e.g., Abrams, Kushner, Medina, & Voight, 2001; Kushner, Sher, & Beitman, 1990). According to TRT, people with social anxiety will consume alcohol to relieve the tension that is caused by the social situation. The reduction of these symptoms will then reinforce the drinking behaviour and motivate individuals to drink in future social situations.

Another frequently cited theory is the Self-Medication Hypothesis (SMH; Khantzian, 1985). SMH is very similar to TRT except that it is more broadly applied to other areas (e.g., understanding comorbidity between depression and substance abuse disorders). SMH similarly postulates that alcohol will reduce negative symptoms in individuals. Another similar theory is the Stress Response Dampening (SRD) model which was developed by Sher and Levenson (1982) as an extension of the TRT. This model states that individuals will drink alcohol to dampen their reactions to a stressful event or situation. This model then predicts that when individuals anticipate an anxiety-provoking event, they will consume alcohol before or during the event to reduce anxiety.

An advantage of this model is that it takes into consideration individual differences, and postulates that some people will be more sensitive to alcohol's stress dampening effects than others (Greeley & Oei, 1999). Applied to social anxiety, SRD then predicts that socially anxious individuals will be more sensitive to alcohol's effects when they are in a socially stressful situation than non-socially anxious individuals.

A number of studies have tested the aforementioned models (TRT, SMH, & SRD) and conflicting results have been found. There is research to suggest that people will consume more alcohol when they are anticipating an anxiety-provoking event compared to when they are anticipating a neutral event (e.g., Higgins & Marlatt, 1975; Kidorf & Lang, 1999). However, other research has found an opposite pattern. An experiment by Abrams, Kushner, Medina, and Voight (2002) had participants take part in an anxiety-provoking task (giving a speech) and a neutral task (reading a magazine). Participants were given the opportunity to drink alcohol before or after each task. It was found that participants drank more alcohol after the anxiety-provoking task than after the neutral task. However, they did not drink more before the anxiety-provoking task than before the neutral task. These findings do not support what is predicted by TRT, SRD and SMH. Abrams and colleagues explained their findings by discussing the importance of the anxiety-provoking task that participants engaged in. It may be that participants did not drink more before the anxiety-provoking task because they believed that drinking would impair their performance on the speech task. A number of researchers (e.g., Kessler, Stein, & Beglund, 1998) have made the distinction between performance-based anxiety (e.g., having to give a speech) and interaction-based anxiety (e.g., having a conversation with a peer). It is then important to examine the types of situations that socially anxious individuals are more likely to drink in. It may not be the case that all anxiety-provoking

situations motivate socially anxious individuals to drink, but that drinking is only more likely when one believes that it will not impair their performance in the situation.

The aforementioned theories are also limited in that they do not explain the exact mechanism through which alcohol may reduce anxiety. It may be the case that alcohol directly reduces anxiety through its pharmacological effects by reducing heart rate (Lipscomb, Nathan, Wilson, & Abrams, 1980), blood pressure (Wilson, Brick, Adler, Cocco, & Breslin, 1989), and/or galvanic skin response (Carpenter, 1957). However, studies have not consistently found alcohol to produce these physiological effects (see Sayette, 1993). This has led investigators to explore more cognitively based explanations for alcohol's anxiety reducing effects.

Alcohol Myopia Theory (Attention Allocation Model)

Steele and Josephs' (1990) Alcohol Myopia Theory (AMT) states that alcohol causes people to narrow their attention to immediate and salient cues in the environment. Applied to social anxiety, this theory predicts that alcohol will only alleviate anxiety if individuals are processing cues that are not related to their anxiety (i.e., if they are distracted). For example, if one is drinking at a party where someone else is singing at the centre of the room, an anxious individual may be able to focus on this other person, rather than on him/herself. As a result of this other-focused attention, the anxious individual will not be as aware of his or her own anxiety and will therefore, find the effects of the alcohol reinforcing. To demonstrate this effect, Steele and Josephs (1988) told sober and intoxicated participants that in 15 minutes, they would have to give a speech. While they were waiting to give the speech, half of the participants engaged in a distraction task and the other half did nothing. Anxiety ratings were taken at various time points throughout the experiment. It was found that anxiety was reduced only for participants who were

intoxicated and engaged in the distraction task. In further studies, Josephs and Steele (1990) have actually shown that the amount of anxiety reduction one experiences is proportional to how demanding the distraction task is.

Other researchers have used a Stroop method to investigate AMT. In a typical Stroop test, participants are presented with words that are written in various colours. The task is to name the colour out loud, but not the word. This is relatively difficult because colour naming is less automatic and less salient than word reading. This task has been modified to compare reactions to anxiety-related words *versus* reactions to neutral words. It has generally been found that in individuals with social anxiety, it takes longer to name the colour of an anxiety-related word than a neutral word (Amir, Freshman, & Foa, 2002). This provides evidence that socially anxious individuals are attuned to anxiety-related stimuli and tend to process them at a deeper level. Furthermore, the Stroop test can also be used to investigate how alcohol may alter the processing of anxiety-related words in socially anxious individuals.

Gerlach, Schiller, Wild and Rist (2006) used a Stroop test to examine how alcohol affected the appraisal of social threat stimuli in individuals with social phobia. Participants performed the Stroop test either after drinking alcohol or after drinking non-alcoholic beverages. The Stroop test consisted of 16 social phobia-related words and 16 neutral words, which were matched on word frequency and word length. Participants also completed an implicit memory test after they did the Stroop task. A number of noteworthy results emerged from this study. Firstly, for both socially phobic and control participants, the social phobia-related words resulted in longer colour-naming latencies than the neutral words. Secondly, alcohol reduced the colour-naming latencies of social phobia-related words to levels similar to that of the neutral words, but this only occurred

in the control group. These findings are surprising and suggest that alcohol may not reduce all aspects of anxiety. For example, alcohol may reduce physiological symptoms of anxiety, but not cognitive symptoms. It seems that the socially- phobic participants were still deeply processing the anxiety-related words, even when intoxicated. This could indicate that alcohol does not actually reduce anxiety levels in socially anxious individuals, even though it may in individuals who experience normal levels of anxiety. Finally, the implicit memory test revealed that those with social phobia remembered more social phobia-related words than neutral words when they did not consume alcohol. However, this effect was eliminated when they did consume alcohol, such that they were recalling the same amount of social phobia-related words as they were neutral words. This effect was not found in the control condition who recalled similar amounts of social phobia-related words and neutral words whether they were drinking or not. These findings suggest that consuming alcohol, in addition to reducing anxiety during a social encounter, may also interfere with the post-event processing that occurs after a social encounter.

Appraisal Disruption Model

Sayette (1993) proposed the appraisal-disruption model as an alternative explanation for how alcohol may reduce anxiety in particular situations, but not in others. This cognitive model helps to reconcile many of the contrasting findings regarding alcohol and stress/anxiety. According to the appraisal-disruption model, alcohol impairs cognitive functioning such that stressful information is not initially processed in the same manner that it would be without alcohol. Specifically, alcohol limits one's ability to encode incoming information and connect it with information stored in long-term memory. This theory then predicts that alcohol will be more likely to reduce anxiety if

one has consumed alcohol *prior* to encountering the stressful stimulus and less likely if one has already made an initial appraisal of the stressful stimulus while sober. This prediction was tested by Sayette, Martin, Perrott, Wertz, and Hufford (2000) by having participants give a self-disclosing speech, which they learned about either before consuming alcohol (or a placebo) or after consuming alcohol (or a placebo). Results revealed that for most of the stress responses measured (heart rate, reaction times on a stroop task, and facial expression), there was an interaction between alcohol and order such that stress responses decreased for those who consumed alcohol and learned of the speech while intoxicated. However, this interaction was not found for self-reported anxiety. The reason for this last finding is unclear. Many studies have found that alcohol has little effect on self-reported measures of anxiety (e.g., Niaura,Wilson, & Westrick, 1988; Sayette, Contrada, & Wilson, 1990). It is possible that in the moment, individuals are unaware of how alcohol is affecting their anxiety levels. Perhaps, it is not until after the stressful situation, when sober, that individuals can reflect on their anxiety levels. It may be the case that when the initial appraisal of the situation is impaired (i.e., when the person first encounters the stimulus while intoxicated), then the subsequent memories of the event will also be skewed. Individuals may recall having decreased levels of anxiety during the situation, simply because their interpretation and memory of the situation are not reflective of what actually occurred. There is some evidence in support of this possibility. Heinrichs, Gerlach, and Henke (2006) had socially anxious individuals engage in a social interaction after consuming alcohol or not consuming alcohol. Self-reported anxiety was then measured immediately after the social interaction and then again, three days after the interaction. It was found that self-reported anxiety actually increased in the alcohol condition when individuals reported on it immediately after the

interaction, however, anxiety decreased when it was measured three days later. These findings point towards the need to further investigate how alcohol affects individuals not just during stressful situations, but also afterwards. The current study was designed to explore how alcohol acts on rumination, which is the post-event cognitive component that contributes to social anxiety.

Moderating/Suppressor Variables

In order to further investigate the relationship between social anxiety and alcohol use, many researchers have looked at variables that may moderate the relationship between social anxiety and alcohol use. Baron and Kenny (1986) define a moderator variable as one that influences the strength and/or the direction of the relationship between an independent and a dependent variable. Alcohol expectancies (e.g., Eggleston et al., 2004; Tran, Haaga, & Chambless, 1997) and motivational factors (e.g., Stewart, Morris, Mellings, & Komar, 2006) have been examined as two potential variables that may moderate the relationship between social anxiety and alcohol use.

Individuals hold varying expectancies regarding how alcohol will affect them in a social situation. If expectancies were to moderate the relationship between social anxiety and alcohol use, then socially anxious individuals who expect positive outcomes should be more likely to consume alcohol than socially anxious individuals who expect negative outcomes. The findings in this area have not fully supported these predictions. Tran and colleagues (1997) examined the alcohol expectancies of individuals who were high and low in social anxiety. They found that for those who had high positive expectancies (e.g., feeling more comfortable and at ease), level of social anxiety did not predict frequency or quantity of alcohol consumption. However, for those who had low positive expectancies, level of social anxiety did predict frequency and quantity of alcohol consumption. It was

found that those high in social anxiety reported drinking smaller quantities and less frequently than those low in social anxiety when they did not expect alcohol to yield positive outcomes. Based on findings of this nature, researchers have suggested that alcohol expectancies may be a suppressor variable, rather than a moderator variable (Bruch, Rivet, Heimberg, & Levin, 1997). Suppressor variables can counteract the effects of an independent variable on a dependent variable (MacKinnon, Krull, & Lockwood, 2000). According to this interpretation, social anxiety and alcohol use should be negatively correlated, unless one has developed positive expectancies regarding alcohol use. If one has developed positive expectations, then they will be *more* likely to consume alcohol and this will "cancel out" the negative relationship between social anxiety and alcohol. On the other hand, if one does not have positive expectancies, then the negative relationship between social anxiety and alcohol use should remain intact. Various research findings support suppressor models of alcohol expectancies (e.g., Bruch et al.; Eggleston et al., 2004). If it is the case that socially anxious individuals drink more when they have positive expectancies regarding alcohol use, then it is important to question how and why these expectancies are formed.

Drinking motives have also been examined as a potential variable moderating the relationship between social anxiety and alcohol use. Cooper (1994) described a four-factor model of drinking motives, which included enhancement motives, social motives, coping motives and conformity motives. This four-factor model was tested in a large sample of adolescents and yielded distinct patterns of drinking outcomes for each motive. Enhancement and social motives were positively related to quantity and frequency of alcohol consumption; however they were not directly predictive of alcohol-related problems. In contrast, coping motives and conformity motives were both directly

predictive of alcohol-related problems. Cooper suggests that drinking as a means of avoiding negative experiences (i.e., coping and conformity motives) is more maladaptive and pathological than drinking to experience positive outcomes (i.e., enhancement and social motives). There is evidence to suggest that individuals with social anxiety drink as a means of coping with their social anxiety, which may put them at risk for the later development of alcohol-related problems (e.g., Bruin, Kocovski, & Battista, 2007). Thomas and colleagues (2003) also found that socially anxious individuals were more likely to drink to cope with social interactions rather than performance situations.

Stewart, Morris, Mellings, and Komar (2006) investigated the relationship among specific components of social anxiety (e.g., social avoidance and distress, and fear of negative evaluation), drinking motives, alcohol use and alcohol-related problems. They found that both social avoidance and distress and fear of negative evaluation were positively related to coping and conformity drinking motives. Fear of negative evaluation was also positively correlated with drinking problems. Furthermore, coping and conformity motives mediated the relationship between fear of negative evaluation and drinking problems. These findings further point to the idea that individuals with social anxiety who are using alcohol to cope with their anxiety are at risk for alcohol-related problems. This may also partly explain why clinically, social anxiety disorder often co-occurs with AUD. In assessing an AUD, clinicians look for a variety of problems associated with alcohol use to aid in diagnosis. Thus, socially anxious individuals who initially drink to cope may develop more problems with alcohol use and may then be more likely to be diagnosed with an AUD in the future.

The Current Study

Despite the abundance of research that has examined social anxiety and alcohol use, many questions still remain unanswered. Although it is generally accepted that alcohol helps to reduce social anxiety, the exact mechanisms by which it does so are relatively unknown. The majority of studies have focused on how alcohol acts in the moment (i.e., the time period during which the participant is actually intoxicated) to reduce anxiety in order to investigate predictions made by TRT, SMH, and SRD. More cognitively based theories (AMT and ADM) have also been explored, but again, the focus is on how alcohol affects social anxiety while one is intoxicated. The current study was designed to focus on how alcohol affects cognitive processes that occur after the actual effects of the alcohol have worn off. Specifically, the current study investigated how alcohol would affect levels of rumination in socially anxious individuals.

Rumination is a particular type of post-event processing that is conceptualized as the extent to which one dwells on the emotional consequences of an event. Rumination has been frequently studied in relation to depression (e.g., Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema, 1991). Applied to depression, rumination is conceptualized as a response style that maintains depressive symptoms by not allowing the person to engage in distraction activities that could possibility alleviate the depressive symptoms. Nolen-Hoeksema (2000) found that the tendency to ruminate about depressive symptoms actually predicted the onset of depressive episodes one year later.

It has only been recently that researchers have begun to examine rumination related to social anxiety. It has been found that socially anxious individuals ruminate more than non-socially anxious individuals, following an anxiety-provoking event (Edwards, Rapee, & Franklin, 2003; Mellings & Alden, 2000). Rumination is often used

as a coping strategy by people who are high in social anxiety, whereas distraction is more often used as a coping strategy in people who are low in social anxiety (Kocovski, Endler, Rector, & Flett, 2005). Rumination appears to be self-defeating because it leads socially anxious individuals to dwell on the negative aspects of a social encounter and to expect similar negative outcomes in future social encounters.

One area of research that has not yet been explored is how alcohol affects rumination in socially anxious individuals. Nolen-Hoeksema and Harrell (2002) examined the connection between depressive rumination and alcohol use. Results revealed that increased rumination was associated with increased alcohol use as a coping mechanism. A gender difference also emerged such that longitudinally, rumination predicted alcohol-related problems in women, but not in men. These researchers suggest that ruminators may use alcohol as a means of decreasing their levels of rumination. However, this hypothesis has never been directly tested. The current study used an experimental method to directly examine how alcohol would affect rumination in individuals who are socially anxious.

Based on the findings of Gerlach and colleagues (2006), there is evidence that people with social anxiety may not actually be reducing the negative symptoms of anxiety *during* the social situation (as many current theories suggest), but rather, they are reducing the negative symptoms of anxiety that occur *after* the social situation. Particularly, alcohol consumption may interfere with the processing and subsequent memory of an event, consequently reducing levels of rumination. This reduction in rumination after the social encounter may be reinforcing for the anxious individual and may motivate them to drink alcohol in future social encounters. The current study recruited a sample of individuals high and low in social anxiety. Participants were

assigned to an alcohol or no alcohol condition and then took part in a social interaction. Approximately one week later, participants completed measures of rumination. Four main hypotheses were tested in the current study:

1. Previous research has found inconsistencies regarding the relationship between social anxiety and alcohol use. The current study recruited participants from the community. Although the majority of participants were expected to be university students, it was hoped that a more diverse sample would be obtained. There is support to suggest that social anxiety and alcohol use are positively correlated when examining more diverse populations (e.g., Lewis & O'Neill, 2000). It was also necessary for participants in the current study to have some previous experience with alcohol. This would likely mean that participants had already developed some positive expectancies regarding alcohol use. As described earlier, positive alcohol expectancies tend to counteract the negative relationship between social anxiety and alcohol use that is often found (e.g., Bruch et al., 1997; Eggelston et al., 2004). Therefore, for the current study, it was hypothesized that those in the high anxiety group would show greater levels of typical alcohol use than those in the low anxiety group.

2. There are mixed findings regarding whether alcohol actually reduces state social anxiety during an anxiety-provoking task. Studies have found alcohol to reduce subjective ratings of anxiety during anxiety-provoking tasks (e.g., Abrams et al., 2001; Himle et al., 1999), to have no effect on subjective ratings (e.g., Sayette et al., 2000), and to increase subjective ratings of anxiety (Heinrichs et al., 2006) during an anxiety-provoking task. In general, studies have most often used a performance-based task (i.e., giving a self-disclosing speech) to induce anxiety in participants. The current study used an interaction-based task in order to achieve a more externally valid social situation,

where normally, one may be motivated to drink alcohol. Given that social facilitation motives are commonly cited as reasons for drinking in young adults (Kuntshe, Knibbe, Gmel, & Engels; 2005), it was hypothesized that individuals in the alcohol condition (both high and low anxiety) would feel less anxious during the social interaction than individuals in the no alcohol condition. It was further hypothesized that the high anxiety group would report greater levels of state social anxiety after the social interaction compared to the low anxiety group due to their existing levels of trait social anxiety.

3. Research indicates that individuals with high levels of social anxiety ruminate more than individuals with low levels of social anxiety (e.g., Edwards et al., 2003; Mellings & Alden, 2000). According to cognitive models of social anxiety, rumination serves to maintain social anxiety (Clark & Wells, 1995). Given that in clinical samples, SAD and AUD are often comorbid (Ross, 1995), it is probable that socially anxious individuals use alcohol to cope with their anxiety. The current study sought to examine specifically how alcohol would affect levels of rumination in socially anxious individuals and in non-socially anxious individuals. An interaction was expected between anxiety level and alcohol condition such that socially anxious individuals who consumed alcohol would ruminate less than socially anxious individuals who did not consume alcohol. This effect was not expected in individuals with low levels of social anxiety who tend to report low levels of rumination (e.g., Kocovski et al., 2005) and who likely do not use alcohol to cope with rumination.

4. It was also hypothesized that the valence (positive versus negative) of one's thoughts would differ among conditions. Socially anxious individuals tend to dwell on the negative aspects of a social encounter (Field & Morgan, 2004; Kocovski et al., 2005). Therefore, it was expected that socially anxious individuals would have more negative

thoughts than non-socially anxious individuals following the social interaction. Previously, it has been found that alcohol reduces negative thoughts and increases positive thoughts in patients with social phobia (Abrams, Kushner, & Reinersten, 2002). Consistent with these findings, it was also expected that consuming alcohol would reduce negative thoughts and increase positive thoughts in socially anxious individuals. In low anxiety individuals, similar levels of negative and positive thoughts were expected for those who consumed alcohol and those who did not.

Method

Participants

A total of 209 individuals completed screening interviews for the current study. Of those who completed the screening interview, 79 were not eligible for the study. The majority of individuals ($n = 43$) were not eligible for the study because their SIAS score did not fall into the high or low anxiety range that was required. It was also necessary towards the end of the study to exclude individuals who fell within the low range of anxiety ($n = 17$) because we had already recruited our full low anxiety sample. Other reasons that participants were excluded were: they did not have enough experience with alcohol ($n = 7$), they smoked ($n = 5$), they had a medical condition or were taking medications that would interact with alcohol ($n = 4$), they did not have proper identification ($n = 2$) or they had a drinking problem ($n = 1$).

After screening, there were a total of 130 male participants eligible for the study. Forty-six of these eligible participants cancelled or did not show up on their testing day to complete the study. Eighty participants completed both Part 1 and Part 2 of the study and four participants completed Part 1 of the study, but not Part 2. The majority of participants were students (78%) and ranged in age from 19 to 69 ($M = 22$ years, $SD =$

5.79). Most participants were White (86%), single (94%), had completed some college or university (89%) and lived off-campus with friends (76%). See Table 1 for a full breakdown of the participants' demographics across conditions. Participants did not differ among the four conditions on any of the demographic variables, except for ethnicity, where the high anxiety group had significantly more Asian participants than the low anxiety group, $t(78) = -2.57, p < .05$. This finding is consistent with past research that has found Asian students to self-report greater levels of social anxiety than White students (e.g., Okazaki, 2000).

Materials

Demographic questionnaire. Participants completed a short demographic questionnaire that asked them to indicate their age, living accommodation (e.g., student residence, family home etc.), level of education, marital status, occupational status, and ethnicity (see Appendix A).

Measure of depression. One measure of depression was included in the current study so that depression could be entered as a covariate during the analyses, allowing the effects due to social anxiety to be isolated. The Beck Depression Inventory (BDI; Beck & Steer, 1987) was administered. The BDI contains 21 items and asks participants to choose a statement that best describes how they have been feeling in the past week. Some examples of the areas that are targeted on the BDI include: "loss of pleasure"; "crying"; "self-dislike". Each item is rated on a 4-point scale, with higher scores indicating higher levels of depression. The BDI has demonstrated good validity and reliability when administered to student samples (Dozois, Dobson, & Ahnberg, 1998). See Appendix B for a copy of the BDI.

Table 1.

Demographic Information Across Conditions in Percentages

	High Anxiety		Low Anxiety	
	Alcohol	No Alcohol	Alcohol	No Alcohol
Education Level				
Graduated from high school	10.5	21.1	4.8	9.5
Completed some college or university	63.2	63.2	81.0	66.7
Graduated with undergraduate degree	21.1	15.8	14.3	19.0
Graduated with a PhD				4.8
Graduated from college	5.3			
Living Accommodation				
Student residence	5.3		14.3	4.8
House/apartment/condo with parents			4.8	19.0
House/apartment/condo with friends	89.5	84.2	71.4	61.9
House/apartment/condo with alone		5.3	4.8	9.5
House/apartment/condo with romantic partner	5.3	10.5	4.8	4.8
Marital Status				
Single	94.7	94.7	95.2	90.5
Married	5.3	5.3		
Cohabiting			4.8	4.8
Widowed				4.8
Occupational Status				
Unemployed	5.3	10.5	19.0	14.3
Employed full-time	10.5	5.3		4.8
Employed part-time	5.3		4.8	9.5
Student full-time	73.7	73.7	76.2	71.4
Student part-time	5.3	10.5		
Ethnicity				
White	78.9	68.4	100	95.2
Asian	15.8	26.3		4.8
Other	5.3	5.3		

Measures of trait social anxiety. Two scales were used to measure levels of social anxiety in participants. The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) contains 20 items that ask respondents about their anxiety experienced during social interactions. For example, "I feel tense if I am alone with just one person"; "I find it difficult to disagree with another's point of view"; "I have difficulty making eye-contact with others". Each item is rated on a 5-point scale that ranges from 0 (not at all characteristic or true of me) to 4 (extremely characteristic or true of me). The Social Phobia Scale (SPS; Mattick & Clarke, 1998) is the companion scale to the SIAS, which also contains 20 items, and the same 5-point scale. Items measure anxiety in situations where one is being observed. For example, "I feel awkward and tense if I know people are watching me"; "I am worried people will think my behavior odd"; "I become anxious if I have to write in front of other people". Both the SIAS and SPS have strong reliability and validity (Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992; Mattick & Clarke, 1998). See Appendices C and D for a copy of the SIAS and SPS, respectively.

Measure of state social anxiety. State anxiety was assessed using the Endler Multidimensional Anxiety Scales – State Anxiety (EMAS-S: Endler, Edwards, & Vitelli, 1991). The EMAS-S contains 20 items (e.g., "hands felt moist"; "self-preoccupied"; "feel inadequate") and has participants report on a 5-point scale ranging from 1 (not at all) to 5 (very much) the extent to which they experienced each item during the social interaction that they took part in. The EMAS-S is divided into two, 10-item subscales, cognitive worry (e.g., "distrust myself) and autonomic-emotional (e.g., "have tense feeling in stomach"). In a sample of male undergraduates, Endler and colleagues found internal consistencies of .90 and .85 for the

cognitive-worry and autonomic-emotional scales respectively. Similarly, in adult males, alpha coefficients were .87 and .84 for the two subscales, respectively. See Appendix E.

Measure of trait rumination. It was imperative to measure trait levels of rumination in order to ensure that there were no differences between the alcohol and no alcohol conditions regarding their tendency to ruminate. The Reflection and Rumination Questionnaire- Rumination Scale (RRQ-R; Trapnell & Campbell, 1999) was given to participants to measure trait rumination. The RRQ-R contains 12 items (e.g., "sometimes it is hard for me to shut off thoughts about myself"; "I often find myself reevaluating something I've done") that measure levels of rumination by having participants indicate their level of agreement with each item on a scale ranging from 1(strongly disagree) to 5(strongly agree). The RRQ-R has strong internal consistency (*alpha* =.90) and measures rumination as a unique construct, distinguishable from reflection (see Trapnell & Campbell). See Appendix F for a copy of this questionnaire.

Measure of alcohol use. The Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985) was used to measure how frequently participants drank alcohol and the average quantity that they drank. This questionnaire measures how many standard drinks per hour a participant consumes in a typical week and how much a participant drank per hour during his heaviest drinking week within the last 30 days. The DDQ also has participants report how often they drank during the past month (ranging from "I did not drink at all" to "once a day or more"), how much they drank on a typical weekend evening (ranging from "0 drinks" to "more than 30 drinks") and how much they drank on the occasion that they drank the most during the last month (ranging from "0 drinks" to "more than 30 drinks"). The DDQ has demonstrated high test-retest reliability (.93) when

administered to undergraduate students (Miller et al., 2002). See Appendix G for a copy of the DDQ.

Measures of blood alcohol concentration (BAC). A breathalyzer (Alco-Sensor FST) was used to measure participants' BAC throughout the study. BAC measurements were taken for participants in both the alcohol and the no alcohol condition at seven time points during the study; when they first arrived in the lab to ensure a BAC of 0.00%, after consuming their drinks, half-way through absorption (10 minutes post-drinking), at the end of absorption (20 minutes post-drinking), after the social interaction (1 hour post-drinking), after the movie (3 hours post-drinking), and before leaving the lab (3 to 5 hours post-drinking). If a participant's BAC did not fall to the appropriate level (0.04%) after watching the movie, then further measurements were taken to monitor BAC until it fell to 0.04%. See Appendix H for a copy of the BAC record form.

Measure of subjective intoxication. Ratings of subjective intoxication were taken so that they could be correlated with BAC. Participants in both the alcohol and the control condition completed subjective measures of intoxication at six time points during the study. They were asked to mark on a visual scale how intoxicated they felt, ranging from 1 (completely sober) to 10 (more drunk than ever). Participants rated their level of intoxication after consuming their drinks, half-way through absorption (10 minutes post-drinking), at the end of absorption (20 minutes post-drinking), after the social interaction (1 hour post-drinking), after the movie (3 hours post-drinking), and before leaving the lab (3 to 5 hours post-drinking). These time points coincided with the BAC measurements that were taken, with the exception of the initial BAC measurement to ensure that participants had a BAC of 0.0%. See Appendix I for a copy of this form.

Social interaction questions. Participants took part in a 20 minute, video-taped, social interaction with a confederate. The confederate was trained to pose as a participant in a related study and to appear as though she was giving on-the-spot answers to the social interaction questions. The confederate was actually giving pre-scripted responses to the questions that had been planned in advance. Back-up confederates were also trained and took part in the social interaction when the primary confederate was unable to do so. The back-up confederates used the same responses as the primary confederate. A research assistant blind to the condition that participants were in, rated the confederates on a list of 20 adjectives (e.g., friendly, considerate, cooperative) to ensure that they were consistent across the four conditions. Three videos were unavailable for coding due to a technical error and a Bonferroni correction was used in the analysis. Ratings were very similar across the four conditions on all of the adjectives, indicating that the confederates acted in a similar manner towards all participants. Another rater blind to the condition that participants were in, rated 20% of the videos. Inter-rater reliability was then calculated by correlating all of the first coder's ratings with all of the second coder's ratings and found to be high, $r(320) = .85, p < .01$. The participant and the confederate were given a list of 17 personal questions and were instructed to take turns asking each other the questions and answering them. The questions were developed by Aron, Melinant, Aron, Vallone, and Bator (1997) and have been used widely to study how people interact with members of the same sex (e.g., Kashdan & Roberts, 2004) and with members of the opposite sex (e.g., Aron et al., 1997). The questions are organized into three sections that increase in level of self-disclosure. For the current study, a subset of 17 of the original 36 items were selected to contain a number of questions from each of the three levels of self-disclosure. For example, "Would you like to be famous, why or

why not?" "For what in your life do you feel most grateful?"; "What would constitute a perfect day for you?" The participant and the confederate went through as many of the questions as they could during the 20 minute time frame. On average, participants answered 13 of the questions and there were no differences among the four groups regarding the number of questions that participants answered. See Appendix J for a copy of the social interaction questions.

Measure of rumination. The Post-Event Processing Questionnaire (PEP; Rachman et al., 2000) was designed to measure rumination specific to a target event. In the current study, the target event was the social interaction that the participant took part in during the first part of the study. The PEP contains 13 items that ask participants to mark on a visual scale (ranging from 0 to 100) their thoughts related to aspects of the social interaction. For example, "Did you try to resist thinking about the interaction?"; "Did you ever wish that you could turn the clock back and re-do it- do it again, but do it better?"; "Did thoughts about the interaction ever interfere with your concentration?" This scale has been shown to have good internal consistency and has been shown to correlate with social anxiety (Rachman et al.). A priori, it was decided that three items (items 5, 9 and 10) from the original 13-item scale would be excluded during data analyses because they failed to load onto the single factor solution during the original scale development. It was also decided that item #1 ("how much anxiety did you experience?") would be excluded as this item does not target rumination. Modified versions of the PEP have been used in past research examining rumination (e.g., Kocovski & Rector, in press; McEvoy & Kingsep, 2006). These four items were administered to participants so that means could be compared across studies. See Appendix K for the PEP.

Measure of valence of thoughts. The Thoughts Questionnaire (TQ; Edwards et al., 2003) was used to examine valence of thoughts related to the social interaction. The TQ was created to measure potential recall biases in socially anxious individuals after they had engaged in a speech task. The original version (Edwards et al.) consists of 29 items, 16 negative items and 11 positive items. The current study used a 23-item version of this questionnaire, with six items removed because they were specific to a speech task and not to a social interaction. Furthermore, the wording of some of the original items was altered to be more specific to the social interaction. Of the 23 items, eight items were positive in valence (e.g., "How confident I felt"; "That I was at my best"; "How smoothly it all went."), 13 items were negative in valence (e.g., "What a failure I was"; "I didn't make a good impression"; "I must have looked stupid"), and two items were neutral in valence (e.g., "Other aspects of the situation; "The situation overall"). Participants were asked to rate how often these thoughts crossed their mind during the past week, on a scale ranging from 0 (never) to 4 (very often). The original 29 item TQ has demonstrated good validity (alpha = .70, .94 and .90 for the positive, negative and total scale, respectively). See appendix L.

Procedure

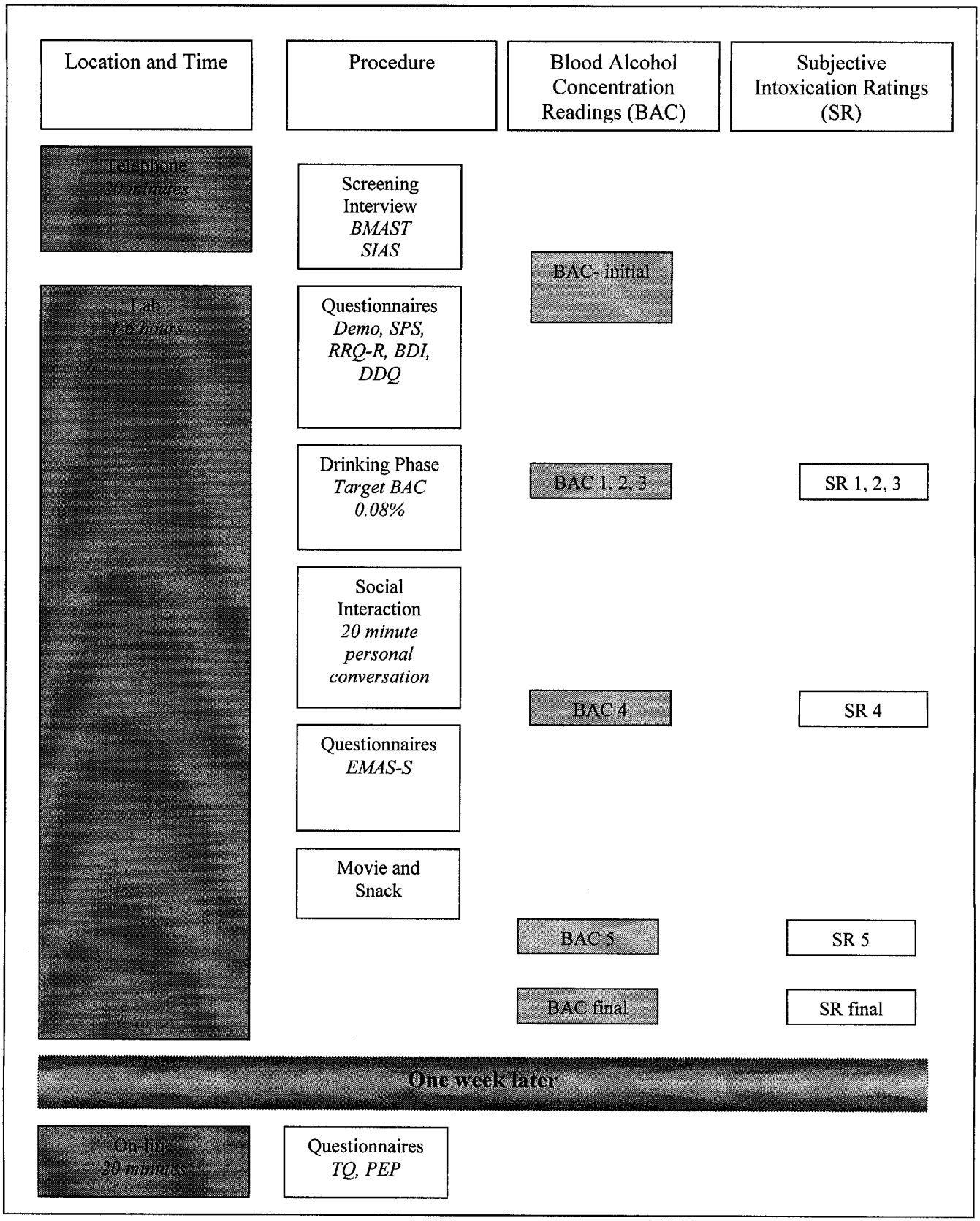
Recruitment and screening. Participants were recruited via flyers (see Appendix M) that were posted on local university and college campuses, bus stops, and telephone poles around the Waterloo region. The flyers contained a brief summary of the study and gave potential participants a contact telephone number and a website that they could visit to learn more about the study. When potential participants visited the website, they could enter their name and contact information so that a researcher could get back to them. Potential participants were contacted and given an initial screening interview to ensure

that they were eligible for the study based on the following inclusion criteria: male, non-smoker, 19 years of age or older with two pieces of identification, some experience with alcohol (defined as having consumed more than two drinks on one occasion at least twice within the past month and having consumed an amount of alcohol to bring one's BAC up to 0.08% or higher at least once in the past year), no problems related to alcohol use [defined as a score of less than six on the Brief Michigan Alcohol Screening Test (BMAST; Pokorny, Miller, & Kaplan, 1972)], and falling within a low or high anxiety range. Cutoff points defining the low and high anxiety range were chosen by examining a recent dataset that used the SIAS. In this dataset, the top third of the sample had a score of 33 or higher and the bottom third of the sample had a score of 21 or lower. This was found to be similar to cutoffs used in past research (e.g., Grant, & Beck, 2006; Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992). However, as the study progressed, there were problems with the recruitment of the high anxiety group, and two participants with a score of 32 on the SIAS were allowed into the study. Once these inclusion criteria were met, a date was arranged for the participant to come into the lab to complete the first part of the study. See Appendix N for a copy of the screening interview.

Part 1: In-lab portion of the study. Figure 1 visually outlines the main steps that were involved in the current study. Participants arrived at the lab on their testing day and were met by the experimenter, who checked identification to ensure participants were 19 or older. An initial breathalyzer was then taken to ensure that the participant's BAC was at 0.0%. Informed consent was then completed with important aspects of the study clearly stated for the participant to understand (see Appendix O). The participant then randomly chose which condition he would be in by taking a slip of paper from an envelope that either said "alcohol" or "no alcohol". The participant's weight and height

Figure 1.

Procedural diagram outlining the main steps of the study.



Note. BMAST = Brief Michigan Alcohol Screening Test; SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; RRQ-R = Reflection and Rumination Questionnaire- Rumination; BDI = Beck Depression Inventory; DDQ = Daily Drinking Questionnaire; EMAS-S = Endler Multi-dimensional Anxiety Scale- State; TQ = Thoughts Questionnaire; PEP = Post-event Processing Questionnaire

were measured so that the experimenter could calculate the proper amount of alcohol to give to participants. The participant then completed the SPS, BDI-II, DDQ, and RRQ-R (order was counterbalanced), while the experimenter mixed the participant's drinks. In the alcohol condition, the goal was to bring the participant's BAC to 0.08%. The amount of alcohol (vodka) to administer was calculated according to the formula proposed by Matthews and Miller (1979; See Appendix P). This formula was chosen based on a review by Hustad and Carey (2005) who found that the Matthews and Miller formula predicted actual BAC more accurately than four other formulas that are commonly used in alcohol research. However, Hustad and Carey also found that despite being the most accurate formula, it still tended to overestimate actual BAC. Pilot testing for the current study also found that the Matthews and Miller formula overestimated BAC. Therefore, it was decided that one standard drink needed to be added to the formula to achieve a BAC closer to 0.08%. The vodka was mixed with orange juice in a 3.5 to 1 ratio of orange juice to vodka. For participants in the no alcohol condition, drinks contained only orange juice (the amount in accordance with the formula). Participants were told during the screening interview not to eat three hours prior to coming in for the study as it was hoped that they would consume their drinks on an empty stomach. Participants were given 20 minutes to consume their drinks and then waited for 20 minutes to allow the alcohol to absorb. BAC measurements and subjective ratings of intoxication were taken immediately after drinking (BAC 1 and SR 1), half-way through the absorption period (BAC 2 and SR 2) and after the absorption period (BAC 3 and SR 3). Participants watched a video while they were drinking and during the absorption period. Once the absorption period ended, participants were told that they would now be taking part in a social interaction with a participant from a related study. They were instructed not to tell

the other participant whether or not they had been drinking alcohol. The experimenter left the lab to go and find the other participant (the confederate). The experimenter brought the confederate into the lab, and had her sit in a chair facing the participant. They were then given the following instructions:

"I'd like you to take part in a 20 minute social interaction. Here is a list of questions that I would like you to ask each other. So (turning to the participant), I would like you to start by asking the first question and then I'd like you (turning to the confederate) to answer and then (turning back to the participant), I would like you to also answer the same question. Then, pass the question sheet over so that you are alternating who is asking the question first. I am going to be video-taping this. Work through as many of the questions as you can and I will stop you when the 20 minutes is up. You may begin now."

When the 20 minutes had elapsed, the experimenter stopped the social interaction and brought the confederate out of the lab. The experimenter then returned to the lab and had the participant take a BAC reading and complete a subjective rating of intoxication (BAC 4 and SR 4). Then, the participant completed the EMAS-S and two other questionnaires that were not used in the current study (order was counterbalanced). Participants then ate a snack and watched a video for approximately two hours. After this time, BAC was measured and a subjective rating was taken (BAC 5 and SR 5). If the participant's BAC was at 0.04% or lower, then they were given a free-recall task (to be used in a related study). If a participants' BAC was not at 0.04% or lower at this time, then they continued to watch videos, while their BAC was monitored and then completed the free-recall task once they reached 0.04%. Once the free-recall tasks were completed, two final BAC readings were taken and a final subjective rating of intoxication was taken

(BAC final and SR final). Furthermore, participants completed three sobriety tests: walking in a straight line, touching their nose with their eyes closed and balancing on one foot with their arms out to the side. Participants were then partially debriefed (see Appendix Q) and given instructions regarding the second part of the study. If participants had consumed alcohol, then they were taken home in a taxi cab.

Part 2: On-line component: Approximately one week (M = 8.7 days, SD = 2.1) after completing the first portion of the study, participants went to the study's website and completed on-line versions of the TQ, PEP, and free-recall task (for a related study). After completing these questionnaires, they were fully debriefed and thanked for their participation (see Appendix R).

Results

Data Screening and Analyses

Data was examined for outliers and three individuals were identified as outliers based on their scores on the main measures. The main analyses were run with these three individuals excluded and no significant differences were found with them excluded. Therefore, in the final analyses, data from these three individuals was retained. Since it was found that significantly more Asian participants were in the high anxiety condition compared to the low anxiety condition, preliminary analyses were run with Asian participants excluded. Again, no differences were found with Asian participants excluded, so they were retained in the final analyses.

Reliability analyses were conducted on all of the main measures used in the current study and all scales demonstrated good reliability (values are summarized in Table 2). As discussed earlier, it was originally decided that a 9-item version of the PEP would be used for the analyses. However, it was necessary to remove one item (item # 3:

Table 2.

Descriptives of Standardized Questionnaires (N = 80)

Questionnaire	Mean	SD	*Alpha*
BDI	7.66	5.48	.83
SIAS	24.89	16.09	.92
SPS	15.27	10.41	.90
RRQ-R	37.55	9.07	.92
EMAS-S	32.19	10.11	.90
PEP- 8 item	158.58	121.51	.79
TQ- positive	14.92	6.55	.88
TQ- negative	9.27	6.82	.89

Note. BDI = Beck Depression Inventory; SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; RRQ-R = Reflection and Rumination Questionnaire- Rumination; EMAS-S = Endler Multidimensional Anxiety Scale- State; PEP = Post-event Processing Questionnaire; TQ = Thoughts Questionnaire.

from the PEP due to a technical error that resulted in 38% of the sample failing to provide a response to this item. Therefore, an 8-item version of the PEP was used in the analyses. This version demonstrated good reliability with an alpha of .79. Since this 8-item version has not been used in previous studies, a factor analysis was carried out. A principal components analysis revealed that all eight items loaded significantly (factor loadings ranging from .38 to .82) onto one factor and accounted for 42.48% of the variance. These results are comparable to the 13-item version of the PEP, where Rachman et al. (2000) report a one-factor solution, accounting for 42.8% of the variance.

Baseline Measures

Table 3 provides a summary of the means and standard deviations for the baseline measures (anxiety, depression, trait rumination, and typical alcohol consumption) and the dependent measures (state anxiety, rumination, positive and negative thoughts) across all four conditions. In order to ensure that there were no differences between the alcohol and no alcohol condition on any of the baseline measures, *t*-tests were run. None of the *t*-tests were significant, indicating that participants were comparable on each of the baseline measures across the alcohol and no alcohol conditions. See table 4 for a summary of the baseline measures across the alcohol and no alcohol condition.

Participants were then compared on each baseline measure across the high and low anxiety conditions using *t*-tests. The high anxiety group had significantly higher levels of social anxiety, $t(78) = -18.49$, $p < .001$, depression $t(78) = -3.32$, $p < .01$, and trait rumination $t(78) = -5.15$, $p < .001$, than the low anxiety group. Table 5 provides a summary of the means and standard deviations for each of these measures.

Table 3.

Measures Across All Four Conditions (N = 80)

	High Anxiety				Low Anxiety			
	Alcohol (n = 19)		No Alcohol (n = 19)		Alcohol (n = 21)		No Alcohol (n = 21)	
Questionnaire	Mean	SD	Mean	SD	Mean	SD	Mean	SD
BDI	10.85	6.19	8.58	6.22	6.43	4.40	5.18	3.35
SIAS	41.32	8.07	38.79	7.55	10.43	5.87	11.90	6.44
SPS	24.16	12.73	18.88	7.50	9.46	6.57	9.76	5.85
RRQ-R	43.00	8.58	41.63	6.88	34.05	9.49	32.41	6.45
DDQ-	14.18	9.35	12.26	12.48	16.62	10.47	17.76	12.91
EMAS-S	39.73	12.03	36.26	9.40	27.62	5.32	26.24	6.07
PEP- 8 item	240.6	147.78	182.56	112.12	112.47	75.90	108.76	99.07
TQ-negative	13.89	7.04	10.89	6.69	7.37	5.96	5.52	4.72
TQ- positive	13.78	4.99	14.63	5.39	15.71	7.00	15.45	8.34

Note. BDI = Beck Depression Inventory; SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; RRQ-R = Reflection and Rumination Questionnaire- Rumination; DDQ = Daily Drinking Questionnaire- drinks per week. EMAS-S = Endler Multi-dimensional Anxiety Scale- State; PEP = Post-event Processing Questionnaire; TQ = Thoughts Questionnaire.

Table 4.

Baseline Measures Across Alcohol and No Alcohol Condition

	Alcohol (n = 40)		No Alcohol (n = 40)			
Measure	Mean	SD	Mean	SD	t	p
BDI	8.53	5.71	6.79	5.15	-1.43	.16
SIAS	25.10	17.08	24.68	15.25	-.12	.91
SPS	16.44	12.33	14.09	8.05	-1.01	.32
RRQ-R	38.30	10.03	36.79	8.06	-.74	.46
DDQ-drinks/week	15.46	9.90	15.15	12.85	-.12	.90

Note. BDI = Beck Depression Inventory; SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; RRQ-R = Reflection and Rumination Questionnaire- Rumination; DDQ = Daily Drinking Questionnaire.

Table 5.

Baseline Measures Across High Anxiety and Low Anxiety Condition

	High Anxiety (n = 38)		Low Anxiety (n = 42)			
Measure	Mean	SD	Mean	SD	t	p
BDI	9.72	6.23	5.80	3.91	-3.32	.002
SIAS	40.05	7.81	11.17	6.13	-18.49	.000
SPS	21.52	10.65	9.61	6.15	-6.04	.000
RRQ-R	42.32	7.70	33.23	8.06	-5.15	.000
DDQ-drinks/week	13.22	10.92	17.19	11.62	1.57	.121

Note. BDI = Beck Depression Inventory; SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; RRQ-R = Reflection and Rumination Questionnaire- Rumination; DDQ = Daily Drinking Questionnaire.

Blood Alcohol Concentration and Subjective Ratings of Intoxication

Participants in the alcohol condition had an average BAC of 0.066% (ranging from 0.038% to 0.095%) when they took part in the social interaction. Average BAC readings at the five time points were compared across the high anxiety and low anxiety condition using *t*-tests. It was found that BAC readings did not differ significantly between the low and high anxiety conditions at any of the time points (see Table 6). A series of *t*-tests were then conducted to compare subjective ratings of intoxication between the high and low anxiety condition at each of the five time points. As can be seen in Table 7, the high anxiety group had higher subjective ratings of intoxication at all time points throughout the study. At time point three, which was taken before participants took part in the social interaction, there was a trend showing that the high anxiety participants rated themselves as more intoxicated than the low anxiety participants, $t(78) = -1.97, p = .06$. A significant difference in subjective ratings of intoxication was found at time point four, which was taken immediately after participants took part in the social interaction, $t(78) = -2.45, p < .05$, indicating that the high anxiety group rated themselves as more intoxicated after the social interaction than the low anxiety group. Significant differences in subjective ratings of intoxication were not found at any other time point. It was also found that within the alcohol condition, subjective ratings of intoxication did not significantly correlate with BAC readings at any of the time points (correlations ranged from -.05 to .25).

Table 6.

Comparison of Blood Alcohol Readings Across High and Low Anxiety Participants

	High Anxiety (n = 19)		Low Anxiety (n = 21)			
Time Point	Mean	SD	Mean	SD	t	p
Reading 1 Post-drinking	.104	.037	.096	.036	-.63	.53
Reading 2 Mid-absorption	.067	.015	.063	.014	-.95	.35
Reading 3 Before social interaction	.070	.014	.063	.017	-1.46	.15
Reading 4 After social interaction	.073	.016	.066	.018	-1.44	.16
Reading 5 After movie	.048	.012	.045	.020	-.53	.60

Table 7.

Comparison of Subjective Ratings Across High and Low Anxiety Participants

	High Anxiety (n = 19)		Low Anxiety (n = 21)			
Time Point	Mean	SD	Mean	SD	t	p
Rating 1 Post-drinking	5.39	2.12	4.42	2.22	-1.41	.17
Rating 2 Mid-absorption	5.52	1.87	4.42	2.17	-1.71	.10
Rating 3 Before social interaction	5.36	1.74	4.13	2.18	-1.97	.06
Rating 4 After social interaction	4.39	2.04	2.85	1.93	-2.45	.02
Rating 5 After movie	1.44	1.33	1.03	0.95	-1.14	.26

Hypotheses

1. Social anxiety and typical alcohol consumption

It was hypothesized that individuals in the high anxiety group would report greater levels of alcohol consumption than individuals in the low anxiety group. In order to gain a better understanding of the drinking patterns of the current sample, the number of drinks that participants reported drinking in a typical week was calculated. A *t*-test comparing the high and low anxiety participants revealed no significant differences between high anxiety participants ($M = 13.22$, $SD = 10.92$) and low anxiety participants ($M = 17.19$, $SD = 11.62$) regarding the amount that they typically drank. Similarly, social anxiety (as measured with the SIAS and with the SPS) and average drinks per week were not significantly correlated, indicating that one's social anxiety level was not associated with typical alcohol consumption. Similar results were found when examining the number of drinks that participants reported consuming in their heaviest drinking week.

2. Effect of anxiety and alcohol on state social anxiety.

It was hypothesized that high anxiety individuals would experience greater levels of state social anxiety during the social interaction as compared to low anxiety individuals. It was also hypothesized that alcohol would lead to reduced state social anxiety in both high and low anxiety participants. State anxiety levels (as measured by the EMAS-S) were compared across the four conditions. Depression was entered as a covariate since it was found that the high anxiety group had significantly higher levels of depression than the low anxiety group. A main effect for anxiety was found on EMAS-S total scores, $F(1, 75) = 21.11$, $p < .001$, indicating that those in the high anxiety condition had greater levels of state social anxiety ($M = 38.00$, $SD = 10.80$) after the social interaction than those in the low anxiety condition ($M = 26.93$, $SD = 5.68$). An interaction

was not found and a main effect was not found for alcohol condition, indicating that alcohol did not reduce levels of state social anxiety. See Table 8 for a summary of these findings. The two subscales of the EMAS-S were then examined. A main effect for anxiety was found for the cognitive-worry subscale of the EMAS, $F(1, 75) = 20.81, p < .001$, and the automatic-emotional subscale of the EMAS-S, $F(1, 75) = 12.27\ p < .01$. Scores on the EMAS-S were also significantly correlated with how anxious participants reported feeling during the interaction when asked approximately one week later using item #1 from the PEP ("How much anxiety did you experience?"), $r(78) = .58, p < .01$. Item #6 ("heart beats faster") from the EMAS-S was examined separately to determine if alcohol had an effect on self-reported heart rate after the social interaction. Depression was not entered as a covariate in the analysis. A main effect was found for anxiety, $F(1, 76) = 3.93, p = .05$, indicating that those in the high anxiety condition experienced a greater increase in heart rate compared with those low in anxiety. No main effect was found for alcohol condition on this item and no interactions were found.

3. Effect of anxiety and alcohol on rumination

An interaction was hypothesized between anxiety level and alcohol condition such that high anxiety individuals would show decreased levels of rumination if they consumed alcohol compared with high anxiety individuals who did not consume alcohol. This effect was not expected in low anxiety individuals. An analysis of variance was conducted comparing levels of rumination (as measured with the PEP- 8 item) across the four conditions. Trait rumination and depression were entered as covariates during the analyses since baseline differences were found on these variables between the high and low anxiety participants. There was a trend towards a main effect for anxiety, $F(1, 74) = 3.59, p = .06$, such that those high in anxiety ($M = 211.59$, $SD = 132.68$) ruminated more

Table 8.

Effect of Trait Anxiety and Alcohol on State Anxiety

Source	*df*	*F*	η^2	*p*
		Between subjects		
Depression	1	9.11*	.11	.003
Anxiety (An)	1	21.11**	.22	.000
Alcohol (Al)	1	.63	.01	.429
An × Al	1	.18	.00	.674
Error	75	(65.41)		

Note. Values enclosed in parentheses represent mean square errors.
* $p < .01$. ** $p < .001$.

than those low in anxiety ($M = 110.61$, $SD = 87.18$). See Table 9 for a summary of these findings. This trend became significant when depression and rumination were not included as covariates, $F(1, 76) = 16.61$, $p < .001$. No main effects were found for alcohol condition and no interactions were found. It was also found that rumination (as measured with the PEP- 8 item) was strongly correlated with state social anxiety (as measured with the EMAS-S), $r(78) = .63$, $p < .01$.

4. Effect of anxiety and alcohol on thoughts.

It was hypothesized that high anxiety participants would report a greater number of negative thoughts related to the social interaction compared to low anxiety participants. It was also hypothesized that alcohol would decrease negative thoughts and increase positive thoughts in both high and low anxiety individuals. Analyses of variance were used to examine each subscale (positive and negative) of the TQ, across the four conditions. Trait rumination and depression were entered as covariates during the analyses. No main effects or interactions were found on the positive subscale. A main effect for anxiety was found on the negative subscale $F(1, 74) = 4.65$, $p < .05$, indicating that those high in anxiety ($M = 12.39$, $SD = 6.94$) had more negative thoughts related to the social interaction than those low in anxiety ($M = 6.45$, $SD = 5.39$). No main effects were found for alcohol condition and no interactions were found. See Table 10 for a summary of these findings.

Further analyses: Predicting rumination

In order to gain a better understanding of the data set, some exploratory analyses were conducted. Based on the finding that BAC readings were not correlated with subjective ratings of intoxication in the alcohol group, the impact of subjective ratings of intoxication on rumination was also examined. In order to do this, participants were

Table 9.

Effect of Anxiety and Alcohol on Rumination

Source	*df*	*F*	η^2	*p*
		Between subjects		
Depression	1	.45	.01	.504
Trait Rumination	1	7.58*	.09	.007
Anxiety (An)	1	3.59	.05	.062
Alcohol (Al)	1	.77	.01	.383
An × Al	1	1.34	.02	.250
Error	74	(10694.28)		

Note. Values enclosed in parentheses represent mean square errors.
* $p < .01$.

Table 10.

Effect of Anxiety and Alcohol on Negative Thoughts

Source	*df*	*F*	η^2	*p*
		Between subjects		
Depression	1	.02	.00	.878
Trait Rumination	1	10.81**	.13	.002
Anxiety (An)	1	4.65*	.06	.034
Alcohol (Al)	1	2.37	.03	.128
An × Al	1	.241	.00	.625
Error	74	(32.54)		

Note. Values enclosed in parentheses represent mean square errors.
* $p < .05$. ** $p < .01$.

divided into two categories based on their subjective ratings of intoxication prior to the social interaction. Participants who gave a subjective rating below 4.9, were considered the "less intoxicated" participants ($n = 21$) and participant who gave a subjective rating above 4.9 were considered the "more intoxicated" participants ($n = 19$). An analysis of variance was then conducted examining the effects of this newly formed category and anxiety condition on rumination. Depression and rumination were entered as covariates. A main effect was found for anxiety condition, $F(1, 34) = 5.05, p < .05$, indicating that the high anxiety participants ruminated more than the low anxiety participants. No main effect was found for subjective intoxication category and no interactions were found. Similar results were found using negative thoughts as the dependent variable. Results were similar when depression and rumination were excluded as covariates.

It was also found that some individuals in the alcohol condition reached their peak BAC after they had engaged in the social interaction as opposed to before. This required further investigation as the design was such that the peak BAC should have been reached prior to engaging in the social interaction. In order to explore this further, participants in the alcohol condition were divided into a group that reached their peak BAC before the interaction ($n = 18$) and a group that reached their peak BAC after the interaction ($n = 22$). An analysis of variance was then conducted examining the effect of "peak" condition and anxiety condition on rumination, with depression and trait rumination entered as covariates. A main effect was found for anxiety condition, $F(1, 34) = 5.55, p < .05$, indicating that those in the high anxiety condition ruminated more than those in the low anxiety condition. No main effect was found for peak category and no interactions were found. Similar results were found using negative thoughts as the dependant variable.

Similar results were also found without depression and trait rumination entered as covariates.

Since no analyses revealed any main effects for alcohol, groups were collapsed across the alcohol and no alcohol condition in order to investigate the high and low anxiety groups in more detail. More specifically, the primary aim of these analyses was to examine state and trait anxiety as predictors of post-event rumination, first using correlational analyses and then using hierarchical regression analyses, as there have been conflicting findings in recent research (Kocovski & Rector, in press; McEvoy & Kingsep, 2006). Correlations among the main measures for the low anxiety and for the high anxiety participants are presented in Table 11. In the low anxiety group, trait anxiety (as measured with the SPS) and state anxiety were positively correlated with rumination and negative thoughts, indicating that as both trait and state anxiety increased, individuals ruminated more and had more negative thoughts related to the social interaction. Similarly, in the high anxiety group, trait and state anxiety were also positively correlated with rumination and negative thoughts. However, for high anxiety participants, trait rumination was also positively correlated with rumination and negative thoughts. Hierarchical regression analyses were conducted to examine whether state anxiety accounted for additional variance in the prediction of post-event rumination beyond that of the trait variables. In the high anxiety condition, trait social anxiety (SPS) was entered as a first step in the regression, followed by trait rumination (RRQ-R), and then followed by state anxiety (EMAS-S). In the first step, trait anxiety accounted for 23.3% of the variance in rumination, $F(1, 36) = 10.92$, $p < .05$. In the second step, trait rumination accounted for 10.2% of additional variance in rumination beyond trait anxiety, *F Change* $(1, 35) = 5.39, p < .05$

Table 11.

Intercorrelations Among Main Variables for Low and High Anxiety Participants

	BDI	SIAS	SPS	RRQ-R	DDQ	EMAS	TQ-pos	TQ-neg	PEP
BDI	-	.44**	.38*	.48**	.04	.40*	-.18	.23	.31
SIAS	.26	-	.62**	.60**	.02	.25	.04	.36*	.34
SPS	.46**	.56**	-	.40*	.08	.35*	.10	.47**	.48*
RRQ-R	.57**	.40**	.52**	-	-.06	.36*	.26	.50**	.49*
DDQ	-.26	.18	.04	-.05	-	.10	.07	.22	.14
EMAS	.22	.35*	.33*	.35*	.12	-	.18	.61**	.55*
TQ-pos	.25	-.05	.01	.14	.01	-.17	-	.41*	.29
TQ-neg	.17	.33*	.38*	.31*	.11	.42**	.33*	-	.68*
PEP	.19	.25	.35*	.28	-.12	.49**	.14	.44**	-

Note. Correlations for the high anxiety group are presented above the diagonal and correlations for the low anxiety group are presented below the diagonal. BDI = Beck Depression Inventory; SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; RRQ-R = Reflection and Rumination Questionnaire- Rumination; DDQ = Daily Drinking Questionnaire (average drinks per week); EMAS-S = Endler Multi-dimensional Anxiety Scale- State; TQ = Thoughts Questionnaire; PEP = Post-event Processing Questionnaire (8-item version)
** $p < .01$. * $p < .05$.

In the final step, it was found that state anxiety accounted for 11.4% of additional variance, beyond what was predicted by trait anxiety and trait rumination, *F Change* (1, 34) = 7.03, $p < .01$. This final model explained a significant proportion of the variance in rumination, $R^2 = .45$, $F(1, 34) = 9.23$, $p < .001$. For the low anxiety group, the same regression analysis was conducted, entering trait social anxiety (SPS) as the first step, followed by trait rumination (RRQ-R), and then followed by state anxiety (EMAS-S). Similar to the high anxiety condition, it was found that in step 1, trait anxiety accounted for 12.3% of the variance in rumination, $F(1, 40) = 5.63$, $p < .05$. In the second step, trait rumination did not account for additional variance beyond trait anxiety. In the final step, it was found that state anxiety accounted for an additional 15.5% of the variance in rumination beyond what was predicted by trait anxiety and trait rumination, *F Change* (1, 38) = 7.52, $p = .01$. This final model explained a significant proportion of the variance in rumination, $R^2 = .28$, $F(1, 38) = 4.87$, $p = .01$. See Tables 12 and 13 for a summary of these regression analyses for high and low anxiety participants, respectively.

Discussion

The current study examined a number of hypotheses regarding the relationship between social anxiety and alcohol use. Socially anxious and non-socially anxious participants were randomly assigned to an alcohol or no alcohol condition. Participants then took part in an anxiety-provoking social interaction with a female confederate. Approximately one week later, participants completed measures of rumination specific to the social interaction that they had taken part in. An interaction between anxiety condition and alcohol condition was expected. It was predicted that high anxiety participants would report lower levels of rumination if they consumed alcohol during the social interaction compared with high anxiety participants who did not consume alcohol.

Table 12.

Summary of Hierarchical Regression Analysis for Variables Predicting Rumination in High Anxiety Participants (n = 38)

Variable	*B*	*SE B*	β
Step 1			
Trait social anxiety (SPS)	6.01	1.82	.48**
Step 2			
Trait social anxiety (SPS)	4.28	1.87	.34*
Trait rumination (RRQ-R)	6.01	2.59	.35*
Step 3			
Trait social anxiety (SPS)	3.12	1.78	.25
Trait rumination (RRQ-R)	4.37	2.47	.25
State social anxiety (EMAS-S)	4.58	1.73	.37*

Note. $R^2 = .23$ for Step 1; $\Delta R^2 = .10$ for Step 2 ($p < .05$); $\Delta R^2 = .11$ for Step 3 ($p < .05$); SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; RRQ-R = Reflection and Rumination Questionnaire- Rumination; EMAS-S = Endler Multi-dimensional Anxiety Scale- State.
* $p < .05$. ** $p < .01$.

Table 13.

Summary of Hierarchical Regression Analysis for Variables Predicting Rumination in Low Anxiety Participants (n = 42)

Variable	*B*	*SE B*	β
Step 1			
Trait social anxiety (SPS)	4.98	2.10	.35*
Step 2			
Trait social anxiety (SPS)	4.05	2.48	.29
Trait rumination (RRQ-R)	1.36	1.89	.13
Step 3			
Trait social anxiety (SPS)	2.92	2.33	.21
Trait rumination (RRQ-R)	.23	1.80	.02
State social anxiety (EMAS-S)	6.31	2.30	.41**

Note. $R^2 = .12$ for Step 1; $\Delta R^2 = .16$ for Step 3 ($p < .05$); SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; RRQ-R = Reflection and Rumination Questionnaire- Rumination; EMAS-S = Endler Multi-dimensional Anxiety Scale- State.
* $p < .05$. ** $p < .01$.

Differences in rumination were not expected for low anxiety participants whether they consumed alcohol or not. It was also hypothesized that both high and low anxiety participants who consumed alcohol would have fewer negative thoughts and more positive thoughts related to the social interaction compared with participants who did not consume alcohol. Contrary to what was hypothesized, alcohol was not found to have an effect on levels of rumination or on thoughts related to the social interaction. Main findings indicated that social anxiety level was most strongly related to rumination and to negative thoughts related to the social interaction, such that high anxiety participants exhibited more rumination and more negative thoughts than low anxiety participants.

Overall, the results of the current study are consistent with cognitive models of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997) that discuss rumination as a maintenance factor in social anxiety. In the current study, it was found that high anxiety participants had higher levels of trait rumination than low anxiety participants. Furthermore, high anxiety participants experienced greater levels of rumination specific to the social interaction one week later compared to low anxiety participants. High anxiety participants also had more negative thoughts than low anxiety participants about the social interaction one week later. These findings are consistent with past research, which has found socially anxious individuals to ruminate more than non-socially anxious individuals (Mellings & Alden, 2000; Rachman et al., 2000). These findings also support research indicating that recall is negatively biased in those who are socially anxious (Field & Morgan, 2004). Lundh and Sperling (2002) found that social anxiety was correlated with rumination specific to negative-evaluational events, but not with socially distressing events in general. Contrary to this finding, the current study found that high social anxiety individuals ruminated more than low anxiety participants after an event

that was not negative-evaluational in nature. Furthermore, the current study found that trait social anxiety correlated positively with trait rumination in the high anxiety participants, indicating that in general, increased anxiety is associated with increased rumination. Findings from the current study also support the notion that socially anxious individuals experience rumination that is specific to social failures, and not depressive symptoms. At baseline, participants' levels of depression were correlated with their levels of trait rumination. However, depression failed to correlate with rumination specific to the anxiety-provoking social interaction one week later. Taken together, these findings support previous research (e.g., Kocovski & Rector, in press), which indicates that while rumination may be common in both depression and in social anxiety, the content of the rumination is diagnostically specific.

Relationship between social anxiety and alcohol consumption.

It was hypothesized that the high anxiety group would show greater levels of typical alcohol consumption than the low anxiety group. This hypothesis was not supported, but rather, it was found that those high in anxiety had less (although not significantly less) experience with alcohol compared to those low in anxiety. This was found when examining both typical alcohol consumption (number of drinks in a typical week) and heavy alcohol consumption (number of drinks in a heavy week). As stated previously, there have been mixed findings regarding the relationship between social anxiety and alcohol use. Clinically, social anxiety disorder (SAD) and alcohol use disorder (AUD) often co-occur (Grant et al., 2004; Kessler et al., 1997; Ross, 1995). Although the high anxiety participants in the current study had levels of social anxiety comparable to those found in clinical samples (e.g., Mattick & Clarke, 1998), the sample did not represent a true clinical sample. It is unknown whether any of the participants had

a formal diagnosis of SAD and/or AUD as this was not directly asked. However, due to the screening process, it is unlikely that a large number of the participants would have had either of these disorders. Participants were excluded if they were taking any medications that would interact with alcohol and/or if they had any medical conditions that would prohibit them from drinking. This reduced the likelihood of recruiting individuals with SAD as psychotropic medications prescribed for SAD interact with alcohol. Furthermore, individuals were excluded if they had any problems related to alcohol use (making AUD unlikely).

In student samples, negative correlations between social anxiety and alcohol use are often found (e.g., Eggleston, et al., 2004; Ham & Hope, 2005; Myers, Aarons, & Tomlinson, 2003; Tran et al., 1997). The majority of participants (78%) in the current study were students, and it is possible that a negative relationship between social anxiety and alcohol use would have been found if more participants were recruited. For example, in the study conducted by Eggleston and colleagues, a correlation of -.12 was found between scores on the SIAS and average number of days per week one consumed alcohol. This correlation is identical to what was found in the current study when looking at SIAS scores and average number of drinks per week one consumed. However, the correlation was not statistically significant in the current study because of its limited sample size. Furthermore, negative relationships between social anxiety and alcohol use are often accounted for by moderating/suppressing variables. Although third variables were not specifically measured in the current study, the results are consistent with suppressor models of social anxiety and alcohol use (Bruch et al., 1997). In order to be eligible for the current study, it was necessary for participants to have some experience with alcohol. Hence, the sample did not include people who abstained from alcohol.

Many of the past researchers who have found a negative relationship between social anxiety and alcohol use point out that this is because socially anxious individuals who hold negative alcohol expectancies often avoid social situations where alcohol is present (Bruch et al.; Eggleston et al., 2004). The current sample would have excluded these avoidant individuals. According to suppressor models of social anxiety and alcohol use, positive alcohol expectancies lead socially anxious individuals to consume alcohol in social situations rather than avoid them. Tran and colleagues found that positive alcohol expectancies predicted drinking habits independent of social anxiety. It is likely then, that the current sample consisted of individuals who held positive alcohol expectancies and drank more than typical high anxiety individuals.

One finding that requires further speculation is that high anxiety participants who consumed alcohol had significantly higher subjective ratings of intoxication after the social interaction than low anxiety participants who consumed alcohol. Although BAC readings were slightly higher at all time points for the high anxiety participants, none of these differences reached significance. Similarly, subjective ratings were also higher for the high anxiety participants at each time point, but it was not until after the social interaction that this difference became especially prominent. This illustrates the importance of the psychological effects that alcohol can have on individuals. It is possible that high anxiety participants interpreted some of their anxious symptoms during the social interaction as being due to alcohol and hence, rated themselves as more intoxicated. This provides a potential possibility for explaining why some socially anxious individuals may find alcohol reinforcing, while others may not. Future studies could investigate how socially anxious individuals interpret the experience of being intoxicated. For example, if socially anxious individuals consistently interpret their

symptoms of anxiety (e.g., increased heart rate, speech impairments) as being due to the effects of alcohol, then this may reinforce using alcohol as it would lead individuals to conclude that alcohol reduced their anxious symptoms. On the other hand, if socially anxious individuals interpret the symptoms of intoxication as being due to their anxiety, then this would not reinforce using alcohol as it would lead individuals to conclude that alcohol increased their anxious symptoms.

Effect of alcohol on self-reported state social anxiety.

It was expected that alcohol would reduce state social anxiety in both the low and high social anxiety groups. This was not supported as state social anxiety did not differ between the alcohol and no alcohol groups. This result is surprising as it is not consistent with predictions made by TRT, SMH, and SRD, which postulate that alcohol should reduce state anxiety. It is clear that this finding was not due to the social interaction failing to provoke anxiety in individuals as differences in state anxiety were found when comparing the high and low anxiety participants. One may also argue that the measure of state anxiety was not reliable. Again, this is unlikely as the EMAS-S has been widely used and found to have good psychometric properties (see Endler et al., 1991). Furthermore, in the current study, state social anxiety scores were found to correlate highly with participants' reports one week later of how much anxiety they experienced during the social interaction. However, as discussed earlier, there have been mixed findings regarding subjective reports of anxiety after one has consumed alcohol. For example, Sayette and colleagues (2000) found that alcohol reduced physiological measures of anxiety (e.g., heart rate) and cognitive responses to stress (e.g., decreased reaction times to stressful stimuli). However, they did not find alcohol to have an effect on subjective reports of social anxiety. This could indicate that while alcohol is leading to

some decreased stress responses, it may not be changing one's *perceived* level of stress or anxiety. Since the current study did not administer any physiological measures of anxiety, it is impossible to determine if alcohol reduced other stress responses that may have been beyond the participant's awareness. The EMAS does, however, include a question that asks participants about their heart rate (item 6: heart beats faster). This question was analyzed separately to investigate if alcohol had an effect on participants' self-reported heart rate. No differences emerged for this item, indicating that participants who consumed alcohol did not perceive their heart rate to decrease more than participants who did not consume alcohol. Future research is needed in this area to explore the connection between physiological anxiety reduction and psychological anxiety reduction.

The finding that self-reported state anxiety was not affected by alcohol may also be accounted for by Alcohol Myopia Theory (Steele & Josephs, 1990), which predicts that alcohol will only reduce anxiety if individuals are not paying attention to their anxious symptoms. This provides an interesting direction for future research, which could examine self-focused attention as a third variable influencing the connection between alcohol and state anxiety. In the current study, it could be speculated that participants were actually forced to pay attention to their anxiety by completing the EMAS immediately after the social interaction. Future research could delay administering measures of state social anxiety to ensure that participants are not forced to think about their anxious symptoms, but rather can engage in distraction if they so choose.

It is also important to point out that the majority of the studies which have examined alcohol's effects on state social anxiety have used a performance-based anxiety provoking task (e.g., Abrams et al., 2001, Abrams, et al., 2002). Moreover, in studies that do use an interaction-based task, the situation is often set up to be more of a performance

than an interaction. For example, many researchers (e.g., Abrams & Wilson, 1979; Burke & Stephens, 1997; Lipscomb et al., 1980) had participants sit across from an opposite-gendered confederate and talk for several minutes about themselves, while the confederate listened and did not respond. Participants were also told that the confederate (who they believed was another participant) would be rating them later based on how good of an impression they made. While this type of task has some elements in common with what was used in the current study (e.g., use of an opposite-gendered confederate, sitting in a chair, and having the participant disclose personal information), it is fundamentally different. The interaction task for the current study was designed to be a more naturalistic social interaction similar in some respects to what one may encounter during a social event. The interaction involved having both the participant and the confederate disclose personal information to each other. While the task was very specific (i.e., they had to ask each other a specific list of questions), it still required thinking of what to say on the spot. Participants in the current study were also not told that they would be evaluated on their interaction and had no reason to believe that they should make a good impression (other than their natural desire to do so or the presence of a video camera). Furthermore, the confederates in the current study were very warm and supportive of the participants, and often gave positive feedback to the participants' responses. Based on these differences, it is hard to compare the current findings to past studies that have used an interaction-based task. It should be noted, however, that Wilson and Abrams (1977) found that alcohol led to a marginally significant decrease in self-reported state anxiety in a sample of male social drinkers who took part in an interaction with a female confederate. Future research is needed to explore how different types of anxiety provoking tasks are affected by alcohol. It may be the case that individuals

engaging in performance-based tasks are more sensitive to alcohol's tension reducing effects, whereas interaction-based tasks are less sensitive to alcohol's effects. Another key component may be the belief that one is going to be evaluated. This belief may result in greater levels of anxiety (particularly in those who fear negative evaluation) and alcohol may help these individuals to excuse poor performances on the effects of alcohol (e.g., a self-handicapping effect). Himle and colleagues (1999) examined self-reports of anxiety at three time points while a sample of social phobics took part in a speech task. Half of the participants received alcohol, while the other half received a placebo that they were led to believe was alcohol. Results revealed that subjective ratings of anxiety did not differ between the alcohol and the placebo group, where the general pattern was that anxiety increased in anticipation of the speech, peaked during the speech, and then decreased after the speech. In order to help interpret these findings further, Himle and colleagues divided participants into two groups based on whether or not participants actually *believed* that they had received alcohol. These "believers" and "non-believers" were then compared on their ratings of state anxiety, and on their cognitions related to the speech task. It was found that the believers had greater levels of state anxiety in anticipation of the speech task, but then had a smaller increase in anxiety when they actually had to do the speech compared with the non-believers. Moreover, it was also found that the believers had fewer negative cognitions after the speech than the non-believers. Taken together, the researchers suggested that these results may be due to self-handicapping and blaming alcohol for performance deficits, rather than feeling personally responsible.

The current study also explored how alcohol affected self-reported social anxiety approximately one week after participants took part in the social interaction. As was

mentioned earlier, Heinrichs et al. (2006) found that alcohol led to increased state anxiety during a social interaction, but then found that state anxiety decreased when measured three days after the interaction. This finding was not replicated in the current study. Alcohol did not lead to decreased self-reports of state anxiety one week later. It should be noted, however, that state anxiety was not measured with the same questionnaire that was used immediately after the social interaction, but rather, this analysis was conducted using one item from the PEP (item 1: how much anxiety did you experience?). Therefore, these results should be interpreted with caution as they need to be further investigated with other measures of state anxiety one week later.

Effect of alcohol on rumination and on valence of thoughts

An interaction was hypothesized between anxiety level and alcohol condition such that those high in social anxiety would ruminate less if they consumed alcohol than if they did not consume alcohol, whereas those low in social anxiety would have similar levels of rumination whether they consumed alcohol or not. This interaction was not supported, indicating that those with high levels of social anxiety showed similar levels of rumination whether they consumed alcohol or did not consume alcohol. This hypothesis was also examined using subjective ratings of intoxication to divide participants into two levels of intoxication (those who were less intoxicated and those who were more intoxicated). Differences in rumination were not found between the less intoxicated and more intoxicated group, again indicating that alcohol did not affect levels of rumination. It was also hypothesized that alcohol would lead individuals to have more positive thoughts and fewer negative thoughts related to the social interaction. This was not supported. Individuals had similar levels of positive thoughts related to the social interaction whether they were drinking or not. Similar levels of positive thoughts were

also found between the high and low anxiety condition. In regards to negative thoughts, alcohol was not found to have an effect on negative thoughts related to the social interaction. However, an effect was found for anxiety such that those high in social anxiety had more negative thoughts than those low in anxiety. There are a number of possible reasons for these findings. Firstly, it is difficult to determine if the results regarding rumination were due to the lack of differences in state anxiety between the alcohol and no alcohol group or if alcohol truly does not have an effect on rumination. It is possible that because of the strong connection between state social anxiety and rumination, alcohol must first lead to changes in state anxiety in order for it to have an effect on rumination. Therefore, because the current study did not find alcohol to have an effect on state anxiety levels, it is difficult to state conclusively that alcohol does not affect rumination. It should also be noted that when examining the mean differences on the PEP, alcohol appears to be leading to increased rumination in high anxiety participants. This is opposite to what was hypothesized and is consistent with what was found by Battista and Kocovski (2006) where increased self-reported alcohol use at a social event was positively correlated with increased rumination after that event. Another possibility is that the nature of the task resulted in less rumination than other types of tasks may have elicited. Lundh and Sperling (2002) found that levels of social anxiety were correlated with rumination after negative-evaluational events, but not socially distressing events in general. While the current study did find that those high in social anxiety ruminated more than those low in social anxiety, it is possible that alcohol may only affect rumination after specific types of social events. A key component in predicting rumination after alcohol use may be whether the individual felt that he or she was being evaluated negatively. If individuals believe that they were evaluated

negatively, then they may be able to use alcohol as an excuse for their negative evaluation, and hence, this may lead to decreased rumination. Future research is necessary to explore this possibility.

Further analyses were also conducted to investigate which factors predicted rumination in the low and in the high anxiety condition. It has been found in previous research that both trait anxiety and state social anxiety following an anxiety-provoking task correlate positively with rumination. There are mixed findings, however, as to whether trait or state anxiety is more predictive of rumination For example, Kocovski and Rector (in press) found that trait anxiety was the most stable predictor of rumination related to two separate anxiety-provoking tasks. State anxiety helped predict rumination beyond trait anxiety, but only when the SIAS was used as the measure of trait anxiety (as opposed to the SPS which targets performance-related anxiety). On the other hand, McEvoy and Kingsep (2006) found that trait anxiety (as measured with the SIAS) did not correlate with rumination, whereas state anxiety was highly correlated with rumination. These researchers concluded that state anxiety was more predictive of rumination than trait anxiety. In the current study, a strong correlation between state anxiety and rumination was found. Furthermore, consistent with McEvoy and Kingsep, regression analyses revealed that state social anxiety was more predictive of rumination than trait social anxiety in low anxiety participants. This effect however, was not found in high anxiety participants, where both trait and state anxiety were predictive of rumination Depression was also examined as a potential predictor of rumination in the high anxiety condition. Inconsistent with findings reported by Kocovski and Rector (in press) who examined a clinical sample, depression did not predict rumination in the current study. Kocovski and Rector also found that rumination was stable across two separate anxiety-

provoking tasks. The current study did not find trait levels of rumination to be predictive of rumination specific to an anxiety-provoking task. These findings are interesting and warrant further investigation. It may be the case that clinical samples differ from student samples with regards to which factors predict rumination. Trait measures may be more significant in clinical samples, where individuals are more affected by their elevated levels of depression and rumination. Whereas state measures may be more significant in student samples, where day to day encounters may play a more prominent role in rumination.

Limitations and Future Directions

The current study had a number of limitations. Participants were self-selected, which has a number of implications for the current study. Regarding anxiety levels, it could be argued that those with extremely high levels of social anxiety would not be comfortable enough to voluntarily take part in a study of this nature. This, however, was not found to be the case. Mean levels of social anxiety as measured with both the SIAS and SPS were comparable to means obtain by Mattick and Clarke (1998) in a sample of social phobics. Thus, a sample of high anxiety participants was successfully obtained. However, as discussed earlier, this sample of anxious participants likely represents individuals who are less avoidant and more accepting of their social anxiety. It could also be argued that self-selection resulted in a sample of participants who drank more than average. There are two reasons that this is not supported. Firstly, only one individual was excluded during the screening interview because he had problems related to alcohol use. Secondly, participants in the current study reported drinking patterns similar to what has been found in other studies (e.g., Murphy, McDevitt-Murphy, & Barnett, 2005).

The current study was also limited in that it only used male participants. The rationale for recruiting males was based on both practical and theoretical reasons. Studies using female participants require pregnancy testing prior to the administration of alcohol. There was also research indicating that males would be more prone to the anxiety reducing effects of alcohol than females. For example, Abrams and Kushner (2004) found that men who held tension-reduction alcohol expectancies reported less anxiety after a speech task when they thought that they were consuming alcohol than men with low tension-reduction expectancies. This relationship was not found in women, suggesting that men may be particularly sensitive to alcohol's ability to reduce tension/anxiety. Furthermore, Abrams and Wilson (1979) found that alcohol (or a placebo) actually increased physiological measures of anxiety (e.g., heart rate, and skin conductance) and self-reported anxiety in a sample of females who interacted with a male confederate. Hence, as an initial study, it was decided that males would provide a solid groundwork on which future studies could then build on with the inclusion of female participants.

Along similar lines, the sample was also limited in that is was relatively homogeneous. Most participants were White, university students. As mentioned earlier, it was found that more Asian participants were in the high anxiety condition compared to the low anxiety condition. It would be interesting to investigate ethnic differences related to how alcohol affects state anxiety and rumination as there is evidence to indicate that Asian Americans experience social situations differently than European Americans (Lee, Okazaki, & Yoo, 2006). Moreover, there is research indicating that rumination is predicted differently in Asian Canadian and White Canadian participants (Kocovski & Rector, 2007).

A further limitation was the lack of an expectancy or placebo condition. Again, there were practical and theoretical reasons for this decision. The inclusion of an expectancy condition would have required recruiting 40 additional participants. It has also been found that at BACs of greater than 0.06%, participants are no longer fooled by the placebo beverages (Rohsenow & Marlatt, 1981). For the current study, it was determined that achieving a BAC of 0.08% would be more comparable to levels that one would normally achieve drinking in a naturalistic setting (e.g., Hustad & Carey, 2004). This points to another potential limitation, however, in that participants had no choice in the amount of alcohol that they could consume during the study. It is unknown whether participants would have decided to consume alcohol knowing that they were about to engage in a social interaction. In a study conducted by Abrams and colleagues (2002), when participants were given a choice, most decided not to consume alcohol before giving a speech, but rather, they chose to consume alcohol after giving the speech. It would be interesting in future research to explore what factors (e.g., type of task, motivations and expectancies) lead one to voluntarily consume alcohol before an anxiety-provoking task. It would also be interesting to explore how different amounts of alcohol affect levels of rumination. For example, high doses of alcohol may lead one to black out and not remember information from when they were intoxicated. One could then explore how memory affects rumination. It is also interesting to note that actual BAC readings did not correlate with subjective ratings of intoxication in the current study. This is consistent with past research indicating that individuals are inaccurate when estimating their actual levels of intoxication (e.g., Kraus et al., 2005). This further emphasizes the need for research to look at both physical and psychological effects of alcohol with the inclusion of an expectancy group.

The inclusion of more questionnaires would also have been informative for the current study. In particular, a questionnaire examining alcohol expectancies would have allowed further investigation into how alcohol affects individuals with social anxiety who hold various alcohol expectancies. It would have also been helpful to have another measure of rumination as it was necessary to exclude a number of items from the PEP.

Future research is needed to explore the relationship between social anxiety and alcohol use. For example, some studies (e.g., Lewis & O'Neill, 2000) have found a positive relationship between social anxiety and alcohol-related problems as opposed to actual patterns of alcohol use. This suggests that socially anxious individuals may have different experiences with alcohol, even if they are drinking similar amounts. Along similar lines, the current study found that individuals high in social anxiety reported greater levels of subjective intoxication after they took part in an anxiety-provoking interaction compared to individuals low in social anxiety. This result needs further investigation as the two groups did not actually differ in BAC level, however, socially anxious individuals may subjectively experience intoxication differently than non-socially anxious individuals, which may contribute to more alcohol-related problems.

Results from the current study also revealed that alcohol did not have an effect on state anxiety or rumination for high or low anxiety participants. This emphasizes the need for future research in this area as high comorbidity between SAD and AUD does imply a connection between social anxiety and alcohol. As mentioned previously, future research should explore how alcohol affects different types of anxiety-provoking tasks. More specifically, individuals may be more likely to use alcohol as an excuse for negative outcomes in negative-evaluational tasks. This type of research would also necessitate the inclusion of an expectancy condition as a self-handicapping effect would be

psychologically based, not physically based. Future research could also explore how the process of rumination changes over time. It is possible that alcohol affects rumination differentially depending on how recently the event took place. For example, the one-week time frame that was used in the current study may have been too long for participants to accurately reflect on their experience.

Implications

Results from the current study are consistent with cognitive models of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997) and have many clinical applications. The current study highlights the importance of rumination as a cognitive process that is closely linked to social anxiety. It is essential that clinicians target rumination during therapy in order to help individuals with social anxiety. Clark and Wells (1995) suggested eliminating rumination all together as a means of helping those with social anxiety. However, research does not support thought suppression as an effective technique for individuals with social anxiety. For example, Koster, Rassin, Crombez, and Naring (2003) had students suppress their anxious thoughts regarding an upcoming painful shock that they believed they would be receiving. Findings indicated that thought suppression resulted in decreased anxiety during the thought suppression stage compared to those in a non-suppression group. However, afterwards, when participants were free to think about anything, anxious thoughts and self-reported anxiety increased for the suppression group, whereas anxious thoughts and self-reported anxiety decreased for the non-suppression group. As an alternative to thought suppression, acceptance-based strategies have been found to successfully reduce negative affect and anxious symptoms for those with social anxiety (e.g., Campbell-Sills, Barlow, Brown, & Hofmann, 2006). There have also been a number of recent treatments that have

incorporated acceptance and mindfulness components into therapy. Mindfulness is conceptualized as paying attention in the moment, in a manner that is non-judgmental (Kabat-Zinn, 2003). There is evidence to indicate that being both more accepting and more mindful can lead to decreases in rumination (e.g., Jain et al., 2007; Ramel, Goldin, Carmona, & McQuaid, 2004). More specifically, mindfulness and acceptance-based group therapy has been found to reduce rumination in socially anxious individuals (Kocovski, Fleming, & Rector, 2006).

A further implication regarding alcohol use in general also emerged from the current study. Results support that individuals are poor judges of how intoxicated they actually are at a given moment. It is therefore, imperative that individuals use extreme caution when deciding to drive after drinking. Furthermore, establishments that serve alcohol should make Breathalyzers available to customers so that they can more accurately assess their level of intoxication.

The current findings also suggest that the common belief that alcohol reduces social anxiety may be false or it may be limited to specific types of situations. There are direct clinical applications for this finding as well. Socially anxious individuals may believe that they are using alcohol as a coping mechanism for their anxious symptoms. Challenging these beliefs and having individuals actually report on their anxious symptoms after alcohol consumption may help to eliminate the use of alcohol as a coping mechanism. Furthermore, the finding that alcohol does not lead to decreased rumination or fewer negative thoughts disputes the belief that individuals can "drink their worries away."

Summary

The current study investigated a number of factors related to social anxiety and alcohol use. High and low anxiety participants were randomly assigned to an alcohol or no alcohol condition and consumed an amount of alcohol to bring their BAC to approximately 0.08%. Participants then took part in a social interaction and a measure of state social anxiety was administered immediately afterwards. One week-later, participants completed measures of rumination. Results revealed that high anxiety participants and low anxiety participants did not have significantly different patterns of typical alcohol use, although the high anxiety participants typically reported consuming fewer drinks/week than the low anxiety participants. High anxiety participants experienced greater levels of state social anxiety after the social interaction compared to low anxiety participants. High anxiety participants also experienced greater levels of rumination and more negative thoughts related to the social interaction one week later. Regarding alcohol, it was found that alcohol did not lead to decreases in state social anxiety in high or low anxiety participants. Furthermore, alcohol did not affect levels of rumination following the social interaction in high or low anxiety participants. Taken together, these findings point towards the need to further investigate the connection between social anxiety and alcohol use.

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Appendix A: Demographic Questionnaire

What is your age? _____

What is the *highest* level of education that you have completed? (check only one)

Completed part of high school ☐
Graduated from high school ☐
Completed some college or university ☐

Graduated from university:
Undergraduate degree ☐
Masters degree ☐
PhD ☐
Other professional degree (e.g., medical, law) ☐
Graduated from college ☐

What is your current living accommodation?

In a student residence ☐
House/apartment/condo with parents ☐
House/apartment/condo with friends ☐
House/apartment/condo alone ☐
House/apartment/condo with a romantic partner ☐
House/apartment/condo with a romantic partner and children ☐
Other_____
(please specify)

What is your marital status?

Single ☐ Married ☐ Cohabiting ☐

Separated ☐ Divorced ☐ Widow ☐

What is your occupational status?

Unemployed ☐ Employed-full time ☐ Employed-part time ☐

Student- full time ☐ Student-part time ☐ Other _____
(please specify)

What is your ethnicity?

White/Caucasian ☐ Asian ☐ Black/African-Canadian ☐

Native Canadian ☐ Hispanic ☐ Other _____

Appendix B: Beck Depression Inventory-II

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past week, including today.** Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3. I am so sad or unhappy that I can't stand it.

2. Pessimism
- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse

3. Past Failure
- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

4. Loss of Pleasure
- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings
- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time

6. Punishment Feelings
- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

7. Self-Dislike
- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

8. Self-Criticalness
- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes
- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

10. Crying
- 0 I don't cry anymore than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

(BDI-II cont.)

11. Agitation
0 I am no more restless or wound up than usual.
1 I feel more restless or wound up than usual.
2 I am so restless or agitated that it's hard to stay still.
3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest
0 I have not lost interest in other people or activities.
1 I am less interested in other people or things than before.
2 I have lost most of my interest in other people or things.
3 It's hard to get interested in anything.

13. Indecisiveness
0 I make decisions about as well as ever.
1 I find it more difficult to make decisions than usual.
2 I have much greater difficulty in making decisions than I used to.
3 I have trouble making any decisions.

14. Worthlessness
0 I do not feel I am worthless.
1 I don't consider myself as worthwhile and useful as I used to.
2 I feel more worthless as compared to other people.
3 I feel utterly worthless.

15. Loss of Energy
0 I have as much energy as ever.
1 I have less energy than I used to have.
2 I don't have enough energy to do very much.
3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern
0 I have not experienced any change in my sleeping pattern.
1a I sleep somewhat more than usual.
1b I sleep somewhat less than usual.
2a I sleep a lot more than usual.
2b I sleep a lot less then usual
3a I sleep most of the day.
3b I wake up 1-2 hours early and can't get back to sleep.

17. Irritability
0 I am no more irritable than usual.
1 I am more irritable than usual.
2 I am much more irritable than usual.
3 I am irritable all the time.

18. Changes in Appetite
0 I have not experienced an change in my appetite.
1a My appetite is somewhat less than usual.
1b My appetite is somewhat greater than usual.
2a My appetite is much less than before.
2b My appetite is much greater than usual.
3a I have no appetite at all.
3b I crave food all the time.

19. Concentration Difficulty
0 I can concentrate as well as ever.
1 I can't concentrate as well as usual.
2 It's hard to keep my mind on anything for very long.
3 I find I can't concentrate on anything.

20. Tiredness or Fatigue
0 I am no more tired or fatigued than usual.
1 I get more tired or fatigued more easily than usual.
2 I am too tired or fatigued to do a lot of the things I used to do.
3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex
0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.

Appendix C: Social Interaction Anxiety Scale (SIAS)

For each question, please check a number to indicate the degree to which you feel the statement is characteristic or true of you. The rating scale is as follows:

0 = Not at all characteristic or true of me
1 = Slightly characteristic or true of me
2 = Moderately characteristic or true of me
3 = Very characteristic or true of me
4 = Extremely characteristic or true of me

1. I get nervous if I have to speak with someone in authority (teacher, boss).

2. I have difficulty making eye-contact with others.

3. I become tense if I have to talk about myself or my feelings.

4. I find difficulty mixing comfortably with the people I work with.

5. I find it easy to make friends of my own age.

6. I tense-up if I meet an acquaintance on the street.

7. When mixing socially, I am uncomfortable.

8. I feel tense if I am alone with just one person.

9. I am at ease meeting people at parties, etc.

10. I have difficulty talking with other people.

11. I find it easy to think of things to talk about.

12. I worry about expressing myself in case I appear awkward.

13. I find it difficult to disagree with another's point of view.

14. I have difficulty taking to attractive persons of the opposite sex.

15. I find myself worrying that I won't know what to say in social situations.

16. I am nervous mixing with people I don't know well.

17. I feel I'll say something embarrassing when talking.

18. When mixing in a group, I find myself worrying I will be ignored.

19. I am tense mixing in a group.

20. I am unsure whether to greet someone I know only slightly.

Appendix D : Social Phobia Scale

For each question, please circle a number to indicate the degree to which you feel the statement is characteristic or true of you.

	Not at all	Slightly	Moderately	Very	Extremely
1. I become anxious if I have to write in front of other people.	0	1	2	3	4
2. I become self-conscious when using public toilets.	0	1	2	3	4
3. I can suddenly become aware of my own voice and of others listening to me.	0	1	2	3	4
4. I get nervous that people are staring at me as I walk down the street.	0	1	2	3	4
5. I fear I may blush when I am with others.	0	1	2	3	4
6. I feel self-conscious if I have to enter a room where others are already seated.	0	1	2	3	4
7. I worry about shaking or trembling when I'm watched by other people.	0	1	2	3	4
8. I would get tense if I had to sit facing other people on a bus or a train.	0	1	2	3	4
9. I get panicky that others might see me faint or be sick or ill.	0	1	2	3	4
10. I would find it difficult to drink something in a group of people.	0	1	2	3	4
11. It would make me feel self-conscious to eat in front of a stranger in a restaurant.	0	1	2	3	4
12. I am worried people will think my behaviour odd.	0	1	2	3	4
13. I would get tense if I had to carry a tray across a crowded cafeteria.	0	1	2	3	4
14. I worry I'll lose control of myself in front of other people.	0	1	2	3	4
15. I worry I might do something to attract the attention of other people.	0	1	2	3	4
16. When in an elevator, I am tense if people look at me.	0	1	2	3	4
17. I can feel conspicuous standing in a line.	0	1	2	3	4
18. I can get tense when I speak in front of other people.	0	1	2	3	4
19. I worry my head will shake or nod in front of others.	0	1	2	3	4
20. I feel awkward and tense if I know people are watching me.	0	1	2	3	4

Appendix E: Endler Multidimensional Anxiety Scales – State

EMAS-S

For each of the following 20 items, please use the 5-point scale to indicate:

How did you feel during the social interaction?

		NOT AT ALL ⟷				VERY MUCH
1.	Hands feel moist	1	2	3	4	5
2.	Distrust myself	1	2	3	4	5
3.	Breathing is irregular	1	2	3	4	5
4.	Unable to focus on task	1	2	3	4	5
5.	Have tense feeling in stomach	1	2	3	4	5
6.	Heart beats faster	1	2	3	4	5
7.	Feel helpless	1	2	3	4	5
8.	Unable to concentrate	1	2	3	4	5
9.	Perspire	1	2	3	4	5
10.	Fear defeat	1	2	3	4	5
11.	Mouth feels dry	1	2	3	4	5
12.	Self-preoccupied	1	2	3	4	5
13.	Feel uncertain	1	2	3	4	5
14.	Feel tense	1	2	3	4	5
15.	Feel inadequate	1	2	3	4	5
16.	Hands feel unsteady	1	2	3	4	5
17.	Feel flushed	1	2	3	4	5
18.	Feel self-conscious	1	2	3	4	5
19.	Feel incompetent	1	2	3	4	5
20.	Feel lump in throat	1	2	3	4	5

Appendix F: RRQ

For each of the statements, please indicate your level of agreement or disagreement by circling one of the scale categori under each statement. Use the scale as shown below.

1.My attention is often focused on aspects of myself I wish I'd stop thinking about.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

2. I always seem to be rehearsing in my mind recent things I've said or done.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

3. Sometimes it is hard for me to shut off thoughts about myself.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

4. Long after an argument or disagreement is over with, my thoughts keep going back to what happened.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

5. I tend to "ruminate" or dwell over things that happen to me for a really long time afterward.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

6. I don't waste time rethinking things that are over and done with.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

7. Often I'm playing back over in my mind how I acted in a past situation.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

8. I often find myself reevaluating something I've done.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

9. I never ruminate or dwell on myself for very long.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

10. It is easy for me to put unwanted thoughts out of my mind.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

11. I often reflect on episodes in my life that I should no longer concern myself with.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

12. I spend a great deal of time thinking back over my embarrassing or disappointing moments.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Appendix G: Daily Drinking Questionnaire (DDQ)

STANDARD DRINK CONVERSION

When asked how much you drink in the following questions use this chart.

ONE STANDARD DRINK IS EQUAL TO:

BEER (3-5% alcohol) — 12 oz. Can or Bottle

BEER (8%-12% alcohol) — 1/2 of a 12 oz. Can or Bottle

WINE (12 – 17% alcohol) — 5oz. Glass

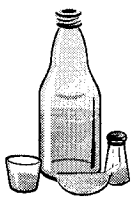
WINE Cooler — 10 oz. Bottle

HARD LIQUOR
Standard Shot
(80-proof, 40% alcohol) — 1-1/2 oz. or One

WINE: 1 Bottle

25 oz. (12 – 17% alcohol) = 5 standard drinks
40 oz. (12 – 17% alcohol) = 8 standard drinks
25 oz. (20% alcohol or more)= 8 standard drinks

HARD LIQUOR: 1 Bottle



12 oz. = 8 standard drinks
25 oz. = 17 standard drinks
40 oz. = 27 standard drinks

DDQ (Daily Drinking Questionnaire)

Gender: Male_____ Female_____ **Height** _____' _____"**Weight**_____ lbs.

INSTRUCTIONS FOR RECORDING DRINKING DURING A TYPICAL WEEK

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

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

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

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

INSTRUCTIONS FOR RECORDING DRINKING FOR YOUR HEAVIEST DRINKING WEEK

IN THE CALENDAR BELOW, PLEASE FILL-IN YOUR DRINKING RATE AND TIME DRINKING DURING YOUR **HEAVIEST DRINKING WEEK** IN THE LAST **30 DAYS.**

First, think of your *heaviest drinking week* in the last *30 days*. (Where did you live? What were your regular weekly activities? Where you working or going to school? Etc.)

Try to remember as accurately as you can, *how much* and for *how long* did you drink during your *heaviest drinking week* in that one month period?

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

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

Drinking Quantity/Frequency Index

1. **How often did you drink during the last *month*?** (check one)

I did not drink at all.

About once a month.

Two to three times a month.

Once or twice a week.

Three to four times a week.

Nearly every day.

Once a day or more.

2. **Think of a typical weekend evening** (Friday or Saturday) during the last ***month***.. How **much** did you drink on that evening? (check one)

0 drinks	8 drinks	16 drinks	24 drinks
1 drink	9 drinks	17 drinks	25 drinks
2 drinks	10 drinks	18 drinks	26 drinks
3 drinks	11 drinks	19 drinks	27 drinks
4 drinks	12 drinks	20 drinks	28 drinks
5 drinks	13 drinks	21 drinks	29 drinks
6 drinks	14 drinks	22 drinks	30 drinks
7 drinks	15 drinks	23 drinks	more than 30 drinks

3. **Think of the occasion** (any day of the week) **you drank the most** during the last ***month***. How **much** did you drink? (check one)

0 drinks	8 drinks	16 drinks	24 drinks
1 drink	9 drinks	17 drinks	25 drinks
2 drinks	10 drinks	18 drinks	26 drinks
3 drinks	11 drinks	19 drinks	27 drinks
4 drinks	12 drinks	20 drinks	28 drinks
5 drinks	13 drinks	21 drinks	29 drinks
6 drinks	14 drinks	22 drinks	30 drinks
7 drinks	15 drinks	23 drinks	more than 30 drinks

Appendix H: Blood Alcohol Readings

Portion of Experiment	Time	BAC
1. Initial *Must be at 0.0%*		
2. Post Drinking (20 minutes)		
3. Halfway through Absorption (30 minutes		
4. Finished Absorption (40 minutes) *Should be around 0.08%*		
5. After Social Interaction		
6. After the Movie		
Readings 7-10 are only done if the participant has not reached 0.04% after the movie		
7. After the Movie (15 minutes)		
8. After the Movie (30 minutes)		
9. After the Movie (45 minutes)		
10. After the Movie (60 minutes)		
11. Before Leaving the Lab 1 *Must be at 0.04% or lower for both readings*		
12. Before Leaving the Lab 2 *Must be at 0.04% or lower for both readings*		

Appendix I: Subjective Ratings of Alcohol Intoxication

Please indicate how drunk you feel by placing a tick mark at the appropriate place along the line provided. A rating of 1 indicates that you feel completely sober, while a rating of 10 indicates that you feel more drunk than you have ever felt before.

Post Drinking: (Time:)

1----------10

Halfway through absorption: (Time:)

1----------10

Finished Absorption: (Time:)

1----------10

After the Social Interaction: (Time:)

1----------10

After the movie: (Time:)

1----------10

Before leaving the lab: (Time:)

1----------10

Appendix J: Social Interaction Questions

1. Given the choice of anyone in the world, whom would you want as a dinner guest?
2. Would you like to be famous? In what way?
3. For what in your life do you feel most grateful?
4. If you could wake up tomorrow having gained any one quality or ability, what would it be?
5. What do you value most in a friendship?
6. What, if anything, is too serious to be joked about?
7. Your house, containing everything you own, catches fire. After saving your loved ones and pets, you have time to safely make a final dash to save any one item. What would it be? Why?
8. Complete this sentence: "I wish I had someone with whom I could share..."
9. Tell your partner something that you like about them already.
10. If you knew that in one year you would die suddenly, would you change anything about the way you are now living? Why?
11. If you were able to live to the age of 90 and retain either the mind or body of a 30-year-old for the last 60 years of your life, which would you want?
12. What would constitute a "perfect" day for you?
13. If a crystal ball could tell you the truth about yourself, your life, the future, or anything else, what would you want to know?
14. Is there something that you've dreamed of doing for a long time? Why haven't you done it?
15. What is the greatest accomplishment of your life?
16. What does friendship mean to you?
17. If you were going to become a close friend with your partner, please share what would be important for him or her to know.

Appendix K: Post-Event Processing Questionnaire (PEP)

Please respond to the following items **focusing on the social interaction that you took part in during the first part of this study**. Place a mark along the scale for each item.

1. How much anxiety did you experience?

   0 ——— 100

2. After you left the lab, did you find yourself thinking about the social interaction a lot?

   0 ——— 100

3. Did your memories and thoughts about the social interaction keep coming into your head even when you did not wish to think about it again?

   0 ——— 100

4. Did the thoughts about the social interaction ever interfere with your concentration?

   0 ——— 100

5. Were the thoughts/memories about the social interaction ever welcome to you?

   0 ——— 100

6. Did you find it difficult to forget about the social interaction?

   0 ——— 100

7. Did you try to resist thinking about the social interaction?

   0 ——— 100

8. If you did think about the social interaction, over and over again, did your feelings about it get worse and worse?

   0 ——— 100

9. If you did think about the social interaction, over and over again, did your feelings about it get better and better?

   0 ——— 100

10. If you did think about the social event, did you see it from your point of view, or how other people would view it?

    0 ——— 100
    yours other people

11. Did you ever wonder about whether you could have avoided or prevented your behaviour/feelings during the social interaction?

    0 ——— 100

12. Did you ever wish that you could turn the clock back and re-do it - do it again, but do it better?

    0 ——— 100

13. As a result of the social interaction, do you now avoid similar events; did this social interaction reinforce a decision to avoid similar situations?

    0 ——— 100

Appendix L: Thoughts Questionnaire (TQ)

Please rate each statement as to how often you **thought** about each aspect over the week **since the social interaction that you took part in during the first part of this study**. Please focus on the social interaction while you are responding.

		Not Never	Often	Sometimes	Often	Very Often
1.	The social interaction went well.	0	1	2	3	4
2.	I could have done much better	0	1	2	3	4
3.	How anxious I felt	0	1	2	3	4
4.	The other person liked me	0	1	2	3	4
5.	If my blushing/sweating/dry mouth/blinking was obvious	0	1	2	3	4
6.	How well I handled it	0	1	2	3	4
7.	How bad the interaction went	0	1	2	3	4
8.	I made a fool of myself	0	1	2	3	4
9.	How much I enjoy these situations	0	1	2	3	4
10.	How I always do badly in this type of situation	0	1	2	3	4
11.	I must have looked stupid	0	1	2	3	4
12.	How smoothly it all went	0	1	2	3	4
13.	How self-conscious I felt	0	1	2	3	4
14.	What a failure I was	0	1	2	3	4
15.	How many mistakes I made	0	1	2	3	4
16.	How confident I felt	0	1	2	3	4
17.	I came across as self-assured	0	1	2	3	4
18.	How awkward I felt	0	1	2	3	4
19.	That I was at my best	0	1	2	3	4
20.	How fast my heart was pounding	0	1	2	3	4
21.	I didn't make a good impression	0	1	2	3	4
22.	Other aspects of the situation	0	1	2	3	4
23.	The situation overall	0	1	2	3	4

Appendix M: Recruitment Flyer

Participate in Research

- We are currently looking for **males, aged 19 and older,** to take part in a study examining the relationship between anxiety and alcohol use

- For participating in the study, you will be compensated $20 and be entered into a draw for a $30 gift certificate to a local restaurant

- As part of the study, you may have to consume alcohol

- The researchers involved in this study are Dr. Nancy Kocovski and Susan Battista, Department of Psychology, Wilfrid Laurier University

- If you are interested, please contact the researchers via telephone or visit our website to learn more

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Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006	Research study 884-0710 x 2587 www.wlu.ca/alstudy2006

Appendix N: Screening Interview

1. Are you a male? Yes ☐ No ☐

If participant responds "no", tell her that at this time, we are only recruiting male participants. Remind her that the information she provided during this interview will be destroyed. Thank her and say goodbye.

2. Are you 19 years of age or older? Yes ☐ No ☐

(Tell them now that they will have to bring proof of age to the study and will not be able to participate if they cannot show 2 pieces of ID, which must consist of a driver's license, passport, birth certificate or citizenship care stating that they are 19 years or older)

If participant responds "no, or does not have the proper ID, tell him that because the study involves consuming alcohol, anyone under the age of 19 cannot be used in the study. Remind him that the information he provided during this interview will be destroyed. Thank him and say goodbye.

3. Are you a smoker? Yes ☐ No ☐

If a participant responds "yes", tell him that the study takes approximately 4 hours, and no outdoor breaks are permitted during this time. Therefore, for his own comfort, smokers are not eligible for the study. Remind him that the information he provided during this interview will be destroyed. Thank him and say goodbye.

4. As part of the study, you will have to drink orange juice.

Are you allergic to orange juice? Yes ☐ No ☐

If a participant responds "yes", tell him that we are only using orange juice in the study and therefore, for his own safety, he is not eligible for the study. Remind him that the information he provided during this interview will be destroyed. Thank him and say goodbye.

5. As part of the study, you may have to drink vodka.

Are you allergic to vodka or have you ever had any bad experiences specifically with vodka? Yes ☐ No ☐

If a participant responds "yes", explain to him that we are only using vodka in the study and therefore, for his own safety, he is not eligible for the study. Remind him that the information he provided during this interview will be destroyed. Thank him and say goodbye.

6. Have you had some experience with alcohol, which we define as having consumed more than 2 alcoholic beverages on one occasion, at least twice within the last month? Yes ☐ No ☐

If a participant responds "no", explain to him that we are looking for people who have had some experience with alcohol, and therefore, he is not eligible for the study. Remind him that the information he provided during this interview will be destroyed. Thank him and say goodbye.

7. Have you at some time in the past year, consumed an amount of alcohol to bring your blood alcohol concentration to 0.08%. Yes ☐ No ☐

a. This is equivalent to approximately 4-5 cans of beer
b. 4-5, 5 oz glasses of wine
c. one bottle of wine
d. or 4-5 mixed drinks made with 1 shot of hard liquor

If a participant responds "no", explain to him that we are recruiting people who have consumed an amount of alcohol equivalent to what he would be receiving during the study. Therefore, for his own safety, he is not eligible for this study. Remind him that the information he provided during this interview will be destroyed. Thank him and say goodbye.

8. Are you currently taking any medications that you know may interact with alcohol? For example: Yes ☐ No ☐

Amphetamines	**(stimulant medications)**
Analgesics/narcotics	**(pain killers, morphine, Demerol, etc)**
Antianginal preps.	**(medication to treat heart/chest pain)**
Antibiotics	
Anticoagulants	**(drugs to reduce blood clotting)**
Anticonvulsants	**(to reduce seizures; eg dilantin, nefazedone, valproate)**
Antidepressants	**(Prozac; Zoloft)**
Antidiabetic drugs	
Antihistamines	**(stop allergy symptoms)**
Antihypertensive drugs	**(drugs to lower blood pressure)**
Diuretics	**(used to reduce bodily fluids – diet pills, for example)**
Penicillin	
Sedative-hypnotics	**(benzodiazepines or barbiturates, "tranquilizers", sleeping pills; Valium)**

If a participant responds "yes" to any of these medications, explain to him that his medication may interact with alcohol and therefore, he is not eligible for the study. Remind him that the information he provided during this interview will be destroyed. Thank him and say goodbye.

9. Do you have any medical conditions that prohibit you from drinking alcohol? For example: Yes ☐ No ☐

Peripheral vascular disorder	**(narrowing or clogging of arm/leg arteries)**
Hypertension	**(high blood pressure)**
Gastrointestinal disorder	**(ulcers, irritable bowel syndrome)**
Neurological disorder	**(epilepsy, parkinson's disease, anything known)**
Pulmonary disease	**(bronchitis, emphysema)**
Cardiac disease	**(any known heart condition)**
Arterial disease	**(clogged arteries)**
Diabetes	
Seizure disorder	**(epilepsy)**
Liver disease.	**(hepatitis, hemochromatosis)**

If a participant responds "yes" to any of these medical conditions, explain to him that for safety reasons, he is not eligible for the study. Remind him that the information he provided during this interview will be destroyed. Thank him and say goodbye.

➢ Now administer the Brief Michigan Alcoholism Screening Test (BMAST)

Brief Michigan Alcohol Screening Test (BMAST)

	Points yes	no
1. Do you feel you are a normal drinker?	-	2
2. Do friends or relatives think you are a normal drinker? -	2	
3. Have you ever attended a meeting of Alcoholics Anonymous AA? 5	-	
4. Have you ever lost friends or girlfriends/boyfriends because of your drinking? 2	-	
5. Have you ever gotten into trouble at work because of drinking? 2	-	
6. Have you ever neglected your obligations, your family, or your work for 2 or more days in a row because you were drinking? 2	-	
7. Have you ever had delirium tremens DTs, severe shaking, after heavy drinking?	2	-
8. Have you ever gone to anyone for help about your drinking? 5	-	
9. Have you ever been in a hospital because of your drinking? 5	-	
10. Have you ever been arrested for drunk driving or driving after drinking? 2	-	

Now, calculate the participant's score

➢ If he scores **above or equal to 6**, then he is **not** eligible for the study. Look at the response that the participant gave that resulted in a score of 6 or greater and use that particular question or questions to explain to the participant why he is not eligible for the study. For example: "For our study we are recruiting people who have not attended a meeting for Alcoholics Anonymous;" "For our study we are recruiting people who have not been hospitalized because of their drinking". Then, tell them that if they would like to learn more about alcohol use, to contact this information line:

- 1-800-565-8603 (Drug and Alcohol Registry of Treatment information line)
- **Do not tell them that they have an alcohol/ drinking problem. Simply use their responses to explain why they are not eligible**

➢ Remind him that the information he provided during this interview will be destroyed. Thank him and say goodbye

➢ If they score **below 6**, then continue on and administer the Social Interaction Anxiety Scale.

Social Interaction Anxiety Scale (SIAS)

For each question, please check a number to indicate the degree to which you feel the statement is characteristic or true of you. The rating scale is as follows:

0 = Not at all characteristic or true of me
1 = Slightly characteristic or true of me
2 = Moderately characteristic or true of me
3 = Very characteristic or true of me
4 = Extremely characteristic or true of me

Note: you should remind them of what the scale is as you give them the questions.

Note: Items # 5, 9 and 11 are reverse scored. Make sure you use the reverse score when you are calculating their total. To make it easier, mark their reverse scores as you go along.

1. I get nervous if I have to speak with someone in authority (teacher, boss).

0 1 2 3 4

2. I have difficulty making eye-contact with others.

0 1 2 3 4

3. I become tense if I have to talk about myself or my feelings.

0 1 2 3 4

4. I find difficulty mixing comfortably with the people I work with.

0 1 2 3 4

5. I find it easy to make friends of my own age.

0 1 2 3 4

Reverse score =

6. I tense-up if I meet an acquaintance on the street.

0 1 2 3 4

7. When mixing socially, I am uncomfortable.

0 1 2 3 4

8. I feel tense if I am alone with just one person.

0 1 2 3 4

9. I am at ease meeting people at parties, etc.

0 1 2 3 4

Reverse score =

10. I have difficulty talking with other people.

0 1 2 3 4

11. I find it easy to think of things to talk about.

0 1 2 3 4

Reverse score =

12. I worry about expressing myself in case I appear awkward.

0 1 2 3 4

13. I find it difficult to disagree with another's point of view.

0 1 2 3 4

14. I have difficulty talking to attractive persons of the opposite sex.

0 1 2 3 4

15. I find myself worrying that I won't know what to say in social situations.

0 1 2 3 4

16. I am nervous mixing with people I don't know well.

0 1 2 3 4

17. I feel I'll say something embarrassing when talking.

0 1 2 3 4

18. When mixing in a group, I find myself worrying I will be ignored.

0 1 2 3 4

19. I am tense mixing in a group.

0 1 2 3 4

20. I am unsure whether to greet someone I know only slightly.

0 1 2 3 4

- Now, total their score, using reverse scores for items 5, 9 and 11.
- *If he scores between **21 and 33**, then he is **not** eligible for the study. Explain to him that levels of social anxiety are variable among people and that for this study, we are looking for people with particular levels of social anxiety and based on his score, he does not fall within the level that we are looking for. Then ask him if it would be alright if we contacted him in the case that we decide to change our cutoff points to include more people. Make a note of his response on his screening interview and in the log. Thank him and say good bye.*
- If he scores **below 21 or above 33**, then he is eligible for the study.
- This completes the screening interview.
- Now, arrange for a day and time for him to come into the lab. Only book 1 participant/day and have them come in at 11:30. *Record this in the scheduling book.*
- Let him know the following information:
    - They cannot drive to the experiment. If they are assigned to the alcohol condition, then a taxi service will be provided for them. The taxi will take them to their home address, free of charge. Explain to them that if they consume alcohol during the experiment, then they will not be able to drive for 12 hours after the study is complete.

- They cannot consume alcohol or drugs, this includes illegal or legal drugs, including over the counter medications, 24 hours prior to their testing day. Let them know that their BAC will be taken when they arrive to the lab and that if it is above 0.0%, then they will not be eligible for the study.

- Tell them to eat a large breakfast on the morning of the study, about 3 hours before they come in, but not to eat during the hours before the experiment.

- Tell them to bring **2** pieces of identification to the study. They must bring 2 of: a driver's license, birth certificate, passport, or citizenship card.

- Tell them that there is the possibility that may have to stay in the lab longer than 4 hours if their BAC doesn't fall to 0.04% within that time. So, they should not make any important plans for a period of time after the study.

- Ask them if they have any food allergies or if they are a vegetarian.

➢ Ask for their e-mail address (if you do not already have it) and tell them that they will receive a reminder e-mail or a reminder phone call 2 days before their testing day.

➢ Tell them that if they cannot make it to their testing day, then they should contact the researcher at 884-0710 x 2587 and set up another day and time to take part in the study.

➢ Finally, thank them for their time and let them know that if they have any further questions they can phone or e-mail the researchers at any time.

Appendix O: Consent Form

WILFRID LAURIER UNIVERSITY
INFORMED CONSENT STATEMENT

Effect of Alcohol Use on Social Anxiety
Dr. Nancy Kocovski and Susan Battista

You are invited to take part in a research study. **In order to be eligible for this study, you must be male, 19 years of age or older, have some experience with drinking alcohol with no alcohol related problems and not be currently using any medications that may interact with alcohol**. The purpose of this study is to examine how alcohol use affects social anxiety, self-focused attention, safety behaviours and rumination. Social anxiety is the anxiety that is experienced in social situations like parties, meeting strangers, and speaking in front of groups. Self-focused attention is when individuals focus their attention inward and pay attention to their own behaviours and thoughts. Safety behaviours are subtle avoidances or attempts to control or hide anxiety (e.g., planning or rehearsing what to say, wearing black to hide sweating). Rumination is the extent to which someone dwells on an event. The researchers are Dr. Nancy Kocovski, an Assistant Professor and Susan Battista, a graduate student in the Department of Psychology at Wilfrid Laurier University. There will be 80 participants taking part in this study.

INFORMATION

The first part of this study will take place in the lab, located at Wilfrid Laurier University, Science Building, room 2059 and will take approximately 4 hours to complete. You will be randomly assigned to either an alcohol condition or a control condition. There is a 50:50 chance of being in either condition. Your height and weight will be measured. You will be asked to complete a number of questionnaires. These questionnaires will ask you to state your age, occupation, marital status, ethnicity, education level and living accommodations. You will also be asked to complete measures of social anxiety, alcohol use, rumination and depression.

If you are randomly assigned to the alcohol condition, the experimenter will calculate the proper amount of alcohol to administer to you in order to reach a blood alcohol concentration (BAC) of 0.08%. This is equivalent to approximately 4-5 mixed drinks containing 1 shot (1.5oz) of vodka, or 180-225 milliliters of vodka, or 4-5 cans of beer. The experimenter will prepare your drinks using a mixture of orange juice and vodka.

If you are randomly assigned to the control condition, then your drinks will contain orange juice only.

You will have 20 minutes to consume the drinks and then there will be a 20 minute waiting period. During this 40 minute time period you will watch a movie clip. Your BAC will be measured after 40 minutes has elapsed regardless of whether you are in the alcohol condition or the control condition. Please note that a Breathalyzer device will be used to measure your BAC. A sanitized, disposable attachment will be used for all of your readings, which will be discarded once you have completed the study. You will also be asked to complete a quick measure of how intoxicated you feel at 6 points during the study.

Participant's Initials _____

You will then take part in a social interaction, where you and a participant in a similar study will take turns asking each other a series of questions. This interaction will last 20 minutes and it will be videotaped. After the interaction, you will be asked to complete questionnaires to measure your state social anxiety, self-focused attention and use of safety behaviours during the social interaction. Then, you will watch a 2 hour movie and eat a snack. Next, you will complete a memory task. You will then complete 3 sobriety tests regardless of whether you are in the alcohol condition or the control condition (walking a straight line, touching your nose with your eyes closed, and balancing on one foot with your arms out to the side). This will complete part 1 of the study. Please note that if you are in the alcohol condition and your BAC level has not reached 0.04% or lower, then you will be required to wait in the lab until it does reach 0.04%.

The second part of the study will take place one week later and will involve a memory task and questionnaires that will take approximately 20 minutes to complete. A research assistant will contact you via email or telephone to remind you to complete part 2. If you have access to a computer, you can complete this portion of the study on-line. If you do not have access to a computer, the experimenters will arrange for you to come into the lab to complete this part of the study. These questionnaires will assess your level of rumination related to the social interaction that you took part in.

RISKS

If you are assigned to the alcohol condition, you will be asked to consume an amount of alcohol that may cause intoxication, drunkenness, dizziness, stomach upset, tiredness and/or headaches. You may stop consuming alcohol at any time. You may also experience physical and/or mental impairment for 1 or 2 hours after you have consumed the alcoholic beverages. In order to protect you, the researcher will be in the lab at all times and you will not be allowed to leave the lab until you have a BAC of 0.04% or lower and show no impairment in the sobriety tests. It is strongly advised that you do not operate a vehicle for 12 hours after leaving the lab. If you require transportation home, please inform the research assistant and arrangements will be made.

If you know that alcoholism runs in your family, then you may also be at increased risk of developing these problems. Therefore, it is recommended that you do not participate in this study. If you have any reason to believe that you might have hepatitis B, hepatitis C, cirrhosis, or any other liver disease, then you should not participate in this study.

Some of the questionnaires that you complete and the social interaction may cause you to become anxious or uncomfortable. You are free to omit responses to any questions that you do not wish to answer and are free to stop the social interaction at any time. You will also be provided with a list of resources if you would like to contact someone to talk about social anxiety, depression and/or alcohol use. You may experience boredom during this study. A movie and a snack will be provided in an attempt to decrease boredom.

BENEFITS

You will have the opportunity to take part in research on social anxiety and alcohol use. This investigation may benefit patients with social anxiety disorder as it may lead to an enhancement of cognitive behavioral treatments of social anxiety. It may also benefit patients with alcohol use disorders by adding to the understanding of the motivational factors that lead to drinking.

Participant's Initials _____

CONFIDENTIATLITY

The contact information that you provided during your telephone interview will only be used to contact you to remind you of part 2 of the study, to inform you if you are the winner of the draw, and to send you feedback once the study is complete. Your name will not appear on any of the research materials collected in the lab. You will be given an identification number in order to match your materials from part 1 of the study to your materials from part 2 of the study. A list will be kept of identification numbers and corresponding names and contact information. This list will be kept separate from the data in a locked file cabinet accessible only to Dr. Nancy Kocovski and Susan Battista and this list will be destroyed once the data have been matched and the winner of the draw has been announced. This consent form will be kept separate from your data. Please note that while you complete the questionnaires on-line in part 2 of the study, complete internet security cannot be guaranteed. Once data is collected, it will be kept in a secure data file. Only the researchers (Dr. Nancy Kocovski and Susan Battista) and the research assistants (Alice Maguire, Andrea Layfield and Jenna Belanger) will have access to the data. Data will be analyzed as a whole and presented at scientific meetings and submitted for publication. Data being published will be reported in aggregate form only. You will not be identified in any dissemination of this research.

The videotapes used in this study will be labeled with identification numbers only (and not names), will be kept secure and will only be accessible to the researchers. The tapes will be used for research purposes only and will be transcribed by a research assistant. The transcriber will keep all of the information on the tapes confidential. The tapes will not be used for any additional purposes without your additional permission.

All of the data, transcripts, and the videotapes associated with this study will be destroyed 7 years after the study is complete. Your contact information will be destroyed once feedback has been sent out.

COMPENSATION

For participating in part 1 of this study you will receive $20. For participating in part 2 of this study, you will be entered into a draw with the chance to win a $30 gift certificate. The odds of winning this gift certificate are approximately 1:80. If you choose not to complete portions of part 1 of the study, you will still be compensated $20. If you do not complete any portion of part 2 of the study, then you will not be entered into the draw. However, if you complete some of part 2 of the study, then you will still be entered into the draw. Also note that if you are required to stay longer than 4 hours in part 1 of the study, you will be paid $5 for every additional hour that you stay in the lab.

CONTACT

If you have questions at any time about the study or the procedures, or you experience adverse effects as a result of participating in this study, you may contact the researchers, Dr. Nancy Kocovski, Department of Psychology, Wilfrid Laurier University (N2025), (519) 884-0710, extension 3519 and Susan Battista, Department of Psychology, Wilfrid Laurier University (N2059), (519) 884-0710, extension 2587. This project has been reviewed and approved by the University Research Ethics Board. If you feel you have not been treated according to the description in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Dr. Bill Marr, Chair, University Research Ethics Board, Wilfrid Laurier University, (519) 884-0710, extension 2468.

Participant's Initials _____

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may decline to complete portions of the study at any time without penalty and without loss of benefits to which you are otherwise entitled. However, if you have consumed alcohol, you may not leave the lab until your BAC has reached 0.04% or lower. If you try to leave the lab before this time, the researcher will contact campus security. If you choose not to complete parts of the study, your data will be returned to you or destroyed. If you choose to withdraw from part 1 after you have completed the social interaction, the videotape of this interaction will be destroyed. Note that part 2 of this study takes place on-line, and if you choose to withdraw from part 2, then this data cannot be returned to you, but will be deleted. You have the right to omit any question(s)/procedure(s) you choose.

FEEDBACK AND PUBLICATION

The research cannot be fully described at this time, but at the conclusion of your participation, a complete explanation of the study will be provided to you. The results of this study will be submitted for presentation at scientific meetings and for publication in scientific journals. Results will also be sent to you via e-mail if you provide an e-mail address. Alternatively, results may be mailed to you if you choose to provide a mailing address. Finally, results will also be posted on the study's website (www.wlu.ca/alstudy2006). Results will be available by April 2007.

CONSENT

I have read and understand the above information.

I have received a copy of this form.

I am aware of the potential physical and mental risks associated with participating in this study.

I agree not to drive for 12 hours after leaving the laboratory if I am assigned to the alcohol condition.

I understand that if I am assigned to the alcohol condition, then I am not allowed to leave the lab until my BAC has reached 0.04% or lower. I understand that if I do leave the lab before this time, campus security will be notified.

I agree to participate in this study.

Participant's Signature _____ Date_____

Investigator's Signature _____ Date _____

Appendix P: Formula to Calculate Amount of Alcohol to Administer

Participant's weight in pounds = _____
Note: this is the only value you need to sub into the formula

Participant's height = _____
*** remember to add the extra inches if you measure their height on the door***

BAC = [(c/2) * (GC/w)] - (β_{60}*t)

C = $\frac{2w}{7.5}$ * (0.09139)

= _____+ 1_____drinks * 1.5 ounces

= _____ ounces *30 milliliters

= _____milliliters of vodka * 3.5

= _____milliliters of orange juice to give

c= number of drinks consumed
GC = gender constant (9.0 for females and 7.5 for males)
w = weight in pounds
β_{60} = the metabolism rate of alcohol per hour (e.g., 0.017g/dl)
t = time in hours since the first sip of alcohol to the time of assessment

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Social Interaction Question that Participant Completed _____

Movies that Participant Watched _____

_____

Appendix Q: Partial Debriefing Form

Thank you for completing part 1 of our study. Part 2 of this study is to be completed one week from today online or in the lab if you do not have access to a computer.

Please access the following website to complete Part 2 of the study:

www.wlu.ca/alstudy06

Your ID number is _____

You will complete the study on _____

A research assistant will contact you to remind you to complete Part 2 of the study. After completing Part 2 of the study, you will be fully debriefed and all aspects of this study will be explained to you.

If you have any comments or concerns regarding Part 1 of the study, please contact Susan Battista, Department of Psychology, Wilfrid Laurier University (N2059), 884-0710, extension 2587 (email: batt1417@wlu.ca) or Dr. Nancy Kocovski, Department of Psychology, Wilfrid Laurier University (N2025), 884-0710, extension 3519 (email: nkocovski@wlu.ca).

If you were assigned to the alcohol condition, you may experience some mild side-effects such as: headache, fatigue, lightheadedness, concentration and/or memory impairments. These side-effects should not last more than 24 hours. If you are concerned about any of these effects or about anxiety please contact the researchers or one of the resources below.

Counseling Services
Wilfrid Laurier University
75 University Avenue West
Waterloo, Ontario, N2L 3C5
(519) 884 0710 x2338

Counseling Services
University of Waterloo
200 University Avenue West
Waterloo, Ontario, N2L 3G1
(519) 888-4096

Kitchener Centre for Mental Health
67 King Street East
Kitchener, ON, N2G 2K4
(519) 744-7645
Toll Free - 1-866-448-1603
www.cmhawrb.on.ca

Grand River Hospital
835 King St. West
Kitchener ON, N2G 1G3
(519) 749-4310
Crisis Line: (519) 742-3611
www.grandriverhospital.on.ca

Assessment and Addiction Counseling
2722 Bleams E
Kitchener, ON N0B 1G0
(519) 634-5821

Alcontrol
215 King Street South,
Waterloo, ON N2J 1R2
(519) 745-4691

Drug and Alcohol Treatment Info Line:
1-800-565-8603

Canadian Mental Health Association Distress Line:
519-745-1166

Appendix R: Full Debriefing Form

It is very important that you read this information. Please take some time to go over it carefully.

The overall goal of this research is to better understand social anxiety by investigating the association between alcohol and a number of variables that contribute to social anxiety. Social anxiety is the anxiety that is experienced in social situations like parties, meeting strangers, and speaking in front of groups, in other words, situations where one may be evaluated or judged by others. It has been found that individuals high in social anxiety tend to be more self-focused during social interactions (i.e., they pay attention to their own thoughts and behaviours). They also tend to use more safety behaviours (e.g., planning or rehearsing what to say, wearing black to hide sweating) when engaged in a social interaction. Finally, it has been found that individuals high in social anxiety ruminate more than individuals low in social anxiety after a social encounter. Rumination is the extent to which one dwells on a situation. The current study is exploring how alcohol use affects each of these aspects of social anxiety.

The questionnaires that you completed were used to assess levels of social anxiety, depression, typical alcohol consumption, and your trait level of rumination. It is expected that individuals with higher levels of social anxiety will report more alcohol consumption than individuals with lower levels of social anxiety. It is also expected that individuals with higher levels of social anxiety will have higher levels of trait rumination. Depression is often associated with rumination as well; therefore, it was included in the current study so that it could be controlled for when analyzing the results.

You were randomly assigned to an alcohol or a control condition. You then took part in a social interaction. **The person involved in this social interaction was a confederate in our lab who had a pre-scripted set of responses to the questions that you asked her.** It was necessary to withhold this information from you in order to make the social interaction more realistic. Please do not discuss this with anyone that might be interested in participating in the study. If you are bothered by this use of deception please speak with the researchers.

After the social interaction, you completed questionnaires to measure your state social anxiety, level of self-focused attention, and use of safety behaviours during the interaction. All of these variables have been found to contribute to the maintenance of social anxiety. It is hypothesized that consuming alcohol will reduce state social anxiety, self-focused attention, and the use of safety behaviours. Furthermore, you completed a memory test. This will be used to examine whether you remembered more of your own responses to the questions or more of the confederate's responses during the social interaction. It is hypothesized that socially anxious individuals who consumed alcohol will remember more of the confederate's responses (as compared to their own) than socially anxious individuals who did not consume alcohol.

In part 2 of the study, you completed questionnaires to measure how much you ruminated about the social interaction over a one week time period. It is hypothesized that individuals high in social anxiety, assigned to the alcohol condition will ruminate less than individuals high in social anxiety assigned to the control condition. This difference is not expected for individuals low in social anxiety.

Previous research has found that social anxiety disorder and alcohol dependency and/or abuse tend to co-occur. Using alcohol to cope with social anxiety is **not** adaptive and is **not** recommended. Repeated alcohol use has been linked to many adverse physical and psychological consequences. It is hoped that the findings of this research will help to treat people who suffer from social anxiety and/or alcohol problems.

Thank you for your participation in this study. Results of this study will be e-mailed or mailed to you by April, 2007. Results will also be posted on our website (www.wlu.ca/alstudy2006).

If you have any questions about your participation in this study or about the study itself, please contact Dr. Nancy Kocovski, Department of Psychology, Wilfrid Laurier University (N2025), (519) 884-0710, extension 3519 (email: nkocovski@wlu.ca) or Susan Battista, Department of Psychology, Wilfrid Laurier University (N2059), (519) 884-0710, extension 2587 (email: batt1417@wlu.ca).

If you would like to discuss social anxiety, depression, and/or alcohol use further, please refer to the following list of resources:

Counseling Services
Wilfrid Laurier University
75 University Avenue West
Waterloo, Ontario, N2L 3C5
(519) 884 0710 x2338

Counseling Services
University of Waterloo
200 University Avenue West
Waterloo, Ontario, N2L 3G1
(519) 888-4096

Kitchener Centre for Mental Health
67 King Street East
Kitchener, ON, N2G 2K4
(519) 744-7645
Toll Free - 1-866-448-1603
www.cmhawrb.on.ca

Grand River Hospital
835 King St. West
Kitchener ON, N2G 1G3
(519) 749-4310
Crisis Line: (519) 742-3611
www.grandriverhospital.on.ca

Assessment and Addiction Counseling
2722 Bleams E
Kitchener, ON N0B 1G0
(519) 634-5821

Alcontrol
215 King Street South,
Waterloo, ON N2J 1R2
(519) 745-4691

Drug and Alcohol Treatment Info Line:	Canadian Mental Health Association Distress Line:
1-800-565-8603	519-745-1166

If you would like to learn more about social anxiety and/or alcohol use, you may wish to read the following books:

Dying of Embarrassment by Barbara Markway
Feeling Good Handbook by David Burns
Educating Yourself about Alcohol and Drugs: A People's Primer by Marc Shuckit

If you would like to learn more about research in this area, you may wish to read the following:

Clark, D.M., & Wells, A. (1995). A cognitive model of social phobia. In R. Heimberg, M. R. Liebowitz, D. A. Hope & F. R. Schneier (Eds.), *Social phobia: Diagnosis, assessment, and treatment* (pp. 69-93). New York: Guilford.

Morris, E. P., Stewart, S.H., & Ham, L. S. (2005). The relationship between social anxiety disorder and alcohol use disorders: A critical review. *Clinical Psychology Review, 25,* 734-760.

Rapee, R.M., & Heimberg, R.G. (1997). A cognitive-behavioural model of anxiety in social phobia. *Behaviour Research and Therapy, 35,* 741-756.