Role of Mood and Implicit Cognition in the Social Anxiety-Problematic Drinking Risk Pathway

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ABSTRACT

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Danit Nitka

The relation between Social Anxiety (SA) and problematic drinking has received mixed empirical support. Theory suggests implicit, *automatically activated,* alcohol cognitions are central to drinking risk. In the context of SA, the cognitions evoked in response to an anxious mood are relevant. The SA-alcohol use literature to date has not examined implicit cognition. Moreover, the influence of mood on drinking has been explored using performance-based mood manipulations, which may inhibit alcohol use for fear of impairing performance. The present study aimed to develop an ecologically valid socially-relevant mood manipulation and examine its effects on implicit alcohol cognitions and drinking outcomes. It was hypothesized that SA would influence the automatic activation of tension reduction alcohol cognitions and drinking behaviour, only for those in an anxious mood. Undergraduates (N = 132; 86% women) completed self-reports of SA and alcohol use/problems, were randomly assigned to an anxious or control mood condition, completed an implicit task, and self-reported urge to drink. Results revealed that mood moderated the effect of SA on urge to drink. When in an anxious mood, those high in SA reported an elevated urge to drink for negative and positive reinforcement purposes. There was little support for the role of implicit alcohol cognition. The activation of implicit cognition in the lab was not associated with drinking status. While the role of implicit cognition in the SA-drinking risk pathway did not receive much support, the current study incorporated a socially-relevant lab-based mood manipulation that was effective in eliciting the urge to drink.

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Introduction

Heavy alcohol use continues to be prevalent among university students (Dusenbury & Botvin, 1992; Hillman & Sawilowsky, 1992), with 30 to 40% of those who drink engaging in hazardous or binge drinking (≥ 4 drinks for women; ≥ 5 drinks for men) (Adlaf, Demers, & Glicksman, 2004; O'Malley & Johnston, 2002; Wechsler et al., 1994). These levels of consumption are of concern at any stage of life. They are associated with physical (e.g., liver damage), psychological (e.g., mood and anxiety disorders), and cognitive (e.g., memory impairment) negative consequences (Firestone & Korneluk, 2003; Patten, 1998). Specific to the university context, heavy drinking is associated with academic failures and potentially life-altering negative consequences such as engaging in unplanned sexual relations (Adlaf, Demers, & Glicksman, 2004). Undergraduate *problematic drinking,* defined here to include heavy drinking and alcohol-related negative consequences, is a public health concern. In order to develop effective interventions, research aimed at identifying who is at risk and the causal mechanisms of risk is needed.

Social Learning Theory (SLT) (Bandura, 1977, 1986) is a useful framework for furthering our understanding of who is at risk for problematic drinking and the underlying mechanism of this risk. SLT posits that distal factors such as individual-level differences (e.g., personality) influence problematic drinking via the effect on, or as mediated through, proximal cognitive mechanisms. This theory conceptualizes drinking as volitional goal-directed behaviour that is governed by learning principles (Wall,

Thrussell, & Lalonde, 2003). Those particularly responsive to the positive (i.e., increase positive affect) and negative (i.e., decrease negative affect) reinforcing effects of alcohol will be at risk for forming strong positive alcohol associations, activating these associations when the opportunity to drink presents itself, and subsequently engaging in heavy drinking. Examining the influence of individual differences on positive alcohol-related cognition is pivotal to understanding problematic drinking aetiology.

Although there are a number of potential factors that may influence risk for problematic drinking, Social Anxiety (SA) is an individual-level difference factor that may be particularly relevant to undergraduate students' problematic drinking. SA is characterized by an intense fear of being perceived negatively and judged by others, leading those high in SA to experience discomfort in social situations (Carrigan & Randall, 2003). SA is the most commonly diagnosed psychological disorder. The prevalence in the general population is 13% (Kessler, Stein, & Berglund, 1998), affecting 5.6% of young adults at a clinical level, 11.7% at a sub-threshold level, and 23.7% at a symptom level (Merikangas et al., 2002). In the university context, social events are common and involve external and internal pressures to participate for social acceptance. Thus, concerns of being negatively evaluated by peers in social interactions may be particularly salient for undergraduates high in SA. At these social events, drinking is a prominent activity, where alcohol not only serves as a social lubricant but is often a developmental rite of passage (Johnston, O'Malley, & Bachman, 1999; Moffitt, 1993; Schulenberg, O'Malley, Bachman, Wadsworth, & Johnston, 1996). Thus, drinking is a normative (expected and accepted) behaviour in these social situations that are particularly distressing for some. Accordingly, the fear of negative evaluation (FNE) by

peers combined with the availability of alcohol as a way to reduce shyness and/or fit in at social events are arguably the critical components linking SA to problematic drinking in undergraduates. Indeed, the literature suggests that FNE captures a facet of SA that is most relevant to university drinking (Leary, 1983; Lewis & O'Neill, 2000; Morris et al., 2004). The SA literature identifies FNE as one dimension of SA, such that it captures an important cognitive component of SA. Data has shown that FNE discriminates between patients with SA and both non-patient controls and patients with other anxiety disorders (Stopa & Clark, 2000; Turner et al., 1968). Further, FNE (e.g., FNE; Watson & Friend, 1969) is correlated with measures that capture SA more broadly (e.g., the Social Phobia Scale and the Social Interaction Anxiety Scale; Mattick & Clark, 1998), and can discriminate groups that differ significantly on other standardized measures of broad SA (e.g., Social Phobia and Anxiety Inventory; Turner, Beidel, Dancu, & Stanley, 1989; Social Avoidance and Distress Scale; Watson & Friend, 1969). A growing body of evidence supports the use of the FNE as an analogue to SA (Stopa & Clark, 2001). Given that FNE characterizes an aspect of SA that may be relevant to university drinking contexts, and that FNE has been supported as a strong correlate of SA broadly, the current study will refer to FNE in this context as a reflection of SA broadly.

The Tension Reduction Theory (Kushner et al., 1990) and the Self Medication Hypothesis (Chutuape & de Wit, 1995; Carrigan & Randall, 2003) support SA as a risk factor for problematic drinking. Both theories center on the responsiveness of SA individuals to the tension reducing effects of alcohol, leading to subsequent formation of negative reinforcement associations in memory. In social situations that generate tension, these individuals are thus likely to activate the negative reinforcement effects of alcohol

from memory and drink as a result (Carrigan & Randall, 2003; Chutuape & de Wit, 1995). These models integrate well with SLT as they speak to the role of alcohol associations and more specifically, anticipating tension reduction effects in the risk pathway to problematic drinking. Consistent with theory, studies examining the relation between substance abuse and SA in clinical samples have demonstrated that those with SA are three times more likely to meet criteria for alcohol use disorders (Merikangas & Angst, 1995). Moreover, when alcohol use and SA disorders co-occur, the literature suggests that SA onset precedes development of the alcohol use disorder (Buckner et al., 2008; Lépine & Pélissolo, 1998; Regier et al.,1998; Schneier et al., 1989) and individuals report using alcohol for the specific purpose of increasing comfort in social situations (Thomas et al., 2003). Examination of the link between SA and problematic drinking in non-clinical and undergraduate samples reveals a much more complex picture with evidence supporting a positive (Booth & Hasking, 2009; Buckner & Schmidt, 2009; Gilles et al., 2007; Kidorf & Lang, 1999; Lewis & O'Neill, 2000; Morris et al., 2004), negative (Eggleston et al., 2004; Ham & Bonin, 2007; Ham & Hope 2006; Holroyd, 1987; Stewart & Morris, 2006), and no meaningful (Ham & Hope, 2005) association. Clarifying the SA-problematic drinking relation in non-clinical populations is central to gaining a more complete aetiological perspective on risk.

It is not surprising that the relation between SA and alcohol use has received mixed support, and more specifically, that SA emerges as both a risk and protective factor for problematic drinking. The complexity of this relation may be pronounced earlier in the aetiological picture, when patterns are first being formed and coping mechanisms are being developed. On the one hand, those high in SA may be responsive

to the negative reinforcement effects of alcohol and therefore identify tension reduction associations (e.g., relief of physical symptoms of anxiety that might be apparent to peers) with alcohol when given the opportunity to drink. Conversely, those high in anxiety are attentive to potential negative consequences and as a result should be aware of negative associations with drinking (e.g., embarrassing oneself in front of peers when intoxicated) when cued with alcohol. An understanding of the circumstances under which these competing associations become salient is central to elucidating risk for high SA individuals.

State anxious affect may moderate risk, specifically in a socially relevant context. Theory suggests that high SA individuals should be at risk for drinking for tension reduction purposes when they are in a socially-relevant anxious mood. However, extant experimental studies investigating the role of anxious mood in this pathway have produced mixed results. Variation in mood inductions and lack of ecologically valid manipulations may in part account for these inconsistencies. Moreover, this work has not looked at the effect of anxious mood on the activation of alcohol-related cognitions, nor has it distinguished between specific alcohol use behaviours. The drinking motives literature consistently finds that drinking to cope is uniquely associated with heavy use and experiencing alcohol-related negative consequences (Cooper, 1994), thus these behaviours need to be disentangled. A careful examination of the effect of SA on in-the-moment alcohol-related cognitions as moderated by mood is needed. As well, the subsequent effect of these cognitions on drinking behaviours will lend to model improvement. The proposed study aims to address these issues.

Alcohol-Related Cognition (Mediator)

According to SLT, alcohol-related cognition plays a fundamental role in alcohol use. Tension reduction cognitions, or associations with alcohol (e.g., "alcohol will relax me"), are shown to predict problematic drinking (Brown, 1985). Positive alcohol cognitions, including enhancement and tension reduction alcohol cognitions, have been associated with quantity and frequency of alcohol consumption (Ham & Hope, 2006; Tran et al., 1997) and negative consequences of drinking such as drinking and driving (O'Hare & Sherrer, 1997). SA has consistently emerged as a predictor of positive alcohol-related cognitions including tension reduction alcohol associations (Eggleston et al., 2004; Ham & Hope, 2006; Johnson et al., 1998; O'Hare, 1990). However, much of this research is limited to self-reports of alcohol-related cognition, which have been criticized given their theoretical and methodological limitations. Self-report questionnaires are subject to social desirability biases which may be particularly problematic for alcohol-related questionnaires given that reporting why one drinks may be a sensitive subject matter for some. Furthermore, heavy drinking in the context of a social event may be a somewhat spontaneous behaviour which may be influenced by automatic cognitive processes. These processes may not be fully available for introspection and self-report (Wiers, Stacy, et al., 2002). In fact, research examining attitudes, self-esteem, and stereotypes revealed inconsistencies between self-report and social behaviour (Greenwald & Banaji, 1995). Assessing implicit alcohol-related cognition, which is the information that is most readily accessible from memory in-the-moment (i.e., strongest associations with alcohol), may help clarify the SA-problematic

drinking relation. Consistent with theory, experiencing state SA should trigger implicit tension reduction alcohol-related cognition, and this in turn should lead to drinking.

Implicit measures have been developed from the social cognition literature and primarily consist of computerized reaction time tasks (e.g., Implicit Associations Test, IAT; Greenwald, McGhee & Schwartz, 1998). These tasks assess associative pairings in memory, such that a faster reaction time in pairing two constructs on the task is believed to reflect the strength of associations. For example, enhanced performance on an implicit task when instructed to pair insect with negative compared to positive words would reflect stronger negative (vs. positive) associations with insects (Greenwald, McGhee, & Schwartz, 1998). Implicit tasks have been adapted in the alcohol literature to incorporate alcohol words into the task to test the ease with which individuals associate alcohol with positively or negatively valenced words (Wiers, Woerden, et al., 2002). These implicit measures have demonstrated a capacity to predict drinking behaviour over and above self-reported alcohol expectancies and attitudes (Houben & Wiers, 2007; Jajodia & Earlywine, 2003). Strong positive implicit associations with alcohol have been linked to both heavy drinking and high levels of alcohol-related problems (Houben & Wiers, 2007). Meta-analyses confirm that implicit measures show predictive ability unique from that of explicit measures (Reich, Below, & Goldman, 2010) and that studies assessing these cognitions via implicit semantic associations show the largest effect sizes (Rooke, Hine, & Thorsteinsson, 2008). Although implicit measures have gained increasing use in the alcohol literature, they have not been used to examine the relation between SA and problematic drinking.

Anxious Mood (Moderator)

Both research and theory suggest state anxious affect may be an important moderator in the SA-drinking risk pathway. Mixed results in this literature may reflect critical methodological oversights or shortcomings. Traditional mood manipulations designed to induce anxious mood often consist of a speech or performance based task, involving talking or performing an arithmetic exercise in front of an evaluative audience. Studies linking anxiety to drinking have produced mixed results and have revealed findings that have been inconsistent with theory. In fact, some of the evidence suggests no difference in drinking patterns related to anxiety. In a study of undergraduate women, McNair (1996) found that women anticipating having to give a speech reported more anxiety but did not drink more than women who casually read magazines without anticipating having to give a speech. Contrary to theory, those experiencing anticipatory anxiety did not show elevated drinking levels. Similarly, Samoluk, & Stewart (1996) found that contrary to their hypotheses, individuals high on anxiety sensitivity did not drink more than those low on anxiety sensitivity in anticipation of a structured interview in which they were expected to self-disclose information. However, those high on anxiety sensitivity drank more than those low on anxiety sensitivity prior to a task involving neutral non-structured discussion. Individuals anticipating a more structured self-disclosure interview may have been concerned with impairing their performance and therefore may have controlled their drinking.

Other evidence has linked anxiety to lower levels of drinking. A study with a clinical sample showed those with SA chose to drink weaker drinks prior to engaging in a moral dilemma solving anxiety task compared to when anticipating a neutral task.

Although these studies draw upon theoretical underpinnings proposed by the Tension Reduction Hypothesis, they fail to address the consideration that performance-based tasks may not elicit drinking behaviour as a result of a concern with impairing performance. Indeed, a study involving a casual social interaction showed more promise in eliciting anticipatory drinking with a mood induction. Knight & Godfrey (1993) found that a higher expectation that alcohol would improve social performance was associated with elevated drinking in males anticipating a casual social interaction with a female. This casual conversation task presented a casual social interaction without a strong performance component. Consequently, this manipulation may have been more effective at eliciting anxiety in a social context and thus affecting drinking outcomes.

Given the shortcomings of current anxiety induction manipulations, it is difficult to interpret findings pertaining to SA risk for drinking outcomes. Research has shown that individuals with SA report using alcohol to cope with social situations rather than to cope with performance situations or fears (Thomas et al., 2003). Furthermore, many of the evaluative or "speech" tasks discussed have been criticized for their artificiality, and their capacity to adequately elicit changes in mood has been questioned (Naftolowitz et al., 1994). Current studies fail to address the confounding nature of a strong performance component. A mood manipulation placing less emphasis on performance and elicits the anxiety related to anticipating social interactions instead is needed. A socially relevant mood manipulation will clarify the mixed SA-problematic drinking findings (Morris et al., 2005) by suggesting that SA is linked to drinking outcomes, and more specifically, alcohol-related problems. It is in a state of SA that implicit cognitions are likely to be activated. The Stress-Response Dampening model suggests personality or individual

difference traits play a critical role in predisposing certain individuals to have expectations that alcohol will reduce their tension and thus drink

Alcohol Use Behaviours (Outcome)

Current mood manipulation studies have assessed the impact of mood on drinking behaviour broadly rather than addressing distinct outcomes (e.g., alcohol-related problems). Recent findings have shown an inconsistency (Abrams et al., 2002; Booth & Hasking, 2009; Eggleston et al., 2004; Ham & Bonin, 2007; Ham & Hope, 2005) in the link between SA and level of use (i.e., amount consumed), yet a robust association between SA and alcohol-related problems (Carrigan & Randall, 2003; Eggleston et al., 2004; Gilles et al., 2007; Ham & Hope, 2006; Stewart & Morris, 2006). Assessing risk for distinct outcomes is central to understanding the link between drinking to cope with anxiety and drinking behaviours. However, a failure to distinguish between these outcomes may account for some of the inconsistencies in studies examining the role of SA and mood with regard to drinking outcomes. The coping literature supports distinguishing overall alcohol use from alcohol-related problems, given that these outcomes are often discrepant and predicted by distinct reasons for drinking (Cooper, 1994). Much of the work relating SA to drinking motives has shown that drinking for social motives is associated with light and infrequent drinking, while drinking for coping or conformity motives is uniquely linked to heavy and/or problematic drinking (Cooper 1994; Morris, Stewart, Theakston, & Mellings, 2004; Stewart & Morris, 2006). Similarly, FNE, most commonly linked to alcohol variables in the literature, has been associated with alcohol-related problems but not levels of use, and this relation is partially mediated by coping drinking motives (Stewart & Morris, 2006). Distinguishing these outcomes

may thus be critical to understanding the link between coping motivated and SA related drinking.

Although examination of distinct outcomes in the context of mood and SA-drinking risk pathways is essential, the empirical and experimental assessment of these outcomes proves difficult in a lab setting. Earlier stages of behaviour that are controllable in a lab setting may be informative with regard to early risk development. Assessment of drinking urge may therefore be of aid given the potential to reveal mechanistic processes related to in-the-moment alcohol-related cognitions. Some examinations of urge to use (Singleton et al., 1994) have been inspired by learning principles, by separating urges occurring in anticipation of positive outcomes from those occurring in anticipation of relief from a negative or aversive outcome. Both theory (Tension Reduction Hypothesis; Conger, 1956) and research (Kushner et al., 1990) suggest individuals experiencing anxiety and FNE will be motivated to drink to relieve their tension, and thus experience urge to drink when in an anxious state. Theory and research thus posit tension reduction cognitions are activated upon anxious mood induction, presumably leading individuals to drink to reduce the tension. The study of drinking urge allows testing this proposition by addressing a process occurring prior to initiation of drinking behaviour. Further, theory supporting a "relief pathway" (desire for tension reduction) and a "reward pathway" suggests the utility of differentiating negative and positive reinforcement urges to drink with the aim of increasing specificity in the examination of these urges (Verheul et al., 1999). There is robust support for the examination of urge to use, overall alcohol consumption and alcohol-related problems as distinct outcomes. These distinctions may be central to clarifying the mixed findings in the SA-drinking risk pathway.

Current Study

The goal of the current study was to clarify a risk pathway to university students' problematic drinking that has received mixed empirical support. This goal would be met by incorporating a socially relevant anxious mood manipulation and by examining the effect of this mood manipulation on the relation between FNE scores and the automatic activation of alcohol-related cognition and subsequent drinking behaviours. The current study used two mood conditions, such that participants were randomly assigned to either a socially-relevant anxious (experimental) or neutral (control) mood condition. This permitted examination of the effect of mood on the relation between FNE scores and activation of alcohol-related cognitions. Positive alcohol-related cognitions were central to the model. Specifically, the mood moderated influence of FNE scores on tension reduction (TR) alcohol cognitions was of primary interest. The mood moderated influence of FNE scores on enhancement (ENH) alcohol cognitions were also examined in order to provide discriminant validity. With regard to drinking outcomes, urge to drink right now (i.e., positive and negative reinforcement urges) and retrospective reports of drinking status (i.e., quantity of alcohol use and alcohol-related problems) were examined in separate models.

It was hypothesized that for individuals in the experimental condition (but not for those in the control condition), elevated FNE scores would be associated with the automatic activation of tension reduction alcohol cognitions. The activation of the tension reduction cognitions would in turn influence a strong urge to drink for negative reinforcement purposes. To test for specificity of the link between FNE scores and positive alcohol cognitions, a similar path was estimated such that the association

between FNE scores and enhancement cognitions (in anxious mood) and subsequent urge to drink for positive reinforcement purposes was examined. A second model tested the hypothesis that for those in the experimental condition, elevated FNE scores would be linked to activation of tension reduction alcohol cognitions and that this in turn would be uniquely associated with alcohol use and alcohol-related problems. A path from SA to alcohol use and problems via ENH cognitions was also tested to provide discriminant validity.

Method

Participants. A sample of 132 (19 men, 113 women) undergraduate students between 18 and 25 years of age participated in this lab-based experimental study. The majority of participants were white (75.8%) and minority groups represented in the sample were Hispanic (4.5%), Canadian Asian (3%), Canadian African (2%), and "other" (14%). Of the total sample, 75.76% reported English to be their dominant language, 18.18% reported French as the dominant language, and 6.06% reported "other". Most students reported living at home with parents (67%), and 32% reporting residing in an apartment on their own, while less than 1% reported living on campus.

Recruitment was conducted via the Concordia Psychology Participant Pool and through advertisements posted around Concordia University. Participants outside the age range, not fluent in English or reporting physical restrictions hindering their ability to perform quick movements (e.g., restrictions potentially affecting the ability to respond with keypress in a computerized reaction time task) were ineligible to participate. Participants were compensated with Participant Pool course credit or a chance to win one of two 100$ prizes in a draw. Efforts were made to ensure that the full range of SA was

represented in the sample. Participants completed a screening measure of SA. Based on an established mean split in the literature (e.g., Carleton et al., 2006) an attempt was made to recruit an equal number of those who were above and below the mean (*Note.* No aspect of the distribution was excluded). Efforts were also made to recruit an equal number of men and women above and below the mean on the SA screening.

Materials

Demographics. Screening demographics included age, gender, sexual orientation, and level at university. Sexual orientation was assessed to determine the gender of the confederates featured in two of the three videos viewed by participants as part of the socially-relevant anxious mood manipulation (Beidel et al., 1985; Larkin et al., 1998). Demographic questions from the screening were re-administered during the lab session, in addition to questions assessing ethnicity, annual income of household in family of origin, work status and whether they reside on campus, with family or in an apartment.

Screening/Brief Fear of Negative Evaluation scale (BFNE). The BFNE (Leary, 1983) was used to assess SA in the online screening questionnaire. This 12-item scale measures the degree to which individuals experience anxiety at the prospect of being judged or evaluated negatively (e.g., "I worry about what other people will think of me even when I know it doesn't make a difference"). Responses are made on 5-point scales (1 = "not at all characteristic of me"; 5 = "extremely characteristic of me"). Mean responses across items were used to classify participants into Low or High SA scores based on a mean cutoff of 30.7, which has been found in undergraduate samples (Carleton et al., 2006). The BFNE has shown a strong correlation (r = .96) with the full FNE scale. In addition, the BFNE has demonstrated strong psychometric properties, with

excellent internal consistency (Cronbach's α = .90, a 10 day test-retest reliability of *r* = .84 and a 4 week test-retest reliability of *r* = .75 (Leary, 1983). In the current study, the BFNE showed excellent internal consistency (α = .92).

Fear of Negative Evaluation Scale (FNE). The FNE scale (Watson & Friend, 1969) is a 30-item questionnaire that asks participants to rate their fear of being negatively evaluated by others on items such as "I am afraid that others will not approve of me". Participants responded by indicating whether statements applied to them with dichotomous "true" (scored as 1) or "false" (scored as 0) responses. Positively endorsed items were summed. A mean score was calculated to provide a continuous measure of FNE. This scale has demonstrated excellent internal consistency (α = .94) (García-López et al., 2001; Watson & Friend, 1969) and adequate 1-month test-retest reliability (*r* = .78; Watson & Friend, 1969) and 10-day test–retest reliability (*r* = .84; García-López et al., 2001). The FNE has demonstrated good validity (Watson & Friend, 1969) and correlates with other measures of anxiety in college/university populations (*r* = .60) (Watson & Friend, 1969) as well as with measures of SA used with both clinical and university samples (Social Phobia Scale, Social Interaction Anxiety scale (Mattick & Clark, 1998). The FNE showed excellent internal consistency (α = .93) in the current sample.

The Visual Analogue Scale (VAS). The VAS (Martin, 1990; Mongrain & Trambakoulos, 1997) is used to assess state affect. In the current study it was adapted to be used to assess anxious and positive mood (see Appendix A). Items on this scale consisted of in-the-moment ratings of anxious mood ("nervous", "anxious", "tense", "distressed", "uncomfortable") and positive mood (cheerful", "glad", "pleased", "happy", "excited"). Filler mood items were included to dilute the focus on anxiety to

prevent participants' potential suspicion (i.e., "sad", "upset", "depressed", "blue"). Responses were recorded on a 0-100 point scale which was illustrated visually on a horizontal line anchored with 0 and 100, with 0 referring to "not at all" experiencing the mood and 100 referring to "very" much experiencing the mood. Participants moved the slider across to the point that best corresponded to their mood at that moment. Two mean scores were calculated to provide separate measures of anxious mood and positive mood.

The original VAS measure was designed to assess positive and negative affect and was used in a musical mood induction study (Birch et al., 2004). It has been since adapted to assess anxious and positive mood (Grant et al., 2007). Grant et al. (2007) adapted the VAS to integrate anxiety-related items taken from Shacham's (1983) Short Form of the Profile of Mood States and used the measure to assess affect pre- and post-anxious and positive mood induction by music. In the current study, items supported by Shacham (1983) and Grant et al. (2007) were used in order to maintain the integrity of the original VAS (i.e. cheerful", "glad", "pleased", "happy", "excited" and "nervous", "anxious", and "tense"). Additional items were included to assess social-anxiety relevant anxious mood to ensure post-manipulation mood change (i.e. "uncomfortable", "Distressed"). In recent years, the VAS has been used in the anxiety literature and in studies assessing experimentally induced anxiety (Abrams et al., 2001; Dannahy & Stopa, 2007; George & Stopa, 2008; Haikal & Hong, 2010; Mansell & Clark 1999). The internal consistency was very good for the anxiety scale ($\alpha = .86$) and excellent for the positive scale ($\alpha = .90$).

Alcohol Cravings Questionnaire (ACQ). The ACQ (Raabe et al., 2005) assesses the degree to which individuals have the urge to drink in-the-moment. The original 47-

item questionnaire measured cravings on nine subscales. Of relevance in the current study are the 18 items loading onto two factors: the urge to drink for the positive reinforcement effects of alcohol (9 items; e.g., "Drinking would be wonderful"); the urge to drink for the negative effects of alcohol (9 items; e.g., "If I were using alcohol now, I would feel less nervous"). Participants were prompted with the phrase "Right Now" and indicated how true each item was for them on 7-point response scales (1 = "strongly disagree*";* 7 = "strongly agree*"*) (Raabe et al., 2005). The reinforcement items relate to enhancement and tension reduction pathways to drinking. Two mean scores were calculated, one providing a composite score reflecting negative reinforcement urge to drink and a second reflecting positive reinforcement urge to drink. In the current study, the internal consistency was very good for the items on the positive scale (α = .88) and excellent for items on the negative scale (α = .92).

Alcohol use. Alcohol use in the past month was assessed with items measuring both quantity and frequency of consumption. In responding to questions, participants were instructed to consider one drink of alcohol as 12 oz. of beer or wine cooler, 4 oz. of wine, or 1 oz. of hard liquor (straight or in a mixed drink). Participants indicated on a one week calendar the number of drinks they consumed on each day of a typical week in the past month (adapted from Collins, Parks and Marlatt, 1985 and Cahalan, Cisin, & Crossley, 1969). Refer to Appendix A for questions assessing past month alcohol use. A score indicating the average amount of alcohol consumed per week was derived from this calendar measure. In separate items, participants indicated their drinking frequency in the past month and the number of drinks consumed per occasion by selecting items that reflected their pattern of drinking on quantity and frequency measures. For the frequency

item, participants indicated on average how often they have a beverage containing alcohol with an 11-item response scale ranging from 1 = "Not at all in the past 30 days" 11 = to "every day of the week". Participants responded to the quantity item by indicating how many drinks they usually have on one occasion, with 12 response items ranging from 1 = "Did not drink in the past 30 days" to 11 = "ten drinks per occasion" or 12 = "other". For "other" responses, either the response was scored as missing or it was fit into one of the other response options. The frequency item responses were adjusted to reflect typical weekly use in the past month, and then multiplied by the quantity item in order to obtain a single composite reflecting quantity by frequency (i.e., average weekly alcohol use). The calendar and response scale items were strongly correlated (r = .84, $p < .0001$), suggesting convergent validity. Accordingly, they were combined to create a single measure reflecting typical amount of alcohol consumed weekly. This composite measure is comparable to measures in the literature that have shown good convergent validity (Collins et al, 1985).

Young adult alcohol consequences questionnaire (YAACQ). The YAACQ (Read et al., 2006) is a 48-item questionnaire that assesses participants' experience of negative consequences as a result of drinking in the past year (e.g., "While drinking, I have said or done embarrassing things"). Participants responded to items with a dichotomous response (yes/no) based on whether or not they had experienced the negative consequence. An overall sum score was derived based on number of items positively endorsed. While eight problem subscales have been supported (Read et al., 2006), an overall composite score has also demonstrated excellent psychometric properties. Given there were no a priori hypotheses for assessing the separate categories

of problems, the overall score was used in the current study. The YAACQ has demonstrated excellent internal consistency (α = .92 -.98) (Gonzales et al., 2009; Read et. al, 2007), good test-retest reliability (*r* = .86) and concurrent and predictive validity (Read et.al, 2007). The YAACQ items showed excellent internal consistency (α = .93) in the current sample.

Single Category IAT (SC-IAT). The SC-IAT (Karpinski & Steinman, 2006; O'Connor, Lopez & Colder, in press) is a modified version of the original implicit associations Task (IAT) developed by Greenwald et al. (1998). The original IAT is a widely used task designed to measure implicit (i.e., automatically activated) attitudes. The original task includes stimuli presented from two opposing object (e.g., insect and flower) and evaluative (e.g., unpleasant and pleasant) categories. This task involves keypress categorization of stimuli which are presented on the computer screen one at a time. Categorization is such that stimuli from one object and one evaluative category are paired to one key (e.g., insect-unpleasant) and stimuli from the other evaluative and object categories are paired to the other key (e.g., flower-pleasant). Pairings switch across blocks of trials, and of interest is the speed of responding across blocks.

The SC-IAT used in the current study varies from the original with regard to the object category. Given that there is not a naturally opposing category to alcohol, a single alcohol object category (picture of alcohol) was used (O'Connor, Lopez & Colder, in press). The bipolar evaluative categorization is maintained in the SC-IAT. The SC-IAT used here included opposing positive and negative evaluative stimuli (words). In the current study, participants completed two SC-IATs. One measured relative strength of positive tension reduction (vs. negative) associations with alcohol and a second assessed

relative strength of positive enhancement (vs. negative) alcohol associations. In the tension reduction SC-IAT, evaluative categories included tension reduction (e.g. relaxed), and negative (e.g. miserable) words, while in the enhancement SC-IAT, evaluative categories included enhancement (e.g. energetic) and the same negative words used in the tension reduction SC-IAT.

Participants were instructed to press the left-hand key (E-key) when they saw a negative/"miserable" word (e.g., sick) and to press the right-hand key (I-key) when they saw a positive/"relaxed" (e.g., relaxed) or positive/"energetic" (e.g., excited) word. In each SC-IAT, the object category (pictures of alcohol) was paired with the response key for negative words in one block of trials and then with the response key for positive words in the other block of trials. Consistent with Karpinski and Steinman (2006) and O'Connor et al., (in press), participants first completed a set of practice trials (10 trials). They then completed two test blocks, each consisting of 72 trials. Stimuli were presented until participants responded and labels instructing which key to press for the evaluative and object stimuli remained in the upper left and right corners of the computer screen. Block presentation was counterbalanced across subjects within each SC-IAT. The inter-trial interval was 250 ms. A red X appeared on the screen upon incorrect response and the trial resumed upon correct key-press response.

The stimuli included six pictures of alcohol and five words from each of the two positive and one negative evaluative categories. The words were matched across subtitle frequency (which is thought to be superior to the previously used written frequency) (Brysbaert & New, 2009), syllabic content, and word length. Three separate one-way ANOVAs indicated that there was not a statistically significant nor meaningful effect size

difference for the evaluative category effect on subtitle frequency F (1, 14) = 2.10, p = .17, η^2 = .26, number of syllables F (1, 14) = 1.36, p = .29, η^2 = .18, and word length F (1, 14) = .45, p = .65, η^2 = .07. Please refer to Appendix A for the SC-IAT stimuli, sample instructions, and screenshots of the task.

In order to prevent response bias, the evaluative stimuli (positive and negative words) and the object stimuli (pictures of alcohol) were not presented at equal frequency. In blocks where alcohol pictures were paired with positive words, 21 trials consisted of positive words, 30 trials of negative words, and 21 trials of alcohol pictures. This configuration resulted in 58% of correct responses being responded to with the right key and 42% with the left key. Similarly, when alcohol pictures were paired with negative words, 30 trials consisted of positive words, 21 trials of negative words, and 21 trials of alcohol pictures. This configuration resulted in evenly biased responses, with 42% of correct responses being responded to with the right key and 58% with the left key. Extant SC-IAT research has adopted this configuration for response bias prevention (Karpinski, 2006; O'Connor, Lopez & Colder, in press).

The D-score algorithm for IAT data developed by Greenwald et al. (2003) and adapted for the SC-IAT by Karpinski and Steinman (2006) was used. In the current study, the D-score algorithm was used to derive measures of tension reduction and enhancement alcohol associations. Specifically, two D-scores were calculated. The tension reduction (TR) D-score and enhancement (ENH) D-score were calculated at the within-person level using the difference in reaction time between the two test blocks and were divided by the standard deviation. Thus, of interest was the difference between the within person mean latencies over the inclusive (not pooled) standard deviations across the two blocks. The

D-scores were calculated such that positive TR and ENH D-scores indicate stronger TR/ENH ("relaxed"/"energetic") than negative associations with alcohol.

Procedure

Participants completed an online screening using Select Survey software (Select Survey.net, Classapps.com). This was used to determine eligibility based on the aforementioned criteria (e.g. BFNE, age) and to assess sexual orientation in order to assign video condition. Eligible participants were then invited to the lab for a session lasting approximately 1.5 hours. Refer to Appendix B for procedure overview.

Phase 1: Baseline. Informed consent was obtained and participants were told that the purpose of the study was to examine perceptions of others as well as beliefs about the self, others, and health-related behaviours in undergraduates. Participants were randomly assigned to one of two conditions: the experimental (socially-relevant anxious mood induction) or control condition. Participants in the experimental condition were assigned to view videos featuring two members of the gender of reported romantic interest (reported at screening) and one member of the other gender in order to effectively induce anxiety at the prospect of a social interaction. This gender assignment is supported by studies examining the effects of opposite gender on interactions in heterosexual samples that have shown increased anxiety, greater blood pressure variability (McCubbin, Wilson, et al., 1991) and higher heart rate reactions (Larkin et.al, 1998) when performing tasks while interacting with a member of the opposite gender. Baseline anxious and positive mood was first assessed for all participants using the VAS (Martin, 1990; Mongrain & Trambakoulos, 1997). Participants also completed demographic information and self-reports of SA (FNE; Watson & Friend, 1969), an assessment of urge to drink (ACQ;

Raabe et al., 2005), and retrospective drinking behaviours (Alcohol use questionnaire, YAACQ; Read et al., 2006). All questionnaires were completed using MediaLab (Select Survey.net, Classapps.com).

Phase 2: Mood manipulation. To induce a socially-relevant anxious state, those in the *experimental* condition were told that the study was about first impressions and how they are related to perceptions of drinking and other people, as this is relevant to university contexts where social environments often include both drinking and making impressions. Participants were told that of primary interest were the first impressions that are formed during interpersonal interactions with peers. They were told that they would be taking part in a "Getting to know you" task with another participant later on in the experiment, and that the impression they make during this task is really important as first impressions tend to be a good marker of success and social ability. Participants were told their peers and the research staff would rate them on various criteria with regard to the first impression made. To heighten anticipatory anxiety of this key first impression task, participants were told that in order to provide a point of comparison for the first impressions formed later on, they were to first evaluate by videotape the participants that they would potentially meet later. Likewise, participants were videotaped in a brief interview, which was to be shown and viewed by other participants. In this interview, participants were asked a number of demographic questions and to describe their personal weaknesses. Thus, it was difficult to make a positive first impression. Participants viewed the videos of their peers, featuring confederates following scripted responses to various questions that highlighted their professional aptitude, academic achievements or social status. The confederates appeared confident and intimidating and made various

statements suggestive of a tendency to be judgmental of others. Each answer contained an element emphasizing the confederate's competence within a domain (e.g. image consulting) after which they proceeded to make a judgmental comment. (Refer to Appendix C for interview scripts). To maintain the face validity of the task, participants then rated the confederates on various social aspects. They were then reminded by the experimenter to think about what they wished to say to their peer, given the importance of making a positive first impression.

During this phase of the manipulation, participants in the *control* condition were not told about the interaction with a peer (i.e. a confederate) and therefore did not anticipate it. Instead, during this phase they filled out a paper-and-pencil version of the interview. These participants then viewed a neutral instructional film that has been used as a control stimulus in previous work. The video depicted an individual describing and demonstrating napkin folding techniques. To provide a parallel experience with the experimental condition, participants in the control group rated their liking of the neutral video and were reminded that the general purpose of the study was to assess perceptions of drinking, the self, and others.

Phase 3: Post-manipulation measures. Participants in both groups then completed a second post anxious and positive mood manipulation check using the VAS (Martin,1990; Mongrain & Trambakoulos, 1997). Also, the tension reduction and enhancement alcohol SC-IATs (Karpinski & Steinman, 2006) were completed. The SC-IATs were administered using Inquisit (Millisecond Software, 2009, Version 3.0). The ACQ (Raabe et al., 2005) was then administered to assess urge to drink "Right Now" for negative and positive reinforcement purposes.

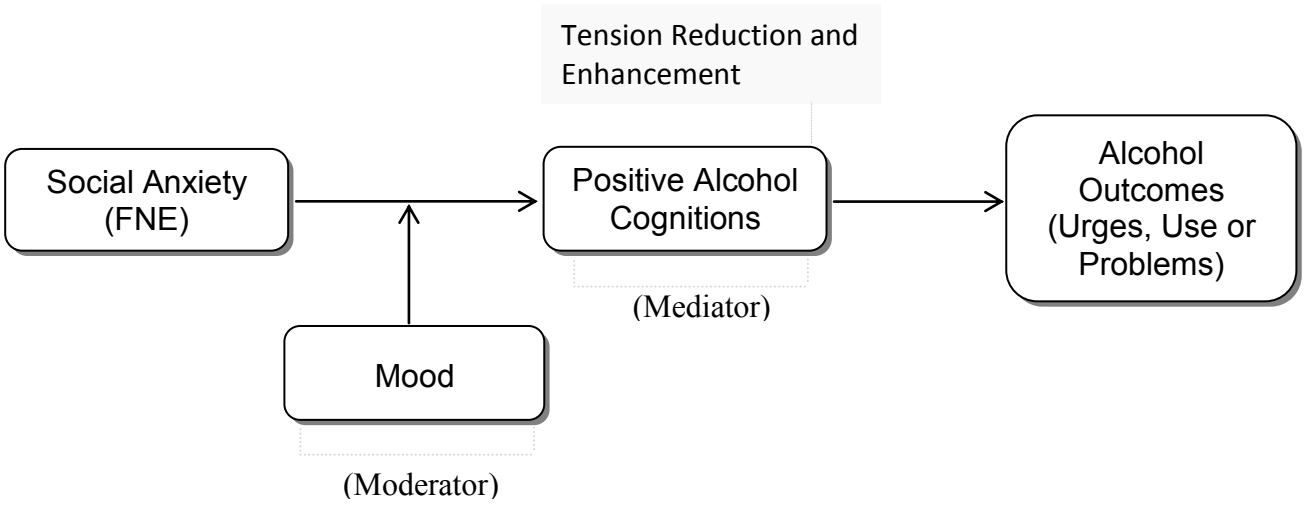
Phase 4: Final tasks. Participants in both mood conditions were then introduced to the confederate and completed the videotaped interaction task (see Appendix C), answering questions adapted from Aron et al. (1997) that have been used in same (e.g., Kashdan & Roberts, 2004) and opposite (Aron et al., 1997) gender interaction tasks. The confederates gave pre-scripted responses. The interaction was interrupted after 10 minutes and participants in both mood conditions completed a final post anxious and positive manipulation mood check using the VAS (Martin, 1990; Mongrain & Trambakoulos, 1997). To maintain the face validity of the study, participants answered questions about their first impressions formed during the interaction. All participants were debriefed, thanked for their time and participation and given the opportunity to ask questions and report any experience of discomfort.

Results

Data Analytic Overview

Analyses were conducted using SAS version 9.2 (SAS Institute, Inc., Cary, NC) and Mplus version 5.2 (Muthen & Muthen, 2008). When effect sizes were examined, Cohen's criteria were used to assess effect magnitude as small (d = 0.20), medium (d = 0.50) and large (d = 0.80) effects (Cohen, 1988). First, preliminary analyses were conducted. This included an examination of study variable descriptives and zero-order bivariate correlations, and a test of the effectiveness of the mood manipulation. Next, the study hypotheses were tested. The conceptual model is presented in Figure 1. Path analysis was used to test a mediated moderation model—a model whereby a moderator interacts with an independent variable to affect a dependent variable via a mediating variable (Morgan-Lopez & MacKinnon, 2006). Path analysis is a specific case of

Figure 1. Conceptual Illustration of Mediated Moderation Model



Structural Equation Modeling, a technique used to specify, estimate and evaluate models of linear relationships with the objective of determining whether an a priori model is valid (Gefen, Straub & Boudreau, 2000; Shah & Goldstein, 2006). The hypothesized path model was theory-driven and was specified a priori. The moderating effect of mood on the association between SA and alcohol cognitions (TR, ENH) was tested and the subsequent mediating effect of these cognitions on alcohol outcomes was examined.

Two separate models were tested. First, urge to drink was examined as the drinking outcome variables. Second, retrospective alcohol use and related problems were examined as the drinking outcome variables. Of initial interest is the interaction between SA and the dichotomous mood condition variable and the resulting effect on activation of TR alcohol cognitions. As previously noted, the effect on ENH alcohol cognitions is included to permit model specificity. Further, the influence of the activation of TR and ENH alcohol associations (activated by anxious mood) on increased urge to drink (first model) and retrospective drinking status (alcohol use and related problems) (second model) were tested. Support for moderation of the direct or indirect (via TR and ENH alcohol cognitions) effects of SA on the alcohol outcome variables by mood condition was followed by a test of simple slopes. Specifically, the simple slopes of the direct and indirect effects of SA predicting the alcohol outcomes at low mood (1 SD below mean; anxious mood) and high mood (1 SD above mean; control mood) was explored

Model fit was evaluated using the Mean Square Error of Approximation (RMSEA; Steiger, 1990), the Comparative Fit Index (CFI; Bentler, 1990) and the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973) fit statistics. Although there are no set standards for evaluating fit using these indices, Hu & Bentler's (1999) recommendation

suggests a cutoff of 0.06 or lower for the RMSEA, 0.96 for the TLI and close to 0.95 for the CFI. These guidelines are more conservative than traditional rules of thumb (i.e., RMSEA ≤ 0.10, and CFI ≥ 0.90; by Weston & Gore, 2006). Models meeting fit criteria proposed by Hu & Bentler were thus considered to have *excellent fit* (Longley, 2005). The models were tested with the mediated moderation methods outlined by Edwards and Lambert (2007), using bias-corrected bootstraps to generate standard errors and confidence intervals for the parameter estimates of the mediated (indirect) effects. Evidence for a mediating difference across the mood conditions was examined (MacKinnon et al., 2002), as recommended in methodological discussions of moderation in the context of mediation (Wegener & Fabrigar, 2000) and SEM (Rigdon, Schumaker & Wothke, 1998).

Data Screening

Prior to analysis, variables were screened for violation of assumptions. The data were inspected to ensure values were within reasonable range and proportion of missing values was assessed. Missing values for all variables represented less than 5% of data and thus, following recommendations by Meyers et al., (2006) no values were altered in the calculation of these variables. Thus, scale scores were derived for the respective measures based on the available information (i.e., items responded to). Two percent of the responses to alcohol use items were outliers. Specifically, three cases had extremely high scores (3.29 SD above or below the mean) on the alcohol use variable. These outlying values were replaced with the next most extreme value that fell within the acceptable standard deviation range as recommended by Kline (2005) (i.e., +/- 3.29 SD of the mean). Normality was examined visually and statistically. Skew and Kurtosis for all

variables of interest were within acceptable range (Skew < 3.0, Kurtosis <10.0; Kline, 2005) and thus, no transformations were applied to the data.

Consistent with the improved IAT scoring algorithm (Greenwald et al., 2003), participants data were excluded if more than 10% of trial latencies were below 300 ms, as these fast responses indicated anticipatory responding. No participants exceeded the 300 ms response time minimum for more than 10% of the trials, and therefore no participants were excluded from the analyses. As well, the scoring algorithm indicates that responses exceeding 10,000 ms should be excluded as they reflect an explicit decision. A total of 6% of ENH trials and 3% of TR trials exceeded the 10,000 ms response time limit and were excluded from analyses. Error trials were replaced with the block means, and consisted of approximately 6% of trials in the ENH blocks and 4% of trials in the TR blocks.

Preliminary Analyses

Descriptive statistics and zero-order correlations. Using the BFNE as a screening tool, an effort was made to recruit an equal number of participants that fell above and below the established mean cut-off from the literature (Carleton, 2006). While the sample was composed of 89 individuals who were classified as high (> mean) SA and 43 who were classified as low (< mean) SA, the overall BFNE mean (M = 36.05) and variability (SD = 9.91) in the current sample was similar to those found with other undergraduate samples (e.g., M = 29.43, SD = 7.74, Rodebaugh et al., 2004; M = 31.85, SD = 7.94, Kocovski & Endler, 2000). The overall mean FNE score for the current sample (see Table 1), once adjusted in terms of scale response to be comparable to those in other studies, was similar to those found in other undergraduate samples (M = 15.47,

SD = 8.62; Watson & Friend, 1969). The FNE was also highly correlated with the BFNE (*r* = .78) and the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987) (*r* = .51), which was an additional measure of SA included in the current study.

Descriptive statistics for variables included in the hypothesized model are presented in Table 1. Surveys of undergraduates in Canadian universities have found mean weekly drinking to be approximately 6.4 drinks (Adlaf et al., 2004). With regard to alcohol-related problems, previous work has demonstrated a mean of *M* = 14.7 (*SD* = 7.8) in U.S. college students (Read et al., 2006). The current sample appears to be on the low end for both alcohol use and experiencing problems related to drinking.

Pearson r correlations were examined to assess the associations between variables analyzed in the model (see Table 1). SA was not a statistically significant correlate of TR or ENH SC-IAT scores, nor with urge to drink, alcohol use or alcohol-related problems (*p*s > .05). The lack of relation between SA, cognitions, and outcome measures highlights the potential utility of examining the role of mood as a moderator.

Mood manipulation. Baseline FNE means were not statistically different for participants in the experimental (*M* = 0.54, *SD* = 0.31) compared to control condition (*M* = 0.55, *SD* = 0.25), *F* (1,130) = .09, *p* = .76, *d* = -0.07. Mean alcohol use was not statistically different across those in the experimental (*M* = 3.89, *SD* = 4.23) and control conditions (*M* = 3.85, *SD* = 4.15), *F* (1,130) = 0.00, *p* = .95, *d* = 0.01. An examination of state affect at baseline revealed that the baseline state anxiety ratings did not differ between the two groups (experimental condition: *M* = 29.26, *SD* = 20.67; control condition: *M* = 28.56, *SD* = 19.95, *F*(1,130) = 0.04, *p* = .84, *d* = 0.00). Moreover, the baseline state positive mood ratings did not differ between the two groups (experimental

Table 1

Zero-Order Correlations and Descriptive for all Variables included in Path Analyses

Variable	1	2	3	4	5	6	7	8
1. FNE	1.000							
2. Mood	0.027	1.000						
3. TR-SC-IAT	0.093	-0.046	1.000					
4. ENH-SC-IAT	0.074	-0.062	0.140	1.000				
5. Neg. Reinf. Urges	0.053	-0.163	0.211*	-0.009	1.000			
6. Pos. Reinf. Urges	0.036	-0.155	0.205*	-0.017	0.998**	1.000		
7. Alcohol Problems	0.072	0.025	0.046	-0.075	0.163	0.164	1.000	
8. Alcohol Use	-0.022	-0.005	-0.009	-0.024	0.143	0.149	0.623**	1.000
Mean	0.543	0.000	-0.020	0.027	2.263	2.393	6.833	3.868
SD	0.281	0.500	0.291	0.230	1.264	1.547	7.192	4.176

Note. $N = 132$. FNE = Fear of Negative Evaluation, Mood = Mood condition (Anxious, neutral); TR SC-IAT = Tension Reduction Single Category Implicit Association Test scores; EN SC-IAT = Enhancement Single Category Implicit Association Test scores; Neg. Reinf. Urge = Negative reinforcement urge to drink; Pos. Reinf. Urge = Positive reinforcement urge to drink; Alcohol Problems = Alcohol-related problems experienced in past year; Alcohol Use = number of standard drinks consumed weekly.

* $p < .05$ ** $p < .01$

condition: M = 57.18, SD = 16.67; control condition: M = 54.35, SD = 16.56, F (1,130) = 1.01, p = .96, d = 0.24).

A manipulation check was conducted to assess the effectiveness of the anxious mood induction. A repeated measures ANOVA was conducted to test the change in anxious mood from baseline to post-manipulation mood between the two groups. The within subjects variable was time (pre to post VAS) and the between subjects variable was mood condition (experimental; control). Results supported a time by mood condition interaction suggesting that change in anxious mood did differ across mood condition, F(1, 130) = 34.00, p < .0001. Follow-up simple effects analyses revealed a statistically significant increase in anxious mood for those in the experimental mood condition, with a medium to large effect size (post-manipulation: M = 44.59, SD = 29.48, t (65) = -5.58, p < .001, d = 0.69). In the control mood condition, there was a statistically significant decrease in anxious mood (post-manipulation: M = 25.65, SD = 20.65, t (65) = 2.05, p = .04, d = 0.25). Notably, this effect size was in the small range. Studies using anxious mood inductions have found mean state anxiety scores as high as M = 46.8 (Grant et al., 2007). Thus, the average state anxiety score for those in the experimental mood condition, post-manipulation mood, found in the current study is consistent with extant research.

Change in positive mood was assessed in order to ensure that the increase in anxiety did not reflect an overall increase in arousal rather than an increase in anxious mood specifically. A manipulation check was thus conducted to assess potential change in positive mood. A repeated measures ANOVA was conducted to test the change in positive mood from baseline to post-manipulation mood across the two groups. The

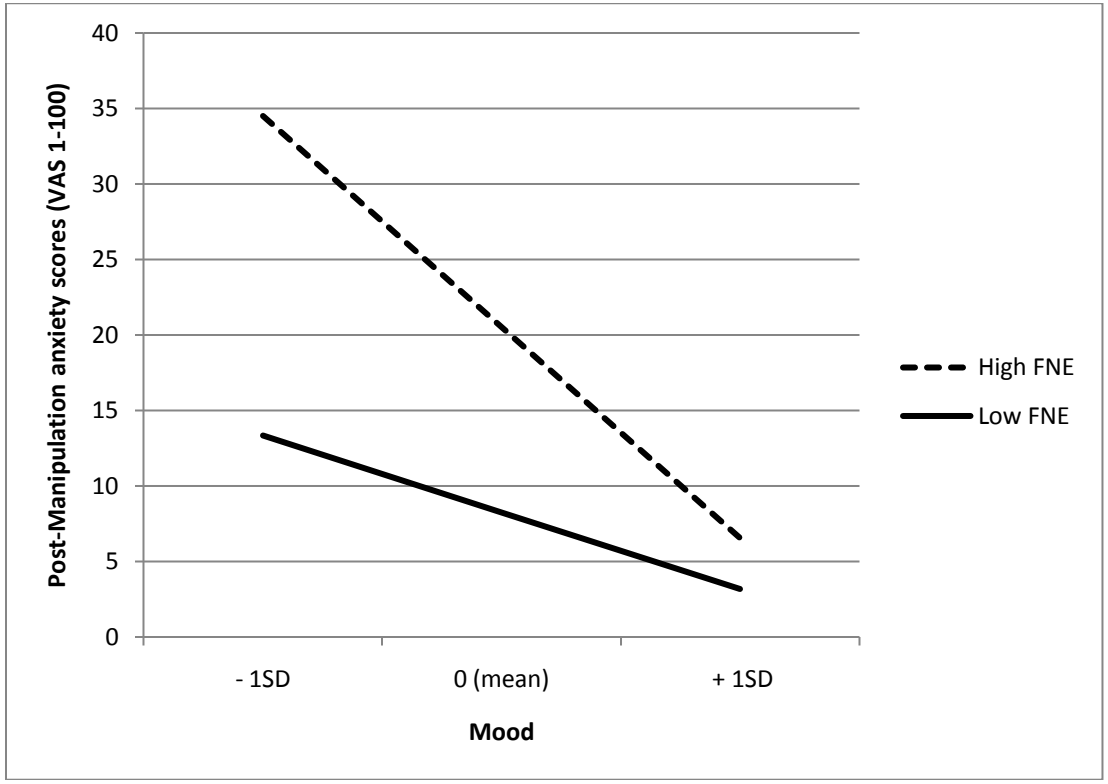
within subjects variable was time (pre to post VAS) and the between subjects variable was mood condition (experimental; control). Results revealed no statistically significant time by mood condition interaction suggesting that change in positive mood did not differ across mood condition F (1, 130) = 0.05, p = .83. However, there was a main effect of time F (1,130) = 29.76, p < .0001 such that when collapsing across mood condition, a general decrease in positive mood from baseline to post-manipulation mood was evident (baseline: M = 55.76, SD = 16.61, post-manipulation mood: M = 48.45, SD = 20.00, d = 0.96). Studies using anxiety induction mood manipulations have found mean positive items between M = 69.20 and M = 71.30 (Grant et al., 2007).In the current sample, the overall ratings of positive mood were thus lower than ratings found in other studies. While the analyses above demonstrate that overall those in the experimental mood condition experienced an elevated anxious mood, it is unclear whether this result was driven by those high in FNE. Specifically, those high in FNE may have been the only participants that responded to the socially-relevant anxious mood manipulation. In order to provide an effective test of the hypothesis that an anxious mood only in combination with a high level of FNE would result in activation of alcohol-related cognitions, it was necessary to demonstrate that even those low on FNE showed an increased anxious mood in response to the experimental manipulation. Accordingly, a Multiple Regression analysis was conducted to test the effect of mood condition (dichotomous variable) on post-manipulation anxious mood (VAS score; continuous variable) as moderated by FNE (continuous variable). In this model, baseline anxious mood (VAS score; continuous variable) was controlled for. Given that the mood condition by FNE interaction was statistically significant, F (1,130) = 8.90, p = .003, simple slopes of mood condition

predicting post-manipulation mood scores were examined. When conditioned on high FNE (1 SD above the mean), the simple slope of mood condition predicting post-manipulation mood scores was statistically significant, B = -27.95, t (126) = -6.76, p < .001. The simple slope of mood condition predicting post-manipulation mood was also statistically significant when conditioned on low FNE (1 SD below the mean), B = -10.16, t (126) = -2.42, p = .017. Upon examination of simple slopes (see Figure **2**), it was evident that those high on FNE who were in the experimental mood condition reported higher post-manipulation anxiety compared to their counterparts in the control mood condition. Likewise, those low on FNE who were in the experimental compared to control mood condition reported higher post-manipulation anxiety. The statistically significant mood condition by FNE interaction term suggests that the simple slopes differed in magnitude. Specifically, the effect of mood condition on post-manipulation anxiety scores was stronger at high compared to low FNE. This suggests that for those high compared to low FNE, there is a larger discrepancy in anxious mood for those in the experimental compared to control mood condition.

Hypothesis Testing

Overall path model predicting urge to drink. To be conservative, the hypothesized mediated moderation model included freely estimated direct effects from FNE, Mood, and the FNE by Mood interaction to the outcome urge variables. The hypothesized model did not provide good fit to the data: χ^2 (2) = 5.48, RMSEA = .12, CFI = 0.97, TLI = 0.69. Examination of the modification indices suggested freeing up the path from ENH to negative reinforcement urge to drink, a modification that is theoretically meaningful given that FNE (directly or indirectly) is expected to be

Figure 2. Mood Condition by FNE Interaction on Post-Manipulation Anxiety Scores

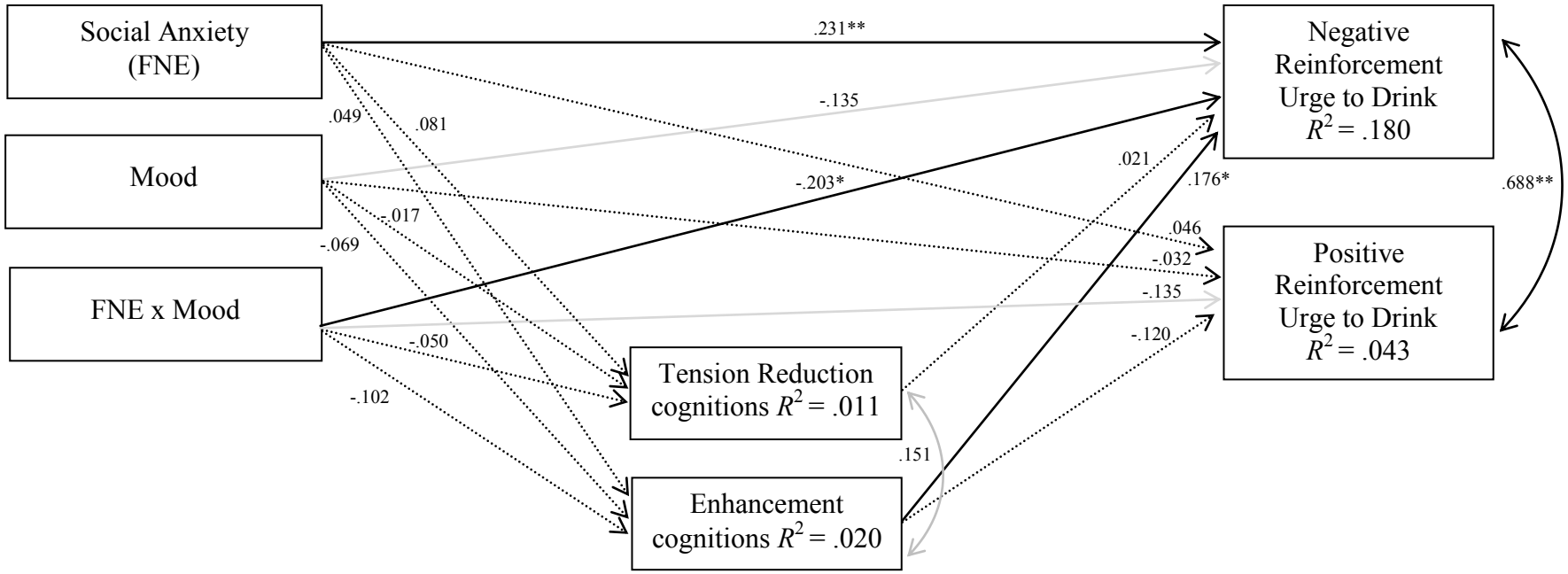


Note. Simple slopes of mood condition predicting post-manipulation anxiety scores at high (1SD above the mean) and low (1 SD below the mean) levels of FNE. Both simple slopes were statistically significant at $p < .05$. FNE = Fear of Negative Evaluation, VAS = Visual Analogue Scale.

associated with an urge to drink for coping or negative reinforcement purposes. The model with this freed up path provided excellent fit to the data: χ^2 (1) = 0.87, RMSEA=0.0000 (90% confidence interval=0.0000, 227); CFI = 1.0; TLI = 1.022. A chi-square difference test revealed that this model provided a statistically significant improvement in model fit ($\Delta \chi^2$ (1) = 4.61, p = .05), and thus this model was retained for further examination. Results of a mediated moderation path analysis (see Figure 3) indicated that the hypothesized FNE by mood interaction term was not a statistically significant predictor of the TR SC-IAT scores (B = -0.10, SE = 0.19, p = .59), nor was it a statistically significant predictor of the ENH SC-IAT scores (B = -0.16, SE = 0.16, p = .29). This suggests that mood did not moderate the effect of FNE scores as expected on the TR SC-IAT scores, nor did mood moderate the effect of FNE scores on the ENH SC-IAT scores. Examination of the first order effects of the mediators regressed on the predictor variables revealed that the FNE scores were not statistically significant predictors of the TR (B = 0.08, SE = 0.09, p = .39) or ENH (B = 0.04, SE = 0.77, p =.61) SC-IAT scores.

Also, mood condition was not supported as a statistically significant predictor of the TR (B = -0.01, SE = 0.05, p = .85) or ENH (B = -0.03, SE = 0.04, p = .43) SC-IAT scores. Examination of the outcome variables regressed on the mediators revealed that there was not the expected statistically significant association between the TR SC-IAT scores and negative reinforcement urge to drink (B = 0.09, SE = 0.28, p = .74). Although ENH SC-IAT scores were not statistically significant predictors of positive reinforcement urge to drink (B = 0.61, SE = 0.49, p = .22), these scores were statistically significant predictors of negative reinforcement urge to drink (B = 0.98, SE = 0.49, p = .05).

Figure 3**.** Path Coefficients for Overall Model Predicting Urge to Drink



Note. $N = 132$. Standardized path Beta coefficients are presented in the path diagram. Solid black lines represent statistically significant paths/correlations, solid gray lines represent marginally statistically significant paths/correlations ($p < .12$), and dotted lines indicate non-statistically significant paths that were tested.
* $p < .05$. ** $p < .01$

Examination of the bootstrapped CI of the indirect effects (see Table 2) revealed no support for a mediated moderation effect from FNE (moderated by mood) via the alcohol-related cognitions to urge to drink. Examination of the direct effects from the predictor to outcome variables revealed that mood moderated the effect of FNE scores on negative reinforcement urge to drink (B = -1.81, SE = 0.76, p = .02) and positive reinforcement urge to drink (B = -1.10, SE = 0.70, p = .12, very marginal effect). Examination of first order direct effects revealed that FNE scores were a statistically significant predictor of negative reinforcement urge (B = 1.03, SE = 0.39, p = .01) but not positive reinforcement urge (B = 0.19, SE = 0.36, p = .61) to drink. Thus, elevated FNE scores predicted increased urge to drink for negative reinforcement purposes. Also, mood condition was a marginal statistically significant predictor of negative reinforcement urge scores (B = -0.34, SE = 0.21, p =.11) but not positive reinforcement urge to drink (B = -0.07, SE = 0.21, p = .72). Thus, those in the experimental compared to control mood reported a higher urge to drink for negative reinforcement purposes.

Model conditioned on anxious mood group. Although the effect of FNE on the alcohol-related cognitions was not significantly moderated by mood condition, given the theoretical support for this model and given that the direct effect of FNE on urge to drink was moderated by mood condition, the model was examined further. Specifically, the simple slopes of FNE predicting alcohol-related cognitions (and in turn predicting urge to drink) and the simple slopes of FNE predicting urge to drink (i.e., direct effect) were examined by conditioning the model first on the experimental mood condition and then on the control mood condition.

Table 2

Overall Urge to Drink Model Bias Corrected Bootstrap Results for Tests of Indirect Effects

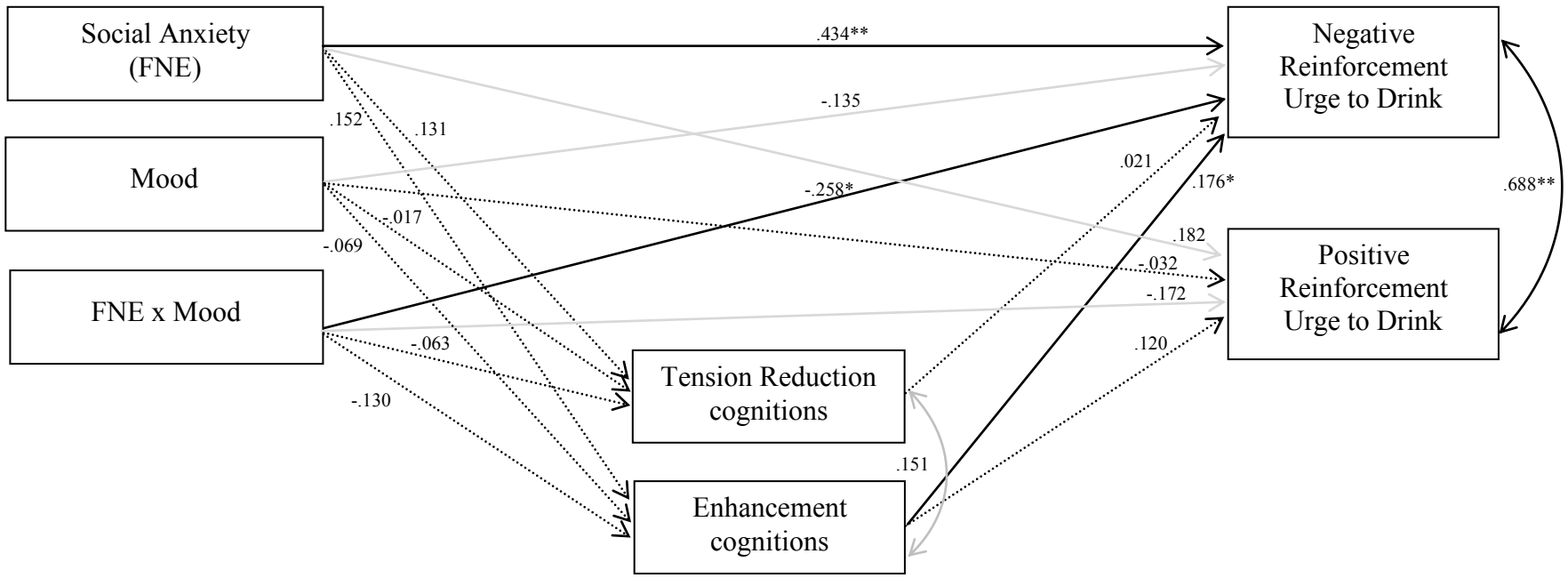
Specified Paths	Estimate	99% CI	95% CI	90% CI
FNE → TR cognitions → Negative Reinforcement Urges	0.008	(-0.092, 0.216)	(-0.046, 0.121)	(-0.032, 0.83)
FNE → ENH cognitions → Negative Reinforcement Urges	0.039	(-0.134, 0.425)	(-0.084, 0.33)	(-0.056, 0.235)
FNE → ENH cognitions → Positive Reinforcement Urges	0.024	(-0.094, 0.328)	(-0.049, 0.224)	(-0.029, 0.184)
Mood → TR cognitions → Negative Reinforcement Urges	-0.001	(-0.07, 0.043)	(-0.046, 0.026)	(-0.034, 0.018)
Mood → ENH cognitions → Negative Reinforcement Urges	-0.031	(-0.228, 0.057)	(-0.173, 0.033)	(-0.151, 0.017)
Mood → ENH cognitions → Positive Reinforcement Urges	-0.019	(-0.177, 0.037)	(-0.143, 0.02)	(-0.115, 0.010)
FNExMood → TR cognitions → Negative Reinforcement Urges	-0.009	(-0.324, 0.116)	(-0.249, 0.064)	(-0.185, 0.041)
FNExMood → ENH cognitions → Negative Reinforcement Urges	-0.160	(-1.204, 0.184)	(-0.742, 0.075)	(-0.612, 0.036)
FNExMood→ ENH cognitions → Positive Reinforcement Urges	-0.100	(-0.865, 0.155)	(-0.58, 0.048)	(-0.521, 0.024)

Note. CI= Confidence Interval

The standardized path coefficients for the hypothesized model conditioned on the experimental group are presented in Figure 4. When conditioned on the experimental group, FNE was not a statistically significant predictor of either the TR (B = 0.13, SE = 0.12, p = .27) or ENH (B = 0.12, SE = 0.09, p = .18) SC-IAT scores. However, the pattern of the data suggested that there was a weak relation between FNE and ENH SC-IAT scores, such that when in an anxious mood an elevated FNE was associated with increased activation of ENH alcohol-related cognitions (see Figure 5). Examination of the bootstrapped CI of the indirect effects of FNE on urge to drink via alcohol-related cognitions revealed very weak support for a mediated effect (See Table 3). Specifically, the 90% CI for the effect of FNE on both positive and negative urge to drink via ENH alcohol-related cognitions included zero as the lower limit. While interpretation of this indirect effect is very tentative, it appears that there is some evidence that when in a socially-relevant anxious mood, those high on FNE show increased activated of ENH alcohol cognitions and this in turn led to elevated urge to drink for negative and positive reinforcement purposes.

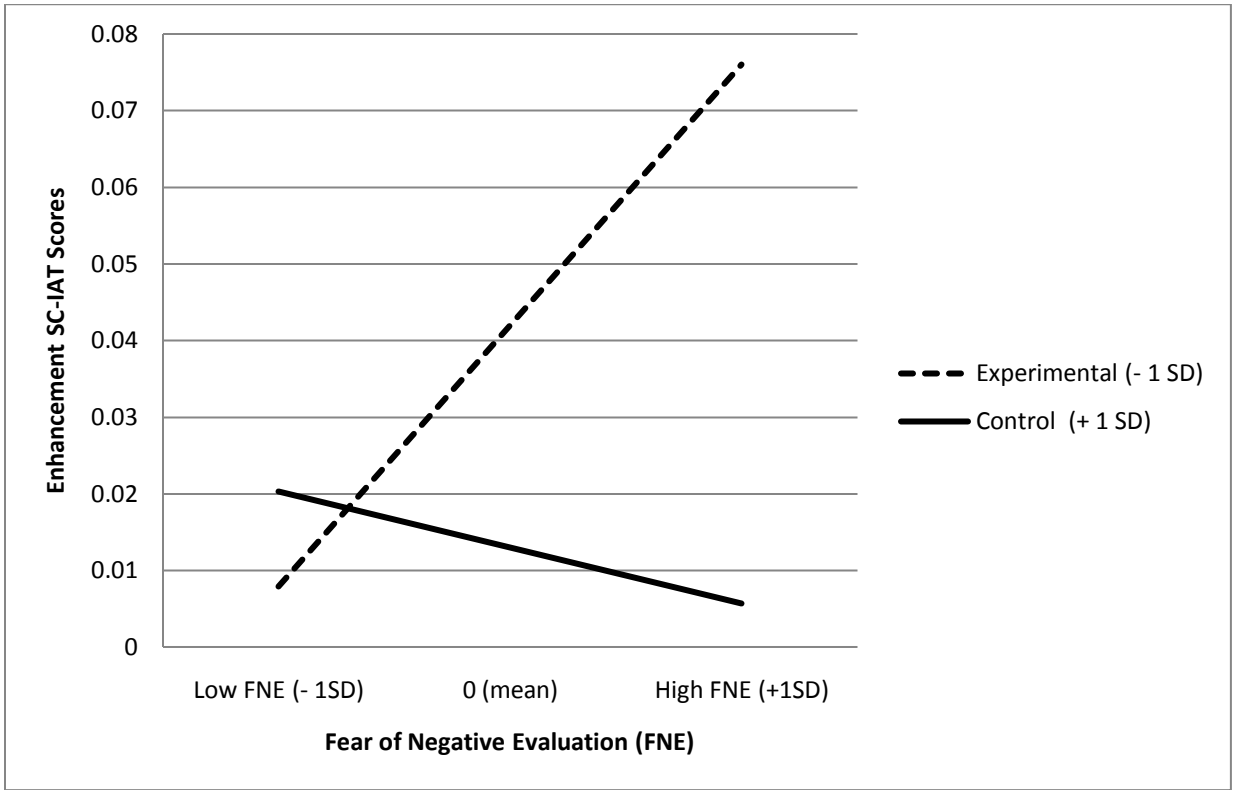
Examination of the direct effect of FNE on urge to drink for the model conditioned on the experimental group revealed that there was a statistically significant association between FNE scores and negative reinforcement urge to drink (B = 1.93, SE = 0.46, p < .01) and a marginal statistically significant association between FNE scores and positive reinforcement urge to drink (B = 0.74, SE = 0.45, p = .11). Specifically, when in a socially-relevant anxious mood, those high on FNE show an elevated urge to drink for both negative and positive reinforcement purposes, and this increased urge was not mediated by or explained by activation of alcohol-related cognitions.

Figure 4. Path Coefficients for Model Conditioned on Anxious Mood Predicting Urge to Drink



Note. $N = 132$. Standardized path beta coefficients are presented in the path diagram. Solid black lines represent statistically significant paths/correlations, solid gray lines represent marginally statistically significant paths/correlations ($p < .12$), and dotted lines indicate non-statistically significant paths that were tested.
* $p < .05$. ** $p < .01$

Figure 5. Simple Slopes for the Effect of FNE by Mood Condition Interaction on Enhancement SC-IAT Scores



Note. Simple slopes of FNE predicting Enhancement SC-IAT scores at experimental (1SD below the mean) and control (1SD above the mean) mood conditions. Both simple slopes were not statistically significant ($p > .05$). FNE = Fear of Negative Evaluation, VAS = Visual Analogue Scale.

Table 3

Urge Model Conditioned on Anxious Mood: Bias Corrected Bootstrap Results for Tests of Indirect Effects

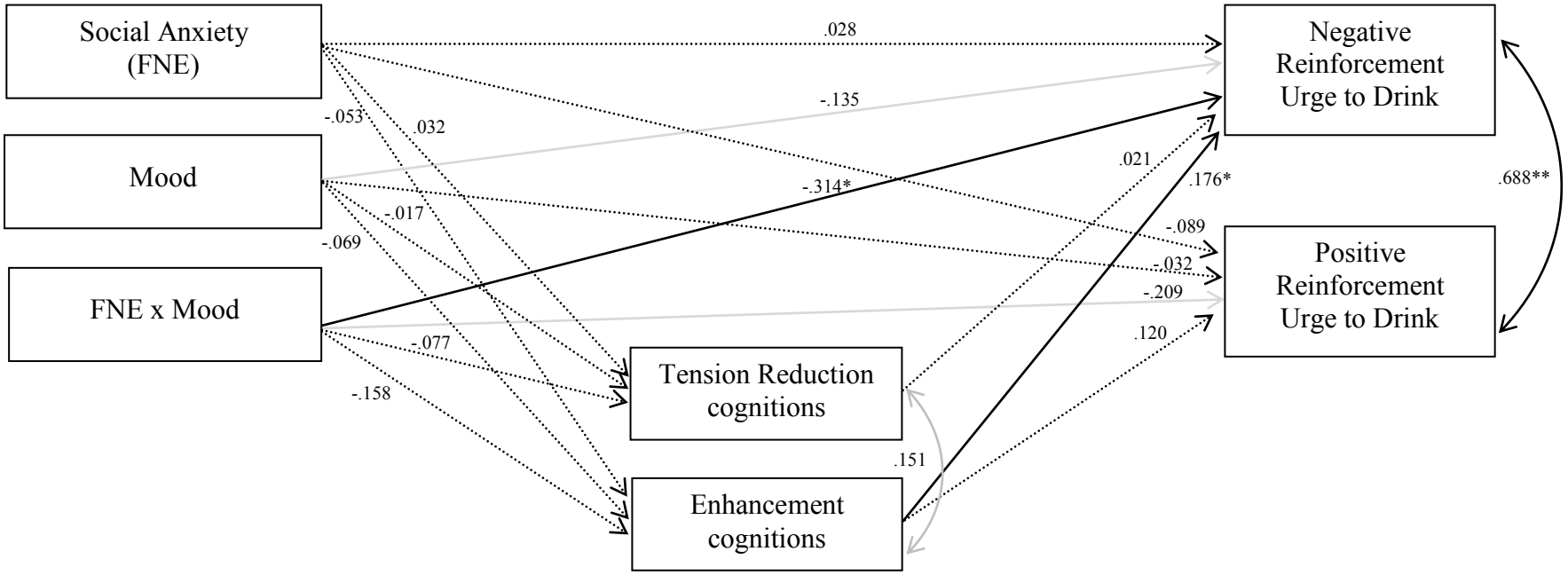
Path Estimated	B	99% CI	95% CI	90% CI
FNE → TR cognitions → Neg. Urges	0.012	(-0.101, 0.224)	(-0.056, 0.171)	(-0.053, 0.123)
FNE → ENH cognitions → Neg. Urges	0.119	(-0.108, 0.718)	(-0.028, 0.567)	(-0.005, 0.477)
FNE → ENH cognitions → Pos. Urges	0.074	(-0.086, 0.507)	(-0.031, 0.448)	(-0.009, 0.361)

Note. CI= Confidence Interval

Model conditioned on control mood group. To provide the comparable examination of the simple slopes of FNE predicting urge to drink both directly and indirectly via alcohol-related cognitions, the model was next conditioned on the control group (see Figure 6). In this condition, the simple slopes of FNE scores predicting TR (B = 0.03, *SE* = .23, *p* = .82) and ENH (*B* = -0.04, *SE* = -0.11, *p* = .70) SC-IAT scores were not statistically significant, and neither even approached marginal statistical significance. This suggested that when in a neutral mood, high FNE scores were unrelated to activation of alcohol-related cognitions. Notably, in contrast to the minimal evidence of a relation between FNE and ENH alcohol-related cognitions in the experimental condition, there was no support for a comparable association in the control condition (see Figure 6). Not surprisingly, the bootstrapped CI of the indirect effects (see Table 4) suggested that the effect of FNE on urge to drink was not mediated by alcohol-related cognitions when individuals were in the control condition. Examination of the simples slopes of the direct effects of FNE on urge to drink (for the control condition) revealed that FNE was not a statistically significant predictor of negative (*B* = 0.13, *SE* = 0.56, *p* = .82) or positive (*B* = -0.36, *SE* = 0.55, *p* = .51) reinforcement urge to drink. Thus, suggesting that when in a neutral mood elevated FNE scores were unrelated to a change in urge to drink.

Overall path model predicting alcohol use and problems. The mediated moderation model was tested with alcohol use and problems as outcomes (See Figure 7. This hypothesized model was saturated, as again to be conservative, the direct effects from the predictors to the outcome variable were freely estimated. Given that the model was saturated, model fit could not be assessed and parameter coefficients were examined instead. Results indicated that the hypothesized FNE by mood interaction term was not a statistically significantly predictor of TR

Figure 6. Path Coefficients for Model Conditioned on Control Mood Predicting Urge to Drink



Note. $N = 132$. Standardized path Beta coefficients are presented in the path diagram. Solid black lines represent statistically significant paths/correlations, solid gray lines represent marginally statistically significant paths/correlations ($p < .12$), and dotted lines indicate non-statistically significant paths that were tested.
* $p < .05$. ** $p < .01$

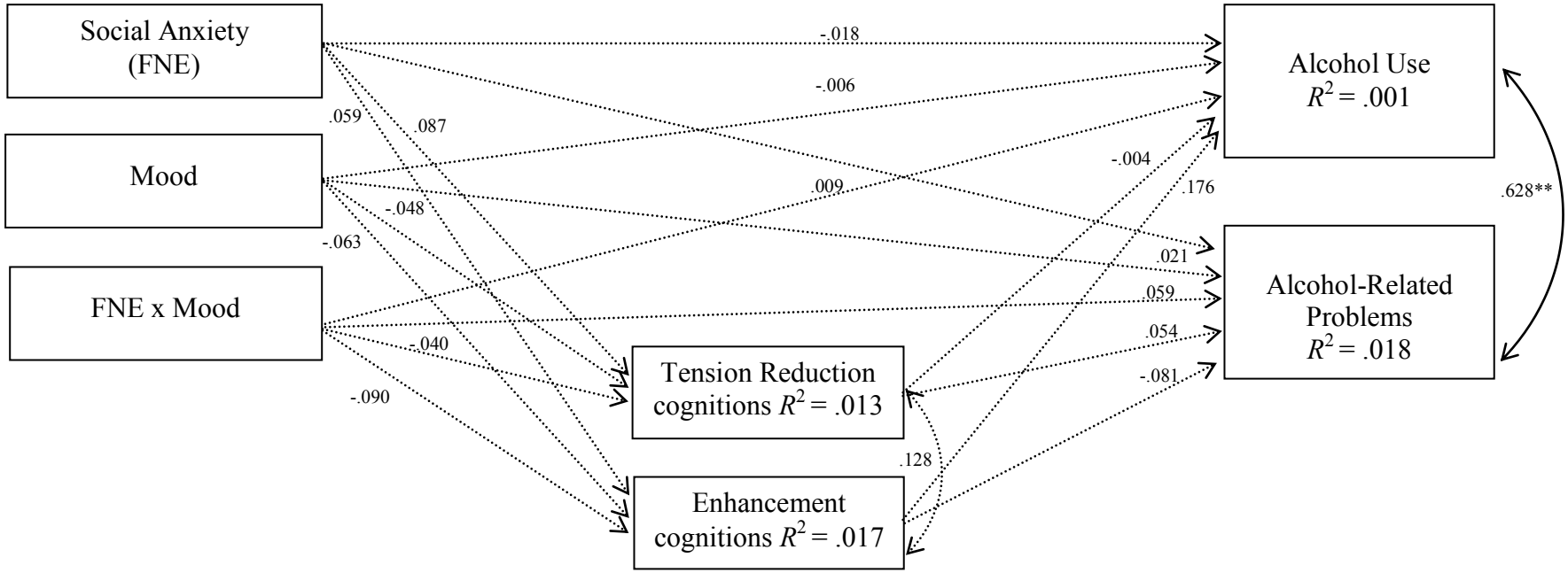
Table 4

Urge Model Conditioned on Control Mood: Bias Corrected Bootstrap Results for Tests of Indirect Effects

Path Estimated	B	99% CI	95% CI	90% CI
FNE → TR cognitions → Neg. Urges	0.003	(-0.134, 0.256)	(-0.087, 0.135)	(-0.057, 0.093
FNE → ENH cognitions → Neg. Urges	-0.042	(-0.626, 0.266)	(-0.356, 0.155)	(-0.282, 0.121)
FNE → ENH cognitions → Pos. Urges	-0.026	(-0.510, 0.162)	(-0.323, 0.087)	(-0.269, 0.049

Note. CI= Confidence Interval

Figure 7. Overall Model Path Coefficients Predicting Use and Problems



Note. $N = 132$. Standardized path Beta coefficients are presented in the path diagram. Solid black lines represent statistically significant paths/correlations and dotted lines indicate non-statistically significant paths/correlations that were tested.
**$p < .01$

(*B* = -0.08, *SE* = 0.18, *p* = .65), or ENH (*B* = - 1.48, *SE* = 1.14, *p* = .31) SC-IAT scores Consistent with the urge to drink model, these data suggest that mood did not moderate the effect of FNE scores on the TR or ENH SC-IAT scores. Examination of the first order effects of the mediators regressed on the predictor variables revealed that FNE scores were not statistically significant predictors of the TR (*B* = 0.09, *SE* = 0.09, *p* = .32) or ENH (*B* = 0.05, *SE* = 0.07, *p* = .51) SC-IAT scores. Also, mood condition was not a statistically significant predictor of TR (*B* = -0.03, *SE* = 0.50, *p* = .58) or ENH (*B* = -0.03 *SE* = 0.04, *p* = .46) SC-IAT scores. Examination of the outcome variables regressed on the mediators revealed that there was not a statistically significant association between TR SC-IAT scores and alcohol use (*B* = -0.06, *SE* = 1.27, *p* = .97) or ENH SC-IAT scores and alcohol use (*B* = -0.40, *SE* = 1.61, *p* = .80). Likewise, there was not a statistically significant association between TR SC-IAT scores and alcohol-related problems (*B* = 1.33 *SE* = 2.16, *p* = .54) or ENH SC-IAT scores and alcohol-related problems (*B* = -2.55, *SE* = 2.75, *p* = .35). Not surprisingly, indirect effects, as assessed based on the bootstrapped CI, from FNE, Mood, and FNE by Mood to alcohol use and problems via TR and ENH SC-IAT scores were not supported (see Table 5).

Examination of the direct effects from the predictor to outcome variables suggested that mood did not moderate the effect of FNE on alcohol use (*B* = 0.27, *SE* = 2.64, *p* = .92) or problems (*B* = 3.01, *SE* = 4.51, *p* = .51), as neither interaction term was statistically significant. Examination of the first order direct effects revealed that FNE scores did not predict alcohol use (*B* = -0.27, *SE* = 1.32, *p* = .84) or problems (*B* = 2.15, *SE* = 2.26, *p* = .34), and Mood condition did not predict alcohol use (*B* = -0.05, *SE* = 0.73, *p* =.94) or problems (*B* = 0.29, *SE* = 1.24, *p* =.81). Given the lack of support for indirect effects from the FNE (as moderated by mood) to

Table 5

Overall Alcohol Use and Problems Model Bias Corrected Bootstrap Results for Tests of Indirect Effects

Specified Paths	Estimate	99% CI	95% CI	90% CI
FNE → TR cognitions → Use	-0.008	(-0.890, 0.499)	(-0.503, 0.267)	(-0.379, 0.205
FNE → ENH cognitions → Use	-0.019	(-0.872, 0.342)	(-0.497, 0.197)	(-0.352, 0.135)
FNE → TR cognitions → Alcohol-related problems	0.120	(-0.422, 1.530)	(-0.200, 1.108)	(-0.107, 0.944)
FNE → ENH cognitions → Alcohol-related problems	-0.122	(-2.497, 0.461)	(-1.641, 0.217)	(-1.116, 0.128
Mood → TR cognitions → Use	0.002	(-0.251, 0.244)	(-0.131, 0.167)	(-0.091, 0.142)
Mood → ENH cognitions → Use	0.012	(-0.187, 0.391)	(-0.106, 0.268)	(-0.074, 0.220
Mood → TR cognitions → Alcohol-related problems	-0.037	(-0.836, 0.201)	(-0.557, 0.109)	(-0.387, 0.072)
Mood → ENH cognitions → Alcohol-related problems	0.074	(-0.246, 0.999)	(-0.121, 0.715)	(-0.074, 0.606)
FNExMood → TR cognitions → Use	0.005	(-0.732, 0.945)	(-0.455, 0.652)	(-0.318, 0.483)
FNExMood → ENH cognitions → Use	0.059	(-0.871, 1.778)	(-0.4822, 1.257)	(-0.329, 0.873)
FNExMood→ TR cognitions → Alcohol-related problems	-0.108	(-2.652, 0.852)	(-1.871, 0.406)	(-1.404, 0.276)
FNExMood→ ENH cognitions → Alcohol-related problems	0.375	(-0.730, 4.300)	(-0.355, 3.426)	(-0.174, 2.990)

Note. CI= Confidence Interval.

alcohol use and problems via the TR and ENH SC-IAT scores, and given that there was no evidence that mood moderated the direct effect of FNE on alcohol use and problems, this model was not explored further.

Discussion

The first goal of this study was to develop an ecologically valid mood manipulation that will be relevant to furthering aetiological models of alcohol misuse in the context of SA. Specifically, the goal was to develop a mood induction manipulation that is representative of typical circumstances that motivate socially anxious individuals to drink. Experimental anxiety manipulations with a strong performance component lack external validity as these situations are less likely to elicit drinking behaviours in individuals high on SA (Morris et al., 2005). Additionally, these individuals report concerns that the alcohol will impair their performance and are therefore less likely to drink in these situations (Abrams et al., 2001). In contrast to these performance-based manipulations, the current mood induction emphasized first impression formation and social interaction specifically. Individuals in the experimental (anxious) mood condition reported significantly higher state anxiety scores than those in the control group, suggesting that state anxiety was successfully induced by the manipulation. Further, individuals in the experimental mood condition reported higher urge to drink than those in the control mood, an effect that was particularly pronounced for high SA individuals. Consistent with theory and empirical work (Battista, Stewart & Ham, 2010; Morris et al, 2004), a socially-relevant mood induction procedure was thus effective in inducing alcohol urges.

The second goal was to examine the mechanisms underlying the aetiological risk pathway from SA to problematic drinking, and at the same time, offer some clarity to the existing mixed literature on the relation between SA and problematic drinking. In addressing this goal, the socially-relevant mood manipulation developed for this study was utilized in the examination of the effects of SA on the automatic activation of alcohol-related cognition when individuals were in an anxious mood. The subsequent link with in-the-moment urge to drink and retrospective broader drinking status was then assessed. Results showed support for a direct effect of FNE on urge to drink. Specifically, as anticipated, those high on SA reported an elevated urge to drink for negative reinforcement purposes, ("to feel less tense") and somewhat unexpectedly, they also reported an urge to drink for positive reinforcement reasons (to be "content"). These preliminary findings suggest both negative and positive reinforcement may play a role in drinking risk pathways. Although it was hypothesized that this mood-moderated effect of SA on urge to drink would be mediated by alcohol cognitions and specifically, tension reduction alcohol cognitions, this mediated effect was not supported. However, additional explorative model probing suggested that enhancement alcohol cognitions may have played a role in partially mediating the effect of SA on urge to drink. This link would suggest that when in anxious mood, those high on SA may have activated enhancement-relevant alcohol cognitions (thoughts that alcohol would enhance their mood), such as "energetic" and "excited", which subsequently led to increased urge to drink. These tentative findings support extant theories emphasizing the central role of cognitions in drinking risk pathways. Also consistent with extant data is evidence for positive alcohol cognitions mediating the association between SA and drinking outcomes (Booth &

Hasking, 2009). Although the role of tension reduction cognitions is emphasized in the explicit cognition literature, the current study provides preliminary support for the relevance of enhancement cognitions at the implicit level.

With regard to drinking outcomes, the pattern of responding in the lab paradigm was unexpectedly unrelated to retrospective drinking status (i.e. reported use and problems). The current study aimed to assess drinking use and problems in the same model in order to clarify potentially unique risk pathways to these two drinking outcomes. The unique link between SA and alcohol-related problems has been established in the literature (Morris et al., 2005), however, this association was not found in the current study.

Extant theories may provide direction in understanding the underlying mechanism of drinking risk in light of current findings. In the context of SA, the Tension Reduction Theory and the Self Medication Hypothesis – both rooted in cognitive and learning theory – suggest that individuals form cognitive associations with alcohol that are characterized by tension reduction outcomes (e.g., alcohol associated with feeling relaxed or calm). It is the activation of these cognitions that leads to an increased likelihood of consuming alcohol in anxiety provoking situations (Chutuape & de Wit, 1995, Carrigan & Randall, 2003). Thus, according to theory, for individuals high on SA, tension reduction alcohol cognitions should play a central role in the aetiological risk pathway to drinking. Furthermore, research has implicated mood as an important moderator within this pathway (Kidorf & Lang, 1999; Holroyd, 1987), suggesting that these tension reduction cognitions are activated in the context of anxious mood. Results of the current study demonstrate that in the control condition, elevated FNE scores were not associated

with enhancement cognitions or urge to drink, whereas in the experimental mood condition, some weak evidence was found to suggest elevated FNE scores may have predicted increased enhancement cognition scores and elevated urge to drink. Thus, the current study provides some preliminary support for a socially-relevant anxious mood potentially leading to an activation of enhancement relevant alcohol cognitions and to the increased urge to drink.

Contrary to theory and hypotheses, the current study did not provide support for the activation of tension reduction alcohol cognitions as mediating the link between SA and in-the-moment urge to drink when individuals were in an anxious mood. Nor was the activation of tension reduction alcohol cognitions by those high in SA (when in an anxious mood) linked with alcohol use or alcohol-related problems more broadly. These findings are inconsistent with data from studies that have shown tension reduction expectancies to moderate a positive association between SA and drinking behaviours (e.g. Booth & Hasking, 2009). Other work has also implicated mood in the examination of alcohol-related cognitions in coping and enhancement motivated drinkers, and demonstrated that negative mood cues activate implicit alcohol cognitions in those who drink to cope (Stewart et al, 2002). Research involving coping-motivated drinkers has shown that when in a negative mood, these drinkers report increased expectancies of relief (Birch, 2004). In these studies, negative affect cues led to an increase in alcohol cognitions for these individuals. Results from the current study are not entirely consistent with theory and data suggesting that an anxious mood should activate tension reduction specific alcohol associations, and that these in turn should lead to alcohol use as a way to reduce negative affect. Reducing anxiety is among the most commonly reported reasons

for drinking for those high in SA (Burke & Stephens, 1999), and thus the lack of support for the mediating role of tension reduction cognitions is surprising. Notably, the current study did demonstrate that anxious mood induced urge to drink for those high in SA, however, enhancement cognitions appeared to play a potentially more substantial role in this association.

A number of methodological factors may account for the discrepancy between the current study and extant literature/theory, with regard to the lack of support for the mediating role of tension reduction alcohol cognitions. Primarily, the alcohol cognitions assessed in many of these studies were either assessed at an explicit level, using questionnaire data (Booth & Hasking, 2009) or implicitly using a lexical semantic activation task (Stewart et al, 2002). It is difficult to compare the findings from the explicit expectancy literature, given the difference in modality in the measurement of these cognitions. Namely, although it is expected that the tension-reducing effects of alcohol may be most meaningful to those high on SA, immediately-activated in-the-moment cognitions are not captured by these measures. With regard to semantic activation tasks, activation has been shown to occur following both positive and negative affective primes for some drinkers, suggesting that both types of valenced primes can affect activation. Differences associated with positive and negative primes may be particularly difficult to interpret given potential semantic associations with these primes.

In addition, evidence suggests that other potential moderators may play a role in elucidating the role of these cognitions. Specifically, Burke and Stephens (1999) argue the SA and tension reduction cognition link may only manifest for individuals low on self-efficacy to refrain from heavy drinking when anxious. Thus, it is purported that this

construct is relevant to and should be incorporated in future work assessing these variables. Individuals who believe that they are unable to cope with anxiety producing situations may be at higher risk for forming tension reduction associations with alcohol. Tension reduction cognitions may therefore only be activated for individuals who are high on SA when self-efficacy to refrain from drinking is low, leading to urge to drink. Indeed findings have shown self-efficacy beliefs about one's ability to moderate drinking specific to socially anxious situations may be important in moderating the link between SA and drinking outcomes (Burke & Stephens, 1999).

Another important consideration is the temporal specificity of tension reduction cognitions. These formed associations with alcohol may be developing gradually and thus be more difficult to detect at earlier stages in the SA-risk pathway. Drawing upon SLT, tension reduction cognitions may be construed as the outcome of consistently reinforced pairings between alcohol and tension reduction, and may therefore only become apparent further along the risk pathway (i.e., as outcomes). Indeed the literature suggests that individuals at later stages of life, and with clinical levels of SA and alcohol use disorders hold tension reduction expectancies among an array of positive expectancies, and exhibit these more so than individuals low in SA and with no alcohol use disorders (Morris, et al., 2005). When compared with non-problem drinkers, problem drinkers show higher positive alcohol expectancies including tension reduction (Lewis & O'Neill, 2000). Furthermore, work with clinical samples of individuals with SA and alcohol use disorders has shown that a majority of those with alcohol use disorders attributed their last episode of drinking to an attempt at reducing tension (Smail et al, 1984). A more robust manifestation of the tension reduction cognitions may thus only become apparent in

clinical populations, or in later stages of life after substantial learned tension reduction cognition-relief via alcohol associations have been established in memory. Given the early risk stage of the current study sample, these learned processes may not have become fully automatized (Birch et al., 2009) and may therefore not yet be detectable in the implicit cognition tasks.

Context may also play a central role in interpreting the lack of support for a mediational role of tension reduction cognitions in the SA-drinking risk pathway. Evidence suggests it is essential to consider alcohol-relevant cognitive processes within environmental contexts, given the strong influence of context cues on drinking behaviour of undergraduates (Harford et al., 1983, Krank et al, 2005). A study of situational specificity showed that testing in an on-campus bar setting, compared to testing in a laboratory setting, yielded faster reaction times on an implicit cognitions task (Wall et al, 2001). Response latencies for alcohol-related sociability were more rapid in the on-campus bar than in the laboratory setting. Other evidence suggests that tension reduction cognitions are more readily accessible in a bar setting than in a laboratory setting (Wall, McKee & Hinson, 2000). Given that the current study was conducted within a laboratory setting devoid of any alcohol priming cues, it is a possibility that the tension reduction associations with alcohol were not primed or detectable as a result.

An additional factor that may account for the lack of support for mediation by tension reduction cognitions relates to the specific content of the tension reduction items on the task. Research suggests that high SA individuals report using alcohol to cope with social situations (Thomas et al., 2003), and thus, assessing the specific activation of social-facilitation relevant negative reinforcement alcohol associations may have been

warranted. In further support of this, Tran, Haaga, and Chambless (1997) found that elevated SA was only associated with alcohol consumption when individuals indicated a strong expectancy that alcohol would reduce anxiety in social situations. This effect was not found when broad tension reduction alcohol expectancies were endorsed. In addition, another study examining SA and problematic alcohol use found that social but not tension reduction expectancies partially mediated the association between SA and hazardous drinking (Ham, 2009). Together, these findings lend support to the necessity of addressing social specificity of tension reduction alcohol cognitions when examining the SA-alcohol use risk pathway. The current study may have lacked this social facilitation specificity in its assessment of alcohol cognitions. Given that the mood manipulation was highly socially relevant, perhaps the general tension reduction cognitions measured failed to tap into the cognitions that should be activated by those high in SA (Birch, 2004). Future work examining cognitive mediators of the SA-problematic drinking relation may benefit from incorporating social facilitation words such as "outgoing", "confident" or "likeable" (Read et al., 2004) in implicit cognition assessments.

Although the lack of support for the role of tension reduction cognitions in the SA-drinking risk pathway is not fully in line with some previous findings a number of extant findings have failed to demonstrate the hypothesized role of implicit rather than explicit tension reduction cognitions within drinking risk pathways. In a study of coping motivated drinkers, Birch et al (2008) found that contrary to their hypotheses, a musical negative mood induction did not influence the activation of implicit relief alcohol cognitions. Their findings replicate previous research showing similar results with the Stroop task, specifically that negative mood only increases tension reduction cognitions

at the explicit but not at the implicit level (Birch, 2008). Although in the current study, tension reduction cognitions did not appear to play an essential role in the SA-drinking urge pathway, there was some preliminary evidence to suggest that anxious mood may have activated enhancement cognitions, which in turn gave rise to an increased urge to drink. Extant research suggests at an explicit level, positive expectancies broadly play a central role in the SA-alcohol use risk pathway (Tran, Haaga, & Chambless, 1997, Eggleston, Woolaway-Bickel, & Schmidt, 2004, Lewish & O'Neill, 2000). The mediating role of tension reduction cognitions may thus be more easily detectable on an explicit level, or may only become apparent upon sufficient strengthening of associations.

With regard to the mechanistic process, it is possible that an automatic level, rather than an increase in tension reduction cognitions in response to anxious mood, it is elevated enhancement cognitions that are conducive to drinking behaviour. This pathway is theoretically meaningful in that individuals in an anxious mood may aim to use alcohol to cope with negative affect by enhancing their mood rather than by reducing their tension. There is evidence demonstrating that reductions in subjective anxiety are accompanied by an increase in positive thoughts rather than by decrease in negative thoughts (Abrams et al., 2001). Individuals in an anxious mood state may have the urge to drink to alleviate their negative mood state, however, they may be associating alcohol with an increase in positive affect rather than a decrease in negative affect. For example, these individuals may associate drinking more strongly with "feeling more content" rather than deriving relief. Thus, the means to alleviating the negative mood may be occurring via experiencing the enhancement effects of alcohol. Individuals high in SA may be particularly eager to increase their positive affect given their experience of

anxiety in social situations (Buckner, Eggleston, & Schmidt 2006). Alternatively, positive alcohol-related cognitions may be difficult to parse at an implicit level. While individuals may distinctly report tension reduction and enhancement on an explicit self-report level, given the plethora of cues present in the environment (e.g. generated by various media), it is plausible that a broad array of tension reduction, enhancement, and other alcohol associations are formed at the implicit level and thus may compete for access in tasks eliciting these associations. Future research should aim to disentangle these implicit associations in order to elucidate their role within drinking risk pathways.

In examining retrospective alcohol outcomes, the current study did not provide strong support for the association between SA and alcohol use or related problems. FNE was not associated with alcohol use. This finding is consistent with the coping and anxiety literatures, in which a link between anxiety and alcohol use is found less consistently than one between anxiety and experiencing alcohol-related problems. Although the literature provides evidence supporting the association between SA and alcohol-related problems (Lewis & O'Neill, 2000; Morris et al., 2005), this link was not seen in the present study. Of primary interest was whether the link between SA and alcohol use/problems was mediated by the cognitive response to the anxious mood induction. Specifically, it was expected that the association between SA and heavy drinking/elevated problems would be evident in both mood condition groups, but that this effect would be mediated by elevated tension reduction alcohol cognitions when an anxious mood was induced. This would suggest that heavy drinking and experiencing alcohol-related problems by those high in SA is accounted for by the automatic activation of tension reduction alcohol cognitions. This hypothesis was not supported. It may be that

the weak activation of alcohol cognitions led to a low powered model, when it came to extending the effect out to broader drinking behaviour. In addition, the lack of the above mentioned direct link between SA and alcohol use/problems (i.e., in the experimental and control conditions) suggests that other moderators need to be considered (e.g., self-efficacy). Further, given the low weekly alcohol use and the low variability of alcohol use by those in the current sample – compared to what is found in other undergraduate sample (e.g. Grant et al., 2007), a link between FNE and drinking outcomes may have been particularly difficult to detect. Studies of undergraduate samples have shown university students report drinking between 9 to 10 drinks per week (*SD* = 8.33) (Grant et al., 2007). The association between FNE and problematic drinking outcomes may not have been observed given the low weekly alcohol use and limited variability (*M* = 3.87, *SD* = 4.18) in the current sample. Furthermore, individual subjective evaluation of alcohol problems was not assessed in the current study. FNE was expected to be linked with alcohol outcomes that are considered to be negative. By assuming all alcohol outcomes assessed in this study were perceived as negative, may have masked the association between SA and experiencing alcohol-related negative consequences. It would be important for future work to only include alcohol outcomes that are truly perceived as negative by the individual as the dependent variable in these models.

A number of limitations of the current study are important to consider. First, the sample consisted primarily of women. Based on the limited number of men tested in the study, it is not possible to generalize the current findings to both genders. However, given that SA levels are generally higher in women than men, the current sample may be reflective of a highly relevant group of at-risk undergraduate problem drinkers. Another

limitation as previously noted was the use of the socially-relevant mood manipulation in a non-drinking specific context. Participants underwent an anxiety manipulation in the context of a laboratory in an academic setting. A more alcohol-related setting or the presence of primes may be central to the in-the-moment activation of implicit alcohol cognitions. Research should aim to address context in future examinations of the SA-drinking risk pathway via implicit cognitions. Finally, given the focus on SA and use of a socially-relevant mood manipulation, effects of state affect on implicit cognition may have been apparent had social facilitation-relevant alcohol cognitions been targeted in the implicit task, rather than broad tension reduction alcohol associations. Future research aiming to tap into socially-relevant anxiety and ensuing cognition should therefore aim for social specificity in the development of an implicit cognition task. Additionally, given that the association between SA and retrospectively reported alcohol outcomes (i.e. use, problems) was not supported in the current study, future research should aim to capture in-the-moment cognitions in a context where individuals are more likely to activate strong alcohol cognitions effecting behaviour. In addition to sampling with adequate range and variability, assessing these cognitions in more ecologically valid settings (e.g. when individuals are out drinking) may reveal a more robust role of cognitions leading to alcohol outcomes. These assessments can be conducted via new technologies such as using diary methods and cell-phones to collect in-the-moment data.

In conclusion, this study makes an important contribution to extant research examining the SA-alcohol use drinking risk pathway. The refined mood manipulation emphasizing a social context elicited anxious mood and urge to drink, addressing the need for an ecologically valid socially-relevant mood induction in the literature. Further,

the modest evidence for implicit cognitive mediators of the SA-drinking risk pathway contributes to aetiological and theoretical model building. Despite the preliminary nature of these results, the current study demonstrates the feasibility of manipulating implicit cognitions in a lab setting and holds promise for future research aiming to elucidate the role of cognition in the SA-drinking risk pathway. Explicating mechanisms of risk may lead to clinical implications such as allowing for more effective and targeted approaches to intervention as well as more relevant alcohol-related psychoeducation for undergraduates. The findings suggest the utility of a potential focus on the automatic activation of alcohol associations as well as the potential value of skills training for managing anxiety or dysregulation in social situations in preventing activation of these automatic in-the-moment processes.

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Appendices

Appendix A

Alcohol Use
Visual Analogue Scale (VAS)
Single Category IAT (SC-IAT)

Alcohol Use

For the next set of questions:

1 drink =

1 Glass of Wine | **1 Can or bottle of beer** | **1 Shot of hard liquor** | **1 Cooler**

For the next set of questions you should think about your typical alcohol use over the **PAST 30 DAYS (1 MONTH**). Remember: A drink of alcohol refers to a regular sized bottle of beer or wine cooler, a small glass of wine, or a shot.

Use the format below to describe your drinking pattern during a TYPICAL week in the **PAST 30 DAYS (1 MONTH).** Please fill in a number (use the number pad) for each day of the week indicating the average number of drinks you consumed that day. For days when you typically do not drink, enter a zero. If you are a non-drinker, enter all zeros. For the next few questions you DO NOT have the option to change your answer (cannot 'Go Back') once you have entered your response. So please DO NOT go to the next screen until you are satisfied with your response.

Monday____
Tuesday____
Wednesday____
Thursday____
Friday____
Saturday____
Sunday _____

In the PAST 30 DAYS (1 MONTH), on AVERAGE how often did you have some kind of beverage containing alcohol?

1. Not at all in the past 30 days
2. Once in past 30 days
3. Twice in past 30 days
4. Three times in past 30 days
5. Once a week
6. Twice a week
7. Three times a week
8. Four times a week
9. Five times a week
10. Six times a week
11. Everyday of the week

How many drinks did you USUALLY have on any one occasion in the **PAST 30 DAYS (1 MONTH)**? USE THE MOUSE to click on the box that corresponds with your answer

1. Did not drink at all in past 30 days
2. One drink per occasion
3. Two drinks per occasion
4. Three drinks per occasion
5. Four drinks per occasion
6. Five drinks per occasion
7. Six drinks per occasion
8. Seven drinks per occasion
9. Eight drinks per occasion
10. Nine drinks per occasion
11. Ten drinks per occasion
12. Other. Please indicate typical number of drinks per occasion

Visual Analogue Scale (VAS)

For the next items, please use the mouse to click at the point on the horizontal line that best corresponds to your mood AT THIS MOMENT.

1. At **this moment** I feel …

not at all cheerful very cheerful
0 _____ 100

2. At **this moment** I feel …

not at all sad very sad
0 _____ 100

3. At **this moment** I feel …

not at all nervous very nervous
0 _____ 100

4. At **this moment** I feel…

not at all upset very upset
0 _____ 100

5. At **this moment** I feel …

not at all glad very glad
0 _____ 100

6. At **this moment** I feel …

not at all depressed very depressed
0 _____ 100

7. At **this moment** I feel …

not at all anxious very anxious
0 _____ 100

8. At **this moment** I feel …

not at all blue very blue
0 _____ 100

9. At **this moment** I feel …

not at all excited very excited
0 _____ 100

10. At **this moment** I feel …

not at all pleased very pleased
0 _____ 100

11. At **this moment** I feel …

not at all tense very tense
0 _____ 100

12. At **this moment** I feel…

not at all distressed very distressed
0 _____ 100

13. At **this moment** I feel…

not at all uncomfortable very uncomfortable
0 _____ 100

14. At **this moment** I feel …

not at all happy very happy
0 _____ 100

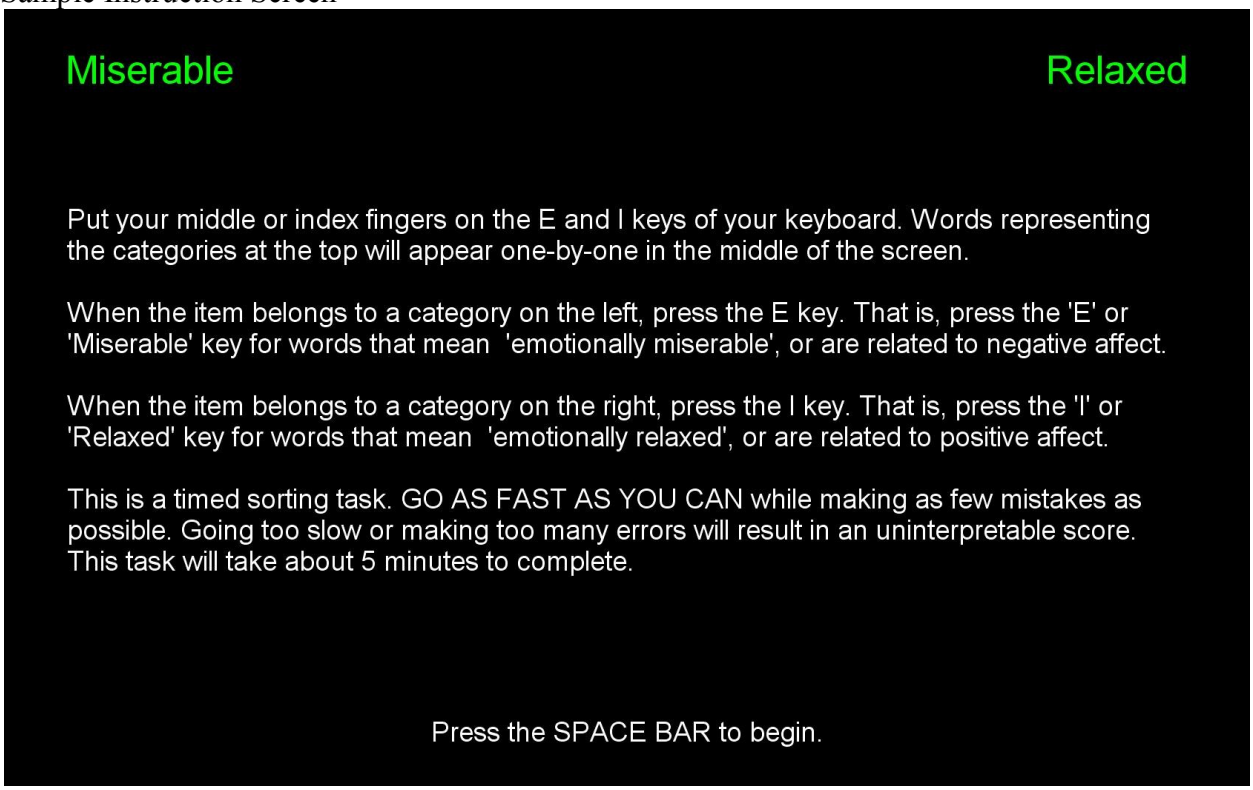
Single Category IAT (SC-IAT)

SC-IAT Alcohol Stimuli

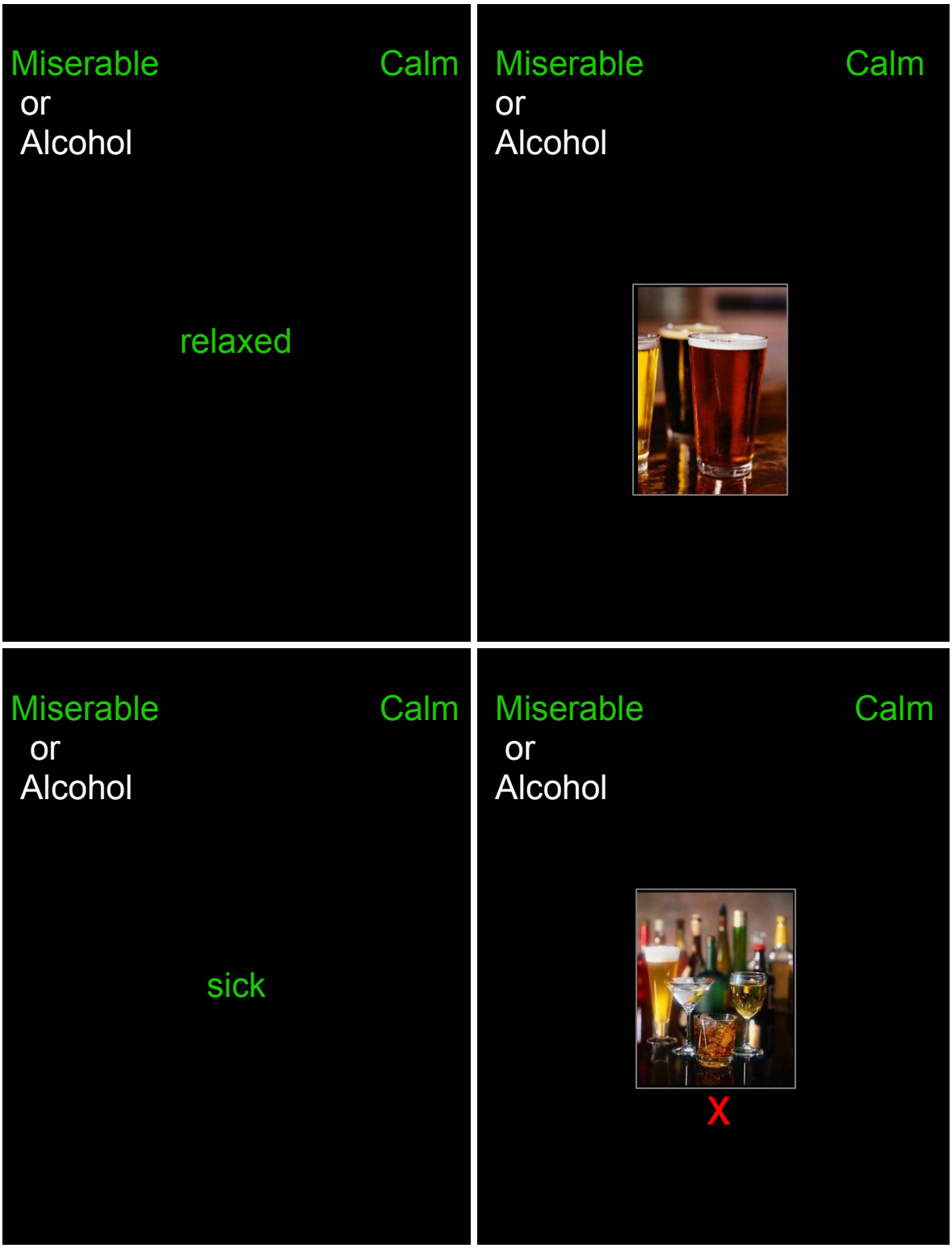
SC-IAT stimuli words

Stimuli Words					
Positive Tension Reduction "Relaxed"	Relaxed	Calm	Soothed	Relieved	Peaceful
Positive Enhancement "Energetic"	Lively	Euphoric	Energetic	Excited	Thrilled
Negative "Miserable"	Sick	Angry	Depressed	Miserable	Guilty

Sample Instruction Screen



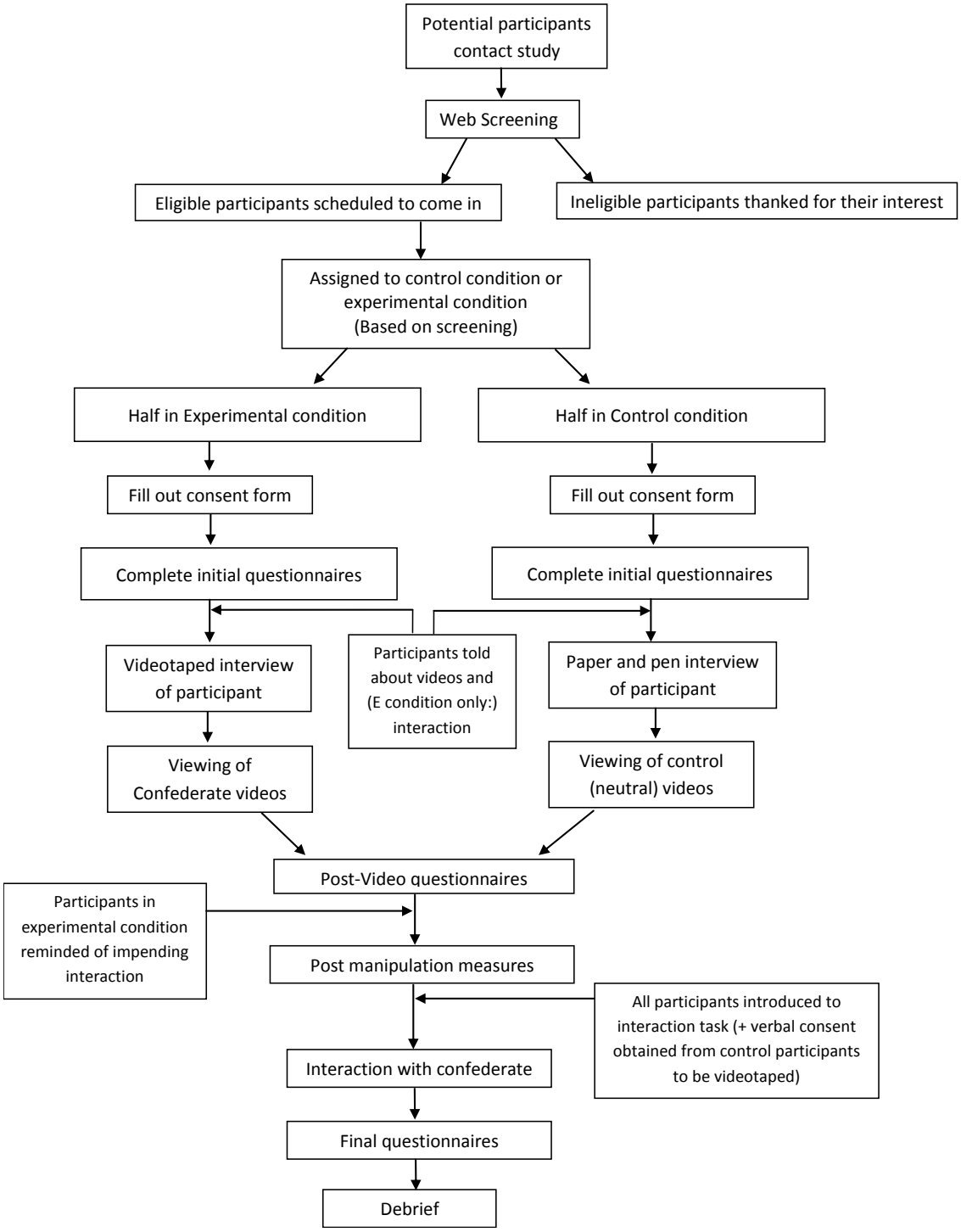
Sample Test Screens



Appendix B

Study Participation Overview

Study Participation Overview



Appendix C

Participant Interview (Experimental Condition)
Participant Interview (Control Condition)
Confederates Video Interview Script
Social Interaction Task Questions
Social Interaction: Confederate Script

Participant Interview (Experimental Condition)

Note: These questions are asked *verbally.*

A) I am going to ask you to give me some information about yourself. An important part of this study is the first impression that is formed when people interact with their peers. This short interview will allow us to make a video of you. The other participants will view this video, so that they can form their first impression of you. One of these participants will be the person that you will interact with later on today. Likewise, the other participants are also being interviewed and videotaped. You will view these videos so that you can form your first impression of them, including the person you will interact with later today.

B) First, tell me your name and age.

C) What school do you attend, and what program and year are you in?

D) What would you consider to be your greatest weaknesses and how have they hindered your relationships and performance at school?

Participant Interview (Control Condition)

Note: These questions are responded to *on paper*.

A) INDICATE YOUR NAME AND AGE BELOW.

B) WHAT SCHOOL DO YOU ATTEND, AND WHAT PROGRAM AND YEAR ARE YOU IN?

C) WHAT WOULD YOU CONSIDER TO BE YOUR GREATEST WEAKNESSES AND HOW HAVE THEY HINDERED YOUR RELATIONSHIPS AND PERFORMANCE AT SCHOOL?

Confederates Video Interview Script

Q1

A) I am going to ask you to give me some information about yourself. An important part of this study is the first impression that is formed when people interact with their peers. This short interview will allow us to make a video of you. The other participants will view this video, so that they can form their first impression of you. One of these participants will be the person that you will interact with later on today. Likewise, the other participants are also being interviewed and videotaped. You will view these videos so that you can form your first impression of them, including the person you will interact with later today.

B) First, tell me your name and age.
→ *"My name is X and I am 22 years old."*

C) What school do you attend, and what program and year are you in.
→ *"I am in my last year at Concordia in the John Molson school of Business."*

D) Do you have a part time job? If so, what do you do?
→ *"I assist at a program run through the John Molson school of Business. The program is designed to teach people about business etiquette and how to present a confident, polished, and successful image. As part of the program, I help one professor run these workshops that teach people how to be aware of and correct the image they're projecting when conducting business or just networking with others. Essentially after the lecture component, everyone mingles and my role is to interact with them during this networking session but also point out when they are engaging in any inappropriate or ineffective behaviours. It is actually quite shocking to see how many people manage to make it this far through school being so socially unskilled and awkward. Never mind exuding a professional image, many of them need to start with just making a reasonable impression with their peers.*

Q2

A) I am going to ask you to give me some information about yourself. An important part of this study is the first impression formed when people interact with their peers. This short interview will allow us to make a video of you. The other participants will view this video, so that they can form their first impression of you. One of these participants will be the person that you will interact with later on today. Likewise, the other participants are also being interviewed and videotaped. You will view these videos so that you can form your first impression of them, including the person you will interact with later today.

B) First, tell me your name and age.
→ *"My name is X and I am 23 years old."*

C) What school do you attend, and what program and year are you in.
→ *"I finished my bachelor's in Sociology at McGill and now I'm taking a few courses that are only offered at Concordia while I figure out what I want to do next."*

D) Describe what you were like in high school. Also, tell me whether you are still like that now, or if you have changed?
→ *"High school was pretty much the best time of my life. I had lots of friends and partied a lot... if there was a party happening it was usually at my place because my parents were often out of town, so we had pool parties and afterhours parties. I always had to make sure to keep all the awkward people out so they wouldn't mess things up.– you know those people – they are just kind of weird and embarrassing and ruin the party. I was always in charge of deciding who got in so those I did not particularly like would*

never make it in. Nothing has really changed since. My friends and I still party a lot but now I have my own place, so that just means better parties. I now also promote at a few clubs downtown, so I'm in charge of getting people on the list and making sure that the party people we want to see are coming in while keeping out all those people that we don't want to see in our clubs

Q3

A) I am going to ask you to give me some information about yourself. An important part of this study is the first impression formed when people interact with their peers. This short interview will allow us to make a video of you. The other participants will view this video, so that they can form their first impression of you. One of these participants will be the person that you will interact with later on today. Likewise, the other participants are also being interviewed and videotaped. You will view these videos so that you can form your first impression of them, including the person you will interact with later today.

B) *First, tell me your name and age.*
→ *"My name is X and I am 23 years old."*

C) What school do you attend, and what program and year are you in.
→ *"I obtained my Bachelor's in honours Psych at Concordia"*

D) *What would you consider your greatest accomplishment and what were some obstacles that were in your way?*
→ *"Definitely my greatest accomplishment was getting into med school. I kept a pretty high GPA in my psych undergrad despite being highly involved in sports and playing on several teams. I did exceptionally well on my MCATs and got accepted into med school. I deferred my acceptance to next year because I got a position working as a volunteer for Red Cross this year. I think it will help me be more competitive once I'm in, and I'll have a better idea of what I'll want to do for my 3rd year doctors without borders internship for my international elective. Specifically, the Red Cross position is giving me the opportunity to travel, so for example, in a few months I'll be heading to volunteer in a hospital in Kenya, but for now it's giving me the chance to continue taking some classes just for interest. I would say a setback to me was when I would sit in class and people would ask useless questions that just took up time. I feel like I would have learned a lot more if people didn't waste so much time asking pointless questions."*

Social Interaction Task 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 does friendship mean to you?
16. If you were going to become a close friend with your partner, please share what would be important for him or her to know?

Social Interaction: Confederate Script

1. **Given the choice of anyone in the world, whom would you want as a dinner guest?**

"Oh, you know what? I think I'd pick Oprah. Everybody loves Oprah and I'd want to actually talk to her and see what she's like in real life. I'm sure she's a good person, but everyone thinks she's so great and there's no way she can be like that in real life. So, I guess I'd just want to really sit down with her and see what she's really like."

2. **Would you like to be famous? In what way?**

"Well, I guess most people think of being famous as like, being a movie star and I know I definitely don't want to do that….But, if I could be "well-known", for something like doing charity work or donating money to a good cause, then I think that would be good. But I wouldn't want the paparazzi following me around or anything."

3. **For what in your life do you feel most grateful?**

"I'd probably say my family. I have a really supportive family and we all get along really well, which just makes everything a lot easier. Like, I have a few friends who are always fighting with their parents and are always stressed out about what their parents think. I'm glad I don't have to deal with that."

4. **If you could wake up tomorrow having gained any one quality or ability, what would it be?**

"Um, probably fly. It would be awesome cause I could just go wherever I want.

5. **What do you value most in a friendship?**

"What do I value most in a friendship? Hmmmmmm I would say honesty…and … loyalty are both really important. I need to know that I can trust my friends and that they're going to be there for me when I need them."

6. **What, if anything, is too serious to be joked about?**

"Ohhhh um, initially I probably would have said nothing. But, I think that now, it's pretty bad if you joke about mental illness. It just seems pointless to joke about that…it's not even funny."

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?**

"I guess if I had to pick just one thing it would have to be my laptop. It has everything on it….my pictures….everything I've done for school…just everything. I'd run back in and save my laptop."

8. **Complete this sentence: "I wish I had someone with whom I could share _____."**

"Ahhh, I don't know …. a laugh?…I know that's cheesy but it's all I can think of. It's always nice to share a laugh with someone."

9. **Tell your partner something that you like about them already.**

"OK…ummmm well, I like that you've been a really good listener this whole time and you've been paying attention to the answers that I've been giving."

10. **If you knew that in one year you would die suddenly, would you change anything about the way you are now living? Why?**

"Yeah. I would definitely make some change. Ya I think I would just stop school. Then, I'd want to do some traveling…probably go to Europe for a while because I haven't been yet. Oh, and I guess I'd also need some money, so I'd have to like take

out a huge loan and I'd probably buy some cool stuff that I've always wanted. But mainly, I'd travel…although I'd have to convince someone to come with me cause I'd rather not travel alone…

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?**

"Hmmm, I think I'd pick body. I'd want to be able to still get around and do all the things that I'm used to doing. And as long as my mind aged normally, so like, not getting dementia or Alzheimer's, then I think I'd still be ok with having my mind get older cause you'd gain a lot of wisdom and experience."

12. **What would constitute a "perfect" day for you?**

"A perfect day? Ummm…going to the beach in Spain and just laying on the beach, relaxing and having a few drinks with some friends. Then, going out for a nice dinner … and then maybe going to a bar after and just having a good time with my friends."

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?**

"Well, I'm not really sure I'd want to know anything because that might change how you're living and everything that you do. Although, I guess if I had to know something, knowing the winning lottery numbers would be sweet and then I wouldn't have to worry about money for the rest of my life."

14. **Is there something that you've dreamed of doing for a long time? Why haven't you done it?**

"Like I said earlier, I haven't been to Europe yet and that's something that I'd really like to do. And I haven't done it yet mostly just because of school and not having enough time or money to go. I was really close to going last summer, but it didn't work out. But, I'll go one day for sure."

15. **What does friendship mean to you?**

"Hmmm, I guess when I think about friendship I think about good times, good memories … you know, those kinds of things."

16. **If you were going to become a close friend with your partner, please share what would be important for him or her to know?**

"Ummmmm…there's probably lots of things you should know, but nothing that important. Oh, except that I get pretty busy sometimes and I don't always call people back right away…so you might find that kind of irritating.

FOLLOW-UPS

 # 10 & 14

These are the travelling to Europe questions. If they follow-up with "where in Europe do you want to go", say the following:

"Well, I'd love to see all of Europe, but the three countries that I've always really wanted to go to are France, Italy and Greece."