Greater involvement and diversity of Internet gambling as a risk factor for problem gambling

Sally M. Gainsbury¹,², Alex Russell¹,², Alex Blaszczynski², Nerilee Hing¹

¹ Centre for Gambling Education & Research, Southern Cross University, Lismore, NSW, Australia
² School of Psychology, University of Sydney, Sydney, NSW, Australia

Correspondence: Sally Gainsbury, Centre for Gambling Education & Research, Southern Cross University, P.O. Box 157, Lismore, NSW 2480, Australia, Tel: +612 6626 9436, e-mail: sally.gainsbury@scu.edu.au

Background: Concerns that Internet gambling has elevated the prevalence of problem gambling have not been substantiated; however, evidence suggests a subgroup of Internet gamblers do experience higher rates of gambling harms. Greater overall involvement in gambling appears to be predictive of harms. The purpose of this study was to examine differences between Internet gamblers with a single or multiple online gambling accounts, including their gambling behaviours, factors influencing their online gambling and risk of experiencing gambling problems. Methods: Internet gamblers (3178) responding to an online survey that assessed their gambling behaviour, and use of single or multiple online gambling accounts. Results: Results revealed that multiple account holders were more involved gamblers, gambling on more activities and more frequently, and had higher rates of gambling problems than single account holders. Multiple account holders selected gambling sites based on price, betting options, payout rates and game experience, whereas single account holders prioritized legality and consumer protection features. Conclusion: Results suggest two different types of Internet gamblers: one motivated to move between sites to optimize preferred experiences with a tendency to gamble in a more volatile manner; and a smaller, but more stable group less influenced by promotions and experiences, and seeking a reputable and safe gambling experience. As the majority of Internet gamblers use multiple accounts, more universal responsible gambling strategies are needed to assist gamblers to track and control their expenditure to reduce risks of harm.

Introduction

Gambling opportunities have expanded worldwide particularly with the availability of Internet gambling. This has led to concerns that the easy accessibility of gambling will contribute to and elevate the prevalence of problem gambling. These concerns have partially been addressed by evidence that communities adapt to gambling, with problem gambling prevalence remaining relatively stable worldwide. However, there is some evidence that problem gambling is more common among online gamblers. As problem gambling is associated with poor psychosocial health, understanding risk factors is important to inform harm minimization policies. This study investigates whether more involved and diverse use of Internet gambling as characterized by multiple gambling accounts is associated with an increased risk of gambling problems. This is important as several studies examining the risk of online gambling are based on users of a single site, and many harm minimization measures, such as spending limits, are designed only for use on a single site. Internet gambling is increasing globally, for example, 15% of UK adults reported gambling online in 2013, compared with 3% in 2007. Similarly, 8% of Australians reported gambling online in 2011, compared with an estimated 1% in 1999. One stated benefit of legalized Internet gambling is greater market competition, allowing consumers greater choice in selecting preferred websites to gamble. This competitive environment allows customers to easily shift between websites. Numerous studies have demonstrated the tendency for online gamblers to use multiple accounts, including unregulated offshore sites. Surveys of Australian Internet wagering site users found that one-half to one-third of respondents reported visiting only one website and these respondents appeared to be less broadly and less frequently involved in online gambling compared with multiple account holders (MAHs). A study of 10838 Internet casino and poker players found that 75–85% of respondents gambled on multiple sites. Poker players were more likely to play on only one to two sites as compared with casino players, suggesting that specific subgroups of gamblers are more likely to hold multiple accounts. Internet gambling itself is not a risk factor for experiencing gambling problems, but greater overall involvement and engagement with gambling, including greater expenditure and gambling on multiple sites and forms, has been found to be predictive of gambling problems. Using multiple forms and modes to gamble is not unique to Internet gambling. For example, problem gamblers report frequent multiple gambling venues more often than at-risk or non-problem gamblers. A study of Internet gamblers found that a greater proportion of problem gamblers reported that they were influenced by incentives provided by online gambling sites as compared with non-problem gamblers. Conversely, professional gamblers may be more likely to hold multiple gambling accounts, to increase their ability to seek favourable returns.

This study aimed to compare gamblers with a single Internet gambling account (single account holders; SAHs) to those with multiple accounts (MAHs) in terms of their demographic characteristics, gambling, factors that influence their gambling, and risk of harm. The objective was to determine whether MAHs are more likely to be at-risk of gambling problems than SAHs to enable implications to be drawn regarding the appropriate provision of consumer protection strategies. Understanding behavioural markers that are associated with gambling problems can enable early interventions that may reduce gambling-related harms.
Methods

Participants
Respondents were recruited through advertisements on various websites, including legal Australian online wagering and lottery sites (53.9%), Facebook (17.6%), and Google (6.3%). Of the 4594 survey respondents, 3178 (69.2%) indicated that they gambled online and were included in the subsequent analyses.

Instrument and measures
Respondents completed an online survey. The completion rate was 68.7% and the mean completion time was 23.1 min. The survey was designed based on a previous study on Internet gambling (N = 6682) and questions were refined based on these results.23 For the purpose of this study, data from specific sections of the survey were used in analyses and information about these sections is presented here (Results from the dataset on which the current study is based were published in a report submitted to the funding body.24

Demographics
Respondents were asked about general demographic information including gender, age, location of residence, country of birth and language spoken at home.

Gambling participation
Respondents were asked whether and how frequently they took part in 10 forms of gambling (including online and offline participation; see table 1).

Internet gambling participation
Respondents were how many separate online betting/gambling accounts they had with different operators. Respondents were asked whether they considered themselves to be a professional, semi-professional or amateur/recreational gambler to list the top three factors that influenced their decision to gamble at a specific Internet site, and the top three advantages and disadvantages of Internet over land-based gambling (from a specified list). Respondents were asked to describe the impact of using electronic payment and viewing promotions for online gambling on the amount they gambled.

Gambling related problems
Respondents completed the Problem Gambling Severity Index (PGSI),23 a nine-item questionnaire used to classify gambling (PGSI) has a demonstrated test-retest reliability score of 0.78. Cronbach’s alpha for the PGSI in this sample was 0.93, indicating good internal consistency and stability. The Kessler 6 scale26 was used to assess the presence of non-specific psychological distress experienced over the most recent four weeks. Questions were framed to specifically relate to gambling-related psychological distress. This measure was selected for its brevity, strong psychometric properties, and ability to discriminate pathological gambling cases from non-cases in general-purpose health surveys. Cronbach’s alpha for the K6 was 0.93.

Analyses
The independent variable was recoded into those who had one online account (SAHs) compared with those who had two or more (MAHs). All analyses were also run retaining the original data (number of accounts); no differences in results between the two approaches were found. Where the dependent variable was continuous, assumptions for parametric analyses were checked and independent samples t-tests were used. Where the dependent variable was ordinal, non-parametric correlations (Spearman’s rho) were used to compare the groups. For nominal dependent variables, chi-square tests of independence were employed with post hoc pairwise comparisons (Z-tests) used for all dependent variables with more than two response options. The results in table 1 were conducted using chi-square goodness of fit tests.

Demographic variables
Respondents mostly lived in a major metropolitan city (63.9%) or major regional city (18.4%). The most commonly reported marital statuses were married (42.6%), living with a partner/de facto (17.1%) or were never married (30.8%). Most worked full- (57.5%) or part-time (10.4%) and 89.8% spoke English as their primary language at home.

MAHs were significantly more likely to be male (91.9%) compared with SAHs (78.5%), P < 0.001. MAHs were significantly younger (M = 39.7, SD = 13.7) than SAHs (M = 42.4, SD = 14.6), P < 0.01. Significant differences were also observed in terms of education, with MAHs significantly more likely to have a university or college degree (28.4%) compared with SAHs (23.7%), but significantly less likely to have a trade, technical certificate or diploma (22.4%) compared with SAHs (27.1%), P = 0.001. No differences were observed between the groups in terms of postgraduate qualifications or other levels of education.

Gambling participation
MAHs participated (online and offline) in a significantly greater number of different forms of gambling (M = 4.77, SD = 1.96) compared with SAHs (M = 3.90, SD = 1.92), P < 0.001. SAHs

---

Table 1 Number and percentage of respondents who reported taking part in each form of activity online within the last 12 months by number of sites with which respondents have Internet gambling accounts

| Form of gambling            | Single account | Multiple accounts | P     |
|-----------------------------|----------------|-------------------|-------|
|                             | N  | %     | N  | %     |       |
| Instant scratch tickets     | 12 | 23.5  | 39 | 76.5  | <0.001|
| Lottery loot pools tickets  | 669| 55.9  | 528| 44.1  | <0.001|
| Sports betting              | 728| 33.5  | 1,447| 66.5 | <0.001|
| Horse or dog race betting   | 683| 33.4  | 1,361| 66.6 | <0.001|
| Bingo                       | 9 | 20.9  | 34 | 79.1  | <0.001|
| Keno                        | 12 | 29.3  | 29 | 70.7  | 0.008 |
| Poker                       | 86 | 17.6  | 404| 82.4  | <0.001|
| Casino table games          | 36 | 20.7  | 138| 79.3  | <0.001|
| Betting on games of skill   | 32 | 34.4  | 61 | 65.6  | 0.003 |
| Electronic gaming machines  | 46 | 27.1  | 124| 72.9  | <0.001|
bought lottery/lotto/pools tickets significantly more frequently than MAHs ($P < 0.001$). In contrast, MAHs gambled significantly more frequently than SAHs on: sports betting ($P < 0.001$), horse or dog race betting ($P < 0.001$), poker ($P < 0.001$) and electronic gaming machines ($P = 0.003$).

Table 1 illustrates the proportions of SAHs and MAHs who reported having gambled online at least once over the last 12 months, for each gambling form. With the exception of lottery/lotto/pools tickets, the majority of individuals who gambled online on all other activities were MAHs. The effect sizes ($w$) indicate that the effects are at least of a medium size ($>0.5$) and most are large effects ($>0.5$).

When asked about their Internet gambling behaviour, MAHs were significantly more likely to do most or all of their gambling online (73.8%) compared with SAHs (58.2%), while SAHs (28.4%) were significantly more likely to rate the following as disadvantages of Internet gambling, while SAHs were significantly more likely to rate the use of free-play sites as advantages. MAHs were significantly more likely than MAHs to rate Internet gambling as more addictive and that it is easier to spend money (table 2).

MAHs were significantly more likely to choose a site based on price, number of betting options and games available, fast payout rates, better game experience/interface, and because of the software used on the site. In contrast, SAHs were significantly more likely to choose a site based on advertising/marketing, the jurisdiction where the site is regulated, whether the site is licensed, customer protection and responsible gambling tools (table 3).

SAHs were significantly more likely than MAHs to say that promotions have no impact on how much they gambled online (68.0% vs. 60.5%), whereas MAHs were significantly more likely to say that promotions increase their likelihood of gambling (38.2% vs. 29.9%), $P < 0.001$. MAHs were significantly more likely to say that the use of credit cards or electronic funds transfer had increased the amount that they gamble (34.1% vs. 19.3%), whereas SAHs were significantly more likely to say that it had had no impact on how much they gambled (74.1% vs. 59.8%).

### Factors that influence Internet gambling behaviour

SAHs were significantly more likely to state that they were amateur gamblers compared with MAHs (96.2% vs. 83.8%), whereas MAHs were significantly more likely to state that they were professional (2.7% vs. 0.4%) or semi-professional gamblers (13.5% vs. 3.4%) compared with SAHs, $P < 0.001$.

MAHs were significantly more likely to rate price, number of betting options/games and lower secondary costs as advantages of Internet gambling, while SAHs were significantly more likely to rate the use of free-play sites as advantages. MAHs were significantly more likely to rate the following as disadvantages of Internet gambling compared with SAHs: unreliable technology or Internet access, difficulty verifying fairness of games, Internet gambling is more addictive, and that it is easier to spend money (table 2).

### Problem gambling

On average, MAHs had significantly higher Kessler 6 scores, indicating greater psychological distress ($M = 3.50$, SD = 4.62) compared with SAHs ($M = 2.95$, SD = 4.44), $P = 0.001$. MAHs were significantly more likely to be classified as moderate risk (31.4% vs. 19.0%) or problem gamblers (18.1% vs. 9.7%) and significantly less likely to be non-problem gamblers (24.9% vs. 46.7%) than SAHs, $P < 0.001$.

### Multivariate comparison of SAHs and MAHs

The dependent variable was single vs. MAH status (coded as 0 and 1, respectively). Positive coefficients indicate higher scores are related

---

**Table 2** Perceived advantages and disadvantages of Internet gambling over land-based gambling by number of Internet gambling accounts

| Reason                                      | Single account | Multiple accounts | $P$  |
|---------------------------------------------|----------------|-------------------|------|
| **Advantages**                              |                |                   |      |
| Price including bonuses, free credit, odds and payout rates | 295 (20.5)     | 832 (47.8)        | <0.001 |
| Greater number of betting options and games available | 216 (15.0)     | 505 (29.0)        | <0.001 |
| Use of free-play sites                      | 61 (4.2)       | 46 (2.6)          | <0.001 |
| Lower secondary costs, e.g. petrol, food and beverages | 151 (10.5)     | 226 (13.0)        | <0.001 |
| **Disadvantages**                           |                |                   |      |
| Unreliable technology or Internet access    | 220 (15.3)     | 390 (22.4)        | <0.001 |
| Difficulty verifying fairness of games      | 160 (11.1)     | 234 (13.4)        | 0.048 |
| More addictive                             | 229 (15.9)     | 342 (19.7)        | <0.001 |
| Easier to spend money                       | 518 (36.0)     | 686 (39.4)        | 0.049 |

Note: asterisks (*) mark significantly higher endorsement of each factor.

**Table 3** Number and percentage of respondents who stated that each reason influenced their decision to choose one operator over another by number of Internet gambling accounts

| Reason                                      | Single account | Multiple accounts | $P$  |
|---------------------------------------------|----------------|-------------------|------|
| Advertising/marketing                       | 183 (12.7*)    | 165 (9.5)         | <0.001 |
| Price including bonuses, free credit, odds and payout rates | 337 (23.4)     | 1,035 (59.5*)     | <0.001 |
| Greater number of betting options and games available | 198 (13.8)     | 554 (31.9*)       | <0.001 |
| Jurisdiction where site is regulated        | 155 (10.8*)    | 101 (5.8)         | <0.001 |
| Legally provided/licensed site              | 296 (20.6*)    | 184 (10.6)        | <0.001 |
| Fast payout rates                           | 173 (12.0)     | 320 (18.4*)       | <0.001 |
| Customer protection, fairness of games, security of deposits and account information | 296 (20.6*)    | 290 (16.7)        | <0.001 |
| Responsible gambling tools and resources e.g. account information and personal limits | 105 (7.3*)     | 51 (2.9)          | <0.001 |
| Better game experience/interface            | 96 (6.7)       | 242 (13.9*)       | <0.001 |
| Software used                               | 53 (3.7)       | 116 (6.7*)        | <0.001 |

Note: Asterisks (*) mark significantly higher endorsement of each reason.
to MAHs. Predictors included in the model were: gender, level of education, age, proportion of gambling done via the Internet and in land-based gambling venues, participation in each gambling form (last 12 months), professional gambling status, Kessler 6 scale score, PGSI group, perceived advantages of Internet gambling, perceived disadvantages of Internet gambling and reasons for choosing one online operator. This model was initially run through a linear regression procedure to check for tolerance between predictors. The lowest recorded tolerance was 0.451 for one of the education dummy variables and thus the predictors were considered to be acceptably independent of each other.

The overall model (table 4) included 42 predictors (including dummy variables) and was significant, $P<0.001$. Overall prediction success was 74.9%, with the model correctly predicting 69.5% of SAHs and 79.5% of MAHs.

Controlling for all other variables, SAHs were significantly more likely to do most of their gambling in land-based venues (compared with Internet gambling), to engage in lottery/lotto/pools tickets gambling and to report advertising/marketing as a reason to choose one site over another. MAHs were significantly more likely to have an undergraduate level of education (compared with those with less than 12 years of education), to engage in sports betting, horse or dog race betting or poker, to classify themselves as semi-professional or professional gamblers (compared with amateur gamblers), to be moderate risk or problem gamblers (compared with non-problem gamblers), to perceive the price and lower secondary costs as advantages of Internet gambling over land-based gambling, to report the difficult of verifying the fairness of Internet gambling games as a disadvantage of Internet gambling and to choose operators based on price, greater selection of games, better game experience and the software used. Contrary to the results above, when controlling for all other variables, MAHs were significantly more likely to be older than SAHs. Variables that no longer significantly differentiated between MAHs and SAHs in the multivariate analysis were: gender, having a trade certificate, diploma or TAFE qualification, mostly gambling online, Kessler 6 scores, two of the

| Predictor | B     | SE    | Wald  | P      | OR     | 95% CI |
|-----------|-------|-------|-------|--------|--------|--------|
| Gender (ref. female) | 0.201 | 0.135 | 2.099 | 0.137  | 1.223  | 0.938, 1.594 |
| Education (ref. less than 12 years) | 0.244 | 0.169 | 2.033 | 0.148  | 1.276  | 0.917, 1.776 |
| Postgraduate education | 0.314 | 0.147 | 4.614 | 0.032  | 1.372  | 1.028, 1.830 |
| Undergraduate university or college degree | 0.316 | 0.147 | 4.614 | 0.032  | 1.372  | 1.028, 1.830 |
| Trade certificate, diploma or TAFE qualification | 0.218 | 0.144 | 0.015 | 0.903  | 1.018  | 0.754, 1.005 |
| Age (years) | 0.112 | 0.147 | 0.057 | 0.818  | 1.119  | 0.838, 1.549 |
| 12 years or its equivalent | 0.013 | 0.004 | 11.977| 0.001  | 1.013  | 1.005, 1.020 |
| Age (years) | 0.013 | 0.004 | 11.977| 0.001  | 1.013  | 1.005, 1.020 |
| Proportion of Internet vs. land-based gambling (ref. only gambled online in last 12 months) | 0.163 | 0.124 | 1.739 | 0.187  | 1.177  | 0.924, 1.510 |
| Mostly gambled online but some land-based gambling in last 12 months | 0.049 | 0.161 | 0.093 | 0.760  | 0.952  | 0.695, 1.305 |
| Half gambling online and half land-based gambling | 0.166 | 0.092 | 1.914 | 0.166  | 1.189  | 0.774, 1.872 |
| Mostly land-based gambling, but some online gambling | 0.870 | 0.154 | 32.066| <0.001 | 0.419  | 0.310, 0.546 |

Table 4 Results from multivariate analysis (logistic regression) comparing SAHs and MAHs

Note: Bold text indicates significant predictors within the model.
perceived advantages of Internet gambling (greater number of betting options and games available, use of free-play sites), three of the perceived disadvantages of Internet gambling (unreliable technology or Internet access, more addictive and easier to spend money), and six of the reasons for choosing one operator over another (jurisdiction where the site is regulated, legally provided/licensed site, fast payout rate, customer protection, responsible gambling tools and resources and the software used).

Discussion

The results suggest that the majority of Australian Internet gamblers use multiple Internet accounts. MAHs were more involved gamblers with respect to gambling frequency and engagement with multiple activities. In particular, betting on sports and races and playing poker were predictive of being a MAH. This may indicate that some gambling activities are more likely to be used by those who switch operators, or alternatively that online poker players may also wager and require additional accounts. The results are consistent with the findings that MAHs were more involved in both online and offline gambling than SAHs. In contrast, SAHs were more likely to gamble on one just activity, most likely the lottery and were more likely to mostly gamble offline.

MAHs are likely to represent a different cohort to SAHs. Almost two-thirds of MAHs were influenced by price and gambling promotions in selecting a gambling operator and were more likely to be influenced by the greater selection of games and overall game experience. This may indicate MAHs are willing to ‘shop around’ to get their preferred experience and price for. The emphasis of MAHs on price, costs and experience is consistent with the greater proportion of this group stating that their gambling represented a main form of income. Professional gamblers are known to make more informed decisions and to treat gambling as work, making them more likely to search for the best offers requiring multiple accounts.

Over one-fifth of SAHs chose a gambling site based on its legality and consumer protection provided, demonstrating that this cohort is seeking a legitimate gambling experience and may prefer the stability of gambling with a single provider rather than switching accounts to optimise price. However, a site’s legality and consumer protection did not differentiate between SAH and MAH in the multivariate analysis. Although advertising was influential for a proportion of SAHs and differentiated this cohort from MAH, they were less likely to respond to promotions, suggesting that advertising may be influential in their initial decision to choose an operator, which they then remain with. This result aligns with previous findings that gambling advertising has a greater impact on more involved gamblers. Research suggests that player retention is associated with greater profitability for gambling operators. This may suggest that even if these players gamble less frequently, the lower cost of customer acquisition and retention makes this group more valuable than more active, but less loyal customers. However, SAH were also likely to do most of their gambling offline, reducing the need for multiple accounts.

Half of MAHs experienced at least moderate gambling-related problems, in comparison with less than one-third of SAHs. MAHs were almost twice as likely as SAHs to be classified as problem gamblers and were more likely to experience psychological distress. The tendency for MAHs to experience a greater level of gambling problems is likely to be related to their greater gambling involvement, consistent with existing research. However, even when their gambling was controlled for being a moderate risk or problem gambler was still predictive of being an MAH. MAHs were more likely to be impacted by promotions and electronic payments, and one-fifth stated that this mode of gambling was ‘more addictive’ than land-based forms. Gambling through multiple accounts makes it difficult for individuals to track their expenditure, which may result in more money spent than intended and subsequent problems.

This study included a large sample of Internet gamblers and included a range of relevant variables enabling it to be the first study known to the authors to specifically compare SAHs and MAHs. However, there are several limitations of the study; the results are based on self-report which is limited to the accuracy of individual’s recall of their behaviour and truthful responses. Participants self-selected into the study meaning the results are not representative of all Internet gamblers. The extent to which gamblers actively used their various Internet gambling accounts was not measured and this is only one variable to indicate gambling involvement. Other variables may moderate the relationship between use of multiple sites and gambling problems. For example, the use of multiple sites may be an indicator of novelty seeking, which is associated with impulse control problems. A propensity to seek different experiences and change actions in the pursuit of stimulation and excitement, such as opening new gambling accounts, may be explained by an underlying trait that is also more likely to lead to excessive and deviant behaviours. This would fit with the theory that arousal dysfunction requires increased stimulation such that if this is not fulfilled by one website, they may seek others. The current study does not allow inferences about the causal nature of relationships between variables. Further research is needed to explore how Internet gamblers use multiple sites and their motivations for doing so.

Conclusions

The differences between gamblers with a single as compared with multiple online gambling accounts have important implications for the field. Behavioural tracking data are increasingly being used to understand how consumers use Internet gambling sites and identify potentially problematic play. However, the current study suggests that relying on data obtained from a single operator may underestimate online gambling for about half of all users. As such, results drawn from such studies may produce biased results that are not representative of Internet gamblers. Similarly, gambling operators who use behavioural tracking to identify potentially risky play are unable to evaluate gambling that occurs outside their own site.

The current results demonstrate that use of multiple websites for online gambling may also be an important behavioural marker of gambling-related problems. Internet gamblers may benefit from public awareness campaigns of the risks of gambling with multiple operators, including unregulated operators. The European Commission has recommended that Internet gambling operators take greater steps to identify risky gamblers and implement resources to facilitate responsible gambling, such as setting time and monetary limits. Use of multiple accounts may obfuscate an individual’s expenditure on Internet gambling sites, increasing the likelihood of spending more than intended, one of the principle causes of gambling problems. Therefore, tools that allow gamblers to track their gambling across multiple sites may be useful in enhancing the ability to track expenditure and reduce excessive gambling.

Acknowledgements

The authors would like to thank Prof. Daniel Lubman and Dr. Robert Wood who assisted with the research on which this manuscript is based.

Funding

This study was commissioned by Gambling Research Australia [Interactive Gambling]—a partnership between the
Commonwealth, State and Territory Governments. GRA had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

Conflicts of interest: None declared.

Key points
- This is the first study to examine the difference between Internet gamblers who hold multiple as compared with a single online gambling account.
- The study revealed that MAHs are more highly involved in gambling, more influenced by price and betting options and have a greater risk of experiencing gambling harms.
- Single Internet gambling account holders are a more stable but steady group of gamblers who are more concerned with legality and consumer protection.
- The results presented here question previous findings based on analysis of player behaviour from a single gambling operator and suggest that these may underestimate actual gambling behaviour.
- The results suggest that harm minimization strategies should be implemented that are effective across multiple operators, rather than restricted to use of a single gambling site.

References
1 Planzer S, Gray HM, Shaffer HJ. Associations between national gambling policies and disordered gambling prevalence rates within Europe. Int J Law Psychiatry 2014; 37:217–229.
2 Shaffer HJ, LaBrie R, LaPlante D. Laying the foundation for quantifying regional exposure to social phenomena: considering the case of legalized gambling as a public health toxin. Psychol Addict Behav 2004;18:40–8.
3 Wood RT, Williams RJ. A comparative profile of the Internet gambler: demographic characteristics, game-play patterns, and problem gambling status. New Media Soc 2011;13:1123–41.
4 Fröberg F, Hallquist J, Tengström A. Psychosocial health and gambling problems among men and women aged 16–24 years in the Swedish National Public Health Survey. Eur J Public Health 2012;23:427–33.
5 Braverman J, Shaffer HJ. How do gamblers start gambling: identifying behavioural markers for high-risk Internet gambling. Eur J Public Health 2012;22:273–8.
6 LaBrie RA, Kaplan SA, LaPlante DA, et al. Inside the virtual casino: a prospective longitudinal study of actual Internet casino gambling. Eur J Public Health 2008;18:410–6.
7 LaPlante DA, Nelson SE, LaBrie RA, Shaffer HJ. Disordered gambling, type of gambling and gambling involvement in the British Gambling Prevalence Survey 2007. Eur J Public Health 2011;21:532–7.
8 Gambling Commission. Gambling participation: activities and mode of access 2014. Available at: http://www.gamblingcommission.gov.uk/pdf/ Gambling%20participation%20activities%20and%20mode%20of%20access%20-%20year%20%20December%202013.pdf (8 February 2015, date last accessed).
9 Wardle H, Sproston K, Orford J, et al. Defining the online gambler and patterns of behaviour integration: evidence from the British Gambling Prevalence Survey 2010. Int Gambl Stud 2011;11:339–56.
10 Woolley R. Mapping Internet gambling: emerging modes of online participation in wagering and sports betting. Int Gambl Stud 2001;1:3–21.
11 Gainsbury S, Russell A, Hing N, et al. The prevalence and determinants of problem gambling in Australia: assessing the impact of interactive gambling and new technologies. Psychol Addict Behav 2014;28:769–79.
12 LaPlante DA, Nelson SE, Gray HM. Breadth and depth involvement: understanding Internet gambling involvement and its relationship to gambling problems. Psychol Addict Behav 2014;28:396–403.
13 Planzer S, Gray HM, Shaffer HJ. Associations between national gambling policies and disordered gambling prevalence rates within Europe. Int J Law Psychiatry 2014;37:217–229.
14 Gainsbury S, Russell A, Wood R, et al. How risky is Internet gambling? A comparison of subgroups of Internet gamblers based on problem gambling status. New Media Soc 2014; doi:10.1177/1461444813518185.
15 Wardle H, Moody A, Griffiths M, et al. Defining the online gambler and patterns of behaviour integration: evidence from the British Gambling Prevalence Survey 2010. Int Gambl Stud 2011;11:339–56.
16 Woolley R. Mapping Internet gambling: emerging modes of online participation in wagering and sports betting. Int Gambl Stud 2001;1:3–21.
17 Brosowski T, Meyer G, Hayer T. Analyses of multiple types of online gambling within one provider: an extended evaluation framework of actual online gambling behaviour. Int Gambl Stud 2012;12:405–19.
18 Gainsbury SM, Russell A, Hing N, et al. The prevalence and determinants of problem gambling in Australia: assessing the impact of interactive gambling and new technologies. Psychol Addict Behav 2014;28:769–79.
19 LaPlante DA, Nelson SE, Gray HM. Breadth and depth involvement: understanding Internet gambling involvement and its relationship to gambling problems. Psychol Addict Behav 2014;28:396–403.
20 Philander KS, MacKay TL. Online gambling participation and problem gambling severity: is there a causal relationship? Int Gambl Stud 2014;14:214–27.
21 Phillips JG, Ogil RP. Decisional styles and risk of problem drinking or gambling. Pers Indiv Differ 2011;51:521–6.
22 Gainsbury S, Russell A, Wood R, et al. How risky is Internet gambling? A comparison of subgroups of Internet gamblers based on problem gambling status. New Media Soc 2014; doi:10.1177/1461444813518185.
23 Gainsbury S, Wood R, Russell A, et al. A digital revolution: Comparison of demographic profiles, attitudes and gambling behaviour of Internet and non-Internet gamblers. Computers in Human Behavior 2012;28:1388–98.
24 Hing N, Gainsbury S, Blaszczynski A, et al. Interactive Gambling. Report commissioned by Gambling Research Australia 2014. Centre for Gambling Education & Research, Southern Cross University. Available at: http://www.gamblingresearch.org.au/home/interactive+gambling+p.pdf.
25 Ferris J, Wynne H. The Canadian Problem Gambling Index: Final report. Ottawa: Canadian Centre on Substance Abuse, 2001.
26 Kessler RC, Andrews G, Colpe L, et al. Short screening scales to monitor population prevalence and trends in non-specific psychological distress. Psychol Med 2002;32:959–76.
27 Lee J. Prize and risk-taking strategy in tournaments: evidence from professional poker players. The Institute for the Study of Labor, 2004, Bonn, Report No.: 1345, 1–23.
28 Radburn B, Horsley R. Gamblers, grinders, and mavricks: the use of membership categorisation to manage identity by professional poker players. J Gambl Issues 2001;26:30–50.
29 Derevensky J, Sklar A, Gupta R, MEsslerian C. An empirical study examining the impact of gambling advertisements on adolescent gambling attitudes and behaviors. Int J Ment Health Addict 2010;8:21–34.
30 Prentice C. Service quality perceptions and customer loyalty in casinos. Int J Contemp Hosp Manage 2013;25:49–64.
31 Hu YM, Bouchard TI. The genetic correlation between impulsivity and sensation seeking traits. Behav Genet 1997;27:455–63.
32 Wood AC, Rijndijk F, Asherson P, Kuntsi J. Inferring causation from cross-sectional data: examination of the causal relationship between hyperactivity-impulsivity and novelty seeking. Front Genet 2011;2:6.
33 Dragicev S, Tsogas G, Kadic A. Analysis of casino online gambling data in relation to behavioural risk markers for high-risk gambling and player protection. Int Gambl Stud 2011;11:377–91.
34 Shaffer HJ, Peller AJ, LaPlante DA, et al. Toward a paradigm shift in Internet gambling research: from opinion and self-report to actual behavior. Addict Res Theory 2010;18:270–83.
35 Gainsbury S. Player account-based gambling: potentials for behaviour-based research methodologies. Int Gambl Stud 2011;11:153–71.
36 European Commission. Commission recommendation on principles for the protection of consumers and players of online gambling services and for the prevention of minors from gambling online. Brussels: European Commission, 2014.