STRESS INCREASES ATTENTIONAL BIAS FOR ALCOHOL CUES IN SOCIAL DRINKERS WHO DRINK TO COPE

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Abstract — Aims: To investigate the effects of stress on alcohol craving and attentional bias for alcohol-related cues in a group of heavy social drinkers. Method: Forty-four heavy social drinkers were exposed to either a laboratory stres sor task or a control manipulation before completing a questionnaire measure of alcohol craving and a visual probe task which measured attentional bias for alcohol-related cues. Participants were subdivided into those with high and low levels of coping motives for drinking. Results: Compared to a control manipulation, the laboratory stres sor task produced increases in alcohol craving ($P < 0.01$). The laboratory stres sor task also produced a significant attentional bias for alcohol-related cues, but only among participants who had high levels of coping motives ($P < 0.05$). Conclusions: Findings are broadly consistent with contemporary negative reinforcement models of substance abuse, and with models of subjective craving and attentional biases for substance-related cues.

INTRODUCTION

As predicted by incentive-motivational models of addiction (e.g. Robinson and Berridge, 1993; Franken, 2003), substance abuse is characterized by an increase in the salience of drug-related cues, as those cues tend to ‘grab the attention’ (see Field, 2006, for a comprehensive review). Numerous experimental procedures have been used to demonstrate attentional biases for substance-related cues in substance abusers, including the addiction Stroop and visual probe tasks. In the addiction Stroop task, participants are required to name the colour in which substance-related or neutral words are printed, and results generally indicate that substance abusers, such as heavy drinkers, are relatively slow to colour-name substance-related words rather than neutral words, which can be interpreted as a consequence of the substance-related words ‘grabbing the attention’ (e.g. Sharma et al., 2001; see Cox et al., 2006, for a review). An alternative measure, the visual probe task, has been used to demonstrate that heavy drinkers tend to respond more rapidly to visual probe stimuli when those stimuli appear in the spatial location that had been occupied by an alcohol-related picture rather than a picture with no alcohol-related content, which can be interpreted as indicating that visuospatial attention was directed at the alcohol-related picture before the probe was presented (e.g. Townshend and Duka, 2001; Field et al., 2004a).

Although attentional biases appear to be specific to substance abusers (as they are not generally seen in light or non-users of any given substance), they are not stable characteristics of those individuals. Instead, attentional biases appear to be most pronounced when the level of motivation to obtain the substance, as indexed by subjective craving, is at its highest. For example, among tobacco smokers, the imposition of a brief period of abstinence (Gross et al., 1993; Field et al., 2004b), administration of a priming dose of alcohol (Field et al., 2005a), and exposure to environmental smoking-related cues (Field et al., 2007b) all produce increases in subjective craving and corresponding increases in attentional bias for smoking-related cues. In heavy drinkers, administration of priming doses of alcohol or exposure to environmental alcohol-related cues also increase attentional bias for alcohol-related cues (Cox et al., 1999, 2003; Duka and Townshend, 2004). These findings are consistent with theoretical models (e.g. Franken, 2003; Kavanagh et al., 2005) which posit that subjective motivational states should promote biases in attention for, or rumination on, motivationally relevant cues in the environment. Recent evidence suggests that these attentional biases may, in turn, provoke further increases in subjective craving, thereby completing a positive feedback loop between attentional bias and subjective craving (Field and Eastwood, 2005; Field et al., 2007a).

One factor that is thought to be a reliable trigger of alcohol craving is the experience of negative mood. For example, anecdotal clinical reports indicate that many alcohol-dependent patients, who relapse into drinking after successful treatment, often attribute their relapse to negative affective states such as stress, anger, and frustration (Marlatt, 1996). Experimental work also indicates that laboratory induction of depressed moods leads to increased alcohol craving in both alcohol-dependent patients (Cooney et al., 1997) and non-dependent undergraduate students (Willer et al., 1998). Within this context, there is evidence that there are individual differences in the degree to which people are motivated to consume alcohol in response to negative affective states. For example, research on drinking motives has highlighted four primary motives that underlie alcohol consumption: coping (drinking to reduce negative mood), enhancement (drinking to experience pleasurable effects of intoxication), social (drinking to obtain social rewards or to improve social interactions) and conformity (drinking to avoid social rejection) (Cooper, 1994). As might be expected, participants who selectively endorsed coping motives for drinking showed greater increases in alcohol craving after a negative mood induction in the laboratory, compared to participants who endorsed other motives for drinking (Birch et al., 2004).

To briefly summarize, the available evidence suggests that negative moods can induce craving for alcohol, particularly...
in individuals who are motivated to drink alcohol in order to cope with negative affect. Given recent interest in cognitive mechanisms in craving, including attentional biases for alcohol-related cues, one plausible hypothesis is that induction of a negative mood should increase attentional biases for alcohol-related cues. In fact, a recent negative reinforcement model of addictive behaviour makes this prediction explicitly. Baker et al. (2004b) argued that ‘when either stressors or abstinence cause negative affect to grow and enter consciousness, increasing negative affect biases information processing in ways that promote renewed drug administration’ (p. 33), and one potential mechanism is that, in tobacco smokers, negative affect could ‘inflate the incentive value of smoking cues’ (Baker et al., 2004a, p. 483). Given that attentional bias is thought to reflect the incentive motivational properties of substance-related cues (Robinson and Berridge, 1993), the Baker model predicts that negative affect should increase attentional biases for substance (including alcohol) cues, and this process might occur fairly automatically. Furthermore, when combined with the literature on coping motives, it seems likely that effects of negative affect on attentional bias for alcohol cues should be most pronounced in those who report drinking to cope as their predominant motive for drinking.

The aim of the present study was to investigate these predictions in a sample of young heavy drinkers. In one group of participants, we temporarily induced anxiety by informing participants that they would shortly be required to give a speech that would be recorded (based on procedures described by Garner et al., 2006); a control group completed a non-stressful task of similar duration. We then compared the effects of these manipulations on anxiety, subjective alcohol craving, and attentional bias for alcohol-related cues, as assessed with a visual probe task. Our hypotheses were as follows: heavy social drinkers with high coping motives for drinking alcohol would report elevated alcohol craving and would express elevated attentional biases for alcohol cues after induction of an anxious mood, relative to participants exposed to a control manipulation. Among participants with low coping motives, we hypothesized that the anxiety mood induction and control manipulations would have no differential effects on either subjective alcohol craving or attentional biases for alcohol cues.

**METHOD**

**Participants**

Forty-four participants (8 males, 36 females) were recruited from the student population at the University of Liverpool, via poster advertising placed around the School of Psychology. All participants who took part were undergraduate psychology students who received course credit. The mean age of participants was 19.14 years (SD = 1.17). In order to take part, participants had to have normal or corrected to normal vision, and to self-report average weekly alcohol consumption at levels above those recommended by the UK Department of Health (14 units for females and 21 units for males; Edwards, 1996). The experiment received ethical approval from the Ethics Committee in the School of Psychology at the University of Liverpool.

**Materials**

Pictorial stimuli used in the visual probe task were the same as those used in earlier studies (Field et al., 2004, 2005b; Field and Eastwood, 2005). These comprised 14 pairs of pictures, with one alcohol-related picture and one matched control picture in each pair. A further six neutral picture pairs, with no alcohol-related content, were used as practice stimuli. All pictures were 100 mm high × 125 mm wide. The visual probe task was programmed in Inquisit version 1.33 and presented on a Pentium PC, with a 15” VGA monitor, attached to a two-button response box.

We used a battery of questionnaires to assess alcohol consumption, alcohol abuse disorders, motives for drinking, alcohol craving, and subjective anxiety. The Timeline Follow-Back (TLFB) procedure (Sobell and Sobell, 1992) is a highly reliable measure of alcohol consumption, with high levels of convergent and discriminant validity (Fals-Stewart et al., 2000). We also administered the Alcohol Use Disorders Identification Test (AUDIT), which has high levels of reliability and validity as a screening measure for alcohol abuse (Babor et al., 2001).

To assess motives for drinking, we used the Drinking Motives Questionnaire (DMQ), which has acceptable levels of reliability and construct validity (Cooper, 1994). We used the Desires for Alcohol Questionnaire (DAQ) to assess alcohol craving. The DAQ is more reliable, and is better at discriminating between excessive and moderate drinkers, than alternative questionnaire measures of alcohol craving (Love et al., 1998). In the present study, we used the brief, 14-item version of the questionnaire (from Love et al., 1998), which contains items with high loadings on each of the four factors of alcohol craving identified in the original factor analysis of the full version of the DAQ. In the present study, there were no differential effects of the experimental manipulation on different factors of the DAQ, so we report an average craving score for the sake of brevity. Finally, the Spielberger State-Trait Anxiety Inventory (STAI; Spielberger et al., 1983), a highly reliable measure of trait and state anxiety that is able to discriminate between high and low stress conditions (Metzger, 1976), was used to assess trait anxiety and state anxiety in response to the experimental manipulations.

**Procedure**

Figure 1 shows an overview of the experimental procedure. Participants were randomly allocated to the stress induction or control group. Upon arrival in the laboratory, participants were seated at a desk in an experimental cubicle, 1 m away from the computer monitor. Participants initially received some information about the study before providing informed consent. All participants were informed that they may be asked to give a speech in front of a video camera during the session. Participants then provided information about their weekly alcohol consumption using the TLFB Procedure (Sobell and Sobell, 1992), before completing a battery of questionnaires: the AUDIT (Babor et al., 2001), the DMQ (Cooper, 1994), and the trait version of the Spielberger STAI (Spielberger et al., 1983). Participants then received the following standardized instructions: ‘One of the objectives of this study is to investigate variations in mood and alcohol
All participants (N = 44) complete initial questionnaire battery: TLFB, AUDIT, DMQ, STAI-trait

↓

All participants complete STAI-state, DAQ

↓

Stress induction group (N = 22) informed that they will be required to give a short speech in a few minutes  
Control group (N = 22) asked to solve easy anagrams

↓

All participants complete STAI-state, DAQ

↓

All participants complete visual probe task

Fig. 1. Schematic overview of experimental procedure.

In order to assess this, I will be asking you to report how you are feeling at several points during the study, the first of which is right now, before they completed the state version of the STAI and the 14-item version of the DAQ (Love et al., 1998).

At this point, participants in the control group were provided with a list of 18 anagrams, which were all created with the intention of being fairly easy and could all be solved to describe species of animals. Participants were asked to solve as many of the anagrams as possible and were given 2 min to do so. Participants in the stress induction group were given the following standardized instructions: ‘One part of the experiment is designed to assess your social skills and public speaking ability. You will shortly be asked to give a short speech in front of a video camera, in which you will outline your views on the war in Iraq. I will stay here to watch you present the speech and rate you on several different measures of effectiveness. The recording will then be presented to other psychologists within the department, at a later date, so they can make similar ratings’. The experimenter then attached a webcam to the PC and stated: ‘I am attaching the camera now so that you can get used to it, but I will not start recording until you present your speech at the end of the session’.

All participants then completed the STAI-state and the DAQ, before they completed the visual probe task. This began with ten practice trials, in which neutral picture pairs were presented, with a short break before two buffer trials, in which neutral pairs were again presented, followed by 56 critical trials, in which alcohol-control picture pairs were presented. On each trial a fixation cross was centrally presented for 500 ms, followed immediately by the bilateral presentation of a picture pair for 500 ms, with pictures 60 mm apart and one picture on the left of the screen and one on the right. After picture offset, a visual probe stimulus (a small arrow which pointed up or down) was presented either on the left or on the right of the screen, and participants were required to rapidly identify this probe by pressing the upper or lower button on the response box. There was an intertrial interval of 500 ms. During the critical trials, each of the alcohol-control picture pairs was presented four times, with the alcohol-related picture presented twice on the left and twice on the right of the screen. Probes replaced alcohol-related and control pictures with equal frequency, and there were an equal number of probes of each type.

After participants had completed the task, participants in the stress induction group were informed that they would not, in fact, have to give a speech in front of the video camera. All participants in this group were informally asked by the experimenter if they had believed that they would have to give a speech; all participants in this group stated that they were expecting to give a speech. All participants were then fully debriefed before being released.

RESULTS

Assignment to groups based on coping motives scores of the DMQ

The median score on the coping motives subscale of the DMQ was 2.4 (possible range of scores 1–5). Nineteen participants (43%) who scored below the median were classed as ‘low coping motives drinkers’, whereas the remaining 25 participants (57%) with scores on the coping motives subscale equal to or greater than the median were classified as ‘high coping motives drinkers’. The stress induction group (N = 22) contained 8 low coping motives drinkers and 14 high coping motives drinkers, whereas the control group (N = 22) contained equal numbers of low (N = 11) and high (N = 11) coping motives drinkers. A chi-square test revealed no association between experimental group assignment and coping motives group ($\chi^2 = 0.83$, $P > 0.1$).

Group characteristics

Table 1 shows characteristics of participants allocated to stress induction and control groups, shown separately for
low and high coping motives drinkers. Data (apart from gender ratio) were analyzed using a series of Univariate Analyses of Variance (ANOVA), with between-group factors of experimental group (stress induction vs control) and coping motives group (high vs low). Weekly alcohol consumption was log transformed before analysis to reduce skewness. The control group had a higher level of weekly alcohol consumption, and higher scores on the AUDIT, than the stress induction group; furthermore, the high coping motives group had higher scores on the trait version of the STAI compared to the low coping motives group. There were no other significant group differences, and no significant interactions between experimental group and coping motives group (P > 0.1). In view of these group differences, in all subsequent analyses, the variables STAI trait, weekly alcohol consumption (log transformed), and AUDIT scores were entered as covariates.

Subjective anxiety (STAI state)

Data were analyzed using a mixed design 2 × 2 ANOVA, with a within-subjects factor of time (before experimental manipulation, after manipulation), and between-subject factors of experimental group (stress induction vs control) and coping motives group (high vs low). Weekly alcohol consumption, AUDIT, and STAI trait were entered as covariates. The main effect of the covariate STAI trait was statistically significant (F(1, 37) = 5.55, P < 0.01), reflecting the significant positive correlation between STAI trait and the average STAI state score (r = 0.44, P < 0.01), but there were no other significant effects of the covariates (P > 0.1). Importantly, the time × experimental group interaction was significant (F(1, 37) = 20.45, P < 0.01), but there were no other significant main effects or interactions (P > 0.1). In order to investigate the interaction, we performed post-hoc paired samples t-tests, separately on participants in the stress induction and control groups. Among participants in the stress induction group, STAI state scores were elevated after the manipulation compared to before the manipulation (t(21) = 4.74, P < 0.01), whereas, in the control group, STAI state scores were significantly lower after the manipulation compared to before the manipulation (t(21) = 2.86, P < 0.01). See Table 2 for summary data.

Subjective alcohol craving (DAQ-brief)

Mean scores on the DAQ-brief were analyzed using a mixed design 2 × 2 ANOVA, as described above for the STAI state. There was a significant main effect of the covariate AUDIT (F(1, 37) = 3.29, P < 0.05), reflecting the significant positive correlation between AUDIT score and the average DAQ score (r = 0.46, P < 0.01), but there were no other significant effects of the covariates (P > 0.1). Importantly, the time × experimental group interaction was statistically significant (F(1, 37) = 11.79, P < 0.01). Post-hoc paired samples t-tests indicated a significant increase in DAQ scores after the experimental manipulation compared to before the manipulation, among participants in the stress induction group (t(21) = 4.13, P < 0.01), but no change among participants in the control group (t(21) = 0.37, P > 0.1). See Table 2 for summary data.

Visual probe task

Reaction time data from trials with errors (3% of data) were excluded. In order to eliminate outliers, reaction times were removed if they were greater than 2000 ms, and then if they were more than three standard deviations (SDs) above the individual mean (1% of data). We calculated mean reaction to probes that replaced alcohol pictures and mean reaction times to probes that replaced control pictures. Reaction time data were then analyzed using a mixed design 2 × 2 ANOVA, with probe position (replaces alcohol picture, replaces control picture) as the within-subjects factor, and between-subject factors of experimental group (stress induction vs control) and coping motives group (high vs low). Weekly alcohol consumption, AUDIT, and STAI trait were entered as covariates. The hypothesized three-way interaction probe position × experimental group × coping motives group was statistically significant (F(1, 37) = 5.05, P < 0.05). There were no significant effects of the covariates (P >

Table 1. Participant characteristics based on questionnaires administered at the beginning of the experiment, shown separately for participants allocated to stress induction and control groups, and for high and low coping motives drinkers. Values are mean ± SD. See text for description of significant group differences.

<table>
<thead>
<tr>
<th></th>
<th>Stress induction group</th>
<th>Control group</th>
<th>ANOVA (all other P &gt; 0.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High coping</td>
<td>Low coping</td>
<td>High coping</td>
</tr>
<tr>
<td>Age (years)</td>
<td>18.63 ± 1.06</td>
<td>19.29 ± 1.38</td>
<td>19.18 ± 0.87</td>
</tr>
<tr>
<td>Gender ratio (M : F)</td>
<td>13:1</td>
<td>6:2</td>
<td>8.3</td>
</tr>
<tr>
<td>Alcohol units/week</td>
<td>22.21 ± 6.47</td>
<td>20.88 ± 5.99</td>
<td>30.36 ± 13.03</td>
</tr>
<tr>
<td>AUDIT</td>
<td>15.50 ± 2.93</td>
<td>13.38 ± 4.31</td>
<td>17.91 ± 6.73</td>
</tr>
<tr>
<td>STAI trait</td>
<td>47.14 ± 8.72</td>
<td>41.38 ± 8.43</td>
<td>46.73 ± 6.18</td>
</tr>
<tr>
<td>DMQ–coping</td>
<td>3.01 ± 0.64</td>
<td>1.83 ± 0.35</td>
<td>3.02 ± 0.68</td>
</tr>
<tr>
<td>DMQ–enhancement</td>
<td>2.87 ± 0.64</td>
<td>2.90 ± 0.73</td>
<td>2.89 ± 0.86</td>
</tr>
<tr>
<td>DMQ–social</td>
<td>3.49 ± 0.54</td>
<td>3.65 ± 0.81</td>
<td>3.56 ± 0.94</td>
</tr>
<tr>
<td>DMQ–conformity</td>
<td>1.80 ± 0.54</td>
<td>1.80 ± 0.55</td>
<td>2.25 ± 0.91</td>
</tr>
</tbody>
</table>

Notes: Alcohol units/week: self-reported weekly alcohol consumption, in UK units; AUDIT: score on the Alcohol Use Disorders Identification Test, possible range of values 0–60; STAI: score on the trait version of the Spielberger State-Trait Anxiety Inventory, possible range of values 1–5.
a significant attentional bias for the alcohol pictures ($t_{(13)} = 2.62, P < 0.05$). Participants in the control group who had low coping motives were also faster to respond to probes that replaced alcohol-related, rather than control pictures, although in this group the difference was only marginally significant ($t_{(10)} = 2.23, p = 0.05$). Among the other two groups, reaction times to probes that replaced alcohol versus control pictures were not significantly different (control group, high coping motives: $t_{(10)} = 0.30, P > 0.1$; stress induction group, low coping motives: $t_{(7)} = 0.07, P > 0.1$).

**DISCUSSION**

Results from the present study were generally consistent with our hypotheses. Among our sample of heavy social drinkers, exposure to a stressor led to increases in both subjective anxiety and subjective alcohol craving, but there was no change in craving and a decrease in anxiety in a control group. The most important result was obtained from the visual probe task, which measures attentional bias to alcohol-related cues: exposure to a stressor led to a significant attentional bias for alcohol-related cues, but only among participants who self-reported ‘drinking to cope’ as a prominent motive for drinking. The implications of these results, together with limitations of the present study, will be briefly discussed.

Participants who had high levels of coping motives who were exposed to the stressor showed a statistically significant attentional bias for alcohol-related cues during the visual probe task; however, participants who had low levels of coping motives did not have a statistically significant attentional bias after the stressor task. Among participants who were exposed to a (non-stressful) control manipulation, those participants who had high levels of coping motives had a marginally significant attentional bias, whereas those participants with high levels of coping motives did not have a significant attentional bias. These results are consistent with theoretical models (e.g. Baker et al., 2004a,b) which posit that negative affect can increase the ability of substance-related cues to grab the attention, and that these effects might occur relatively automatically. There are two main issues which qualify this interpretation. Firstly, the effects of the anxiety induction on attentional bias were mediated by coping motives for drinking, whereas the effects of anxiety induction on self-reported anxiety and alcohol craving were not.
It is notable that in one study (Birch et al., 2004), coping motives did mediate the effects of a negative mood induction on levels of subjective alcohol craving. Therefore, the specific nature of the effects of anxiety induction on subjective alcohol craving and objective indices of the incentive-motivational properties of alcohol cues, and their relative mediation by individual differences in drinking motives, should be clarified in future research. Secondly, Baker et al. (2004a) and Baker et al. (2004b) posit that negative affect might cause substance-related cues to grab the attention automatically, possibly before those cues cross the threshold of conscious awareness; however, the visual probe task used in the present study might not be a suitable measure of ‘automatic’ allocation of attention for substance-related stimuli. As reviewed elsewhere (Field, 2006; Field et al., 2006), when picture pairs are presented for 500 ms during the visual probe and similar tasks, there is evidence that attentional bias is amenable to conscious control. For example, alcohol-dependent participants who are motivated to abstain from drinking show diminished attentional bias or even attentional avoidance of alcohol-related cues when presented for 500 ms (Stormark et al., 1997; Noel et al., 2006), which might reflect strategic override of attentional bias. In the present study, as picture pairs were presented for 500 ms, it is therefore possible that the observed attentional bias might reflect a relatively strategic (and therefore, non-automatic) cognitive process. Future studies should explore effects of anxiety induction on measures of more ‘automatic’ attentional processes, such as the visual probe task with very briefly presented stimuli (e.g. 50–100 ms, see Stormark et al., 1997; Noel et al., 2006), in order to explicitly test Baker et al. (2004a,b) prediction that negative affect can increase the incentive-motivational properties of substance-related cues automatically.

An unexpected finding was the observed marginally significant attentional bias for alcohol cues among participants in the control group who had low coping motives. One possibility is that this marginally significant result is spurious, caused by the relatively small sample size which may have limited the statistical power of the analyses. In future research, investigators could replicate the basic procedure described here, with a larger sample size, in order to investigate whether this finding (attentional bias in heavy drinkers with low coping motives who are not exposed to a stressor) is robust. However, this finding might be explained if we consider that all the participants in the present study were heavy drinkers and, therefore, we might expect all participants to demonstrate a statistically significant attentional bias for the alcohol-related pictures (cf. Townshend and Duka, 2001; Field et al., 2004a). The pertinent question then becomes why we did not observe significant attentional bias in the remaining two groups of participants: low coping motives drinkers exposed to the stressor, and high coping motives drinkers exposed to the control manipulation. Among participants with low coping motives who were exposed to the stressor, attentional bias may not have been absent because these participants do not normally drink in response to negative mood; therefore, when their negative mood was temporarily increased, this could have inhibited their attentional bias for alcohol-related cues. Similarly, participants with high coping motives who were exposed to the control manipulation did not demonstrate statistically significant attentional bias. It is possible that among participants who drink to cope with negative affect, attentional bias for alcohol-related cues is only increased when negative affect is high.

The present results are also consistent with theoretical models of craving (e.g. Franken, 2003; Field, 2006) which posit that increases in craving can result in increases in attentional bias for substance-related cues. As outlined in the introduction, various manipulations which increase the motivation for substances of abuse (e.g. cue exposure; deprivation; alcohol priming effects) appear to increase attentional bias for substance-related cues. The present results complement this literature, as they demonstrate that induction of a negative mood can increase alcohol craving and produce a corresponding increase in attentional bias for alcohol-related cues, albeit only in participants with high levels of coping motives for drinking. The emerging picture is that elevated craving, no matter how it is induced, produces an increase in the ability of substance-related cues to grab the attention. However, there are relatively few empirical studies which address this issue, so it is incumbent upon future researchers to investigate this issue more thoroughly.

Finally, one potential limitation of the study is that the manner of participant recruitment and the general experimental procedures may have influenced participants’ responding on the visual probe task. Participants were clearly recruited on the basis of their alcohol consumption and the majority of the experimental procedure involved assessing alcohol consumption and alcohol-related cognitions (e.g. the numerous questions about alcohol consumption and craving; the repeated presentation of alcohol-related pictures during the visual probe task). In research on smoking-related attentional bias, Yaxley and Zwaan (2005) found that an attentional bias for smoking-related stimuli could be induced in non-smokers simply by informing participants that the focus of the study was on cigarette smoking. By extension to the present study, it is possible that, as the study was clearly an investigation involving alcohol, this may have increased attentional bias for alcohol-related stimuli, although it should have done so equally among all the participants. Although this is a potentially important issue, the significance of which can only be investigated in future research, it seems unlikely that it would have influenced the results from the present study. In the present study, the magnitude of attentional bias was influenced by drinking motives (which were not experimentally manipulated) and stress induction, and it seems unlikely that the stress-induction manipulation would have made the alcohol-related focus of the investigation any more salient to those participants who were allocated to the stress induction group.

In summary, results from the present study demonstrate that a laboratory stressor task increases attentional bias for alcohol-related cues, but only among participants who self-report high levels of coping motives for drinking. Results are broadly consistent with models that posit effects of negative affect on substance-seeking, and models of the effects of subjective craving on attentional bias for substance-related cues.
REFERENCES


