

## Trust in Internet gambling and its association with problem gambling in university students

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### Abstract

The Internet has become a major means of accessing a variety of gambling activities. As a result, there is concern that the Internet may provide more opportunities for consumers to engage in problematic gambling behaviours. The current study examined factors related to Internet gambling and problem gambling in a university student sample ( $N = 325$ ). Measures included the South Oaks Gambling Screen, the *DSM-IV-TR*-Based Questionnaire, the Canadian Problem Gambling Index, and a questionnaire examining Internet gambling behaviours and trust. Internet gamblers ( $n = 53$ ) reported significantly higher levels of trust in Internet gambling sites than non-Internet gamblers ( $n = 182$ ) and non-gamblers ( $n = 90$ ). Among Internet gamblers, significant predictors of problem gambling included level of trust in Internet gambling sites, negative effects of this activity on academic achievement and class attendance, and alcohol consumption while gambling on the Internet. Implications of these findings are discussed.

### Résumé

Internet est devenu l'un des principaux moyens d'accéder à diverses activités de jeu. On craint par conséquent qu'il n'incite les consommateurs à adopter un comportement de jeu problématique en proposant quantité d'occasions de jouer. La présente étude a examiné les facteurs liés au jeu sur Internet et le jeu compulsif chez un échantillon d'étudiants d'université ( $N = 325$ ). Les indicateurs de résultats choisis étaient le South Oaks Gambling Screen, le questionnaire basé sur le *DSM-IV-TR*, l'Indice canadien du jeu excessif et un questionnaire qui examine les comportements de jeu sur Internet et la confiance des joueurs. Les joueurs sur Internet ( $n = 53$ ) ont rapporté que leur confiance dans les sites de jeu en ligne était significativement plus élevée par rapport à celle des joueurs qui ne jouaient pas en ligne ( $n = 182$ ) ou que les personnes qui ne jouaient pas du tout ( $n = 90$ ). Parmi les joueurs en ligne, les facteurs prédictifs du jeu compulsif les plus importants étaient le degré de confiance dans les sites de jeux en ligne, les effets négatifs que cette activité entraîne sur les résultats scolaires et la présence des étudiants aux cours, ainsi que la consommation d'alcool pendant qu'ils jouent en ligne. La présente étude examine la signification de ces résultats.

## Introduction

Over the past 15 years, the Internet gambling industry has developed at an incredible pace, currently providing consumers worldwide with a diversity of gambling activities that generate yearly profits estimated to be from \$US20 billion to \$US24 billion (Wood & Williams, 2009). More and more consumers are choosing to engage in Internet gambling because it has a variety of benefits over land-based gambling, including convenience, access to credit, physical comfort, anonymity, and privacy (Griffiths, Parke, Wood, & Parke, 2006; Wood, Williams, & Lawton, 2007). It appears that advances in technology have changed the way many consumers are willing to wager their money. However, with these changes has come concern that the Internet may provide more opportunities for consumers to engage in problematic gambling behaviours (Griffiths, 2006). For example, credit cards allow Internet gamblers to gamble themselves into excessive debt, and unlike land-based casinos, Internet casinos cannot monitor the alcohol or drug consumption of their patrons. As a result, they are unable to stop intoxicated patrons from gambling further (Griffiths, 2001). Although the prevalence of Internet gambling problems is unknown because studies examining this issue frequently suffer from methodological limitations (most notably the inclusion of convenience samples that are unlikely representative of all Internet gamblers), several studies have found evidence of a strong relationship between Internet gambling participation and problem gambling behaviours (e.g., Wood & Williams, 2009; Wood, Williams, & Lawton, 2007).

In Canada, university student status has been found to be predictive of both Internet gambling participation and problem Internet gambling behaviours (Griffiths & Barnes, 2008; Petry & Weinstock, 2007; Wood & Williams, 2009). Many authors have argued that younger populations are drawn to Internet gambling because of their comfort level with technology (e.g., computers and the Internet) and newly emerging popular media (e.g., televised poker tournaments) (Griffiths & Parke, 2010) — factors that may contribute to familiarity with and trust in Internet gambling. Lack of trust by consumers has been found to have a negative effect on the number of consumer transactions over the Internet (Bauer, Grether, & Leach, 2002). For example, if consumers lack trust in the service provider, they are less likely to buy from online shops (Büttner & Göritz, 2008) or use Internet banking (Nor & Pearson, 2007). Griffiths and Barnes (2008) found that 79% of university student Internet gamblers reported the Internet as a trustworthy medium of gambling, suggesting an association between trust in Internet gambling and Internet gambling participation. It is possible that trust in Internet gambling websites, a factor that has been given little attention in the Internet gambling literature, may play an important role in whether or not consumers choose to gamble over the Internet.

One purpose of the present study was to learn more about the relationship between trust in Internet gambling sites and Internet gambling participation by university

students. What aspects of trust are most strongly associated with Internet gambling? A second purpose was to gain a better understanding of the relationship between Internet gambling and problem gambling. Among Internet gamblers, what characteristics or behaviours are most strongly associated with problem gambling? The design compared Internet gamblers, non-Internet gamblers, and non-gamblers on a variety of measures, including trust in Internet gambling and problem gambling.

## Method

### Participants

The participants were 325 university students who were attending a Canadian university, of which 93.1% self-identified as being Canadian. Participants included 230 women and 95 men. Age ranged from 17 to 52 years ( $M$  age = 20.8 years,  $SD$  = 4.62). Following recruitment into the study, participants were classified as non-gamblers (reported having never gambled for money before) ( $n$  = 90), non-Internet gamblers (reported having gambled for money but not on the Internet) ( $n$  = 182), and Internet gamblers (reported having gambled for money on the Internet) ( $n$  = 52).

### Measures

**Demographic questionnaire.** Individual characteristics including age, sex, program and year of study, academic average, current residence, marital status, and occupational status were assessed.

**Gambling behaviour questionnaire.** This questionnaire is a modified version of the questionnaire used by McBride (2008) and was adopted because it captures various gambling behaviours that were of particular interest in the current study. This questionnaire is divided into two sections, one section addressing gambling behaviours and the other Internet gambling behaviours. Items included questions regarding types of gambling (e.g., scratch tickets, sports betting, VLTs, cards, etc.), reasons for playing, wins/losses first time playing, and whether the individual gambles alone or with others. Alcohol and drug use both during Internet gambling activities and during daily living were assessed. Participants rated their alcohol and drug use over the previous 12 months on a 4-point scale, where 0 is “never,” 1 is “less than once a month,” 2 is “1–3 times per month,” and 3 is “once a week or more.” Additional questions developed by the current researchers were also included within this questionnaire. These included items examining trust and perceived risks associated with Internet gambling, along with items examining the effects of Internet gambling on academic achievement and class attendance. These items were assessed on a 4-point scale consisting of “strongly disagree,” “disagree,” “agree,” and “strongly agree.” The four trust items administered were combined to create the

general construct of trust toward Internet gambling. This yielded a global trust measure with a Cronbach's alpha of 0.76.

**South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987).** The *SOGS* is a 20-item self-report questionnaire used to measure gambling behaviour. This measure is based on *Diagnostic and Statistical Manual of Mental Disorders* third edition (American Psychiatric Association, 1980; *DSM-III*) criteria for pathological gambling and has been widely used in gambling research. Scoring is completed by adding the number of items endorsed by the participant (out of a possible 20), with 5 being the cut-off score indicating probable problem gambler.

**DSM-IV-TR-Based Questionnaire (DBQ) (Beaudoin & Cox, 1999).** The DBQ is a *DSM-IV-TR* (American Psychiatric Association, 1994) based self-report questionnaire assessing gambling behaviours and associated features characteristic of problem gambling. This measure contains 32 items and is broken down into 2 sections. The first section contains 10 items, and each is rated on a 4-point scale ranging from 0 (*never*) to 3 (*yes in the past month*). The second section contains 22 yes/no items. This section assesses several characteristics associated with problem gambling.

**Canadian Problem Gambling Index (CPGI) (Ferris & Wynne, 2001).** The CPGI is a 31-item self-report questionnaire that measures four dimensions: (1) gambling involvement (4 items), (2) problem gambling behaviour (8 items), (3) adverse consequences (4 items), and (4) problem gambling correlates (15 items). Nine of these items are rated on a 4-point scale ranging from 0 (*never*) to 3 (*almost always*). These 9 scores are summed to generate a score from 0 to 27 with a cut-off score of 8 or more indicating problem gambling.

**Impulsivity scale of the Personality Research Form (PRF) (Jackson, 1987).** The impulsivity scale of the PRF consists of 16 self-report true/false items. A high score on the PRF impulsivity scale indicates characteristics such as acting without deliberation, spontaneously, recklessly, and impatiently. The impulsivity scale has been shown to have good test-retest reliability ( $r = .86$ ) and internal consistency ( $\alpha = .87$ ). Correlations found between PRF self-ratings and roommate ratings showed validity (.56) for the impulsivity scale. The PRF impulsivity scale has also been found to have good convergent and discriminate validity.

**Desirability scale of the Personality Research Form (Jackson, 1987).** Eight of the 16 true/false items from the PRF desirability scale were administered. High scores on the desirability scale indicate that respondents, either consciously or unconsciously, are responding to the items in such a way that is making themselves appear desirable. The desirability scale has been shown to have good test-retest reliability ( $r = .86$ ) and internal consistency ( $\alpha = .82$ ). The PRF desirability scale has been used in numerous studies in personality as a measure of participants' distortion or faking.

**Infrequency scale of the Personality Research Form (Jackson, 1987).** Eight of the 16 true/false items from the PRF infrequency scale were administered. A high score on the infrequency scale indicates that the respondent may be randomly or carelessly responding to the questionnaire items. Test-retest reliability ( $r = .46$ ) and internal consistency ( $\alpha = .51$ ) are adequate given the nature of this scale. The infrequency items were scattered throughout the online questionnaire to detect careless or non-purposeful responding.

## **Procedure**

Undergraduate students were recruited through brief in-class recruitment presentations conducted by the researchers. In addition, recruitment posters were placed at various locations on campus. Recruitment presentations and posters described the study as an online survey comprising various questions examining behaviours, attitudes, and beliefs in regards to gambling and Internet gambling participation. However, students were encouraged to participate regardless of their previous gambling experiences. Students interested in participating contacted the researcher via email and were sent an online link to the study. This link provided further information about the study and informed participants that they were able to withdraw their consent at any time and that complete confidentiality would be maintained. Informed consent was then obtained, followed by the administration of the online questionnaire (via SurveyMonkey). Completion of the questionnaire took approximately 30 to 45 minutes. Upon completion of the study, participants were given a debriefing form. Participants filled out the online questionnaire at their convenience. Undergraduate psychology students received one bonus mark toward their final grade for their participation in the study. All other participants, not eligible for a bonus mark, were entered into a drawing for \$50 (Canadian) for their participation in the study. Online questionnaires are available from the lead author upon request.

## **Data Screening**

Descriptive statistics were examined for univariate outliers and missing data. No univariate outliers were detected. If a participant failed to answer one item from the PRF infrequency scale, PRF desirability scale, PRF impulsivity scale, problem gambling DBQ, SOGS, or CPGI, that item was replaced with the participant's average score from that particular scale. If the participant failed to answer more than one item from any one of these scales, that total scale score was not calculated for the participant. Infrequency items were totalled to examine whether any participants had endorsed over two items on the scale. One participant was identified as endorsing three infrequency items, and upon further examination of this participant's questionnaire responses, it was determined that this participant had responded carelessly or non-purposefully and, as a result, was eliminated from further data analysis. Finally, a single composite problem gambling score was calculated for each participant in both the non-Internet gambling and Internet

gambling groups. This composite problem gambling score was created by averaging the  $z$  scores from the DBQ scale, SOGS, and CPGI total scores. This composite problem gambling score was created to minimize random error associated with each individual gambling scale. Table 1 contains correlations between total scores on the PRF desirability scale and total scores on each of the gambling measures. These correlations show that no gambling measure had a significant relationship with the desirability scale and, as expected, all four gambling measures were significantly correlated in a positive direction.

## Results

Table 2 contains differences in demographics, drug use, and attitudes about Internet gambling among the three groups, as well as the statistical significance of the group effect. Among the three groups, there was a large significant difference in sex. The Internet gambling group was 71.7% male, which was significantly higher than the non-Internet gambling group and non-gambling group, which were 23.1% and 16.7% male, respectively. There was also a significant difference in age among the three groups. Post hoc tests showed that the mean ages of the Internet gambling group and the non-Internet gambling group were significantly higher than that of the non-gambling group, while the Internet gambling and non-Internet gambling groups did not differ on age. No significant differences were found for reported average university grades.

There were significant differences in reported previous 12-month drug use among the three groups. All three groups differed significantly on alcohol use, with the Internet gambling group reporting the most alcohol use, followed by the non-Internet group and the non-gambling group. Reported tobacco use was significantly higher in the Internet gambling group than the other two groups, and reported

Table 1  
*Correlations between Problem Gambling measures and Desirability Scale*

Measure	SOGS problem gambling score	CPGI problem gambling score	Global problem gambling score	Desirability scale
<i>DSM-IV-TR</i> -based questionnaire	.698**	.866**	.920**	.006
South Oaks Gambling Screen		.828**	.905**	-.084
Canadian Problem Gambling Index			.966**	-.033
Global problem gambling score				-.042

\*\*  $p < .001$

Table 2  
Differences among the Three Groups

N	Non-Internet gambler		Statistic (df)	p
	Non-gambler (n=90)	Internet gambler (n=52)		
Male, n (%)	15 (16.7%)	42 (23.1%)	$\chi^2(2, N = 325) = 56.4$	< .001 <sup>c</sup>
Age, M (SD)	19.64 (3.67)	21.22 (5.05)	F(2, 319) = 4.19	.016 <sup>b</sup>
Academic average, M% (SD)	74.36 (9.34)	74.8 (8.23)	F(2, 298) = .062	n.s.
Drug use				
Alcohol use	1.38 (.97)	1.87 (.80)	F(2, 319) = 18.38	< .001 <sup>a</sup>
Tobacco use	.28 (.70)	.55 (1.00)	F(2, 318) = 10.74	< .001 <sup>c</sup>
Marijuana or hash use	.28 (.80)	.60 (.97)	F(2, 319) = 3.82	.023 <sup>d</sup>
Attitudes toward gambling				
Legitimate	2.11 (.77)	2.18 (.82)	F(2, 316) = 22.93	< .001 <sup>c</sup>
Trust	1.44 (.64)	1.50 (.66)	F(2, 317) = 77.29	< .001 <sup>c</sup>
Credit cards	147 (.62)	1.52 (.62)	F(2, 316) = 50.65	< .001 <sup>c</sup>
Afraid	3.00 (1.06)	2.90 (.92)	F(2, 315) = 8.71	< .001 <sup>c</sup>
Payouts equal	2.15 (.73)	2.12 (.92)	F(2, 313) = 1.08	n.s.

Note. Results of post hoc tests (pairwise  $\chi^2$  or SNK):

<sup>a</sup> All three groups significantly differ.

<sup>b</sup> Two gambling groups significantly different from non-gamblers.

<sup>c</sup> Internet gamblers significantly different from other two groups.

<sup>d</sup> Internet gamblers significantly different from non-gamblers.

n.s. = differences are not statistically significant.

marijuana or hashish use was significantly higher in the Internet gambling group than in the non-gambling group.

There were also significant group differences in attitudes toward Internet gambling sites. The Internet gambling group reported significantly higher ratings than the other two groups on the statements “Internet gambling is a legitimate business,” “I trust Internet gambling,” and “Credit card numbers are secure when gambling on the Internet.” The Internet gambling group also reported significantly lower ratings on the statement “I am afraid to download gambling games on the Internet because of possible computer viruses that may be attached to the download” than the other two groups. Responses by the non-Internet gambling group and non-gambling group did not significantly differ on any of these statements. No significant differences were found to the statement “Internet gambling payouts are equal to land-based casino payouts.” Because of the larger percentage of males in the Internet group, additional two-way ANOVAS that included gender as a second factor were performed on each of these five questions. The main effect of group remained significant for the first four questions ( $p$ 's .026 to  $< .001$ ), indicating that the group differences in trust were not simply due to the higher percentage of males in the Internet group. There was a significant effect of gender for each question ( $p$ 's .02 to  $< .001$ ), with males showing more positive attitudes toward the Internet in each case. No significant gender by group interactions were found.

Table 3 compares the two gambling groups on the three problem gambling indices, along with the composite problem gambling score. The Internet gambling group scored significantly higher than the non-Internet gambling group on all three problem gambling scales. Moreover, Internet gamblers were significantly more likely to meet criteria for problem/pathological gambling on the *DSM-IV-TR* DBQ, SOGS, and CPGI.

Predictors of composite problem gambling score among all gamblers ( $n = 234$ ) were examined using bivariate correlations. Four measures were not significantly correlated with the composite problem gambling score: alcohol use  $r(222) = .108$ , use of marijuana or hashish  $r(220) = .022$ , age first gambled for money  $r(225) = -.017$ , and impulsivity  $r(223) = .076$ . The remaining measures, which were significantly correlated with the composite score, were examined using multiple regression to identify any predictors that made unique predictions relative to the others. The bivariate correlations and partial correlations resulting from the multiple regression are presented in Table 4. Together, the five predictors explained 26.6% ( $R$  squared) of the variance in the composite problem gambling score,  $F(5, 215) = 15.61$ ,  $p < .001$ . Only three measures had significant unique contributions to the prediction of the composite problem gambling score: age (older had higher scores), family member with a gambling problem (family member with a gambling problem had higher scores), and gambling group (Internet gamblers had higher scores). Internet gambling had by far the largest unique contribution,



Table 3  
*Comparisons of the Two Gambling Groups on Problem Gambling Indices*

	Non-Internet gambler ( <i>N</i> = 182)	Internet gambler ( <i>N</i> = 52)	Statistic ( <i>df</i> )	<i>p</i>
Mean ( <i>SD</i> ) scores on the problem gambling scales				
DSM	.08 (.39)	1.23 (2.29)	$F(1, 228) = 41.41$	< .001
SOGS	.66 (1.31)	2.83 (2.98)	$F(1, 227) = 57.10$	< .001
CPGI	.50 (1.42)	4.47 (5.78)	$F(1, 228) = 70.26$	< .001
Meeting criteria for problem gambling <i>n</i> (%)				
DSM	0 (0%)	7 (13.5%)	$\chi^2(1, N = 230) = 24.71$	< .001
SOGS	3 (1.7%)	11 (21.2%)	$\chi^2(1, N = 229) = 26.51$	< .001
CPGI	2 (1.1%)	12 (23.5%)	$\chi^2(1, N = 230) = 34.88$	< .001
Mean ( <i>SD</i> ) scores on the composite of the three z-scores				
Composite	-.24 (.39)	.83 (1.58)	$F(1, 227) = 67.49$	< .001

explaining 18.6% of the variation in composite problem gambling scores (using partial correlation squared).

To examine whether trust in the Internet was also an independent predictor of gambling problems, the five trust items were entered into the regression equation at a second step. This resulted in a significant increase in *R* squared of .069,  $F(5, 210) = 4.273$ ,  $p = .001$ , showing that trust in the Internet was significantly related to problem gambling, even with control for whether or not one gambled on the Internet.

A number of questions were asked of only the Internet gamblers. Most Internet gamblers reported gambling on the Internet primarily alone (66%) or with friends (30.2%), with few Internet gamblers reporting gambling primarily with parents, siblings or relatives, co-workers, or significant others. Almost all Internet gamblers

Table 4  
*Predictors of Problem Gambling (composite of the three z-scores)*

	Bivariate correlation	<i>p</i>	Partial correlation ( <i>n</i> = 221)	$\beta$	<i>t</i>	<i>p</i>
Age	$r(222) = .171$	.010	.162	.14	2.4	.017
Tobacco use	$r(222) = .169$	.001	.033	.03	.49	n.s.
Sex	$r(225) = .210$	.001	-.010	-.09	-.14	n.s.
Group	$r(223) = .480$	<.001	.425	.46	6.88	<.001
Family member with a gambling problem	$r(225) = .201$	.002	.141	.12	2.09	.038

Table 5  
*Internet gambling behaviours*

	<i>f</i> (%)	<i>r</i> with problem gambling
How often have you used the following substances while gambling on the Internet?		
Alcohol		$r(50) = .399, p = .004$
Never	24 (46.2)	
< Once per month	14 (26.9)	
1–3 times per month	12 (23.1)	
Once a week or more	2 (3.8)	
Academic impact		
Internet gambling negatively affects my academic achievement		$r(50) = .615, p < .001$
Strongly disagree	20 (39.2)	
Disagree	13 (25.5)	
Agree	9 (17.6)	
Strongly agree	9 (17.6)	
I miss classes because I am gambling on the Internet		$r(50) = .667, p < .001$
Strongly disagree	30 (60)	
Disagree	14 (28)	
Agree	5 (10)	
Strongly agree	1 (2)	

reported engaging in Internet gambling from their home (96.2%), followed by a friend's home (20.7%), and few Internet gamblers reported ever gambling from work, school, an Internet café, or a cell phone. Responses to the questions "Who do you gamble with on the Internet?" and "From where do you gamble on the Internet?" were not correlated with the composite problem gambling score.

While most Internet gamblers reported never consuming alcohol or consuming alcohol less than once a month while gambling on the Internet, the reported frequency of alcohol consumption while gambling on the Internet was correlated with problem gambling (see Table 5). Tobacco use (28.8%) and marijuana or hashish use (18.6%) were not as common as alcohol use during Internet gambling participation, and neither was correlated with problem gambling. Most Internet gamblers did not endorse the statements "Internet gambling negatively affects my academic achievement" and "I miss classes to gamble on the Internet"; however, endorsing these statements was associated with problem gambling.

Among Internet gamblers, three items were found to be positively correlated with the composite problem gambling score: "Internet gambling is a legitimate business,"  $r(50) = .43, p = .002$ ; "I trust Internet gambling,"  $r(50) = .499, p < .001$ ; and "Credit card numbers are secure when gambling on the Internet,"  $r(50) = .497, p < .001$ .

## Discussion

This study examined the relationship between trust in Internet gambling websites and Internet gambling participation. Significant differences were found for four aspects of trust, with Internet gamblers showing significantly more trust than non-Internet gamblers or non-gamblers. A second purpose was to examine the relationship between Internet gambling and problem gambling. Again, significant differences were found, with Internet gamblers showing more gambling problems than non-Internet gamblers. As well, a number of issues related to problem gambling were examined within the Internet gambling group. The contribution of these findings to the understanding of Internet gambling is discussed.

Since we knew of no established measure of trust in Internet gambling, we created five questions to capture different aspects of trust. The Internet gambling group scored significantly higher on three items—“Internet gambling is a legitimate business,” “I trust Internet gambling,” and “Credit card numbers are secure when gambling on the Internet”—and significantly lower on the statement “I am afraid to download gambling games on the Internet because of possible computer viruses that may be attached to the download.” No significant group differences were found with the statement “Internet gambling payouts are equal to land-based casino payouts.” The findings show that Internet gamblers believe that Internet gambling is legitimate and trustworthy, as well as safe from both credit card security issues and computer viruses or spyware. The fifth item about differential payouts was not a differentiating factor.

It is not clear from the present study whether these beliefs provided a basis for students to begin Internet gambling, or whether this trust resulted from positive experiences using the Internet. A causal model linking trust in the Internet to online gambling intention has been proposed by Haried (2009), but more research is needed to determine the nature of such linkages. McCormack and Griffiths (2012) conducted a qualitative study to examine the reasons why individuals choose whether to gamble on the Internet and found that concern about the authenticity of Internet gambling websites, most notably the trustworthiness and safety of such websites, was a commonly reported reason for deciding not to gamble over the Internet. Furthermore, they found that although Internet gamblers believed that Internet gambling websites were secure, some Internet gamblers reported they only gambled on well-known websites that they perceived as more trustworthy. Thus, lack of trust in Internet gambling sites is a factor that deters individuals from engaging in Internet gambling, and Internet gamblers may choose to gamble only on websites that are well established and perceived as trustworthy.

Collectively, our findings and those of McCormack and Griffiths (2012) support the conclusion that consumers are less likely to invest money in an Internet product or service if they believe they may be deceived by the service provider (e.g., Büttner & Göritz, 2008). In this case, it appears that individuals are less likely to wager money

over the Internet if they are concerned the gambling website provider may cheat them. Such concerns may be warranted given that many gambling website providers reside in locations unknown to the consumer and are not required to follow gaming regulations put forth by a regulatory body (McMullan & Rege, 2010). However, several Canadian provincial governments have recently begun to offer their residents legal access to government-run Internet gambling websites, the most recent being the provincial government of British Columbia (with the Ontario government planning to launch in 2014). Such government-run sites should certainly be perceived as trustworthy, and, based on our findings and those of McCormack and Griffiths (2012), would be expected to remove the distrust barrier, thereby resulting in more gamblers who will choose to participate in Internet gambling.

Consistent with the findings of others (e.g., Griffiths & Barnes, 2008; Wood & Williams, 2009), significantly more problem gambling was found among Internet gamblers. However, the Internet group had significantly more males than the non-Internet gamblers, so it was important to clarify whether the higher level of problem gambling in the Internet group could be explained by this gender difference. A multiple regression analysis revealed that the difference in level of problem gambling between the Internet and non-Internet groups was still significant when demographic factors such as age and gender were controlled. The group difference was by far the strongest predictor, explaining 18.6% of the variation in problem gambling scores. These findings support a strong linkage between Internet gambling and problem gambling that is not simply due to the higher percentage of males who gamble on the Internet.

Internet gambling brings various new dimensions to the gambling experience (e.g., comfort of gambling from your home, unlimited and easy access), and, as a result, Internet gamblers may be at an increased risk of gambling more frequently and for longer periods of time, eventually leading to problem gambling behaviours (Griffiths & Barnes, 2008). By definition, problem or pathological gambling behaviours have negative effects on the individual's personal, family, or vocational pursuits (American Psychiatric Association, 1994). Included in such pursuits is a student's educational achievement, and although the current study found that most Internet gamblers did not endorse the statements "Internet gambling negatively affects my academic achievement" and "I miss classes to gamble on the Internet," endorsing either of these statements was associated with problem gambling behaviours. An association between problem gambling and poor grades in school has previously been reported (Hardoon, Gupta, & Derevensky, 2004; Ladouceur, Boudreault, Jacques, & Vitaro, 1999). The present findings confirm that this relationship is also present among Internet gamblers.

About half of all Internet gambling participants reported consuming alcohol at some point while gambling on the Internet. This finding is consistent with previous reports that Internet gamblers were more likely than non-Internet gamblers to engage in alcohol use while gambling (McBride & Derevensky, 2009; Wood &

Williams, 2009). The present study also found that alcohol consumption while gambling on the Internet was significantly more frequent in those with higher problem gambling scores. These findings are of concern since alcohol consumption can impair an individual's judgement, negatively influencing their gambling behaviours (Barnes, Welte, Hoffman, & Dintcheff, 2002; French, Maclean, & Ettner, 2008). Thus, individuals gambling over the Internet while under the influence of a substance may be likely to gamble more money and for longer periods of time than intended. Land-based casinos monitor their patrons' alcohol consumption and will usually prohibit intoxicated patrons from gambling further. However, while gambling over the Internet, there are no such restrictions placed on the gambler.

It is also of importance to note that, among Internet gamblers, three trust items ("Internet gambling is a legitimate business," "I trust Internet gambling," and "Credit card numbers are secure when gambling on the Internet") were strongly correlated ( $r$ 's above .40) with problem gambling score. Thus, among Internet gamblers, those who reported greater trust in the safety of Internet gambling also tended to have higher levels of problem gambling. These findings suggest that trust may not simply be a barrier to Internet gambling; it may also be related to the development of problem gambling. This possibility is further supported by the finding that trust emerged as an independent predictor of problem gambling, even when controlling for whether or not one gambled on the Internet. The role of trust in the development of problem gambling among Internet gamblers warrants further investigation. For example, does greater trust contribute to lengthier and more frequent Internet gambling sessions that in turn lead to problematic gambling behaviours? Or, is it the case that problem Internet gamblers tend to report higher levels of trust simply because they gamble on the Internet more frequently and have not been given any reason to distrust it?

There are a few limitations to the current study. First, a retrospective self-report methodology was employed, which can result in participant memory errors or response biases, particularly when participants are reporting on a sensitive topic such as their engagement in problem gambling behaviours. To help overcome this limitation, desirability and infrequency items were inserted throughout the survey to detect desirable self-presentation response biases and random responding. Second, the current study was presented to potential participants as a study examining gambling behaviours in university students, which likely resulted in an inflated number of student gambler participants. Thus, the rates of gambling we report here might be higher than in the overall student population.

In summary, the present findings show Internet gamblers had greater trust in the safety of Internet gambling and higher levels of problem gambling than non-Internet gamblers. Among Internet gamblers, higher levels of problem gambling were found for those who had more trust in the safety of Internet gambling sites, who reported that Internet gambling caused academic problems for them, and who consume

alcohol more frequently while gambling on the Internet. The finding that consumer trust in Internet gambling websites was a strong predictor of Internet gambling participation raises a concern that more individuals may begin to gamble over the Internet due to the recent availability of more trustworthy government-run Internet gambling sites. As well, the linkages between alcohol use while gambling on the Internet, academic problems, and gambling problems among university student Internet gamblers raise particular concern about Internet gambling in this population.

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