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Commonalities in the Psychological Factors Associated with Problem Gambling and Internet Dependence

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Abstract

The most commonly applied conceptual approach for excessive Internet use has been as a behavioral addiction, similar to pathological or problem gambling. In order to contribute to the understanding of Internet dependence as a disorder resembling problem gambling, the current study aimed to examine the relationship between problem gambling and Internet dependence and the degree to which psychological factors associated with problem gambling are relevant to the study of Internet dependence. The factors of depression, anxiety, student stressors, loneliness, and social support were examined in a sample of university students from several Australian universities. The findings revealed that there is no overlap between the populations reporting problem gambling and Internet dependence, but that individuals with these disorders report similar psychological profiles. Although requiring replication with larger community samples and longitudinal designs, these preliminary findings suggest that problem gambling and Internet dependence may be separate disorders with common underlying etiologies or consequences. The implications of the findings in relation to the conceptualization and management of these disorders are briefly discussed.

Introduction

DESPITE MOUNTING INTEREST IN THE CONCEPT of Internet "addiction" or dependence, there has been much debate regarding the degree to which it should be considered a psychiatric disorder, and which theoretical conceptualizations are most appropriate. In the face of substantial opposition,¹ the most commonly applied conceptual approach has been to define excessive Internet use as a behavioral addiction, similar to pathological gambling.^{1,2} This perspective views excessive Internet use as an impulse-control disorder that does not involve an intoxicant² but which shares characteristics of substance dependence such as salience, mood modification, tolerance, withdrawal, conflict, and relapse.³ Although Internet dependence has not yet been included as a psychiatric diagnosis in the Diagnostic and Statistical Manual (DSM) nosological system, the proposed diagnostic criteria have been directly modeled on the DSM-IV criteria for pathological gambling.²

The behavioral addiction perspective suggests that behaviors such as problem gambling and Internet dependence have additional commonalities that may reflect a common etiology.⁴ Indeed, the syndrome model of addiction proposes that each outwardly unique addiction disorder (such as problem gambling, problem drinking, substance abuse, and

excessive shopping) is an opportunistic distinctive expression of the same underlying syndrome.⁵

Separately, the problem gambling and Internet dependence research literatures seem to support similar psychological profiles for individuals displaying problem gambling and Internet dependence. There is now a large body of evidence confirming that problem gambling is associated with factors related to subjective distress (including depression, anxiety, and stress), loneliness, and social isolation in both adult and adolescent populations.⁶⁻⁹ An emerging literature suggests that similar factors are associated with the development of Internet dependence.^{4,10,11}

In order to contribute to the understanding of Internet dependence as a disorder resembling problem gambling, the current study aimed to examine the relationship between these problem behaviors and the degree to which psychological factors associated with problem gambling (depression, anxiety, student stressors, loneliness, and low social support) are relevant to the study of Internet dependence. Specifically, it was hypothesized that there would be a positive association between problem gambling and Internet dependence, and that both problem gambling and Internet dependence would be positively associated with depression, anxiety, student stressors, and loneliness, and negatively associated with social

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support after controlling for relevant socio-demographic variables.

Method

Participants

Participants were 173 university students (59 males, 114 females) from Australia. Participants were aged between 18 and 50 years ($M = 22.5$, $SD = 5.5$, $Mdn = 21$). Over half (57%) were single, with a further 29% in non-cohabiting relationships, and the remaining 14% in cohabiting relationships. Most participants were born in Australia (60%), were in their third year or lower at university (87%), and were enrolled on their course on a full-time basis (92%).

Measures

Participants were assessed on several self-report instruments measuring demographic information, problem gambling, Internet dependence, and psychological factors (depression, anxiety, student stressors, loneliness, and social support). All of these measures demonstrate good construct validity^{12–18} and displayed good internal consistency in the current study ($\alpha = 0.71 - 0.91$).

Problem gambling. Problem gambling severity was measured using the 9-item Problem Gambling Severity Index (PGSI) of the Canadian Problem Gambling Index.¹² Participants indicated on a 4-point scale how often they experienced each item, where 0 = “never” and 3 = “almost always”. Scores can range from 0 to 27, with higher scores indicating a higher level of problem gambling severity. Individuals can be classified into one of four categories: no problem gambling (a score of 0), low risk (a score of 1 or 2), moderate risk (a score between 3 and 7), and problem gambling (a score between 8 and 27).

Internet dependence. The Internet Addiction Test (IAT)¹³ was employed to measure levels of Internet dependence. The IAT consists of 20 items measured on a 5-point scale ranging from 1 = “rarely” to 5 = “always”. Scores can range from 20 to 100, with higher scores representing more severe Internet dependence. Scores between 20 and 49 indicate average online use (non-dependent Internet use), scores between 50 and 79 suggest frequent problems (at-risk Internet use), and scores between 80 and 100 indicate significant problems (dependent Internet use).

Depression and anxiety. Levels of depression and anxiety over the past week were measured using the depression and anxiety subscales of the Depression Anxiety Stress Scales (DASS-21).¹⁵ Each subscale comprises seven items measured on a 5-point scale ranging from 0 = “almost never/never” to 4 = “almost always/always.”

Student stressors. A 12-item scale was employed to measure common student problems and difficulties (e.g., financial difficulties, friendships, accommodation problems, academic pressures). Participants indicated how much each of these issues was a problem or source of worry on a 4-point scale ranging from 0 = “not at all” to 3 = “very much.”

Loneliness. Loneliness was measured using the 4-item loneliness subscale of the Utrecht Homesickness Scale

(UHS).¹⁷ Participants indicated the extent to which they had experienced each item in the past 4 weeks on a 5-point scale ranging from 0 “not at all” to 4 = “very strong.”

Social support. Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS).¹⁸ The MSPSS evaluates perceived support from family, friends, and significant others. Participants indicated how much they agreed or disagreed with each item on a 7-point scale ranging from 1 = “very strongly disagree” to 7 = “very strongly agree.”

Procedure

Following approval from the Monash University and RMIT University Human Research Ethics Committees, student participants were recruited via advertisements placed around campuses, electronic newsletters, and direct invitation from the researchers. Participants completed the questionnaire either online or in a hard-copy format. Hard-copy questionnaires were returned by post using reply-paid envelopes.

Prior to analysis, all relevant variables were inspected for accuracy of entry, missing data, and violation of any assumptions associated with subsequent analyses. Missing data were managed using a combination of casewise exclusion and person mean substitution.¹⁹ Given missing data represented less than 5% of the data and appeared to be at random, it was not considered a serious threat to data integrity.²⁰ The distributions of the continuous variables that violated the assumption of normality were transformed using square root transformations.

The gambling activities and Internet applications of the participants were summarized. The pattern of participants classified within each PGSI and IAT risk category was explored and a partial correlation controlling for socio-demographic factors was conducted. A series of partial correlations controlling for socio-demographic factors were then employed to explore the relationship between the two problem behaviors and the psychological factors.

Results

Table 1 displays the gambling and Internet activity participation of the sample. The most common forms of gambling were electronic gaming machines, scratch tickets, casino table games, and lotteries; the most frequent Internet activities were Internet surfing, chat rooms/Internet messaging, and downloading media.

Table 2 displays the proportion of participants classified within each risk category on the PGSI and IAT. There were no significant gender differences for either PGSI problem gambling, Levene’s $F = 4.11$, $t(101.67) = 1.15$, $p = 0.25$, or IAT Internet dependence, Levene’s $F = 0.01$, $t(169) = -0.76$, $p = 0.45$. An examination of this table reveals that there is no overlap between the risk categories of the two problem behaviors, $\chi^2(3) = 2.24$, $p = 0.52$. The means and standard deviations for the variables are provided in Table 3. A partial correlation (controlling for age, gender, Australian-born status, and cohabiting relationship status) revealed that PGSI problem gambling was not significantly associated with IAT Internet dependence, $r(163) = -0.004$, $p = 0.96$.

TABLE 1. GAMBLING AND INTERNET ACTIVITY PARTICIPATION

<i>Gambling activity in previous 6 months</i>	<i>n</i>	<i>Not at all</i>	<i>Less than once a month</i>	<i>More than once a month</i>
Scratch tickets	170	143 (84%)	24 (14%)	3 (2%)
Sports betting	170	154 (30%)	12 (7%)	4 (2%)
On course horse/dog race betting	170	159 (94%)	9 (5%)	2 (1%)
Off course horse/dog race betting	169	161 (95%)	5 (3%)	3 (2%)
Online/Internet gambling	170	161 (94%)	5 (3%)	4 (2%)
Casino table games	170	142 (84%)	25 (14%)	3 (2%)
Bingo	170	168 (99%)	2 (1%)	0 (0%)
Lotteries	169	151 (89%)	14 (9%)	4 (2%)
Electronic gaming machines	170	139 (81%)	29 (17%)	2 (1%)
Other	142	132 (94%)	6 (4%)	4 (3%)

<i>Internet activity participation during a typical week</i>	<i>n</i>	<i>No time</i>	<i>2-10 h</i>	<i>>11 h</i>
Internet surfing	170	13 (8%)	127 (75%)	30 (18%)
E-mail	169	1 (1%)	163 (96%)	5 (3%)
Chat rooms/Instant messaging	167	54 (32%)	90 (54%)	12 (14%)
File Transfer Protocol (FTP)	169	123 (73%)	46 (27%)	0 (0%)
Newsgroups	168	125 (75%)	43 (26%)	0 (0%)
Multuser domains	165	126 (76%)	36 (22%)	3 (2%)
Downloading media (software, DVDs, music)	167	53 (32%)	100 (60%)	14 (8%)
Interactive (online) games	169	118 (70%)	42 (25%)	9 (5%)
Online journaling (weblogging)	167	112 (67%)	52 (31%)	3 (2%)
Discussion forum	169	110 (65%)	55 (33%)	4 (2%)
Checking home pages	167	73 (44%)	90 (54%)	4 (2%)
Online gambling	168	160 (95%)	6 (4%)	3 (2%)

A series of partial correlations (controlling for age, gender, Australian-born status, and cohabiting relationship status) revealed that PSGI problem gambling was significantly associated with: DASS-21 anxiety, $r(164)=0.18, p=0.02$; student stressors, $r(164)=0.19, p=0.02$; and UHS loneliness, $r(160)=0.19, p=0.02$. However, it was not significantly associated with DASS-21 depression, $r(164)=0.12, p=0.13$, or MSPSS social support, $r(163)=0.07, p=0.39$. Another series of partial correlations (controlling for age, gender, Australian-born status, and cohabiting relationship status) revealed that IAT Internet dependence was significantly associated with: DASS-21 depression, $r(165)=0.27, p<0.001$; DASS-21 anxiety, $r(165)=0.35, p<0.001$; student stressors, $r(165)=0.20, p=0.008$; and UHS loneliness, $r(162)=0.30, p<0.001$. However, it was not significantly associated with MSPSS social support, $r(164)=0.11, p=0.16$. All partial correlations were repeated using untransformed variables. These analyses produced a similar pattern of findings as those reported using the transformed variables, with the exception of the partial correlation between PSGI problem gambling and DASS-21 anxiety, $r(164)=0.11, p=0.14$.

TABLE 2. PROPORTION OF PARTICIPANTS CLASSIFIED WITHIN EACH PSGI AND IAT RISK CATEGORIES

	<i>Non-dependent Internet use</i>	<i>At-risk Internet use</i>	<i>Dependent Internet use</i>
No problem gambling	134 (79.3%)	16 (9.5%)	0
Low risk gambling	11 (6.5%)	0	0
Moderate risk gambling	7 (4.1%)	0	0
Problem gambling	1 (0.6%)	0	0

Discussion

This study aimed to investigate the relationship between problem gambling and Internet dependence and to explore the degree to which certain psychological factors are related to each of these disorders. The findings revealed that 0.6% of participants were classified as problem gamblers and a

TABLE 3. MEANS, STANDARD DEVIATIONS, SKEWNESS, AND KURTOSIS FOR PROBLEM GAMBLING, INTERNET DEPENDENCE, AND PSYCHOLOGICAL FACTORS

	<i>n</i>	<i>M (SD)</i>	<i>Skewness</i>	<i>Kurtosis</i>
PGSI problem gambling	170	0.29 (1.07)	5.12	31.78
IAT Internet dependence	171	30.43 (12.61)	0.98	0.82
DASS-21 depression	172	4.30 (4.99)	2.03	4.06
DASS-21 anxiety	172	3.07 (3.43)	1.91	4.32
Student stressors	172	8.64 (5.63)	0.98	1.33
MSPSS social support	171	68.56 (12.96)	-1.17	1.32
UHS loneliness	168	2.78 (3.48)	1.65	2.67
<i>Transformed variables^a</i>				
PGSI problem gambling	170	0.17 (0.52)	3.17	9.91
IAT Internet dependence	171	5.40 (1.13)	0.20	1.01
DASS-21 depression	172	1.74 (1.14)	0.56	0.29
DASS-21 anxiety	172	1.44 (1.01)	0.28	-0.23
Student stressors	172	2.76 (1.01)	-0.16	0.27
MSPSS social support	171	3.72 (1.63)	0.17	-0.37
UHS loneliness	168	1.24 (1.13)	0.38	-0.87

^aAll variables were transformed using square root transformations.

further 4.1% were classified as moderate risk gamblers; interestingly, none of the sample was classified as Internet dependent, but 9.5% of the sample was classified as "at-risk" Internet dependent. Although these rates of problem gambling are generally consistent with other studies employing the generally conservative PGSI,²¹ the rates of Internet dependence are lower than those generally reported in other studies employing the IAT.¹¹ Caution should be employed in generalizing these prevalence rates to other samples of young people given the convenience sampling employed in this study.

The hypothesis that there would be a positive relationship between problem gambling and Internet dependence was not supported. There was no overlap between the populations reporting problem gambling and Internet dependence, and there was no significant correlation between the problem behaviors after controlling for relevant socio-demographic factors. These findings must be interpreted cautiously, as only small proportions of participants were classified as within the "at-risk" and problem categories of both problem behaviors.

The hypothesis that problem gambling and Internet dependence would be associated with similar psychological factors was supported. After controlling for relevant socio-demographic variables, both disorders were associated with anxiety, loneliness, and student stressors, but not social support. These findings are consistent with the bulk of the studies in both empirical literatures.^{4,6-11} Although Internet dependence was significantly associated with depression, there was no significant relationship between problem gambling and depression. This finding, which contrasts with a generally consistent literature^{6,8} may be due to the small sample of individuals classified as problem gamblers in this study.

Taken together, the findings suggest that there is no overlap between the populations reporting problem gambling and Internet dependence, but that individuals with these disorders report similar psychological profiles. Similar findings have previously been reported in relation to Internet dependence and problematic mobile-phone use.⁴ These findings support the perspective that problem gambling and Internet dependence may be distinctive and opportunistic expressions of the same underlying vulnerabilities.^{4,5}

The similarity in psychological profiles has implications for the management of these disorders. First, clinicians treating either disorder should be encouraged to recognize alternative manifestations of the syndrome ("addiction hopping").⁵ Second, the most effective treatments for these problem behaviors may be multimodal approaches that include both object-specific (gambling and Internet) and addiction-general treatments.⁵ The success of cognitive-behavioral interventions for problem gambling²² suggests that these approaches could be successfully employed for Internet dependence.²³ Finally, the comorbid presence of psychological issues such as depression, anxiety, stressors, and loneliness may influence the selection of treatment and impact on its effectiveness.²⁴

When considering the practical implications of the findings of this study, it is important to note several methodological limitations. The findings of this study may be difficult to generalize to the full spectrum of individuals with problem gambling and Internet dependence, as they are derived from a relatively small sample of university students; replication with larger community samples is required. The findings also do not allow for causal statements concerning the direction of the relationship between the problem behaviors and

psychological factors. Although there is some evidence that psychological disorders generally precede the development of problem gambling,⁶ longitudinal investigations are required to establish the temporal relationship between these problem behaviors and psychological disorders.

In conclusion, these findings suggest that problem gambling and Internet dependence may be separate disorders with common underlying etiologies or consequences. Regardless of the debate about the conceptualization of these problem behaviors, the findings clearly indicate that individuals classified as problem gamblers or Internet dependent may require assistance in enhancing their psychological functioning.

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