Psychological and physiological responses to gambling cues in pathological gamblers

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1. Introduction

Gamblers experience exposure to gambling cues on a daily basis, ranging from celebrity-endorsed TV commercials, to walking past a high street bookmaker. Research on substance addictions indicates that these cues are likely to activate urges / cravings to gamble. 

Wulfert et al (2005) found higher rates of subjective excitement following a horse race with a wager on in students, Kushner et al (2008) used frequent gamblers in a simulated casino environment and found positive anticipation and positive priming increased urges to gamble. However, these studies used only a single self-report item to measure craving. Ashrafioun et al (2012) used the Gambling Urge Scale (GUS, Raylu & Oei, 2004b) and found increases in craving following gambling cues in student gamblers.

Cringes comprises the short-term, acute ‘urges’ to obtain relief and reward (Raylu & Oei, 2004b), as well as more stable aspects of ‘preoccupation’ (Pallanti, 2005). The current study used the Gambling Craving Scale (Young & Woli, 2009) to measure stable preoccupation, and the three most heavily loaded factors from the GUS to capture short-term gambling urges generated by the images / adverts on a block by block basis, thus capturing both facets of craving.

Previous studies have used heart rate and skin conductance levels to measure physiological arousal following gambling cues, finding increased reactivity recreational gamblers (Ladouceur et al 2003) and pathological gamblers (Sodano et al 2010). However, different physiological parameters tend not to correlate with each other, or with subjective craving measures (Diskin et al 2008). Therefore, physiological and psychological measures are not necessarily capturing the same elements of craving. Annual has been measured following different cue types and images, but to date not actual gambling adverts.

When differentiating between different gambling forms, Sharpe & Tarrier (1995) showed EGM players to gambling urges generated by the images / adverts on a block basis, and to control block, and did not differ from either. This highlights the importance of preferred games in cue reactivity research, showing that gambling cues do not form a uniform way to all gambling stimuli (Sharpe & Tarrier 1995). The full GACS scores reduced significantly over the duration of the task, suggesting the initial pre-task questions capture the stable preoccupation identified by Pallanti et al (2005). It is possible that completing the full version 3 times in a relatively short time period modifies the scale sensitivity, given that cravings evidently were detected on the short version on a block by block basis.

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2. Methods

Participants (n=15, age m=38.5, f. 14-7) were recruited from the Addictions and Gambling Clinic, London. Participants were instructed to imagine themselves within the stimulus block, and did not differ from either. This highlights the importance of preferred games in cue reactivity research, showing that gambling cues do not form a uniform way to all gambling stimuli (Sharpe & Tarrier 1995). The full GACS scores reduced significantly over the duration of the task, suggesting the initial pre-task questions capture the stable preoccupation identified by Pallanti et al (2005). It is possible that completing the full version 3 times in a relatively short time period modifies the scale sensitivity, given that cravings evidently were detected on the short version on a block by block basis.

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3. Results

Preferred form

Preferred measures ANOVA (3 levels: preferred form, other forms, control) shows a significant main effect of stimulus block (F(2,22)= 5.6, p= .012). Preferred form block was followed by increased craving following preferred gambling blocks relative to control blocks (t(11)= 3.95, p=.002). Other forms tested were not significantly different to preferred form or control blocks. Difference in craving ratings between gambling adverts and control adverts approached significance (t(12)= 2.1, p=.056).

Psychological - Pictures

A repeated measures ANOVA showed a significant difference in full GACS score as a function of timing of scale administering (F(1.4, 16)=5.8, p=.020). Pairwise comparisons reveal the pre task GACS score to be significantly higher than the post adverts (task end scores) (t(12)= 2.82, p= .015).

Psychological - Adverts

Skin Conductor: A paired samples t test indicated no significant difference in skin conductance when watching gambling or control adverts (t(11)=79, p=.442). Within the gambling advert block, repeated measures ANOVA for skin conductance showed a effect of advert that approached significance (F (1, 15)=1.3, p<.05), with a significant effect restricted to advert 1 displaying online slot machines (t(12)=2.35, p=.037).

Heart Rate: A paired samples t test found no significant difference in overall heart rate between gambling and control adverts (t(13)=71, p=.491). Within the gambling advert block, repeated measures ANOVA for heart rate showed the main effect of advert was non-significant (F (3,39)= 2.1, p=.113).

4. Results

SAGS ratings by Group

Performing the same analysis with treatment stage (pre vs. complete) as the between groups variable in no significant differences.

5. Discussion

The ratings provided after each block show the highest cravings are reported following presentation of cues from the preferred game. Non-preferred form fell intermediate between the preferred block and the control block, and did not differ from either. This highlights the importance of preferred games in cue reactivity research, showing that gambling cues do not form a uniform way to all gambling stimuli (Sharpe & Tarrier 1995). The full GACS scores reduced significantly over the duration of the task, suggesting the initial pre-task questions capture the stable preoccupation identified by Pallanti et al (2005). It is possible that completing the full version 3 times in a relatively short time period modifies the scale sensitivity, given that cravings evidently were detected on the short version on a block by block basis.

The psychological data indicate no consistent changes in skin conductance or heart rate in response to gambling related images, but during the gambling adverts, there was some evidence of heterogeneity with a significant increase in skin conductance to an advert for online slot machines. It may be relevant that the slot machine players consistently rated their cravings as higher than other groups across all blocks and in both the short and longer form of the GACS. Besides the inference that dynamic gambling films may constitute a more powerful cue than a static image, our results also suggest that slots players may be more susceptible to cravings, or that the nature of the slots games induce more cravings. However these results should be interpreted with caution due to the small number of the groups.

Methodological issues - to allow for a return to baseline of the psychological measures, the ITI was 60 seconds; the picture blocks only lasted 20 seconds, therefore the task was not very interactive and required longer periods of inactivity than activity. Secondly, the stimuli were the researchers interpretation of what represents each form of gambling. The gambler’s triggers may well be subtly yet significantly different from the researchers perspective. Finally, all changes in physiological measures were compared to a pre-block baseline; it is possible that the participants knew they were coming to the end of the ITI and therefore displayed an anticipatory increase in arousal, distorting the change created by the stimulus.

6. Conclusions

The psychological data presented show that greater cravings are generated by stimuli that are personally relevant to the individual gambler. This result is not fully supported by the physiological data, although the general trend of reduced heart rate is response to gambling stimuli warrants further investigation.

To address the methodological issues raised in the discussion, further analysis of the data will be done relevant to the individual gambler. This result is not fully supported by the physiological data, although the general trend of reduced heart rate is response to gambling stimuli warrants further investigation.