



Does gender moderate the subjective measurement and structural paths in behavioural and cognitive aspects of gambling disorder in treatment-seeking adults?



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HIGHLIGHTS

- We assess for gender differences in conceptualising gambling symptoms.
- We model urge and cognition paths to gambling disorder moderated by gender.
- Gambling symptom constructs were equally salient between men and women.
- Men reported stronger levels of urge and interpretive bias.

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ABSTRACT

Introduction: Gender differences have been observed in the pathogenesis of gambling disorder and gambling related urge and cognitions are predictive of relapse to problem gambling. A better understanding of these mechanisms concurrently may help in the development of more directed therapies.

Methods: We evaluated gender effects on behavioural and cognitive paths to gambling disorder from self-report data. Participants ($N = 454$) were treatment-seeking problem gamblers on first presentation to a gambling therapy service between January 2012 and December 2014. We firstly investigated if aspects of gambling related urge, cognitions (interpretive bias and gambling expectancies) and gambling severity were more central to men than women. Subsequently, a full structural equation model tested if gender moderated behavioural and cognitive paths to gambling severity.

Results: Men ($n = 280$, mean age = 37.4 years, $SD = 11.4$) were significantly younger than women ($n = 174$, mean age = 48.7 years, $SD = 12.9$) ($p < 0.001$). There was no gender difference in conceptualising latent constructs of problem gambling severity, gambling related urge, interpretive bias and gambling expectancies. The paths for urge to gambling severity and interpretive bias to gambling severity were stronger for men than women and statistically significant ($p < 0.001$ and $p = 0.004$, respectively) whilst insignificant for women ($p = 0.164$ and $p = 0.149$, respectively). Structural paths for gambling expectancies to gambling severity were insignificant for both men and women.

Conclusion: This study detected an important signal in terms of theoretical mechanisms to explaining gambling disorder and gender differences. It has implications for treatment development including relapse prevention.

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1. Introduction

Whilst treatments are efficacious for gambling disorder, relapse to problem gambling is pervasive (Hodgins, Currie, el-Guebaly, & Diskin, 2007; Hodgins & el-Guebaly, 2004) and gambling related urge and cognitions are predictive of relapse (Hodgins & el-Guebaly, 2004; Oakes et al., 2012; Smith et al., 2015). These variables are underpinned

by two important approaches to explaining gambling behaviour, encompassing the brain reward system (psychobiological approach) and erroneous cognitions (cognitive approach) and their anomalous interaction (Clark, 2010). Patterns of urge–cognition circuitry are likely to vary at the individual level due to differences in brain function or neurochemistry (Clark, 2010). In addition, gender differences have been observed in the pathogenesis of gambling disorder such as disease severity, hereditary links and premorbid psychopathology (Grant, Chamberlain, Schreiber, & Odlaug, 2012) as well as treatment needs and response (Crisp et al., 2000). Gender may also moderate neural correlates in decision-making during gambling (Clark, 2010). Therefore,

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a better understanding of potential gender differences in urge and cognition mechanisms could significantly benefit the development of treatments for gambling disorder.

The commonalities between gambling disorder and substance use disorders (SUD) in neurocognitive and physiological pathways (Paris, Franco, Sodano, Frye, & Wulfert, 2009; Tamminga & Nestler, 2006) was a key catalyst to the reclassification of Pathological Gambling (PG) from 'Impulse-Control Disorders Not Elsewhere Classified' to 'Addiction and Related Disorders' in DSM-5 (American Psychiatric Association, 2013). Central to the maintenance of SUD and relapse after a period of abstinence are urge or craving states experienced by individual users (Bohn, Krahn, & Staehler, 1995; Tiffany, 1992). Whilst not a diagnostic criterion for substance dependence, craving is stated to be experienced by 'most (if not all)' individuals with the disorder (American Psychiatric Association, 2013). Similarly, urge states play an important role in gambling pathology (Raylu & Oei, 2004b) and have been proposed to increase during periods of psychological disturbances, such as depression and stress (American Psychiatric Association, 2000). The physiological state of gambling urge can arise from internal triggers (e.g. depression) and external triggers (e.g. gambling cues) that activate arousal and gambling related cognitions (Sharpe, 2002).

Neuroimaging studies have established links between intensities of self-reported gambling urges and changes in brain activity including retrieval and processing of emotion and impulse regulation (Balodis, Lacadie, & Potenza, 2012; Potenza et al., 2003). Similarly, subjective reports of craving by cocaine dependent individuals have shown to be commensurate with corticostriatal-limbic activations (Potenza et al., 2012). The combination of neuroimaging and neurocognitive tasks has revealed gender dimorphism in decision-making during gambling. Women have shown to utilise different cognitive strategies and neural networks than men when performing the Iowa Gambling Task (IGT) (Bolla, Eldreth, Matochik, & Cadet, 2004). Animal models have also supported gender differences in reward based decision-making based on a rodent version of the IGT (van den Bos, Jolles, van der Knaap, Baars, & de Visser, 2012).

Beyond the laboratory, men and women in the general community have shown to be at variance in self-reports of gambling related cognitions (Raylu & Oei, 2004a). Furthermore, cognitions relating to gambling expectancies (GE) or desired outcomes (e.g. "Having a gamble helps reduce tension and stress" (Raylu & Oei, 2004a)) may be mediated by 'escapist motivation' and moderated by gender where paths are stronger in women than men (Balodis, Thomas, & Moore, 2014; Bonnaire, Bungener, & Varescon, 2009; Thomas, Allen, & Phillips, 2009). In conjunction with GE, interpretive bias (IB) (e.g. "Relating my winnings to my skill and ability makes me continue gambling" (Raylu & Oei, 2004a)) is also rewarded, learned, and becomes habitual in gambling pathology. Different levels of IB have also been shown to occur between men and women in the general community (Raylu & Oei, 2004a).

To date, there is uncertainty to whether gender moderates the paths in behavioural and cognitive aspects of gambling disorder in treatment-seeking adults. In this study, we investigated the following questions. Firstly, are different characteristics of subjective reports of gambling urge, cognitions (interpretive bias and gambling expectations) and gambling disorder more central to men than women? Secondly, are the latent predictor variables of urge and cognitions equally salient to predicting disordered gambling in men and women?

2. Methods

2.1. Study design

We retrospectively evaluated gender effects on structural paths in behavioural and cognitive aspects of gambling disorder from self-report measures. Data was collected at participant's first presentation to an outpatient gambling treatment centre between January 2012

and December 2014. The study was approved by the Southern Adelaide Health Service/Flinders University Human Research Ethics Committee.

2.2. Service and participants

The Statewide Gambling Therapy Service (SGTS) offers free cognitive-behavioural therapy (CBT) for help-seeking problem gamblers in South Australia. The service is staffed by a psychiatrist and therapists with professional registration in psychology, nursing or social work. All therapists have Masters level qualifications in CBT (Battersby, Oakes, Tolchard, Forbes, & Pols, 2008). The dataset consisted of records for 454 adult treatment-seeking problem gamblers.

2.3. Measures

2.3.1. Problem Gambling Severity Index (PGSI)

A self-report questionnaire that was developed to reflect severity of problem gambling behaviour from a social context (Table 1). Each of the 9 items is rated on a Likert (0–3) scale. A total score is indicative of either non-problem gambling (score of 0), low level of problems (1–2), moderate level of problems (3–7) or problem gambling (8+). The classification of 'problem gambling' is considered to be equivalent to DSM-IV Pathological Gambling (Ferris & Wynne, 2001). Whilst PGSI was originally developed for use in prevalence surveys involving general populations, it has also shown sound psychometric properties in a clinical setting (Young & Wohl, 2011).

2.3.2. Gambling Urge Scale (GUS)

A self-report questionnaire measuring the extent of gambling urge (Table 1). The scale consists of six items rated on a Likert (1–7) scale. A final score is generated as a total of the response to each item. Research into concurrent, predictive and criterion-related validity of the GUS suggest that it is a valid and reliable instrument for assessing gambling urges among treatment seeking problem gamblers (Smith, Pols, Battersby, & Harvey, 2013) and non-clinical or non-treatment seeking gamblers (Raylu & Oei, 2004b).

2.3.3. Gambling Related Cognitions Scale (GRCS)

A self-report questionnaire that records common thoughts associated with problem gambling. The 23 items of the GRCS contribute to five subscales reflective of the broader categories of gambling related cognitions that have been described in the literature. In this study, two subscales were the central focus based on the previous literature: interpretive bias (GRCS-IB) and gambling-related expectancies (GRCS-GE) (Table 1). Problem gamblers use a Likert (1–7) scale to indicate how much they agree with each of the statements. The final score is created by adding the values gained from the items, with a higher score reflecting more gambling-related cognitions. A previous comparison with the South Oakes Gambling screen indicated that the scale has good psycho-metric properties in measuring gambling cognitions in a non-clinical sample (Raylu & Oei, 2004a).

2.4. Internal consistency

The Cronbach alpha coefficient was used to measure internal consistency. It is dependent on the average correlation or covariance of the items with one another and the number of items. For health status questionnaires, values between 0.70 and 0.95 are indicative of good internal consistency. Low coefficient values suggest that test scores are less reliable due to a lack of correlation and very high scores indicate redundancy of one or more items (Terwee et al., 2007).

2.5. Measurement and structural models

Confirmatory factor analysis (CFA) was used to model associations between factor variables and observed items plus unique variances of

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