

Editorial

Pathological gambling: a neurobiological and clinical update

Henrietta Bowden-Jones and Luke Clark

**Summary**

A proposed merging of pathological gambling with the drug addictions in the forthcoming DSM-5 prompts an overview of the neurobiological data showing similarities between these conditions, as well as an update on national trends in gambling behaviour and current treatment provision.

Declaration of interest

H. B-J. is Founder and Director of the National Problem Gambling Clinic, is a member of the government's Responsible Gambling Strategy Board and the spokesperson on problem gambling for the Royal College of Psychiatrists.

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Pathological gambling was introduced as a psychiatric entity in the DSM-III in 1980, and for the past two editions, it has been classified in the Impulse Control Disorders alongside pyromania and trichotillomania. Now, in a draft of the forthcoming DSM-5, a bold reclassification has been announced, where pathological gambling is likely to be moved alongside the drug and alcohol use disorders. It will be renamed 'disordered gambling', and the category itself would be necessarily relabelled 'addiction and related disorders'.

These changes are not without controversy among gambling researchers and professionals in the addictions field.^{1,2} The decisions of the DSM-5 Work Group are predicated upon multiple lines of evidence for overlap between pathological gambling and the substance use disorders.³ In terms of clinical expression, it is well known that pathological gamblers display withdrawal symptoms (irritability when attempting to stop or cut down the amount of gambling), and signs of tolerance (the tendency to gamble higher and higher amounts), both of which are considered hallmarks of addiction. The pattern of comorbidities for the disorders is very similar, and around 30-50% of pathological gamblers have co-occurring substance misuse.⁴ Common risk factors have been identified, including genetic markers influencing dopamine transmission, and personality traits linked to impulsivity.⁵ In addition, the most validated drug medications for pathological gambling are the opioid antagonists (e.g. naltrexone);⁶ drugs that were initially trialled in pathological gambling based on their efficacy in drug and alcohol dependence.

Brain mechanisms of disordered gambling

The DSM-5 Work Group also paid careful attention to recent research on the underlying pathophysiology of disordered gambling. Neuropsychological studies in pathological gamblers have identified core deficits in risky decision-making, which resemble the changes observed in patients with brain lesions with damage to the ventromedial prefrontal cortex. Pathological gamblers place higher wagers on simple probability decisions,⁷ they are less likely to choose delayed rewards over immediate gratification,⁸ and they struggle to learn the advantageous tactic

on a test that pits short-term gains against long-term penalties.⁹ These indications remind us, at a clinical level, of their predisposition towards poor risk evaluation and persistent play in the face of mounting debt. In substance use disorders, these neurocognitive measures have value in predicting short-term treatment outcomes.¹⁰ However, the neuropsychological data do not carry unequivocal implications for grouping these disorders, as these deficits could equally be used to support the classification of pathological gambling alongside attention-deficit hyperactivity disorder or bipolar affective disorder, for example.

The neuropsychological research is now complemented by neuroimaging studies that directly illuminate underlying brain substrates. Potenza and colleagues¹¹ have used functional magnetic resonance imaging to monitor brain responses while pathological gamblers viewed gambling videos and performed tasks of self-control. Cocaine addicts in their lab have undergone comparable procedures in the scanner. Both groups showed impaired recruitment of the ventromedial prefrontal cortex region during both procedures, in contrast to healthy controls.¹¹ A separate study had pathological gamblers complete a simple card game where they could win or lose €5 on each trial. The brain responses in dopamine-rich reward circuitry were attenuated, and some of these changes were proportional to gambling severity.¹² As the activation tasks in these studies become more sophisticated, it is proving possible to quantify some of the more subtle cognitive distortions seen in problem gamblers, such as the impact of near-miss outcomes⁵ and loss-chasing decisions.¹³ However, it should also be noted that these neuroimaging studies are few in number, used small numbers of participants, and the findings may again cut across several disorders and suggest pathophysiology shared with multiple conditions.

These neurobiological conceptualisations run the risk of assuming that pathological gamblers represent a homogeneous group. This is unlikely to be true. The Pathways Model explicated by Blaszczynski & Nower¹⁴ (although not as yet fully validated) hypothesises three routes into disordered gambling. Individuals in the first group have no predisposing vulnerabilities; rather their gambling problems have been conditioned by the psychological properties of the games themselves, and perhaps by the experience of a 'big win' early in their gambling careers. The second subgroup is prone to depression or anxiety, and these individuals begin gambling as a means of escape or to otherwise alleviate these emotional difficulties. The third group present with antisocial and impulsive tendencies, accompanied by neuropsychological evidence of frontal cortex involvement, and it may be this subgroup that is characterised in the neurobiological studies in clinical groups described above.

Decisions in the diagnosis of pathological gambling

Two further changes in the diagnosis of pathological gambling are likely in the DSM-5. The decision to rename the illness 'disordered gambling' has been prompted by confusion between the terms pathological gambling and 'problem gambling'. Epidemiological data¹⁵ demonstrate that substantial harms from gambling exist in many individuals who do not meet the formal DSM-IV cut-off of five symptoms from the ten listed, leading some to use the term 'problem gambler' somewhat indiscriminately. The British Gambling Prevalence Survey¹⁶ adopted a more liberal threshold of three DSM symptoms for detection of 'problem gambling' (see below). Having proposed to abolish the general distinction between drug 'abuse' and 'dependence', the DSM-5 Work Group are continuing to source evidence on the precise placement of the threshold for diagnosing disordered gambling.

A further modification is the removal of one of the ten criteria, which asks whether the gambler has committed any illegal acts to support their gambling. Besides the obvious point that people may be unwilling to disclose this information, two epidemiological studies have shown that this item is only reliably endorsed by the most severe pathological gamblers who already meet most of the other listed criteria, and as such, the 'illegal acts' item adds little discriminatory power.^{15,17} However, this conclusion has been derived from work in adult populations, and it is conceivable that the illegal acts item may have more utility in specific populations such as adolescents.² Our clinical experiences suggest that it can be highly informative to assess whether the moral line into criminal activity has been crossed in the pursuit of gambling funds.

The National Problem Gambling Clinic

International guidelines such as the DSM must be considered at a national level, in the specific context of gambling within British society. The 2007 British Gambling Prevalence Survey¹⁶ found that 68% of those interviewed reported gambling in the past year, which is similar to a lifetime rate of 78% reported in a US survey.¹⁸ Evidently, gambling is a major branch of the entertainment industry and appeals to the majority of the population. The most common forms of gambling in the UK are the National Lottery, scratch cards, horse racing, and slot machines. For disordered gambling, the lifetime prevalence of DSM pathological gambling was 1–2% in a North American meta-analysis,¹⁹ and the past-year prevalence of problem gambling was 0.6% in the 2007 British survey. The report from the 2010 British Gambling Prevalence Survey shows the past-year prevalence of gambling to have risen to 73% of the adult population. The prevalence of problem gambling has also increased to an estimated 0.9% of the population. Future analysis of data will look closely at internet gambling and its harms.²⁰

The National Problem Gambling Clinic was opened in October 2008 as the first National Health Service facility specifically set up to treat problem gamblers. At the time of writing, we have received over 700 referrals, from across the UK. The treatment approach is evidence-based, with a cognitive-behavioural therapy (CBT) formulation²¹ complemented with family therapy and debt counselling. Acknowledging the multiple pathways into problem gambling, we offer several levels of intervention, from weekly CBT group sessions lasting 9–12 weeks through to individual treatment designed for dual diagnosis clients. Our multidisciplinary team consists of psychologists, psychiatrists, family therapists and financial advisors, all working

according to standardised protocols. The clinic maintains a strong research focus, the data recording is extensive and initial findings are in preparation. For further information, or to make a referral, please see our website www.cnwl.nhs.uk/gambling.html or email us at gambling.cnwl@nhs.net.

Future directions

We believe the DSM-5 proposals for reclassification will be popular with problem gamblers and gambling support groups, who have long considered gambling to be an addictive behaviour with a similar potency to drugs or alcohol. The nosological changes are likely to enhance research funding in the area, as gambling researchers may benefit from funding mechanisms ring-fenced for addiction research (e.g. the Medical Research Council's current Addiction Research Strategy). But of course, profound theoretical issues are also raised about the true nature of addiction, and some experts in drug addiction oppose the changes.¹ Other candidate behavioural addictions exist in the form of compulsive shopping, excessive online videogame play and internet addiction,²² but in preparing the DSM-5, the research literatures on these conditions were considered premature for evidence-based reclassification. If we accept that gambling is addictive, then what psychological properties of gambling games enable them to harness the motivational systems of the brain so effectively? By answering this question, we will be better placed to judge in future which other conditions should be added to the behavioural addictions.

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Reading for well-being

David Fearnley

Patients and carers tell us about themselves using stories. Indeed, psychiatry prides itself on its ability to listen carefully and then to record these stories (or *histories*). What is less well developed is the use of fiction, or imaginary narrative, to improve health and well-being. Nevertheless, we may quietly turn to the greatest writers, expecting them to entertain but also guide us towards feeling better about ourselves. Books are often readily available, portable and inexpensive. Reading can offer a chance for self-discovery and self-help, and is a unique emotional and cognitive experience that should be of major interest to psychiatry.

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