

# Gambling Involvement and Increased Risk of Gambling Problems

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Published online: 21 July 2012  
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**Abstract** The opportunity to gamble has undergone rapid expansion with technology allowing for access to gambling products 24 h a day. This increased online availability challenges governments' abilities to restrict access to gambling. Indeed, the ready access to multiple forms of gambling may potentially contribute to impaired control over urges for problem gamblers. The present study considered whether problem gamblers manifested a tendency to engage in multiple forms of gambling and identified forms of gambling which were more strongly related to problem gambling. In reanalyses of two surveys (Sample 1,  $N = 464$ , Sample 2,  $N = 1141$ ), significant relationships accounting for between 11.3 and 13.5 % of the variance were found between the numbers of forms of gambling accessed and degree of problem. Participation in online poker, playing cards and sports wagering were linked to problem gambling. Access to multiple forms of gambling may pose difficulties for the tracking and control of gambling.

**Keywords** Gambling · Availability · Access · Online · Involvement

## Introduction

The worldwide expansion of gambling has led to concern that ready availability and accessibility contributes to a greater incidence of problem gambling within communities (Abbott and Volberg 1991, 1996; Potenza et al. 2005; Wood and Williams 2011). Concern as to the harmful effects of increased availability have to some extent been allayed by

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indications that communities adapt to gambling (Shaffer et al. 2004a) with some communities not exhibiting an increased incidence of problems with increased gambling availability (Abbott 2006; Abbott et al. 2004). Nevertheless, such observations indicate that degree of harm is a dynamic process that can vary as communities evolve (Shaffer and Martin 2011). Given that the Internet potentially affords access to gambling 24 h a day, 7 days a week, the present study investigates whether increased access to, in contrast to availability of, more forms of gambling products for individuals is associated with an increased risk of developing a gambling problem.

There are likely to be relationships between access to gambling and gambling problems. Studies have previously observed relationships between the geographical distribution of gambling availability (particularly electronic gaming machines) and gambling related harm (Clarke et al. 2006; Marshall and Baker 2002). Indeed, Phillips and Ogeil (2011) found that problem gamblers reported frequenting a specific gambling venue more often ( $N = 2.78$ ) per month than at risk ( $N = 1.88$ ) and non problem gamblers ( $N = 1.22$ ). Nevertheless others have not observed relationships between geographical availability and gambling problems (McMillen and Doran 2007). These differences likely occur because local situational factors are important (Marshall 1998) and because people travel in order to gamble (Doran and Young 2010) making tracking behaviour difficult. For instance Phillips and Ogeil (2011) found that problem gamblers also reported frequenting other gambling venues more often ( $N = 1.19$ ) than at risk ( $N = 1.00$ ) or non problem gamblers ( $N = 0.51$ ). Mobility can pose difficulties for studies of the relationship between access and problem gambling, and the Internet further complicates such studies as it potentially confers the ability to gamble from any location with wireless access, regardless of neighbourhood or location.

The emerging capability of the Internet to deliver services electronically to consumers (Kruse 2002) 24 h a day 7 days a week challenges a jurisdiction's capacity to control gambling and an individual's capacity to self regulate, potentially creating problems for any social adaptation to gambling. Greater access to new gambling products has the potential to lead to increased levels of harm for new cohorts of consumers (King et al. 2010; Phillips and Blaszczyński 2010). Indeed, compared to non-Internet gamblers, a higher proportion of Internet gamblers meet criteria for problem gambling (Griffiths et al. 2008; Wood and Williams 2007, 2009).

Gambling is widely available in the Australian community. Legalised gambling has grown into a \$AUD 19 billion dollar industry, generating approximately 10 % of state revenues (Productivity Commission 2010). Australia has been a strong market for Internet gambling, which Gainsbury et al. (2012) have attributed to a long standing cultural acceptance of betting, ease of access to Internet and wireless devices and uptake of new smart phone technology. Online gambling is increasing in prevalence with a further \$ 0.79 billion dollars (Productivity Commission 2010) being spent on forms (online poker, Internet casinos) that the provision of which are illegal in an Australian jurisdiction (Productivity Commission 2010).

Despite reports of greater problems associated with Internet gambling, in an online environment, consumer loyalty and patron tracking schemes potentially mean that every element of a person's gambling can be monitored and controlled (Broda et al. 2008; Haefeli et al. 2011; Nelson et al. 2008). However this greater potential for consumer protection needs to be considered in the light of findings that consumer support systems can suffer from problems determining the needs of new users (cold start) and can suffer difficulties when faced with missing values (sparsity) (Montaner et al. 2003) if patrons move from provider to provider, and there is evidence that this occurs for more involved

consumers in other online environments (Johnson et al. 2004). For instance, attempts to self-exclude (Moore et al. 2011) or restrict access to electronic gambling machines within gaming venues (Delfabbro 2008) are less likely to control problem gambling if personal computers and mobile phones can also serve as personalised gambling terminals. There is thus a need to look at the variety of forms of gambling accessed, particularly online forms.

Some authors have previously suggested that the characteristics of specific games (i.e. high event frequency) are likely to cause problem gambling (e.g. Dowling et al. 2004; Parke and Griffiths 2007), whereas others have suggested that it is the range, versatility (Welte et al. 2009) and number of forms (LaPlante et al. 2011) of gambling activities engaged in or their frequency (LaPlante et al. 2012) that can be a predictor of gambling problems. Shaffer and Martin (2011) indicated that further work was required in this area across cultures and instruments. The number of gambling activities engaged in will herein be referred to as the degree of involvement as per (LaPlante et al. 2011).

The present paper re-analyses existing survey data where the variety of forms of gambling accessed were available. Sample 1 is derived from a study conducted by Phillips and Ogeil (2011) that had considered the number of gambling venues accessed. This study used the South Oaks Gambling Screen as it incorporated questions addressing a variety of forms of gambling engaged in. Sample 2 is derived from a study conducted by Phillips and Blaszczynski (2010). Although this study used the Canadian Problem Gambling Index it also addressed the variety of forms of online gambling engaged in. Sample 1 is from a cohort of younger adults (university students). Sample 2 comes from an online survey conducted within the general community. A reanalysis of data from these two Australian studies allowed a consideration of any relationships between increased involvement and access to a range of gambling products, particularly online forms and risk of gambling problems. It was expected that access to more forms of gambling product would be associated with a greater risk of a gambling problem, and that newer or illegal forms of gambling would be associated with greater risk.

## Method

### Participants

*Sample 1* Participants ( $n = 464$ ) were undergraduate psychology students (133 males, 329 females, 2 unspecified) from Melbourne, Australia ( $M = 20.40$  years,  $SD = 4.58$ ). Risk of developing a gambling problem was assessed using the South Oaks Gambling Screen (Lesieur and Blume 1987). Thirty-four participants scored 5 or above, 225 participants scored 3–4 and 199 participants scored 3 or less on the SOGS.

*Sample 2* There were 1,141 community respondents (490 males and 646 females) ranging in age from 16–75 years of age ( $M = 37.7$ ,  $SD = 12.79$ ). The majority had some form of university qualification, with 354 (31.2 %) having attained an undergraduate degree and 272 (24.0 %), a postgraduate degree. Of the remainder, 201 (20.2 %) had completed a technical or business college course, and 279 (24.6 %) reported secondary school as the highest education attained. Of the total sample, 654 participants (72.5 %) were classified as non-problem or non-gamblers; 133 participants (14.7 %) were low-risk gamblers; 87 participants (9.6 %) were moderate-risk gamblers; and 28 participants (3.1 %) were problem gamblers using the Problem Gambling Severity Index of the Canadian Problem Gambling Index (Ferris and Wynne 2001).

## Materials

A battery of questionnaires assessed problem gambling status, degree of involvement in a number of forms of gambling both online and offline.

*South Oaks Gambling Screen* The SOGS is a widely used 20-item self-report instrument that was based on DSM criteria for pathological gambling. Lesieur and Blume (1987) have recommended using a cut-off score of 5 to identify “probable pathological gamblers” and that scores of 3–4 are used to identify “potential pathological gamblers”. These cut-off scores were used in analysing the number of problem gamblers in sample 1.

*Problem Gambling Severity Index* The Problem Gambling Severity Index (PGSI) of the Canadian Problem Gambling Index (CPGI) (Ferris and Wynne 2001) is a nine-point self-report scale used to assess problem gambling status. Scores on the PGSI range from ‘0’ to ‘27’, and were used to classify participants into: 0 = non-problem or non-gambler, 1–2 = low risk gambler; 3–7 = moderate risk gambler; and 8+ = problem gambler. It is a reliable scale with a Cronbach’s alpha of 0.84, and a test–retest reliability of 0.78 (Wynne 2002).

*Number of Forms of Gambling* For Sample 1, the South Oaks Gambling Screen elicited the extent of participation in various forms of gambling. The number of forms of gambling engaged in were summed. For Sample 2, a series of questions asked whether participants engaged in sports betting, wagered on races, purchased lottery tickets (online), used the Internet to bet on sports and races, and played online poker. The number of modes of bet placement subscribed to was then summed.

## Procedure

The Monash University ethics committee approved the conduct of both studies. For sample 1, participants completed a questionnaire for partial course credit in their own time (typically 15–20 min). Interested participants were provided with a link to a web-site containing the explanatory statement for the study. Implicit informed consent was obtained by participants beginning the questionnaire; however participants could discontinue the study at any time without penalty. All responses were stored electronically on a school data base and data were de-identified prior to being provided to the researchers (see Phillips and Ogeil 2011). For sample 2, a questionnaire was advertised in Australian national newspapers and posted on a website. Participants completed the electronic survey to be entered in a draw to win one of ten iPods (see Phillips, Ogeil, & Blaszczyński, in press). Any identifiers (i.e. contact phone numbers) were stored separately from participants’ responses.

## Results

*Sample 1* The percentages of respondents reporting engaging in specific forms of gambling may be seen in Table 1. There was a significant association between involvement as measured by the number of forms of gambling accessed and risk of a gambling problem as measured by the SOGS ( $r = 0.287$ ,  $n = 443$ ,  $p < 0.001$ ). Correlations between risk of problem gambling and gender ( $r = -0.113$ ,  $n = 464$ ,  $p = 0.015$ ) and age ( $r = 0.020$ ,  $n = 462$ ,  $p > 0.05$ ) were smaller. Problem gamblers (Mean = 5.80, SD = 2.11) accessed more forms of gambling than at risk (Mean = 5.21, SD = 2.21) and non problem gamblers (Mean = 3.92, SD = 2.39), ( $F(2,440) = 20.824$ ,  $p < 0.001$ ).

**Table 1** Percentage reporting engaging in specific forms of gambling (N included in parentheses)

Gambling activity	Male	Female	Total
Cards	77.61 (134)	50.61 (328)	58.44 (462)
Races	46.67 (135)	47.55 (326)	47.29 (461)
Sports	63.16 (133)	33.44 (326)	42.05 (459)
Dice	31.34 (134)	26.38 (326)	27.83 (460)
Casinos	78.95 (133)	74.69 (324)	75.93 (457)
Lotteries	55.22 (134)	56.88 (327)	56.40 (461)
Bingo	35.07 (134)	49.39 (326)	45.22 (460)
Stock market	23.13 (134)	13.54 (325)	16.34 (459)
Pokies	72.59 (135)	68.90 (328)	69.98 (463)
Games of skill	54.07 (135)	26.46 (325)	34.57 (460)

**Table 2** Percentages reporting involvement in gambling activity as a function of problem gambling status as measured by the SOGS (N included in parentheses)

Gambling activity	Non-problem gambler	At risk of problem gambling	Problem gambler
Cards	45.00 (200)	67.26 (226)	77.78 (36)
Races	43.94 (198)	51.54 (227)	38.89 (36)
Sports	34.01 (197)	45.58 (226)	63.89 (36)
Dice	17.68 (198)	34.96 (226)	38.89 (36)
Casinos	71.07 (197)	79.56 (225)	80.00 (35)
Lotteries	44.95 (198)	63.44 (227)	75.00 (36)
Bingo	40.82 (196)	49.12 (228)	44.44 (36)
Stock market	9.05 (199)	20.09 (224)	33.33 (36)
Pokies	63.32 (199)	75.00 (228)	75.00 (36)
Games of skill	24.75 (198)	39.38 (226)	58.33 (36)

Multiple regression analysis was performed to determine which form(s) of gambling were associated with a gambling problem. Participating in gambling accounted for a significant proportion of the problem gambling variance (11.3 %) ( $F(10,432) = 6.616, p < 0.001$ ), but of specific interest are the forms that were more predictive of gambling problems. The percentages engaging in specific forms of gambling may be seen in Table 2 as a function of problem gambling status. In Sample 1, playing cards ( $t(432) = 2.736, p < 0.01$ ), lotteries ( $t(432) = 3.020, p < 0.01$ ) and the stock market ( $t(432) = 2.768, p < 0.01$ ) emerged as significant predictors of at risk and gambling problems in this younger and better educated cohort.

*Sample 2* The percentages of respondents reporting engaging in specific forms of gambling may be seen in Table 3. There was a significant correlation between involvement (as measured by the number of forms of gambling accessed) and risk of a gambling problem as measured by the PGSI ( $r = 0.367, n = 849, p < 0.001$ ). Correlations between risk of a gambling problem and gender ( $r = -0.090, n = 902, p < 0.001$ ), age ( $r = -0.013, n = 896, p > 0.05$ ), education ( $r = -0.082, n = 902, p = 0.014$ ) or income ( $r = -0.071, n = 854, p = 0.038$ ) were smaller. Fewer (but newer) forms of gambling were surveyed in Sample 2. Problem gamblers (Mean = 1.64, SD = 2.33) reported accessing more forms of gambling than moderate risk (Mean = 1.10, SD = 1.37), low risk

(Mean = 0.47, SD = 0.92) and non problem gamblers (Mean = 0.20, SD = 0.65) ( $F(3,845) = 45.60, p < 0.001$ ).

The percentages engaging in specific forms of gambling may be seen in Table 4 as a function of problem gambling status. Multiple regression analysis was performed to determine which specific forms of gambling were associated with gambling problems. Engagement in gambling accounted for a significant proportion (13.8 %) of problem gambling variance ( $F(7,841) = 20.411, p < 0.001$ ). In Sample 2 the newer forms of gambling, namely Internet poker ( $t(841) = 4.031, p < 0.001$ ), and sport wagering ( $t(841) = 3.653, p < 0.001$ ) were significant predictors of gambling problems.

## Discussion

Technology is challenging various jurisdictional abilities to restrict the availability of gambling products, with online forms allowing personalised access to gambling 24 h a day 7 days a week and potentially confusing attempts to localise the activity. As predicted, there were significant relationships in both samples between gambling involvement (the number of forms of gambling accessed) and self-reported gambling problems. These relationships were able to account for between 8.2 and 13.5 % of variance in the samples. The increased range of forms of gambling that problem gamblers reported engaging in, indicated their greater involvement (LaPlante et al. 2011) or versatility (Welte et al. 2009). A greater involvement in gambling suggests that these individuals may be harder to track or control (Shaffer and Martin 2011) as they may be more likely to move from provider to provider.

**Table 3** Percentages reporting engaging in specific forms of gambling (N included in parentheses)

Gambling activity	Male	Female	Total
Sports betting	10.00 (460)	4.77 (608)	7.02 (1,068)
Betting on Races	11.89 (454)	3.67 (599)	7.22 (1,053)
Betting on lotto (internet)	4.91 (448)	5.18 (599)	5.06 (1,047)
Betting on races (internet)	5.59 (447)	2.68 (598)	3.92 (1,045)
Betting on sports (internet)	7.37 (448)	2.51 (598)	4.59 (1,046)
Poker (internet)	7.59 (448)	4.85 (598)	6.02 (1,046)
Betting on the phone	2.26 (443)	0.68 (590)	1.36 (1,033)

**Table 4** Percentages reporting involvement in gambling activity as a function of problem gambling status as measured by the PGSI (N included in parentheses)

Gambling activity	Non-problem	Low risk	Moderate risk	Problem gambler
Sports betting	3.41 (646)	9.16 (131)	29.76 (84)	28.57 (28)
Betting on races	3.91 (639)	12.98 (131)	21.43 (84)	28.57 (28)
Betting on lotto (internet)	3.71 (647)	6.87 (131)	10.47 (86)	14.29 (28)
Betting on races (internet)	2.16 (648)	3.03 (132)	10.34 (87)	25.00 (28)
Betting on sports (internet)	2.15 (650)	3.82 (131)	18.39 (87)	32.14 (28)
Poker (internet)	3.70 (649)	8.33 (132)	18.39 (87)	25.00 (28)
Betting on the phone	0.31 (653)	1.54 (130)	4.65 (86)	10.71 (28)

The greater mobility conferred to consumers posed by eCommerce has been a concern for providers, as one's competitors are only a mouse click away (Nielsen 2000). The eCommerce sector has adopted two broad solutions to this problem. One approach has been to develop a range of personalised consumer support systems (Schafer et al. 2001) to take the role previously occupied by shop assistants. It is reasoned that such systems will confer greater customer loyalty, if they recognise and assist the consumer, creating a more "personal" relationship with the consumer. However, such systems require that customers be known so that assistance can be properly rendered (Hoffman et al. 1999). The other approach has been to enhance the perceived trustworthiness of the eCommerce site (Riegelsberger et al. 2005). The suggestion that all consumers online are mobile and may visit other websites (Nielsen 2000) is somewhat overstated, but there are indications that the more involved consumers are more likely to visit a range of websites (Johnson et al. 2004). The present data, supports previous observations that problem gamblers are more mobile, frequenting more venues (Phillips and Ogeil 2011), and engaging in a wider range of gambling activities both online and offline (LaPlante et al. 2012, 2011; Welte et al. 2009).

A specific section of the community is more involved in gambling (Lund 2008). Problem gamblers report frequenting more venues (Phillips and Ogeil 2011) and accessing more forms of gambling (LaPlante et al. 2012, 2011; Welte et al. 2009) and this could be a more general feature of uncontrolled and addictive behaviours (Shaffer et al. 2004b). Phillips and Ogeil (2011) also found that problem drinkers also frequented more venues, and this can be a problem when trying to control drinking, if alcohol is readily available from alternative sources (Forster et al. 1995; Wagenaar et al. 1993). Similarly substance abusers also appear to frequent more sources of drugs, shopping from doctor to doctor (Martyres et al. 2004; Rigg et al. 2011), with this behaviour escalating in the period before death (Martyres et al. 2004). Indeed, technology has facilitated access to drugs including controlled substances (Ivanitskaya et al. 2010; Nielsen and Barratt 2009) and to combat this, central registers and a list of behaviours predictive of doctor shopping have been employed (Martyres et al. 2004).

Although it has been suggested that forms of gambling with a higher event frequency are more likely to cause problem gambling (Dowling et al. 2004; Parke and Griffith 2007), this was not observed in the present study. When considering specific forms of gambling, for the younger adults in Sample 1 there were relationships between cards, lotto and the stock market and problem gambling. For the adults from the general community in Sample 2 there were relationships between newer forms of gambling such as sports wagering and online poker (provision illegal in Australian jurisdiction). Rather than games with high event frequency being associated with gambling problems, the present data suggest that other factors such as learning or an absence of protective measures are playing a role in the emergence of gambling problems (Shaffer et al. 2004a).

Although it was not possible to look at the frequency of wagering in both samples, participants in Sample 2 were asked as to the frequency of bets placed. The correlation between the number of bets people reported placing per week and risk of developing a gambling problem was significant ( $r = 0.246$ ,  $n = 849$ ,  $p < 0.001$ ), with Internet poker emerging as a specific risk factor. Nevertheless, the relationship with frequency of wagering and gambling problem was smaller than that associated with the number of forms of gambling engaged ( $r = 0.367$ ,  $n = 850$ ,  $p < 0.001$ ). The present data suggests it is not necessarily the high event frequency of a game that is associated with problem gambling, but problem gambling may be associated with higher frequencies of wagering.

## Limitations

The present studies used self reports of gambling behaviour in two cross-sections of the community. The two surveys did not canvas all possible forms of gambling (e.g. Poker Machines and online casinos) and the SOGS does not ask about Internet gambling, limiting the conclusions of this form within Sample 1, nor were the relative proportions of poker played ‘online’ versus in a ‘casino’ recorded in Sample 2. In addition, it is possible that there may be additional forms of gambling that are more predictive of gambling problems than the forms considered. However the present data is of interest as it is from a cross section of “at risk” individuals in the community rather than from a clinical population under treatment and in the latter stages of their problem (Shaffer and Martin 2011), replicates the importance of involvement observed in British (LaPlante et al. 2011) and American (Welte et al. 2009) samples, and considers involvement in a number of forms of online gambling.

It is possible to track play online (Siler 2010), whereas self reports may be limited by insight, memory and social desirability (Shaffer et al. 2010). Studies have tracked participation in online forms of gambling (Shaffer et al. 2010) and monitored their behaviour over time. Such studies observe that the majority of individuals do not escalate unavoidably into problems (Broda et al. 2008; LaBrie et al. 2007, 2008; Nelson et al. 2008). However it may also be important to appreciate that problem gamblers frequent multiple venues (Phillips and Ogeil 2011) and as the present data indicate, engage in more than one form of gambling. This poses problems for systems that track gambling participation, as tracking is only as good as the degree of integration of databases. Where a gambler can shift from one provider to another, tracking could tend to underestimate the degree of problem, and this could pose problems for systems seeking to identify problem gambling (Schellinck and Schrans 2011). Centralised systems (Haefeli et al. 2011) improve the capacity to track the individual but there can still remain a problem if gamblers can “opt out” of tracking.

The present data addresses the effects of individual access rather than differences in jurisdictional availability upon the incidence of gambling problems, and it is likely that other factors such as education and socioeconomic status also contribute to the development of problem gambling. In particular, as relationships are reported they should not be taken as indications of causality. For instance, an increased access to online poker could lead to gambling problems as it could be accessed 24 h a day 7 days a week, with providers bombarding players with inducements to play (Phillips et al. in press). Conversely, the observed relationships might equally reflect a greater predisposition to access online forms by sections of the community with poorer impulse control.

## Conclusion

The Internet increases the availability of gambling, and challenges a jurisdiction’s capacity to restrict access to gambling. The present data considered relationships between access and the risk of a gambling problem. Problem gamblers accessed more forms of gambling and this is likely to pose difficulties for any attempts to curb gambling at any specific source (e.g. poker machines) as the problem gamblers can access gambling by other means (e.g. personal computers, mobile phones).



**Acknowledgments** This paper is based in part on a study commissioned by Gambling Research Australia (Tender No 119/06).

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