The Effect of Alcohol Cue Exposure on Gambling-Specific Attentional Biases and Cross-Cue Reactivity

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Introduction

- Problematic gambling and problematic alcohol use often co-occur, but exactly how they interact is still being investigated.
- This study sought to investigate the relationship between gambling and alcohol by testing two separate but related constructs:
  (1) Cross-cue reactivity: a phenomenon where a stimulus related to one addiction elicits cravings for a different addiction.
  - Well-studied in smoking and alcohol co-use, but very little gambling-related research
  - ***Research Question 1: Is there evidence of cross-cue reactivity between gambling and alcohol?***
- (2) Attentional biases: the irrepressible tendency to pay attention to certain stimuli over others; i.e. addiction-related stimuli
  - Gamblers preferentially attend to images related to their preferred gambling activity (McGrath et al., 2018)
  - ***Research Question 2: What is the effect of alcohol cue exposure on gambling-specific attentional biases?***

Hypotheses

H1: Alcohol cue group will experience higher subjective cravings for alcohol compared to neutral cue group [cue reactivity]

H2: Gamblers in the alcohol cue group will experience greater cravings for gambling compared to gamblers in the neutral cue group [cross-cue reactivity]

H3: Alcohol cue group will preferentially attend to alcohol images to a greater extent compared to the neutral cue group [attentional biases; cue reactivity]

H4: Gamblers in the alcohol cue group will exhibiter greater attentional biases towards gambling images compared to gamblers in the neutral cue group [attentional biases; cross-cue reactivity]

Methods

Participants

Males aged 18-35 who regularly play poker (Gs) OR have not gambled in the past 12 months (NGs) AND regularly drink alcohol (n = 62)

Design

All participants were randomly assigned to the alcohol or neutral cue condition. Procedure was the same for each condition except for the type of cue exposure.

Procedure

(1) Craving measures (Pre Cue)
(2) ***Cue Exposure***: asked to look, smell, and bring selected beverage to lips without drinking it
(3) Craving measures (Post Cue)
(4) ***Eye-Tracking Task***
(5) Craving measures (Post Eye-Tracking)

Measures

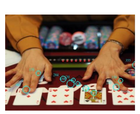
Craving measures were the Gambling Craving Scale (GACS) and the Alcohol Urge Questionnaire (AUQ). The eye-tracking task consisted of 20 trials (4000 milliseconds per trial) of each of these categories:

Gambling

Neutral

Alcohol

Gambling



Alcohol

Neutral

There are multiple measures used to assess attentional biases in eye-tracking. For this study, we focused on:

Mean Trial Dwell Time
Length of time a participant spent looking at the target image

Results - Figures

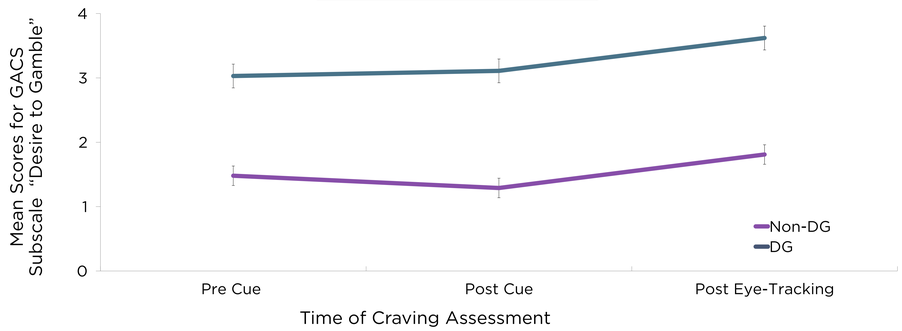


Figure 1. Average scores of item "desire to gamble" on the GACS, measured pre cue exposure, post cue exposure, and post eye-tracking for disordered gamblers (DGs) and non-disordered gamblers (non-DGs). Higher scores indicate greater desire to gamble.

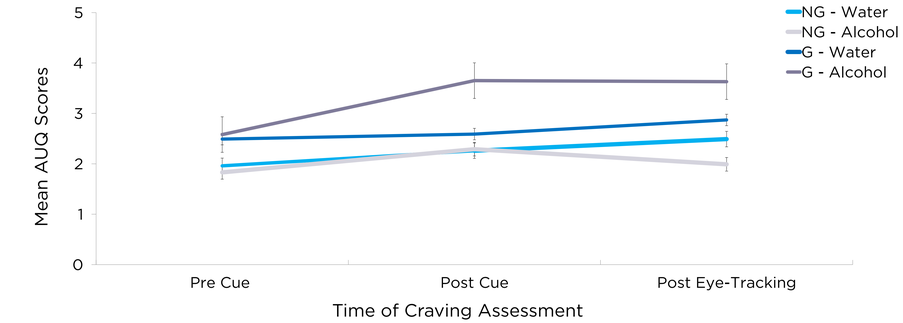


Figure 2. Average AUQ scores measured pre cue exposure, post cue exposure, and post eye-tracking task for each combination of condition (water vs. alcohol) x group (G vs. NG). Higher scores indicate greater alcohol craving.

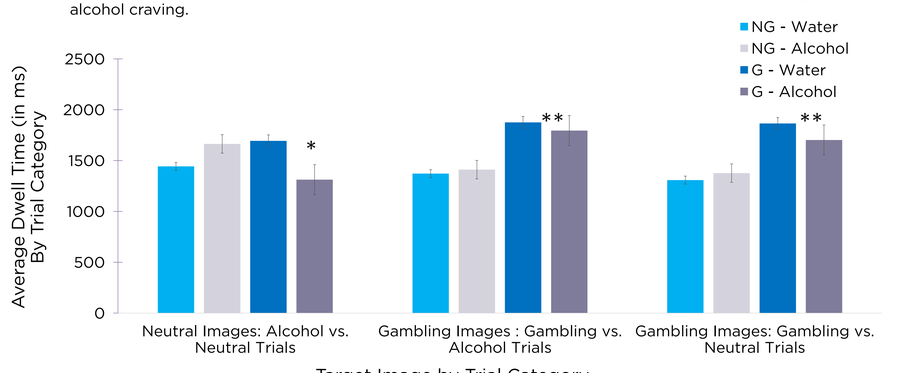


Figure 3. Mean trial dwell time for each combination of condition (water vs. alcohol) x group (G vs. NG), organized by the target image within each type of category.
*significant interaction **significant main of effect of group

Results

*There was a significant difference between groups on the Alcohol Use Disorder Identification Test (AUDIT). Gamblers reported higher scores on average than non-gamblers, t(60) = -3.51, p = .001. As such, we controlled for AUDIT scores in all analyses.

H1: Effect of alcohol cue exposure on cravings for alcohol; ***Partially Supported***

- NGs and Gs: There was a significant three-way interaction between time, group (G or NG), and condition (water cue or alcohol cue) on AUQ scores, F(1.77, 95.58) = 4.09, p = .02. Gamblers in the alcohol cue condition reported greater cravings for alcohol (M = 3.65, SD = 0.36) after cue exposure compared to non-gamblers in the alcohol cue condition (M = 2.29, SD = 0.34).
- Gs only: significant two-way interaction between PGSI classification (PGSI > 8 = disordered gambler [DG], PGSI < 8 = non-DG) and time, F(2, 46) = 5.89, p = 0.01. There was a significant linear trend in AUQ scores for the DGs only, such that they reported greater craving for alcohol at each time point.

H2: Effect of alcohol cue exposure on gambling cravings; ***Not Supported***

- Gs only: There was no statistically significant main effect of condition on any subscale of the GACS; however, there was a significant main effect of PGSI classification (DG vs. non-DG) on the "Desire to Gamble" subscale of the GACS. DGs reported greater cravings for gambling than non-DGs at all three time points, irrespective of condition (ps < .02).

H3: Effect of alcohol cue exposure on alcohol-specific attentional biases; ***Partially Supported***

- NGs and Gs: There was a statistically significant interaction between condition and group for mean trial dwell time (MTDT) on neutral images in the alcohol vs. neutral trials only. Gamblers in the alcohol cue condition had significantly lower MTDTs compared to gamblers in the neutral cue condition, t(16.99) = 2.65, p = .02.
- NGs and Gs: There was no statistically significant main effect of condition on MTDT for alcohol images for the gambling vs. alcohol trials, F(1, 51) = 0.11, p = .75, or the alcohol vs. neutral trials, F(1, 51) = 0.83, p = .37.

H4: Effect of alcohol cue exposure on gambling-specific attentional biases; ***Not Supported***

- Gs only: There was no statistically significant main effect of condition on MTDT for gambling images in the gambling vs. neutral trials, F(1, 19) = 0.71, p = .41, or the gambling vs. alcohol trials, F(1, 19) = 0.15, p = .70.

Discussion

- This study is currently only halfway through recruitment, so the presented results are tentative and subject to change until the full sample size is recruited.
- We sought to determine whether cross-cue reactivity between alcohol and gambling exists by assessing craving for gambling and attentional biases towards gambling images after alcohol cue exposure.
- While we did not find a significant main effect of cue condition on gambling cravings or gambling-specific biases, there are a few results of note.
  - First, disordered gamblers craved alcohol more at all three times of cravings assessment when compared to non-disordered gamblers, while controlling for AUDIT scores and irrespective of condition.
  - Second, gamblers in the alcohol condition craved alcohol more after cue exposure than non-gamblers in the alcohol condition.
  - Third, there was a consistently strong main effect of group on gambling-specific attentional biases. Gamblers, regardless of condition, spent much longer looking at the gambling images than any other type of image.
- This suggests that the impact that gambling and alcohol use have on each other is complex, and results from an interaction of many factors, including severity of alcohol use and severity of problem gambling.

Questions or Comments?
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