How Psychological Symptoms Relate to Different Motivations for Gambling: An Online Study of Internet Gamblers

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Background: Gambling can be motivated by both its hedonic value and by attempts to cope with dysphoric or stressful states. Thus, motivations constitute important mechanisms linking mood fluctuations and gambling. However, little is known about how different kinds of affective disturbance, such as mood elevation and dysphoria, motivate gambling behavior.

Methods: To estimate relationships between different mood experiences and gambling motivations, we recruited 4125 Internet gamblers via hyperlinks placed on gambling Web sites. Mean (SD) age of respondents was 35.5 (11.8) years, with 79.1% (3263) being male and 68.8% (2838) UK residents. We collected ratings for 11 gambling motivations. We used principal components analysis, followed by hierarchical linear regression, to model the relationships between motivation factor scores and gambling behavior, depressive symptoms, hypomanic experiences, deliberate self-harm, and alcohol and substance misuse.

Results: Gambling to regulate mood, gambling for monetary goals, and gambling for enjoyment were enhanced in individuals at heightened risk of problematic gambling, with mood regulation and enjoyment factors being enhanced in female compared with male problem gamblers. Lowered mood reduced the enjoyment motivation, whereas previous mood elevation enhanced it. Gambling problems alongside previous hypomanic experiences or current dysphoria enhanced gambling to regulate emotional states.

Conclusions: Recent theorizing argues that mood disorders and pathologic gambling may share aspects of pathophysiology. Different forms of emotional disturbance, such as mood elevation and dysphoric states, which confer heightened risk for bipolar disorder and depression, are associated with divergent motivations that might represent distinct pathways into gambling behavior.

Gambling behavior is motivated by a number of interrelated psychological and social factors (1,2). Improving our understanding of motivations for gambling can help us characterize the complex clinical presentations of problematic or pathological gambling (2–5). Although the precise motivations identified tend to vary depending on the population of gamblers surveyed (6–8), several classes of motivation tend to recur. These include gambling to raise money (6,7), gambling for excitement (6,9) or the intrinsic enjoyment of gambling including its social reinforcers (6,10,11), and gambling to escape from stress (6) or to cope with adverse events that depress mood (1,6). A sense of inquiry and competitiveness ("enhancement") has also been identified as a motivation for gambling (12). These motivations tend to reflect the distinct expectations that gamblers have about the positive rewarding aspects of gambling behavior, and their potential to relieve negative emotional states (13).

Some of these motivations are naturally influenced by variables such as gender (1,11), age (14), and, possibly, preferences for particular forms of gambling (9,15). However, studies have consistently shown that it is the emotional and monetary motivations that tend to be most enhanced among problem gamblers (1,2,14,16–18). Unsurprisingly, the mood-regulating functions of

gambling behavior are salient features of etiologic accounts of pathologic gambling (19,20) and general perspectives on excessive gambling as an addictive response to aversive or stressful states (21).

Pathologic gambling, as defined by DSM-IV criteria (22), tends to present alongside other psychiatric difficulties including anxiety disorders, such as panic, together with alcohol and substance misuse (23,24). However, comorbidity with major depressive disorder is especially high, with some studies finding that up to two thirds of pathologic gamblers might satisfy diagnostic criteria for major depressive disorder (25,26). Although some of this comorbidity, together with increases in suicidality (27,28), can be attributed to the adverse life consequences of excessive gambling activity (29,30), pathologic gambling and depression may also share genetic risk (31), reflecting either a causal impact of the mood disorder on gambling behavior or a common underlying pathophysiology.

Other evidence attests to an association between bipolar disorder, a strongly genetic condition, and problem gambling (26,32). An etiologic relationship between bipolar disorder and gambling behavior would highlight the additional potential for pharmacologic and other treatments for bipolar disorder to have a positive impact on problem gambling behavior. Although clinical anecdote and recent small-scale trials of antidepressant and lithium treatment (33–36) suggest some potential for the pharmacologic management of pathologic gambling through improved mood regulation, we know relatively little about the specific psychological mechanisms that might allow experiences of mood elevation to promote gambling behavior in individuals who are vulnerable to bipolar disorder.

It is easy to imagine how a tendency to mood elevation and the symptoms of hypomania, including sleeplessness and an orientation toward reward-based behaviors (37), might drive

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gambling by enhancing its enjoyment and excitement. By contrast, depressive symptoms could diminish such motivations via anhedonia but instead provide an impetus to console or comfort oneself through gambling (13,17,20). Individuals who satisfy diagnostic criteria for bipolar I or bipolar II disorder will experience both poles of mood and will more frequently suffer significant episodes of depressed mood and anxiety than hypomania (38,39). Therefore, we might expect that the affective features of bipolar disorder and depression will influence the mood regulation and enjoyment aspects of gambling in different ways. Understanding the psychological mechanisms that link mood elevation and dysphoria to gambling behavior will clarify the relationship between gambling and mood disorders.

Here, we tested the hypothesis that the central affective experiences of bipolar disorder and depression—mood elevation and dysphoric symptoms—exert divergent effects on gambling motivations. We surveyed the motivations of a large sample of Internet gamblers (*n* = 4125) recruited directly from online gambling sites. We used exploratory principal components analysis (PCA) to derive factors that captured respondents' key gambling motivations, followed by hierarchical linear modeling to test links between mood elevation and dysphoria, and different gambling motivations. We explored these relationships in individuals whose gambling was or was not likely to be problematic.

Methods and Materials

The survey was approved by a United Kingdom National Health Service Research Ethics Committee. All participants provided informed consent electronically as part of the web survey.

Participants

A self-selected sample of 4125 Internet users were recruited via hyperlinks placed on gambling and gambling-related Web sites registered within Europe. Respondents provided information about demographic characteristics and their online gambling behavior (i.e., frequencies, preferred activities, modes of access), and completed validated screening questionnaires for psychological disorders. Further details of the Web-based methodology are provided in Supplement 1.

Seventy-nine percent of our respondents were male, with a mean (SD) age of 35.5 years (11.76). More than half were married (35.2%) or living with a partner (17.6%), with 41.4% being single, and the remainder divorced, separated, or widowed. Respondents tended to be educated to degree level or above (41.8%), others possessing college or vocational training (36.0%), or

having completed secondary or primary education (22.2%). Most were employed full-time (55.8%), self-employed (11.4%), or part-time (6.2%); 6.6% fell into the "unemployed" category, approximately 5% were retired, and 5% were "taking care of the house." Most were located within the United Kingdom (68.8%), followed by the United States (*n* = 364, 8.8%), Canada (*n* = 129, 3.1%), Germany (*n* = 104, 2.5%), Ireland (*n* = 72, 1.7%), and Australia (*n* = 61, 1.5%). The remaining 13.6% were from other European and Asian countries. These characteristics are broadly typical of those reported in previous samples of Internet gamblers (40–44).

Measuring Gambling Motivations

Respondents rated how frequently their gambling behavior involved 11 motivations, using a 4-point Likert scale with response anchors of "never," "occasionally," "fairly often," and "very often," similar to that used in previous investigations (1,6,7,9,45). Three items tested the central motivation of gambling for money (6). Other items tested the need for excitement; desire to relieve boredom, routine, and negative mood; to socialize; and to test one's luck. The 11 items are listed in Table 1.

Measuring Psychological Disturbances

Respondents completed several validated screening questionnaires used to identify the presence of psychological disturbances. These were scored not to identify severe cases that might satisfy diagnostic criteria for major depressive disorder or bipolar disorder as specified by DSM-IV but rather to identify the presence of mood-related disturbances that might be expected to influence gambling behavior. Selected screening instruments included the 10-item criteria for DSM-IV problem gambling (22), scored positive with three or above items endorsed (46–49). These items assess the central features of pathologic gambling as represented by the DSM-IV criteria: pervasive loss of control, preoccupation with gambling-related behaviors, and the tendency to keep gambling to recover monetary losses.

Respondents who scored above threshold on the General Health Questionnaire (GHQ-12) (50) completed the Patient Health Questionnaire (PHQ-9) (51). The PHQ-9 includes the Primary Care Evaluation of Mental Disorders (PRIME-MD) (52) to confirm DSM-IV criteria for subsyndromal depressive experiences: three of nine items, including an indication of lowered mood, anhedonia, or both (52). The PHQ-9 also assessed panic disorder: all five anxiety items endorsed (52). All participants completed the Mood Disorders Questionnaire (MDQ) (53) to screen for previous symptoms of mood elevation and hypomanic

Table 1. Item Loadings from the Principal Components Analysis of 11 Gambling Motivations

Motivation for Gambling	Factor 1: Mood Regulation	Factor 2: To Obtain Money	Factor 3: For Enjoyment
To Escape from Routine	.835		
Because You Cannot Help It	.828		
To Make Yourself Feel Better (e.g., when sad/stressed/angry)	.790		
To Relieve Boredom	.644		.308
To Test Your Luck	.461		.303
To Make Money, As a Profession		.893	
Because You Need the Money	.320	.777	
Because You Enjoy It/It's Fun			.967
For the Thrill of It			.816
To Socialize			.391
For the Chance to Win Big Money		.355	.386

Item loadings are listed where they are greater than .3 (70).