Psychological and physiological responses to gambling cues in pathological gamblers

Steve Sharman1, Dr Eve Limbrick-Oldfield1, Dr Mike Aitken1, Dr Henrietta Bowden-Jones2,3, Dr Luke Clark1

1Department of Psychology, University of Cambridge, UK; 2National Problem Gambling Clinic, London, UK; 3Imperial College, London, UK.

1. Introduction

Craving comprises the short-term, acute ‘urges’ to obtain reward and relief (Raylu & Oei, 2004b), as well as more stable aspects of ‘preoccupation’ (Pallanti et al. 2003) suggesting physiological and psychological measures are not necessarily capturing the same elements of craving. Arousal has been implicated in pathological gambling (Sodano et al. 2003) and will use cues that are identified and created with help from problem gamblers, to remove any cues that are nonsignificant (F(1, 14)= 2.1, p=.056).

2. Methods

2.1 Participants

Participants (n= 15; age 28–59; 9 men) were recruited from the client list of the Gambling Clinic, London. All participants were diagnosed as pathological gamblers (LaTour et al. 2003) and pathological gamblers (Sodano et al. 2016). However, different physiological tend to correlate with each other, with subjective craving measures (Skidmore et al. 2003) suggesting physiological and psychological measures are not necessarily capturing the same elements of craving. Annual change was measured following different cue types videos and images, but to date not actual gambling adverts.

2.2 Stimuli

The psychophysiological 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. The bias towards dynamic gambling models may constitute a more powerful cue than a static image. Other results also suggest that slot players may be more susceptible to cravings, or that the nature of the slot games induce more cravings. However, it is important to note that these results should not be interpreted with caution due to the small numbers in the groups.

Methodological issues - to allow for a return to baseline of the physiological 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 but significantly different from the perspectives of researchers. 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 gambling stimuli.

3. Results

3.1 Skincare Conduction

A repeated measures ANOVA (3 levels: preferred form, other forms, control) of heart rate responses to the pictures showed the main effect of form was non-significant (F(2, 22)= 5.6, p< .012). Paired sample t tests performed on the 3-item GACS completed immediately after each block showed increased cravings following preferred gambling blocks relative to control blocks (t (11)= 3.95, p=.002). Other forms of gambling are not significantly different to preferred form or control blocks. Difference in craving ratings between gambling adverts and control adverts approached significance (F(1, 11)= 2.1, p=.056).

3.2 Skin Conductance

A repeated measures ANOVA showed a significant difference in full GACS score as a function of timing of scale administration (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 task scores) (t (12)= 2.82, p< .015).

Psychophysiological data was collected via a Biopac MP150 linked to a Dell laptop running Eprime programmed task, and an Acre laptop running AcqKnowledge 4.1. Skin Conductance was measured via two 6mm AgAgCl electrodes attached to the middle and index fingers of the left hand. Heart Rate was collected via 2 electrodes attached via recording disks to the left wrist and right ankle.

Psychophysiological data was manually extracted for i) a 10s baseline period pre-stimulus presentation, ii) for the 20s of each picture block, iii) for each individual 30s advert and whole advert block, and iv) for the 12s seconds post-offset, approximating to the craving rating. Raw data was converted into percentage change from baseline to allow for individual differences in analysis.

4. 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 immediately 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 gamblers do not go through a uniform way to all gambling stimuli (Sharpe & Tailor 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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