Effects of Acute Alcohol Consumption on Alcohol Attentional Bias

Sally Adams and Marcus R Munafò
University of Bristol, Department of Experimental Psychology

Introduction
Incentive salience theory suggests drugs of abuse render reward systems hypersensitive to the motivational value of drug-related stimuli. To date, only two studies have explored the effects of an alcohol on motivation to drink via attentional bias, with inconsistent results. We investigated (1) the effects of alcohol on attentional bias for alcohol-related cues, (2) the similarity of any effects of alcohol across two measures of alcohol attentional bias, and (3) the effects of social drinking status on attentional bias.

Methods
72 healthy, heavy and light social alcohol users were examined in a double-blind placebo-controlled design. Participants received either 0.000 g/kg, 0.014 g/kg or 0.400 g/kg of alcohol in a between-subjects design and completed a modified Stroop task and a visual dot probe task.

For the former, word stimuli matched for frequency and length were presented until a response was made or 2500ms had elapsed. For the latter, pictorial stimuli were displayed side by side for 500ms, followed by a probe in one of the picture locations until a response was made or 500ms had elapsed.

Figure 1. Example of pictorial stimuli pairs from the alcohol dot-probe task.

Discussion
These data indicate that the attentional processes assayed by the dot probe and Stroop tasks may not be mediated by a common underlying mechanism. Heavier drinkers compared to lighter drinkers demonstrated enhanced attentional bias, but only on the modified Stroop task, suggesting effects associated specifically with mechanisms involved in the selective processing of salient cues. Additionally, following alcohol consumption, participants demonstrated enhanced alcohol attentional bias on the dot-probe task only, suggesting that the priming effect of alcohol on attentional bias may function via processes associated with the maintenance of selective attention.

Results
Stroop data indicated a main effect of cue type ($F[1, 66] = 1.51, p = 0.001$), such that participants were slower to respond to alcohol words, irrespective of drink condition (alcohol, 0.000g/kg, 0.014 g/kg, 0.400g/kg, placebo) or drinking status (light, heavy). An interaction effect on reaction time between cue type and drinking status was also significant ($F[1, 66] = 5.10, p = 0.027$), with heavier drinkers slower to respond to alcohol-related cues.

Dot-probe data indicated a significant interaction effect between validity (alcohol, neutral) and drink condition, ($F[2, 66] = 4.59, p = 0.014$). Following an acute dose of alcohol (0.400g/kg), participants were faster to respond to alcohol-related stimuli.

Figure 2. RT (ms) to probes replacing valid vs. invalid trials, by challenge condition groups. Values are mean ± SE.