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**Problem Gambling on the Internet:
Implications for Internet Gambling Policy in North America**

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ABSTRACT

Internet gambling is legal in many jurisdictions around the world, and observers predict that it is simply a matter of time before various North American governments, in Canada and the USA, take steps towards legalizing and regulating Internet gambling opportunities. Indeed, the proportion of North America gamblers who choose to gamble on the Internet is increasing at a dramatic rate. Unfortunately, however, relatively little is known about the characteristics of these individuals, or their propensity for problem gambling. Past studies predict that Internet gamblers are especially at risk for developing gambling problems, and that a substantial proportion of them already can be properly classified as problem or pathological gamblers. The present study investigates this issue using data collected from an Internet-based survey administered to 1920 American, Canadian, and International Internet gamblers. Confirming predictions of a relationship between Internet gambling and problem gambling, we find that 42.7% of the Internet gamblers in our sample can be classified as problem gamblers. In light of our findings, and bearing in mind recommendations made by other gambling researchers, we conclude with a discussion of issues and cautions for governments to heed when crafting Internet gambling policies.

Introduction

Gambling has become an important economic growth industry across much of North American society. Indeed, casino gambling is available to residents of over half the US states, and at least some form of legalized gambling is available to people in all states except for Utah and Hawaii (The National Gambling Impact Study Commission, 1999). Legalized gambling opportunities are even more widely available to residents of Canada (Canadian Partnership for Responsible Gambling, 2004). While gambling is considered a potentially dangerous vice in some sectors of North American society, increasing gambling prevalence rates suggest that gambling is becoming a socially acceptable activity in other sectors of the population. According to Korn and Schaffer (2002), for example, the prevalence of gambling among the US adult population increased from 68% in 1975 to 86% in 1999. Consistent prevalence rates are observed in Canada, with 76% of Canadians reporting that they gamble at least once in the past year, and 38% on a weekly basis (Statistics Canada, 2003a). A vast majority of this North American gambling activity involves playing legitimate games in legitimate venues. The continued expansion of the Internet into American and Canadian homes, however, is bringing unprecedented access to new forms of gambling via Internet-based casinos, bingos, and sports-books.

While online pari-mutuel account wagering is legal in many U.S. states, most form of Internet gambling, such as wagering at an offshore Internet casino, are illegal (Auriemma and Erlich, 2002; Friedrich, 2003; U.S. General Accounting Office, 2002). In Canada, the Canadian Criminal Code does not directly refer to online gambling, but many observers agree that the code could be interpreted as prohibiting an individual from gambling on a website located in another country. Operating an Internet gambling website is legal in Canada, but it is restricted to provincial governments, and could only legally accessed by patrons that are within-province (Jepson, 2000; Kelly, Todosichuk, Azmier, 2001). With the exception of some provincial online lotteries and online horse-betting (which is regulated by the Canadian Pari-Mutuel Agency), provincial governments have only taken tentative forays into this arena.

Observers predict that many governments will, and must, inevitably transition to a state of legalized and regulated Internet gambling (Friedrich, 2003; Kelly et al, 2001). There are strong rationales for this prediction, one of which relates to public demand for Internet gambling opportunities. Legalized or not, it is a fact that a substantial proportion of North American gamblers have convenient access to offshore Internet gaming sites. Moreover, the number of people with Internet access will increase into the future, and the number of online gambling sites will similarly increase. As a result, the proportion of North Americans who choose to engage in offshore Internet gambling almost certainly will rise dramatically into the foreseeable future. This trend already is confirmed by data on gambling revenue and expenditures. Between 2001 and 2002, American consumer spending on Internet gambling increased by 33.37% (Christiansen Capital Advisors, n.d.). From 2002 to 2003, it increased by 42.04% (Christiansen Capital Advisors, n.d.). This trend will not be offset by the current Canadian and American laws, prohibiting offshore Internet gambling, since the laws are practically unenforceable (Azmier, 2000; Friedrich, 2003). Thus, Internet gambling is a social reality that likely cannot be criminalized away, and governments ultimately may be pressured to meet the public demand for online gambling opportunities.

A second factor suggesting that North American governments may, over time, move towards a state of legalized and regulated Internet gambling, stems from the strong economic incentive for doing so. In the United States, between 1975 and 1997, revenues derived from legal wagers increased 1600 percent (The National Gambling Impact Study Commission, 1999). Gambling revenues have similarly increased in Canada (Azmier, 2001). Legalized and regulated Internet gambling opportunities could increase government gaming revenues even further. Indeed, experts estimate that Internet gambling sites generated 2.2 billion US dollars in 2000 (Hammer, 2001), compared to only 300 million dollars several years earlier. Some predict that Internet gambling will become at least a 10 billion dollar per year industry before the end of the decade (The Wager, 2001). Thus, in this age of continued fiscal austerity, and as other Western nations, such as Australia, New Zealand, and the United Kingdom move also towards legalized Internet gambling (see McMillen and Grabosky, 1998; Smeaton and Griffiths, 2004; Wooley, 2003), it seems likely that North American governments would seek to divert “lost” Internet gaming revenue into government owned and regulated gaming sites.

If North American governments do make efforts to legalize and regulate Internet gambling, it is important that they do so only with a realistic appreciation of corresponding social costs, as well as the ways in which those costs can be minimized. More specifically, if governments wish to promote a sustainable ethos of responsible gambling, then they must first have an understanding of the potential relationship between Internet gambling and problem gambling. Problem gambling has proven to be, at times, a difficult phenomenon to define. The present authors adhere to the view that problem gambling is gambling behavior that creates negative consequences for the gambler, others in his or her social network, or for the gambler’s community (Smith and Wynne, 2002). Unfortunately, most governments have a rather poor track record of minimizing and preventing problem gambling behavior in their respective jurisdictions. In Canada, for example, only about 4% of Canadians exhibit evidence of a gambling problem, but recent studies estimate that problem gamblers generate roughly a quarter to one-third of all Canadian government gaming revenues (Williams and Wood, 2004a; Williams and Wood, 2004b). Only a miniscule portion of this problem gambling revenue gets diverted back into treatment and prevention initiatives.

It is important to point out that minimizing problem gambling is not solely the issue of government. Indeed, the gaming industry itself must shoulder some responsibility for ensuring that its products are as safe as possible. Moreover, the individual gambler, who ultimately is the one who chooses whether or not to participate, must bear some responsibility for his or her gambling choices. In many North American jurisdictions, and in all Canadian ones, however, governments directly control, sponsor, and benefit from the gambling activity of its citizens. Benefiting from an activity that proves disastrously harmful, for some people, clearly can be interpreted as a contradiction to the government’s manifest role of meeting and serving the best interests of citizens. Thus, if government sponsored gambling is to maintain any moral or political legitimacy whatsoever, we feel that governments must play a special and disproportionate role in creating an environment where problem gambling is minimized and where responsible gambling is facilitated.

In sum, we conduct the present study under the assumption that North American governments do indeed have a vested interest in promoting responsible gambling among

citizens in their respective jurisdictions. Moreover, we also assume that governments will wish to minimize problem gambling and to ensure that problem gamblers do not generate a disproportionate share of gaming revenues. If these assumptions are correct, then governments will want to be aware of any potential relationship between Internet gambling and problem gambling, prior to considering the further legalization and regulation of Internet gambling opportunities. It is our goal in the present study to shed light upon this potential relationship. Using survey data from an online questionnaire, we explore the nature and dynamics of problem gambling among 1920 Internet gamblers, primarily from the USA and Canada. In light of our findings, and bearing in mind recommendations made by other gambling researchers, we conclude this study with a discussion of issues and cautions, which governments might heed in the event that they craft and implement Internet gambling policies.

Literature Review

Problem Gambling and Internet Gambling

Since the beginning of widespread introduction of the Internet into domestic settings, the number of online gaming sites has increased at a staggering rate each year. In May 1998, there were approximately 90 online casinos, 39 lotteries, 8 online bingos, and 53 sport books (Basham and White, 2002). Within a year, those figures had increased to 250 online casinos, 64 lotteries, 20 bingos, and 139 sports books (Auriemma and Lahey, 1999; Basham and White, 2002). In 2001, hundreds of millions of people had convenient Internet access, and these people were able to explore upwards of 1400 different online gambling sites (Kelly et al, 2001). The vast majority of these Internet gambling sites are located off of North American shores, with a large concentration in Antigua (Cabot, 2001).

Although online gambling opportunities are both abundant and easily accessible, the prevalence of Internet gambling appears to be relatively low. For example, recent Canadian studies consistently report that between 0.2% to 0.5% of Canadian adults have gambled on the Internet (Alberta Gaming and Liquor Commission, 2001; Azmier, 2000; Brown et al, 2002; Kelly et al, 2001; Smith and Wynne, 2002). Studies conducted in American jurisdictions tend to mirror the low rates of problem gambling observed in Canada. In a recent study of employees at an American university, Ptery and Mallya (2004) found an Internet gambling prevalence rate of only 1.2%. Even lower rates were observed in a US national gambling survey, where Welte et al (2002) found an Internet gambling prevalence rate of only 0.3%. Moreover, even in countries where Internet gambling is legalized and regulated by the government, it appears that only a small proportion of the population actually gambles online. Studies conducted in the UK, for example, find that 1% of UK citizens have gambled on the Internet (Griffiths, 2001), with similar prevalence rates found in New Zealand (Amey, 2001).

The proportion of North Americans who can be classified as “problem gamblers” is relatively small. A meta-analysis of all available North American prevalence studies indicates that approximately 4.0% of adults meet criteria for problem or pathological gambling in the past year (Shaffer et al., 1997; Shaffer & Hall, 2001). While this relatively low rate of problem gambling may not be cause for serious alarm to many observers, this small proportion yields substantially more problematic implications when viewed in light of the problem gambling prevalence rate among people who gamble on

the Internet. Recent research suggests that Internet gamblers, compared to non-Internet gamblers, are more likely to be suffering from a gambling problem and are also at greater risk of developing one (Azmir, 2000; Hammer, 2001). In a study of disordered gambling among university students, for example, Ladd and Petry (2002) find that Internet gamblers were more likely to have substantially higher scores on the South Oaks Gambling Screen (SOGS), compared to non-Internet gamblers. Similarly, another recent study found that the mean SOGS score (7.8) for Internet gamblers is over 4 times higher than the mean SOGS score (1.8) for non-Internet gamblers (The Wager, 2002).

While there certainly appears to be a relationship between problem gambling and Internet gambling, it is unclear to what extent Internet gambling actually leads to problem gambling as opposed to gamblers with pre-existing problems being attracted to the Internet (Shaffer, 1996). Recent research, however, suggests that Internet gambling sites may provide both a unique interface and an overall experience that facilitates the emergence of a gambling problem, where none might have emerged otherwise (Griffiths, 2003; Griffiths and Parke, 2000; LaRose et al 2001). More specifically, according to many observers, problem gambling may be facilitated by the nature of the Internet gambling interface and experience, which is convenient, easily accessible, anonymous, immersive, and potentially more affordable (Griffiths, 2003; Griffiths and Parke, 2002; Griffiths and Wood, 2000).

Illustrating the immersive qualities of Internet gambling, for example, computer use may accelerate the subjective passage of time (Shaffer, 1996) due to the visual, aural, and tactile qualities of the Internet gambling interface (Griffiths, 1996). Additionally, the convenience and comfort of home Internet access may lead to a higher than normal frequency of play (Griffiths and Wood, 2000). Combined together, the potential frequency and play-length associated with Internet gambling may result in greater than normal gambling losses. This may especially be the case if the psychological value of electronic cash is less than that of real cash (Griffiths and Wood, 2000). Greater than normal losses might also be facilitated by online gamblers' perceptions that online venues provide better pay-outs than land-based venues. Researchers have recently determined, however, that many online gaming sites inflate pay-out rates during demo sessions, but do not maintain the same rates during regular play (Sevigny, et al, in press). Not only do such practices foster the illusion that gamblers have a better chance of winning online, but they also increase the chance that online gamblers will experience a hypothetical "big win" during demo sessions. This might not be a cause for concern, were it not for the well-established fact that experiencing a big win, early on in one's gambling career, is highly correlated with the development of future gambling problems. Compounding this potentially problematic link between Internet gambling and problem gambling, it seems that very few Internet gambling sites incorporate safeguards to promote responsible gambling among their online patrons (Smeaton and Griffiths, 2004).

Methodology

Research Questions

In light of our review of the current literature, the present study explores the following research questions:

1. *To what extent do Internet gamblers manifest a propensity for problem gambling?*
2. *What, if any, are the correlates and predictors of problem gambling among Internet gamblers?*
3. *In the event of an observed relationship between problem and Internet gambling, how might governments best craft Internet gambling policies that minimize the relationship?*

Sampling at Online Gambling Sites

Using random digit dial methods, many past studies of gambling among general populations have generated extremely small samples of Internet gamblers. Indeed, it is not uncommon to see gambling prevalence studies, with sample sizes in the thousands, obtain data from only a few Internet gamblers. Thus, in order to obtain a sufficiently large sample we felt it necessary to pursue an alternate recruitment strategy. To this end, we recruited Internet gamblers at the very gaming sites that they frequent. When conducting an Internet search for online gaming sites, most individuals will be directed to gaming site portals rather than individual sites. Portals are web pages containing links to multiple online gambling sites, and it is common for portals to contain banner advertisements (468x60 pixels) centred near the top of the page. We paid to have such banner advertisements placed for a period of five months, on three Internet gambling portals. Anyone who clicked on the banner ad would be immediately linked to an online survey that we constructed (the nature of the survey will be explained below). In order to increase potential respondents' exposure to the banner ad, a pop-up window, also containing a link, emerged when people attempted to exit or close the portal home pages. As an incentive for participation, the banner and pop-up ads offered a free gift for everyone completing the survey. The gift was a plastic coin collector for managing coins and tokens collected from slot machines. The value of the gift was \$3.99 US. We felt that such a gift would be of interest to gamblers, but was not of sufficient value to cause multiple survey submissions, nor of sufficient value to constitute a form of coercion. Using this recruitment technique, we obtained usable surveys from 1920 Internet gamblers.

As we mentioned earlier, there are literally hundreds of online gaming sites and portals. The three that we chose appeared to be similar to the typical gaming portal that one encounters in an online search. The portal home pages appeared to be professionally designed and maintained, contained a number of colourful and prominent advertisements (of which ours was one), and featured links to various online casinos and gambling information pages. It should be noted, however, that many owners / managers of online gaming portals are not very receptive to the idea of researchers "bothering" their patrons for the purposes of research. Indeed, anyone who has tried to recruit gamblers even at land-based casinos will likely have encountered the same sort of resistance. Thus, our choice of online gaming portals was obviously constrained by the fact that very few site managers agreed to place our advertisements on their websites. Nonetheless, as we mentioned, we are reasonably confident that our chosen sites were highly typical in nature.

Online Survey

The online survey was constructed and maintained by the *University of Lethbridge, Curriculum Re-Development Centre*, and was designed such that data from completed questionnaires was submitted directly to a Microsoft Excel data base, located and maintained on a server at the University of Lethbridge. Completion of the survey required respondents to possess a reading and writing knowledge of English. The survey comprised 46 closed and open-ended questions, divided into several distinct sections. The survey required approximately 10 minutes to complete. The survey and data base were constructed in such a way that no individual person could be matched to any particular survey that was submitted. In order to minimize repeat responses, a “cookie” was built into the survey, such that those who attempted to repeat the survey would be politely denied access and reminded that they had already completed the survey once before. It is, of course, possible for people to remove cookies from their computer hard drive. But, in order to receive a free gift, people were required to submit a name and a mailing address. Thus, we were able to scan our data base for multiple entries of the same name and/or address. Of the 1844 surveys that were submitted with contact information (for the free gift) only 38, or 2.06% were “multiple submissions.” Due to ethical considerations, whereby we constructed the survey such that individuals could not be matched to their submitted surveys, it was not possible to eliminate these 38 surveys from the database. However, given that they constitute such a small proportion of all surveys submitted, we believe these multiple responses have an insignificant effect on the aggregate results of the survey.

Recent research suggests that response-rates for Internet-based surveys can be lowered by peoples’ perceptions of privacy risks or expectations of future unwanted email solicitations (Cho and LaRose, 1999). Indeed, even the casual user likely will be familiar with the frustration of receiving unsolicited email, or “spam.” In anticipation of a similar potential problem, we made considerable efforts to immediately assure all respondents of their anonymity, as well as the confidentiality of any information that they provide. Moreover, we explicitly guaranteed respondents that their participation would not result in unexpected or unwanted email solicitations in the future.

The first segment of the survey asked respondents about demographic information. This included gender, age, country of residence, marital status, ethnicity, religion, employment status, occupation, and disability status. The second segment of the survey asked respondents about the nature of their Internet gaming activity. This included questions about preferred games, preferred gaming days, preferred hours, preference between Internet versus land-based casinos, and location while gambling online (home versus work). Finally, and of particular importance to the present article, respondents completed the short version of the Canadian Problem Gambling Index (CPGI), in order to determine their level of problem-gambling behavior (see Appendix A).

The CPGI is a well validated instrument that produces high levels of reliability and validity (Ferris and Wynne, 2001). The short version of the CPGI is comprised of nine easily scored questions, which classify respondents into one of four gambling behavior categories: 1) non-problem gambler; 2) low-risk gambler; 3) moderate-risk gambler; 4) problem gambler. Relative to the long version, the short CPGI does not include questions about gambling opportunities specific only to a Canadian context.

Instead, the nine questions on the short CPGI focus on individuals' experiences of their gambling behavior and others' reactions to it. Consequently, the short CPGI allows us to gauge problem gambling among all populations of gamblers, without confusing international respondents with references to Canadian-specific gambling opportunities and issues. Moreover, by using the short version we are better able to keep the survey to a reasonable length, and thereby guard against excessive attrition by participants.

Individual CPGI items are scored as 0, 1, 2, or 3. Individual scores on the nine items are then added, to generate an overall score between 0 and 27. People who score zero are classified as non-problem gamblers, those who score 1 to 2 are classified as low risk, those who score 3 to 7 are scored as moderate risk, and those who score over 8 are classified as problem gamblers. While the CPGI has indeed been well-validated by past research, some contemporary scholars observe that the scale could benefit with some revision of the CPGI category descriptors (see Williams and Wood, 2004a). Specifically, in order to score 3 on the CPGI, respondents must report at least some problematic experience in their lives which results from their gambling behavior. Thus, a score of 3 to 7 actually reflects problem gambling behavior, albeit at a relatively less severe level. Moreover, also supporting the need for some level of change in the CPGI category descriptors, people who score in the 3 to 7 moderate risk category on the CPGI tend to score in the "problem gambling" category on the South Oaks Gambling Screen (SOGS), which is used for diagnosing gambling problems in clinical settings (Williams and Wood, 2004a). Thus, we do not modify the actual CPGI scale in any way, but for the purposes of this study all people who score 3+ on the CPGI are classified as some level of problem gambler. Specifically, people scoring zero are classified as non-problem gamblers, those who score 1 to 2 are classified as at risk, those who score 3 to 7 are classified as moderate problem gamblers, and those who score 8+ are classified as severe problem gamblers.

Should We Trust Online Surveys?

In past years, many scholars have questioned the validity of Internet-administered surveys. However, substantial evidence suggests that online surveys, when properly conducted, generate data that is just as valid, if not more so, than data collected using traditional forms of data collection (see Brohn, 2001; Lipsitz et al, 2001; Miller et al, 2002; Treuer et al, 2001; Van Der Heijden et al, 2000; Witte et al, 2000). Indeed, recent research, published in the top tier psychology journal, *American Psychologist*, finds that many concerns about online surveys are rooted in a series of misconceptions. In particular, Gosling et al. (2004) concludes that: 1) Internet samples tend to be more diverse than traditional samples, in many domains; 2) Web based questionnaires do not have a greater propensity to generate frivolous responses; 3) Steps can be easily taken by Internet researchers to eliminate repeat responses; and 4) Internet data are often just as valid, if not more so, than data collected via "traditional methods."

Further research suggests that Internet based modes of data collection may be especially effective for researching highly sensitive issues. When dealing with issues such as problem gambling, respondents may be inclined to distort or mask their responses in order to create a socially desirable presentation of self. Such instances of impression management can be particularly problematic in face-to-face or over-the-phone interviews. Thus, others who have conducted research into sensitive issues have found that self-administered, computer-based, questionnaires tend to produce more valid results than

researcher administered questionnaires (Brohn, 2001; Lipsitz et al, 2001; Miller et al, 2002; Treuer et al, 2001; Van Der Heijden et al, 2000). In light of the fact that Internet surveys afford the respondent near total anonymity, thus reducing the need for impression management, we feel confident in having minimized the odds that our respondents would provide non serious or untrue answers to the survey questions.

In sum, we cannot say with certainty that our sample is representative of all Internet gamblers. Nonetheless, we can say that the respondents were recruited from typical online gambling sites, and that repeat responses were minimized, and that we are confident the computer-administered format of the survey actually increased the validity of responses. Moreover, as we outline further into this paper, our sample is highly diverse in terms of respondents' demographic characteristics, Internet use, and gambling activity. Thus, especially in terms of inter-group comparison, we feel that we can draw relatively valid conclusions about the propensity for problem gambling among Internet gamblers.

Ethical Issues

Since this study deals with potentially pathological, and in some cases illegal, behavior, it was especially important to be attuned to any ethical implications associated with conducting the research. Prior to beginning the questionnaire, all participants encountered a home page where they were briefed about the general nature and research goals of the study, and where they were reminded about the voluntary nature of their participation. This home page also contained contact information for the primary researcher, in the event that participants had further questions about the study. All participants were assured of complete anonymity in any subsequent research reports or publications, and all potentially identifying information (such as names and addresses for receipt of the free gift) was kept strictly confidential. This information was destroyed after the research process had ended. Moreover, as we explained earlier, our database was constructed in such a way that no individual could be matched with any particular survey that was submitted. The survey home page also included a link to the official home page for *Gambler's Anonymous* (which contained contact information for *Gambler's Anonymous* chapters throughout the world) in anticipation that some respondents would be problem gamblers looking for help to address their problems.

Findings

Demographic Characteristics

In terms of gender composition, our sample was comprised of 56% men and 44% women (see Table 1). The average age of respondents was 34 years, with a range of 18 years to 84 years. Relatively consistent with other studies' estimations of the proportion of online wagers placed in different countries, 87% of the sample originated from the USA, 10% from Canada, and only 3% from all other countries combined. When asked about their ethnic background (which differs from nationality), 40.6% claimed to be of European ancestry, 11.4% were of East Asian ancestry, and only 1.7% identified themselves with an African ethnic background. In terms of employment, 79.5% reported that they were employed at some time during the past year. However, only 41.7% claim to be currently employed. Interestingly, 12.3% of the sample described themselves as "disabled," thereby implying that issues of access and physical environment may play a

role in prompting at least some people to gamble online, as opposed to gambling in land-based venues.¹ Only 45.1% of the sample was married, with another 12.7% describing themselves as unmarried but living with a partner. Only 5.9% described their marital status as “divorced.” Looking at religiosity, we found that 52.8% of the sample described themselves as religious people. Breaking down self-identified religiosity into denominational affiliation, we found that 31.6% of self-identified religious people claimed to be Catholic Christians, while another 24.6% described themselves as Protestant Christians. Our sample appears also to be a relatively well-educated group of people, with 61.2% claiming to have at least some post-secondary education. Indeed, only 2.5% of our sample reported less than a high school level of education.

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Suggesting that the sample is comprised of relatively computer-savvy individuals, 71.6% either agreed or strongly agreed with the statement, “I have a good deal of knowledge when it comes to using computers.” Furthermore, suggesting a high level of comfort with online transactions, 65.3% either agreed or strongly agreed with the statement, “I feel comfortable buying merchandise or other products on the Internet.” Many of the respondents reported having been active in a number of Internet-based activities over the previous month. Much of this activity involved some form of online communication via email (93.4%), message boards (64.2%), chat rooms (43.9%), and instant messengers (65.2%). In addition to these communication-based activities, many of our respondents reported banking (52.3%) and shopping (70.8%) online in the previous month.

Gambling Behavior

The average weekly amount of time invested in online gambling was five hours, with a median of two hours. Only 4.1% claimed to gamble online in excess of 20 hours per week. Preference for gambling on the Internet over gambling in land-based venues was stated by 73.8% of our sample. The computer most often used for online gambling was located in their own home for 86.6%, whereas 4.3% claimed that their primary gaming computer was located in their workplace. When asked more specifically about workplace gambling, a total of 16.3% indicated they gamble from the workplace either “once in awhile” (13.4%) or “often” (2.9%).

The gamers in our sample appear to involve themselves in a variety of online games, although there are several that are clearly preferred (see Table 2). When asked which games they had ever played online, blackjack was the most widely tried game, with 52.5% claiming to have played it at least once. 49% had tried slot machines, 38.5% had tried video poker, 31.1% had tried bingo, and only 15.8% had tried roulette. When asked which *single* game they played *most often*, respondents selected blackjack (28.3%), slot machines (25.2%), video poker (15.7%), and bingo (12.1%) more frequently than other games.

As the reader will recall, we assessed problem gambling using the short version of the Canadian Problem Gambling Index. People scoring 3 on the CPGI exhibit at least some level of problem gambling behavior, with higher numbers indicating more severe problem levels. Numerous past studies have confirmed the high reliability and validity of the CPGI, and the present study is no exception. When applied to our sample of Internet gamblers, the nine items of the short CPGI produced a Cronbach’s Alpha score of .92, with each item adding to the overall strength of the scale. Among our respondents, the

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mean raw score was 3.9, with a median score of 2.0. Using the CPGI 3+ criteria, an astonishing 42.7% can be classified as either moderate (22.6%) or severe (20.1%) problem gamblers, with a further 23.9% at risk of developing a gambling problem. Only 33.5% of the sample were classified as non-problem gamblers (see Table 3).

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Predictors of Problem Gambling Status

Preliminary cross-tabulations revealed a number of notable differences, in the proportion of problem gamblers, between the different demographic and game play categories (see Tables 1&2, last columns). Thus, we conducted an SPSS 12.0 logistic regression to determine exactly which characteristics differentiated problem from non-problem gamblers. Eleven predictor variables were selected: time spent gambling, type of game most often played, age, marital status, gender, religious orientation, whether they preferred gambling on the Internet, employment status, having a disability, level of education, and ethnicity. Entry of the variables was simultaneous. After deletion of 267 cases with missing values, data from 1656 individuals were available for analysis: 919 non problem gamblers and 737 problem gamblers. Univariate outliers in age and time spent gambling were winsorized. There was no evidence of nonlinearity in the logit for the continuous predictor variables or multicollinearity among any of the predictor variables.

A test of the full model with all 11 predictors against a constant-only model was statistically reliable, $\chi^2(23, N = 1656) = 235.5, p < .001$, indicating that the 11 predictors, as a set, reliably distinguished between problem gamblers and non problem gamblers. The variance accounted for was small, however, with Nagelkerke $R^2 = .178$. Overall prediction success was a modest 66.7%. Table 4 shows regression coefficients, Wald statistics, and odds ratios for each of the 11 predictors. On an individual basis, the only variables that reliably predicted problem gambling status were: time spent gambling, East Asian ancestry, South Asian Ancestry, African ancestry, a preference for non-Internet gambling, and male gender.

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Greater time spent gambling is not a surprising correlate of problem gambling. Male gender and ethnic minority status are also characteristics that have been well established in the literature (National Research Council, 1999). Most surprising is the fact that problem gamblers in this study prefer land-based gambling over Internet gambling. This finding might lend support to the argument that Internet gambling does not necessarily facilitate problem gambling, but rather problem gamblers naturally gravitate to the Internet as simply one more gambling opportunity. Before drawing any firm conclusions about this potential relationship, however, further research needs to be done into the patterns of problem gamblers' online and land-based gaming activities.

Summary and Recommendations

Characteristics of Internet Gamblers

Relatively little research has been done on Internet gamblers. With a sample size of 1,920, the present study is one of the largest academic studies of Internet gambling yet conducted and provides a unique window onto this population. The results of the present study suggest that North American Internet gamblers come from a highly diverse array of ethnic, religious, educational, marital, gender, and age backgrounds. As a group, the proportion of male Internet gamblers is only slightly higher than the proportion of

females, the majority are under the age of 35, a slight majority claim to be religious, about half are married, and most have at least some post-secondary education. Moreover, among this group of Internet gamblers, the most preferred games were blackjack and slot machines, by a fairly large margin.

These characteristics differ somewhat from those observed in the few other studies of Internet gamblers. Other studies, however, have not focused primarily on North American gamblers, and they typically have been conducted in jurisdictions where Internet gambling is legal and government regulated (see Griffiths, 2001; Woolley, 2003). Contrasting the results of the present study, for example, Woolley's (2003) study of Australian Internet gamblers found a much larger proportion of men (approximately 85%) than women. He also found that the preferred gambling opportunities involved betting on horse racing and sports events, with relatively few people playing at online casinos (Woolley, 2003). It is important to note, however, that Woolley's sampling procedure was biased towards recruiting sports and racing betters, due to various practical constraints. This sampling bias, in turn, could explain the high proportion of men in his sample, assuming that men tend to be more interested than women in horse racing and sporting events.ⁱⁱ

In any case, such inter-study differences should serve as an impetus for further study. Indeed, Internet gambling is available to citizens of most nations around the world. Moreover, a different social climate as well as a different set of regulations regarding Internet gambling characterizes each jurisdiction. Thus, it is reasonable to expect that the characteristics of Internet gamblers will vary, depending on the jurisdiction in which they live, and depending also on the sorts of games they tend to play. In the future, researchers may well turn their efforts to investigating and explaining such inter-jurisdiction and inter-game differences.

Future research might also turn to an exploration of the characteristic differences between people who tend to gamble on the Internet and those who gamble in land-based venues. One of the more recent and prominent Canadian studies, for example, found a gender distribution among land-based gamblers that is roughly similar to that observed in the present study of Internet gamblers (Statistics Canada, 2003b). Revealing some dissimilar results, however, the same Canadian study found an average age of 44 years for land-based gamblers (Statistics Canada, 2003b), while the Internet gamblers in the present study had an average age of only 34 years. The causes of such differences, as well as whether or not such differences are systematic, remain to be investigated in future studies.

Propensity for Problem Gambling

Perhaps the most notable finding of the present study concerns the very high rate of problem gambling among the Internet gamblers in our sample. Using the 3+ cut-off for the CPGI, 42.7% meet criteria for either moderate or severe problem gambling in the past year. By comparison, only 4.0% of adults in North America meet criteria for problem or pathological gambling in the past year (Shaffer et al., 1997; Shaffer & Hall, 2001). Thus, we suggest that the rate of problem gambling among Internet gamblers may be 10 times higher than the rate among the general population. While this difference between Internet and land-based gamblers needs to be examined and verified by future studies, we can nonetheless conclude that Internet gamblers are a high-risk group for

problem gambling. Moreover, certain categories of Internet gamblers, such as males and people from African and Asian ethnic backgrounds, appear to be particularly at risk.

Another pressing concern, which future studies clearly need to address, involves the direction of the apparent link between problem gambling and Internet gambling. In other words, we need to know if Internet gambling (relative to land based gambling) is more likely to lead to a gambling problem, or if problem gamblers are attracted to the Internet as simply one more easily accessible gambling opportunity. In all likelihood, the relationship is operating in both directions. On the one hand, for example, we find that having a preference for land-based gambling is a predictor of problem gambling. This finding could support the argument that problem gamblers gravitate to the Internet. On the other hand, we also find that the amount time spent gambling online is a strong predictor of problem gambling. This finding could support the argument that Internet gambling is facilitating problems where none existed before. In any case, this is a relationship that needs to be investigated in more depth and detail before it can be properly understood.

Policy Suggestions

We work under the assumption that North American governments wish to promote an ethos of responsible gambling among their citizens. In other words, we assume that many governments desire a situation in which citizens have the right to gamble legally, but also in which government sponsored gambling does not facilitate social, psychological, and economical problems for its citizens. Thus, in any jurisdiction where governments are considering legalizing and regulating Internet gambling, it is imperative that those governments also strive to minimize the relationship between Internet gambling and problem gambling. To that end, we offer the following suggestions:

1) *Provide Internet gamblers with feedback about their problem gambling status.* Internet gambling sites should provide gamblers with prominent and easy access to some type of feedback about their problem gambling status. For example, web-pages could include links to online forms, where people can complete the short version of the Canadian Problem Gambling Index. Such feedback may make online gambling patrons more cognizant of the nature of their gambling behavior, and may even have a therapeutic effect, if problem and at-risk gamblers constrain their gambling as a result.

2) *Develop Internet-based treatment and prevention programs.* Given the fact that Internet gamblers tend to also be competent “netizens,” rates of problem gambling could be minimized by the development of an effective and easily accessible web-based problem gambling treatment and prevention program. Although further research needs to be conducted in order to determine how an effective program should be structured and delivered, it is plausible that such initiatives could involve online information about problem gambling, online counseling, and access to online support groups.

3) *Implement controls that regulate access and use.* Future online gambling sites should incorporate controls over the gambling experience, such that the probability of developing a gambling problem is substantially reduced. For example, given that the amount of time one spends gambling is associated with a higher likelihood of being a problem gambler, Internet gambling sites could implement a time and frequency limit for site patrons. Or at very least, sites could incorporate a periodic “warning” once patrons

have exceeded a certain amount of time on the site. Other researchers suggest that problem gambling may also be reduced if sites incorporate a self-imposed credit limit (which can not be easily reversed) or even a self-exclusion program (Smeaton and Griffiths, 2004).

4) *Implement strict controls over advertising and promotion.* Just as many Western governments impose strict controls over the advertising and promotion of substances such as tobacco and alcohol, governments wishing to legalize and regulate Internet gambling must also implement controls over the advertising and promotion of online gambling sites. Governments should take care not to advertise in a way that disproportionately targets, or appeals to, high-risk groups. Moreover, given that there are health risks associated with gambling, information about those risks should also be included in any advertising or promotion efforts. Having made this recommendation, it is important to note that the control of advertising poses unique obstacles in an online world. While it is certainly possible for governments to control traditional modes of advertising (e.g. billboards, magazine advertisements, television commercials) in their own jurisdictions, it is far more difficult and perhaps even impossible to control online advertisements which originate from other jurisdictions. Future research may be needed to assess how such obstacles might be overcome.

Conclusion

Observers predict that various North American governments, in the United States and Canada, will move to legalize and regulate Internet gambling opportunities in the relatively near future. Indeed, there are strong economic rationales for doing so, and a number of other Western societies have already legalized Internet gambling opportunities for their citizens. If governments do move to legalize and regulate Internet gambling in the future, it is imperative that they adequately address the relationship between problem gambling and Internet gambling. As the present study suggests, with Internet gamblers potentially being 10 times more likely to have a gambling problem than other gamblers, this relationship is rather substantial. Thus, if governments wish to expand gambling operations to the Internet, they must take care to do so in a way that does not exacerbate, and take advantage of, the problem gambling behavior of these high risk groups.

While we have made several policy recommendations that might impact the relationship between problem gambling and Internet gambling, it is clear that substantially more research needs to be conducted on the prevention of problem gambling among Internet gamblers. Those who gamble on the Internet are not representative of the broader population of gamblers. Thus, we can not simply assume that the awareness and prevention initiatives, which may work for “mainstream” gamblers, will also work for Internet gamblers. Ease of access, potential frequency of play, potential length of play, and the immersive qualities of the Internet medium itself, all may pose a unique set of challenges, along with a unique set of opportunities, for crafting effective problem gambling awareness and prevention programs for Internet gamblers.

In addition to conducting further research into problem gambling prevention, we also urge researchers to continue to explore the prevalence rates of problem gambling among different populations of Internet gamblers. The biggest challenge to such projects will be generating sufficiently large samples, which are highly representative of Internet gamblers. Random digit dial surveys, as they have been executed in the past, consistently

have produced very low numbers of Internet gamblers. Online surveys may remedy this deficiency to some extent, insofar as they produce substantially larger and relatively diverse samples. Unfortunately, however, online surveys also seem to be limited to samples that are self-selected, and the representativeness of such samples may be impacted as a result. In any case, both of these recruitment techniques likely retain much untapped potential, and we urge other researchers to continue exploring that potential, with the goal of achieving highly valid estimates of the rate, nature, and dynamics of problem Internet gambling. We trust that the present study has at least taken us a step in that direction.

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Table 1: Demographic Characteristics (N=1920)		
Category	Percentage of Sample	Percentage of Problem Gamblers in Category
<i>Gender</i>		
Male	55.8	49.4
Female	44.2	34.2
<i>Age</i>		
18-19	7.5	57.2
20-24	21.1	53.3
25-29	16.0	46.2
30-34	14.5	39.7
35-39	12.2	36.1
40-44	9.8	32.4
45-49	8.2	33.3
50-54	5.4	33.0
55-59	3.0	33.3
60+	2.2	36.6
<i>Nationality</i>		
USA	86.8	43.3
Canada	10.1	34.1
Other	2.8	55.8

<i>Ethnicity (Ancestry)</i>		
Aboriginal	2.1	40.0
African	1.7	81.3
Caribbean	1.3	62.5
East Asian	11.4	60.3
European	40.6	36.3
Latin American	3.0	46.4
Middle Eastern	1.4	58.3
Polynesian	0.4	42.9
South Asian	4.8	55.4
Other	33.6	36.0
<i>Marital Status</i>		
Married	45.1	34.9
Living with partner	12.7	46.0
Divorced	5.9	47.8
Widowed	1.6	24.1
Single / Dating	17.7	55.5
Single / Not Dating	17.1	47.4
<i>Education</i>		
Less than high school	2.5	52.2
High school	36.3	39.4
Trade/Technical School	17.4	37.2
Bachelor's Degree	31.1	45.4
Graduate Degree	9.5	53.5
Professional Degree	3.2	42.3
<i>Religiosity</i>		
No	47.2	47.3
Yes	52.8	39.0
<i>Religion</i> (% of religious people)		
Agnostic	2.6	32.1
Buddhist	3.6	71.1
Catholic	31.6	40.3
Hindu	2.3	60.0
Jewish	4.7	48.0
Latter-Day-Saints	1.9	42.1
Muslim	0.9	60.0
Orthodox	1.3	50.0
Pagan	2.0	28.6
Protestant	24.6	33.3
Other	24.4	36.9
<i>Currently Employed</i>		
Yes	41.7	37.7
No	58.3	46.5
<i>Disability Status</i>		
Disabled	12.3	40.4
Not Disabled	87.7	43.0

Table 2: Game Preference			
	% Ever Played	% Most often Played	% Problem Gamblers by Game Most Often Played
Baccarat	5.2	1.2	76.2
Bingo	31.1	12.1	32.5
Blackjack	52.5	28.3	47.8
Caribbean Poker	9.2	2.4	66.7
Craps	10.8	2.7	61.7
Keno	12.8	2.3	58.5
Pai Gow Poker	7.2	1.5	70.4
Roulette	15.8	2.5	46.7
Slot Machines	49.0	25.2	38.2
Sports Betting	12.3	6.2	48.6
Video Poker	38.5	15.7	41.3

Table 3: Problem Gambling Prevalence		
	Frequency	Percentage
Non Problem Gambler	629	33.5
At Risk Gambler	449	23.9
Moderate Problem Gambler	425	22.6
Severe Problem Gambler	377	20.1
Total	1880	100.0
No Response	40	
Total	1920	

Table 4: Logistic Regression Model of Problem Gambling			
Variable	Regression Coefficients (B)	Wald Statistics	Odds Ratios
Time Spent Gambling	.05	38.8**	1.1
East Asian Ancestry	1.18	34.2**	3.3
Prefer Internet Gambling	-.53	18.3**	.6
African Ancestry	2.0	15.6**	7.6
Male Gender	.43	11.9**	1.5
South Asian Ancestry	.64	6.1*	1.9
Age	-.01	3.1	1.0
Marital Status	-.21	3.1	.8
Employment	.21	2.9	1.2
Middle Eastern Ancestry	.71	2.2	2.0
Caribbean Ancestry	.69	2.0	2.0
Dice most often Played	.65	1.8	1.9
Latin American Ancestry	.43	1.7	1.5
Aboriginal Ancestry	.40	1.0	1.5
Cards most often Played	.25	.6	1.3
Slots or VLTs most often Played	.22	.4	1.2
Religious	-.07	.3	.9
Educational Level	.02	.2	1.0
European Ancestry	-.05	.2	.9
Disability	-.04	.1	1.0
Polynesian Ancestry	.29	.1	1.3
Sports Betting most often Played	.13	.1	1.1
Keno or Bingo most often Played	.01	0	1.0
CONSTANT	-.48	1.1	.6

* $p < .05$

** $p < .01$

Endnotes

ⁱ This relationship, however, is only speculative at this point. Subsequent research might better address this potential relationship by comparing rates of disability among land-based versus Internet gamblers.

ⁱⁱ Having critiqued Wooley's study, it is only fair to reflexively offer a critique of our own study, which could be biased towards online casino gamblers, thereby tending to exclude those who place sports and horse-racing wagers online.