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Social anxiety and alcohol consumption: The role of alcohol expectancies and reward sensitivity

Catherine Booth, Penelope Hasking *

School of Psychology, Psychiatry and Psychological Medicine, Monash University, Australia

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ABSTRACT

Although the relationship between social anxiety and alcohol consumption has been the subject of extensive exploration, previous studies have failed to draw consistent conclusions about the nature of this relationship. Gray [Gray, J.A. (1970). The psychophysiological basis of introversion–extraversion. Behaviour Research and Therapy, 8, 249–266] suggested that individuals who are sensitive to reward are likely to place themselves in potentially rewarding environments (e.g. pubs and clubs). As such these individuals will have a greater chance to experience and vicariously observe the effects of alcohol in these environments, leading to the formation and modification of alcohol expectancies. Consequently, reinforcement sensitivity theory and alcohol expectancies are inherently related, yet have remained disparate areas of research. In this study, a total of 454 young adults responded to a questionnaire assessing social anxiety, alcohol consumption, reward sensitivity and alcohol expectancies. Regression analyses revealed a positive relationship between reward sensitivity, expectations of tension reduction and increased confidence, and alcohol consumption. Expectations of tension reduction were observed to moderate the relationship between social anxiety and alcohol consumption. In addition, three-way relationships between reward sensitivity, alcohol expectancies and social anxiety were observed to predict alcohol consumption. Overall, these results suggest that both reward sensitivity and alcohol expectancies play a role in the relationship between social anxiety and alcohol consumption, and that inclusion of these constructs in further research may aid in further clarifying the mechanisms underlying comorbid social anxiety and alcohol abuse.

For most people, social interaction is an integral part of day to day functioning. Yet, when a person struggles with these interactions, the consequences can be far reaching. Social anxiety, or social phobia, remains the single most prevalent clinically diagnosed psychological disorder, affecting up to 13% of the population (Book & Randall, 2002). For those suffering from social anxiety, social and performance situations are anticipated with considerable fear, and are either endured with significant discomfort and anxiety or avoided entirely (Book & Randall, 2002). As a result, considerable empirical research has been generated to explore and further understand the important issues surrounding social anxiety.

According to tension reduction theories the anxiolytic effects of alcohol facilitate alcohol use by anxious individuals (Kalodner, Delucia & Ursprung, 1989; Spencer & Hutchison, 1999), explaining a high comorbidity between social phobia and substance use disorders in clinical samples (Thomas, Randall & Carrigan, 2003), and relationships between social anxiety and drinking in community samples (Lewis & O'Neill, 2000; Stewart, Morris, Mellings & Komar, 2006). However, such a pattern has not been observed in all studies (Burke & Stephens, 1999), and a negative relationship between social anxiety and alcohol consumption has often been noted (Bruch, Rivet, Heimberg & Levin, 1997; Himle et al., 1999; Hover & Gaffney, 1991; Keane & Lisman, 1980). These inconsistent findings have led researchers to investigate potential moderators in this relationship. In this study we focus on the role of alcohol expectancies and reward sensitivity.

Burke & Stephens (1999) proposed a social cognitive model of social anxiety and alcohol use among young adults. In this model, the authors proposed that the relationship between social anxiety and alcohol use is moderated by alcohol outcome expectations regarding social facilitation, such that socially anxious individuals who held strong social facilitation expectancies were observed to drink more than socially anxious individuals with weak social facilitation expectancies. Similarly, using an experimental design Abrams, Kushner, Medina and Voight (2001) found that both the pharmacological effects of alcohol and outcome expectancies about tension reduction worked together to reduce anxiety in socially anxious samples. While this model serves to explain the role outcome expectancies may play in the relationship between social anxiety and alcohol use, others have found no support for a moderating effect of expectancies (Eggleston, Woolaway-Bickel, & Schmidt, 2004).

* Corresponding author. School of Psychology, Psychiatry and Psychological Medicine, Monash University, Caulfield East, Victoria 3145, Australia. Tel.: +61 3 9903 1148; fax: +61 3 9903 2501.
E-mail address: Penelope.Hasking@med.monash.edu.au (P. Hasking).

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Although the inclusion of alcohol expectancies has furthered understanding about the complex relationship between social anxiety and alcohol consumption, the relationship is far from clear. The addition of the more stable trait of personality may help to explain the remaining variance. One particular theory of personality which has been used to study alcohol consumption is Gray's (1970) reinforcement sensitivity theory (RST). RST is a biologically based theory of personality which seeks to link phenotypic personality traits with underlying biological and neurological systems, and explores the traits of anxiety and impulsivity in the context of reinforcement (Matthews & Gillard, 2000).

There are two primary systems underlying Gray's (1970) theory; the Behavioural Approach System (BAS) and the Behavioural Inhibition System (BIS). The behavioural approach system is characterized by a motivation to receive reward and heightened sensitivity to potentially rewarding stimuli (Van der Linden, Taris, Beckers & Kindt, 2007). Such reward seeking behaviour is associated with positive mood states, impulsivity, extraversion and sensation seeking. Conversely, activation of the BIS results in heightened sensitivity to potentially threatening stimuli (Smillie & Jackson, 2006) and behaviours associated with anxiety such as worry and rumination (Van der et al., 2007).

One of the more widely used measures of BIS/BAS is Carver and White's (1994) BIS/BAS scales. On this measure BIS is assessed as a single factor, while BAS comprises three separate factors: drive (the persistent pursuit of a desired goal), reward-responsiveness (positive response to the expectation of reward) and fun-seeking (the desire to seek reward and eagerness to pursue a rewarding event on impulse). Using this, and other measures of reward sensitivity, increased alcohol consumption has consistently been observed in individuals highly sensitive to reward. Using a cue reactivity paradigm, Franken (2002) found that those who measure high in BAS drive reported a strong desire and intention to drink. Johnson, Turner and Iwata (2002) report that samples with alcohol use disorders record higher scores on two scales conceptually similar to BAS: sensation seeking and fun-seeking. More recently Kambouropoulos and Staiger (2004) have added to the literature linking BAS sensitivity and alcohol use by observing heightened sensitivity to reward among a sample of hazardous drinkers using both questionnaires and behavioural tasks. Examined together these results form a strong basis of support for the relationship between drinking and sensitivity to reward.

Although Gray (1970, 1982) proposed that BIS sensitivity may be the basis of anxiety, and correlations between BIS and anxiety have consistently been observed (e.g. Hagopian & Ollendick, 1994; Johnson et al., 2002), few researchers have examined whether socially anxious individuals report greater BIS sensitivity. In studies that have specifically examined socially anxious participants, correlations between BIS and social anxiety have been observed in children (Coplan, Wilson, Frohlick, & Zelenski, 2006), and reductions in harm avoidance (conceptually similar to BIS) were associated with reductions in social phobia after treatment (Hofmann & Loh, 2006).

According to RST, in its simplest form, individuals highly sensitive to BAS are more likely to drink alcohol, while those sensitive to BIS are likely to have heightened anxiety. Consequently there appear to be two competing drives relating to drinking behaviour and anxiety. Current theory suggests that these are dimensional traits, and that both exist to a certain extent in each individual (Corr, 2004), however an underlying predisposition to either pursue reward or avoid punishment may partially explain the mixed results regarding the relationship between social anxiety and drinking. In addition, Gray (1970) suggested that rather than BAS directly leading to alcohol use, individuals who are BAS sensitive are likely to place themselves in potentially rewarding environments (e.g. pubs and clubs). As such these individuals will have a greater chance to experience and vicariously observe the effects of alcohol in these environments, leading to the formation and modification of alcohol expectancies. However, in individuals with heightened social anxiety, such environments may be avoided, even among those who are sensitive to reward. Thus socially anxious individuals who are sensitive to reward may actually consume less alcohol than individuals who are not socially anxious.

Although, reinforcement sensitivity, alcohol expectancies and social anxiety are theoretically related, they have remained disparate areas of research. By examining the combined effects of RST and alcohol expectancies on the social anxiety-drinking association we aim to further understand this complex relationship. We hypothesise positive relationships between BIS and social anxiety, BAS and annual intake of alcohol, and expectations of increased confidence (conceptually similar to social facilitation), tension reduction and alcohol intake. Further, we aim to examine how BIS, BAS and alcohol expectancies may moderate the relationship between social anxiety and drinking. To the best of our knowledge these relationships have not previously been examined, so we can only offer tentative hypotheses. However based on RST and expectancy theory, we anticipate that individuals who report higher levels of social anxiety, who are BAS sensitive, and report strong expectations of increased confidence and tension reduction, will drink more than BAS sensitive, socially anxious individuals with weaker expectancies.

1. Method

1.1. Participants

A total of 454 participants (365 females and 89 males) aged between 16 and 62 years of age ($M = 21.4$ years, $SD = 6.3$) participated in this study. The majority of participants were born in Australia (64%), with an additional 18.9% born in South East Asia. The majority of the sample had commenced, but not completed, university (83.2%) and 13.8% had completed a university degree or diploma. The majority of participants were employed for less than 20 hours per week (78.3%). Approximately half (49.8%) the participants were undergraduate university students who received course credit for their participation.

1.2. Materials

1.2.1. BIS/BAS scales (Carver & White, 1994)

This scale consists of 24 items measured on a four point Likert scale. The items measure the behavioral inhibition sensitivity (BIS) and behavioral approach sensitivity (BAS) component of the reinforcement sensitivity theory of personality. BIS sensitivity is assessed as a single factor and BAS sensitivity is comprised of three subscales: drive, fun-seeking and reward responsiveness. The BIS/BAS scales have sound internal consistency with Cronbach's alphas, ranging from .73 to .82 (Campbell-Sills, Liverant & Brown, 1994). In the current sample alpha coefficients were: .79 (Drive); .70 (Reward responsiveness); .70 (Fun-seeking); .59 (BIS).

1.2.2. Liebowitz Social Anxiety Scale (Liebowitz, 1987)

This instrument is a self-report measure consisting of 24 items. The responder rates their level of fear and avoidance in relation to particular social behaviours on a four point Likert scale. Items are summated to create subscales of 'fear' and 'avoidance' (Heimburg et al., 1998). Importantly, participants rate their fear and avoidance to the same situations, allowing a direct comparison of these constructs. Assessed using an out-patient sample of 382 participants, the scale was found to be a valid and reliable measure of social phobia with Cronbach alpha coefficients ranging from .81 to .96 (Heimburg et al., 1998). In the current sample both the avoidance ($\alpha = .92$) and fear ($\alpha = .93$) subscales were reliable.