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JOURNAL OF GAMBLING ISSUES

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Formerly the *Electronic Journal of Gambling Issues: eGambling* (*EJGI*)

JOURNAL OF GAMBLING ISSUES

intro

New name, new Advisory Board, new ethics guidelines

This is our 11th issue and it brings happy changes. Our Editorial Board unanimously voted for a name change and we are now the *Journal of Gambling Issues* (*JGI)*. The change reflects the normalization of electronic publishing.

We warmly welcome the 17 clinicians and researchers who form the new international Advisory Board for the *JGI.* We invited them to advise us on policies and content and to alert us to strategic publishing possibilities (specific topics, special issues, and notable emerging researchers, clinicians, and authors). In everyday language, they will tell us about our shortcomings and notify us about opportunities in gambling topics, research, and clinical approaches. Their names and affiliations are given below.

Standards in scholarly publishing are in flux and the threshold for acceptable ethical practice rises constantly. Editorial policies that were considered progressive 10 years ago might now be seen as bordering on neglect. Some medical journals have taken the lead in requiring greater openness and transparency by authors of peer-reviewed articles with regard to their participation (Who was specifically involved in which areas of research and analysis? Who wrote which parts of the article?), funding, and potential competing interests (Do authors have financial involvements or memberships that could potentially be seen to bias their involvement?). The *JGI* Editorial Board unanimously adopted ethical guidelines that were developed by the International Society of Addiction Journal Editors (ISAJE) and summarized in the Farmington Consensus. This brief ethics statement sets out the current standards for ethical publishing practices for research in addictions. It now constitutes our guide in publishing a journal that is current in terms of scholarly openness and accountability.

Beginning with this issue, all articles will have information to help readers know where the authors stand in terms of their commitments. Even articles that are not peer reviewed and letters to the editor will have statements of the authors' competing interests. Peer-reviewed articles will have statements on (a) each author's role in producing the article, (b) competing interests for

each author, (c) details of the ethics-approval process for projects involving human or animal subjects, and (d) the funding that allowed the article to be written. For the sake of openness, a future *JGI* editorial will describe the process of article submission, peer review, acceptance, and publication at the *JGI.*

For the ISAJE statement on publishing ethics and the Farmington Consensus as adopted by *JGI,* please see http://www.isaje.net/ and click on "Publishing Ethics" — the ninth item in the left-hand margin. This site also has interesting information about ISAJE.

In line with this policy of openness, the editor makes this declaration:

Statement of competing interests: The editor is an employee of the Centre for Addiction and Mental Health, Toronto, Canada.

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Please contact us with your comments about the *JGI:* Phil_Lange@camh.net.

Statement of purpose

The *Journal of Gambling Issues* (*JGI*) offers an Internet-based forum for developments in gambling-related research, policy and treatment as well as personal accounts about gambling and gambling behaviour. Through publishing peer-reviewed articles about gambling as a social phenomenon and the prevention and treatment of gambling problems, it is our aim is to help make sense of how gambling affects us all.

The *JGI* is published by the Centre for Addiction and Mental Health and is fully funded by the Ontario Substance Abuse Bureau of the Ministry of Health and Long-Term Care. We welcome manuscripts submitted by researchers and clinicians, people involved in gambling as players, and family and friends of gamblers.

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Canada

Design staff
Graphic Designer: **Mara Korkola,** *Centre for Addiction and Mental Health, Toronto, Ontario, Canada*

HTML Markup & Programming: **Bernie Monette**, *InterActive Arts www.iaai.ca, Toronto, Ontario, Canada*

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Editorial Contact: phil_lange@camh.net
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JOURNAL OF GAMBLING ISSUES

feature

[This article prints out to about 42 pages]

How do slot machines and other electronic gambling machines actually work?

Nigel Turner Centre for Addiction and Mental Health Toronto, Ontario, Canada
E-mail: Nigel_Turner@camh.net

Roger Horbay Game Planit Interactive Corp. Elora, Ontario, Canada

Abstract

Slot machines and other electronic gambling machines (EGMs) are gambling devices that offer a variety of games. They are inexpensive to run, which makes it possible for casinos to offer low-stakes betting to a large number of customers. As a result, they have become the most profitable form of gambling. EGMs are found at casinos, on cruise boats, at racetracks, at local bars, and even at corner stores. Slot machines and other EGMs seem to attract a lot of myths. This is partly because of a lack of accurate information on how the machines work and partly due to the design of the machines. In this paper, we will discuss how slot machines really work. Our goal is to demystify the machines in order to demystify the games. We will also discuss some of the myths about slot machines. This paper is intended to serve as a resource for counsellors and prevention workers in the field of problem gambling. It is also intended for people in the general public who wish to understand slot machines. [Keywords: slot machines, problem gambling, random]

Introduction

Slot machines and other electronic gambling machines (EGMs) are gambling devices that offer a variety of games. EGMs are found at casinos, on cruise boats, at racetracks, and, in some provinces and states, in local bars and corner stores. There are three main varieties of EGMs: slot machines, video slots, and video poker. These machines are inexpensive to run compared to roulette or blackjack games, which makes it possible for casinos to offer low-stakes betting to a large number of customers. As a

result, they have become the most profitable form of gambling. A recent report from Statistics Canada (2003) indicates that EGMs outside of casinos (e.g., video lottery terminals (VLTs) in bars and slot machines at racetracks) took in a total of $4.5 billion in 2002, or 40% of the total revenue from noncharity gambling in Canada. In addition, slots accounted for 80% (KPMG, 2003) of the revenue from casinos in 2002, or an additional $3 billion in casino slot revenue, bringing the total revenue from EGMs in Canada to over $7.5 billion. The purpose of this paper is to examine how EGMs work and to address some of the most common misunderstandings about these machines.

For the most part, very little accurate information is available from the gambling industry on how EGMs work. AGMMA's (2000) recent booklet on EGMs is an exception to this comment. However, even it falls well short of full disclosure about the machines. Information is available from numerous "how-to-gamble" books, videos, and Web sites. While some of these are remarkably accurate, others are filled with misinformation about gambling (see Turner, Fritz, & Mackenzie, 2003, for some examples).

It is difficult for the consumer to distinguish between accurate and inaccurate information (see Turner et al., 2003). In the absence of easily accessible and accurate information, people tend to create their own beliefs about how things work. When these ideas are shared, they take on a life of their own as myths. Eventually, these myths are written down in "how-to" books or Web sites. Once written, the myths seem to become fact. EGMs seem to attract a lot of these myths. The mythification of slots may be due to the way the machines are designed. Mythification may be the basis of many of the great works of literature, but, in the case of gambling, it is the source of much misery. In this paper, we will explain how slot machines really work, and we will discuss and debunk some of the related myths.

The paper is divided into five parts. First, we briefly describe the types of electronic games available. Second, we show that problems with human reasoning are a source of myths about electronic gambling. Third, we present a technical description of how the machines work. The fourth part contains a series of questions and answers about slot machines. Finally, in the fifth part, we list and debunk common myths about the machines. The focus of the paper is EGMs, but, from time to time, we will draw analogies from other forms of gambling to highlight the fact that many of the issues that arise with EGMs are also true with other forms of gambling.

EGMs

Slot Machines

The basic game of a slot machine involves setting three or more reels into motion. In many modern slot machines, the reels are simply computer-generated pictures of simulated reels, but the essential game is the same. Typically, if all three reels match when they stop moving, the player wins, but other combinations can also lead to a prize (e.g., one cherry). Common symbols include lemons, cherries, lucky sevens, and diamonds. The amount of the win is inversely related to the probability of a symbol coming up on the payline. However, there is very little relationship between the number of pictures on the reel and the probability of a particular symbol landing on the payline. The wins and the player's remaining credits are displayed using a small LED screen (a matrix of little red dots). If the player has won more than the machine can pay out, a light on top of the machine usually flashes, notifying the casino of a big win. The remainder of the win is paid by cheque.

The payout of the slot is determined by the mathematical structure of the game, not by how recently the machine has paid out. Game structures are very complex and, as a result, the odds against winning on most EGMs are hidden from the player. In Ontario, most slot machines have actual reels. However, some casinos have video slots (also called VLTs) with simulated reels that appear on a video screen. The introduction of video slots allows the game manufacturer a much greater degree of freedom in the structure of the game. Many video slots have bonus features that come up if certain combinations occur. Bonus features are not new. Reel slots have always had bonus features run either by a separate wheel or oversized dice located at the top of the machine or through a separate display screen that is activated when a bonus feature occurs. The advantage of video slots, however, is that upgrading the program or replacing it with a new game is easier. In our view, slot lineup games presented on a video screen and slots with reels are essentially the same, except that video slots offer a greater variety of wagers (nickel machines range from 1 to 45 coins) and bonus features.

Video poker

Video poker is a completely different game than slots. It is based on five-card-draw poker played against the machine. Players win if they get certain combinations of cards, such as three of a kind (e.g., 4-4-K-4-7) or a flush (e.g., five hearts). Players press a deal button, select the cards they want to keep by pressing a hold button, and then press deal to replace the rest of the cards. Typically, players only get one draw per hand. Some versions include wildcards (e.g., the joker or deuce), which are worth any value needed to complete a hand. The computer calculates the

highest hand present and pays credits that are inversely related to the odds of a particular hand coming up. A flush might pay five credits for every credit bet while a full house might pay eight.

Video poker is different from slots in two main respects. First, the probabilities of the game are based on a simulated deck of cards, so that players can actually compute the probability of winning based on their knowledge of the cards. For example, if you have four hearts and one spade, you can estimate that the chance of getting a flush if you replace the spade is 19% (9/47). Second, you have an option to choose which card to hold, which means that there is an element of skill in the game. For example, with Jacks or Better video poker, say a player has a pair of tens, but also has a flush draw (e.g., four hearts). Taking into account the probability and payout for various hands, the player would be better off throwing away the ten and drawing for a flush than throwing away the three hearts to draw for two pairs or three of a kind (see http://www.wizardofodds.com for a discussion). However, if the player has a pair of jacks, he or she is better off keeping the jacks and throwing away the flush draw (http://www.gamblecraft.com/review/videopok/jbstrat.htm). While some of the rules of play seem self-evident, optimal play actually involves memorizing a fairly large number of conditional rules. Thus, players who study the game and make probability-based choices can improve their success. However, skill in video poker does not usually allow players to overcome the house edge. Skilled players might lose at a rate of 1% per bet, whereas less-skilled players might lose at a rate of perhaps 10% per bet. Exact figures for skilled and unskilled would depend on a player's level of skill and the particular machine played. Note that there are apparently video poker games where an optimal strategy would allow the player to break even or even beat the house. Evaluating the accuracy of this claim is beyond the scope of this paper (but go to http://www.gamblecraft.com/review/videopok/index.htm). However, on most video poker machines, even expert players are playing against a house edge.

Video lottery machines

There is a great deal of confusion about the nature of VLTs. People often use the term VLT when referring to video poker or video slots located in a casino. There are four main differences between a VLT and a video slot machine. First, in some jurisdictions, the outcome of the games on a VLT is determined by a central determination system rather than the individual machine. This is in fact why they are called video lottery "terminals." This distinction might have important legal implications in terms of whether a VLT is classed as a slot machine or a lottery, but is irrelevant in terms of the gambler's experience. Second, VLTs in Canada are often multi-game platforms that offer slot games,

video poker, and sometimes a variety of other games such as video blackjack or keno. The range of games offered means that VLTs may appeal to a broader range of players than single-game slot machines. Slot games played on a VLT are largely the same as video slots on a stand-alone machine. Video poker on a VLT is essentially the same as video poker on a dedicated video poker machine. As described above, slot lineup games and video poker are quite different. One is a game of pure chance, the other a game with some skill elements. When discussing machine gambling with a client, it may be important to know the type of game played. Telling a VLT player who only plays video poker on the VLT that the game involves no skill could interfere with therapy by undermining the credibility of the counsellor (the focus with video poker should be on the limits of skill). Third, VLTs are often located in bars and corner stores — areas that are more easily accessible. Single-game machines (slots or video poker) make up the majority of machines offered in casinos in Canada, but multigame platforms can be found in Las Vegas casinos. The multigame nature of VLTs is likely due to the pragmatic need to offer a variety of games in a setting with only a small number of machines. Fourth, wins from VLTs in Canada are usually paid with vouchers, whereas slot wins are paid with coins. However, both accumulate credits until a "cash-out" button is pressed.

Global variations

Gambling is a multinational industry that is regulated locally. As a result, there are regional variations in the games that are available and the regulations that control them. Fruit machines in the United Kingdom, for example, are required by law to pay out a minimum percentage within a short period of time (Parke & Griffiths, 2001). Apparently this regulation came into effect because the bar owners responsible for these machines were worried about potential losses due to the volatility of games (Jonathan Parke, personal communication). According to U.S. patent #6,666,765 (http://www.uspto.gov/patft/index.html):

[British] fruit machines generally use a form of "adaptive logic" wherein coin-in and coin-out is monitored over time and wherein odds/payouts of the fruit machine are proactively adjusted to achieve a target win percentage. Examples of adaptive logic fruit-machines in Great Britain are GB 2 185 612 A and GB 2 087 618 A …. In the United States, the casino game operated with a random number generator must, over all play of the casino game, provide a known player expected return (or house advantage) and the casino game cannot proactively monitor performance and correspondingly adjust play parameters.

As a result, some of the myths about slot machines in North America may in fact be true in the United Kingdom (Griffiths &

Parke, 2003; Parke & Griffiths, 2001). Parke (personal communication), however, recently told us that adaptive logic machines are being phased out as the United Kingdom moves toward adopting North American standards in order to permit larger prizes.

Slots and the limits of human reasoning

Issues, myths, and questions

We suspect that EGMs are the most frequently misunderstood type of gambling. People do not really understand random chance and therefore hold a variety of naive theories and beliefs about random chance and their ability to win in gambling (Wagenaar, 1988; Turner, Littman-Sharp, Zengeneh, & Spence, 2002). In addition, most people do not really understand machines. How often have you seen people swearing at their cars for breaking down or pleading with their computers to give them back their lost or deleted files? People often project animate qualities onto machines. In literature, this is called personification, a type of metaphor that helps us understand and relate to inanimate objects. Slot machines appear to take on the myths of gambling and the myths of machines. When you combine this with the absence of accurate information about how they work, the number of myths is not surprising.

The focus of this paper will be mainly on slot machines, but other forms of EGMs in general will be considered as well.

Erroneous beliefs and gambling

Problem gamblers may have a wide variety of erroneous beliefs about winning (Turner, 2000; Wagenaar, 1988). In fact, most people have a very poor understanding of the nature of random events. However, problem gamblers tend to have more erroneous beliefs than nonproblem gamblers (Turner et al., 2002). Most of these errors are based on a fundamental misunderstanding of the independence of random events. Many problem gamblers, for example, believe that, if a number has not come up recently, it is due to come up. This sort of reasoning actually works in the case of card decks. If you draw three aces out of a deck, your chances of getting a fourth one are pretty small (1/49). Card counting is based on the shift in the probability of specific cards that occurs as cards are drawn without being replaced in the deck. This is called random without replacement. But most random events are very different from a deck of cards. Each spin on a roulette wheel or roll of the dice is completely independent of the previous spin or roll. This is called random with replacement. The random numbers drawn on regulated slot machines and other EGMs in North

America are independently random.

Related to this belief is the view that all random events should look "random," and therefore people underestimate the chances of repeated numbers, sequences, or other patterns occurring. Faced with unusual events such as 10 heads in a row, many people will believe either that the coin has a bias (i.e., bet on heads) or that the coin will now start to show a string of extra tails to balance itself out (i.e., bet on tails). Often these errors are due to a misunderstanding of the nature of long-term outcomes. From interviews with gamblers (Turner et al., 2002), it is clear that many people conceive of the long term as some definite time in the future (e.g., a million flips of the coin) by which the number of heads and tails will have balanced itself out. In reality, the time frame is infinite. In addition, the coin is not balanced out in the long term, but short-term deviation from the expected average gradually becomes watered down. Suppose the first 100 flips of the coin were all heads and then the next 999,900 were perfectly balanced between heads and tails. The initial 100 heads might still be there, but, by the one millionth flip, the difference of 100 would hardly be noticeable. In fact, 3000 more heads than tails would still round off to 50% heads and 50% tails. The difference between heads and tails is not corrected at all, but that difference becomes less noticeable in the long term.

Many of the features of EGMs are poorly understood by problem gamblers, at-risk players, and treatment providers. Therefore, we believe that it is vitally important to understand how the machines work in order to set up effective treatment and prevention programs. However, in considering the nature of slots, we must keep in mind that misunderstanding of randomness is not unique to slots but is a general feature of gambling.

Technical details of a slot machine: Can a machine be random?

Technically, a machine cannot be random. Slot machines in fact are "pseudo"-random. All physical events are deterministic, or caused by something. Mechanical randomizers such as bingo balls, roulette wheels, and dice use the laws of physics to maximize uncertainty. The basis of all random-like events is a combination of complex or nonlinear relationships and initial uncertainty. A roulette wheel spins in one direction and the ball is thrown in the opposite, so there are a huge number of possible paths that the ball could follow around the wheel. The roulette wheel is complex. Nonetheless, it would still be possible to predict where the ball was going to land (which path it would take) if you knew exactly how much effort was put into throwing it and where exactly the ball was relative to the wheel when it was thrown. The

fact that we cannot control or measure exactly how much energy is put into throwing the ball means that the outcome of the roulette wheel is essentially random. In fact, we cannot measure anything exactly (see Orkin, 2000, p. 17). The combination of complexity and uncertainty produces chaos (see Gleick, 1987), and chaos is the basis for randomness. Scientists used to believe that error in measurement only had a trivial effect on prediction, but the study of chaos has shown that a little error when measuring something complex can lead to complete uncertainty and a fundamental inability to predict.

Slot machines are computers, and computers are inherently complex, but they are not uncertain. Slot machines use a random number generator (RNG) to create an erratic sequence of numbers. If the right values are selected for the RNG, the sequence will be virtually unpredictable.

Technical details of the RNG

It is not essential that you understand how the RNG creates "random" numbers, but the following information is provided here for those who are interested. Essentially, our goal is to demystify the nature of slot machines and random numbers. Readers who are not interested in the details of how slots create random events should proceed to the next section of this document.

The RNG in slots uses Lehmer's congruential iteration (for more information see Brysbaert, 1991; Onghena, 1993). In this formula, there are three constant values that are usually set as very large numbers: a multiplier (*a*), an added number (*b*), and a divider also know as the modulus (*m*). The RNG works as follows.

1. Start with a seed number, e.g., time of day.

2. Multiply by one number (*a*) and add another number (*b*).

3. Divide by the modulus (*m*).

4. The remainder is the first random number.

5. Translate this into a number in a useful range, e.g., 0 to 1, 1 to 36, 1 to 516, etc.

6. Use the remainder as the seed for the next number.

In Table 1, we illustrate how this algorithm works with $a = 3$, $b = 5$, $m = 7$, and a starting value (seed) of 12. The values in Table 1 would not produce a very good series of random numbers, but they do illustrate how the algorithm works.

Table 1

Algorithm for generating pseudorandom numbers from 0 to 6

Seed	Times 3 plus 5		Divide by 7	Remainder
12	12 * 3 + 5	= 41	5.857	6
6	6 * 3 + 5	= 23	3.286	2
2	2 * 3 + 5	= 11	1.571	4
4	4 * 3 + 5	= 17	2.429	3
3	3 * 3 + 5	= 14	2.000	0
0	0 * 3 + 5	= 5	0.714	5
5	5 * 3 + 5	= 20	2.857	6
6	6 * 3 + 5	= 23	3.286	2 etc.

The size of the random number will depend on the size of the modulus number. As in the example in Table 1, with a modulus of 7, the possible range of the "random" values is from 0 to 6. The maximum value of the remainder will always be one less than the modulus. The remainder is the raw "random" number. The raw "random" number is translated into a number in a useful range by first dividing it by the modulus number so that it becomes a proportion between 0 and 1. Given a modulus of 7, a remainder of 2 becomes an RNG value of 2/7 = 0.286. If the programmer would like the final range of RNGs to be between 1 and 36, the proportion is multiplied by 36 and rounded off. The value 0.286 times 36 is 10.296, which rounds off to 10. This then is the final number, or "stop," used to determine which image is displayed on the slot machine reel or video screen. The numbers produced by this procedure are not random, but, if produced by a very large modulus (e.g., a number in the billions) and then translated into a reasonably small range (e.g., 1 to 36 or even 1 to 516), are very erratic and difficult to distinguish from numbers in a sequence produced by pure chance.

Random versus pseudorandom

As shown above, the numbers produced by the RNG are not truly random. Mathematicians call them pseudorandom numbers. In fact, it would be a contradiction in terms to compute a random number, because computing means that the number is exactly predictable. But numbers produced by the RNG are difficult to distinguish from truly random numbers (Brysbaert, 1991; Onghena, 1993). Most computerized RNGs are good enough for practical purposes. This algorithm can run at an incredibly rapid speed, churning through thousands of pseudorandom numbers per second (slot simulation exercise 1: see note at end of paper for a slot machine tutorial).

It may be possible in the future that computers will no longer have to rely on Lehmer's congruential iteration to produce pseudorandom numbers. Instead, chips may become widely available that rely more directly on chaotic processes such as turbulence to generate truly random numbers. If this is the case, the technology would change a little, but the fact is that slots would still be just as unpredictable.

As stated above, the inherent limitation of a machine is that it cannot create true uncertainty, only complexity. The RNG always follows exactly the same order. The "random" numbers always go through the same sequence or cycle. If the modulus is a prime number around four billion, then the sequence will not repeat itself until it has run through about four billion numbers. At that length, assuming a 90% payback percentage and a 25-cent bet per spin, one would lose about $33 million trying to wait for the cycle to repeat itself.

Breaking up the cycle

However, even a cycle that is four billion numbers long would still leave the slot machine vulnerable to a clever (and very rich) player determined to beat the game. As stated above, to achieve true randomness, you must have both complexity and uncertainty. The congruential iteration provides a great deal of complexity, but no uncertainty. If you know the first number in the sequence, you know exactly what the next number will be. To add uncertainty, the RNG runs continuously whether or not anyone is playing (slot simulation exercise 1: see note at end of paper for details). The RNG in an EGM runs all the time, but most of these numbers are not used. When the spin button is pressed, the current value of the RNG is "polled." What this means is that the value of the RNG at that millisecond when the spin button is pressed is passed from the RNG to the virtual reel part of the slot program, where the computer calculates which pictures to display.

For a three-reel slot, three numbers are drawn from the RNG and used to determine where to spin the reels. As such, the numbers drawn depend on the exact millisecond when the spin button is pressed. A millisecond later and the outcome of the slot machine will be different. The player does not know how many RNGs were skipped between one button press and the next. As a result, the outcomes of slot machines are in effect random, so waiting for the cycle to repeat itself is not possible. To reiterate, only a small percentage of the RNG numbers are actually used by the slot machine: those numbers that it is generating at the millisecond when the player presses the spin button. Therefore, you never know which part of the cycle you are in, so the result is essentially random.

It must be noted that slot machines and other EGMs are designed according to a number of different specifications. In some cases, several different RNGs may be used; in other cases two RNGs are used (one to determine if the spin will win or lose and another to determine how much to pay out). Details on the implementation of random numbers in slot machine designs can be found by searching through the U.S. patent office's Web site (http://www.uspto.gov/patft/index.html). An advanced search using the phrase "slot machine" found 1391 patents since 1976. The design is presented here not to represent all slot machines, but to help the reader understand how an EGM can create a random experience from pseudorandom numbers and provide the player with a varied gambling experience.

Reel weights

The pictures shown on a slot reel do not necessarily correspond directly to the odds of winning. A symbol might occur twice on the reel, but only land on the payline once every 50 spins. This is accomplished through a process called mapping, determined by a computer inside the slot machine. Each stop on the slot machine's "virtual" reel is equally likely, but more of these virtual reel stops are mapped onto nonpaying symbols (blanks) or low-paying symbols (bars) than onto high-paying symbols (sevens and cherries). Thus, through virtual reel mapping, the outcomes are weighted in favour of low-paying outcomes.

Virtual reel mapping was developed because the number of pictures on the physical reel was limited by the circumference of a reel. If slot manufacturers did not use virtual reel mapping to weight the pictures on the actual reels, they would only be able to offer small prizes. A reel with only 20 symbol stops would have only 8000 possible outcomes. Such reels would be limited to fairly small prizes. Varying the probability of different pictures on the slot machines means that they can have virtually any possible prize structure, including many small to medium prizes with rare huge jackpots. With 516 stops on the virtual reel, the jackpot prize could be as rare as 1 in 137 million ($1/516^3$), which means that the machine could safely offer progressive jackpot prizes as high as $20 million or $30 million and still make a profit in the long term. U.S. Patent #4,448,419 describes the logic of virtual reel mapping, and can be found at http://www.uspto.gov/patft/index.html.

Because of virtual reel mapping, the odds of any picture coming up on a payline are independent of the number of pictures on an actual reel. The reels simply display computer-determined outcomes. The computer tells the reel of pictures where to stop depending on the random selection from the virtual reel positions.

The pictures do not determine what the slot machine will pay out or not; the computer determines where the pictures will stop and when to pay out.

Inside a slot machine is a computer chip with tables of weights called virtual reels. The values generated by the RNG are used to select numbers on the virtual reels, which connect to specific pictures on the actual reels or video-displayed reels. Each virtual reel has a specific number of stops: it could be 32, 64, or as many as 516. Some symbols are linked to a large number of stops; some are linked to very few. Some pictures might not be mapped to any number, meaning that the reel will never stop on that particular spot. The Safe@play slot machine tutorial gives an example of how the virtual reel is "mapped" to the actual reel on a mechanical slot machine (Figure 1). Note that there are only 9 virtual reel positions mapped to "winning" symbols on the actual reel and 20 virtual reel positions mapped to blanks. Also notice how virtual reel positions 24 to 30 map onto stop #12 on the actual reel. Stop #12 is a blank placed between two sevens. This particular figure might be a bit of an exaggeration. However, it clearly illustrates the manner in which virtual reel symbols are mapped onto the physical reel that is then seen by the player. On an actual slot machine, the bias toward nonwinning stops might be more subtle.

A real-life example of differential slot weighting can be found at http://wizardofodds.c o m/game s /slots/slotapx1.html. At that site, Michael Shackleford, "The Wizard of Odds," reports how he spent several hours (4000 spins) recording every symbol from a slot machine and then presents his results in a table. His table illustrates how blanks in particular are more common on the third reel. Also note that the blanks around some symbols (double red seven) came up more often than around other symbols (single bar).

Virtual reel mapping applies specifically to three-reel slot machines. Five-reel video slots are so incredibly complex, with so many paylines (up to nine crisscrossing), that it is difficult to see what advantage the casino would gain by using virtual reel weights. The five reels by themselves would give the game long enough odds to permit large jackpots. An anonymous reviewer, from the gaming industry, of an earlier draft of this paper told us that, with video slots, the player sees the virtual reel. That is, with video slots, the pictures are not weighted. This is because the game's designer is not limited by the circumference of a reel but can set the reel length at any arbitrary number of symbols. Virtual reels are simply not needed on video slots. However, as with mechanical slots, trying to determine the size and symbol distribution on the video slots is quite difficult.

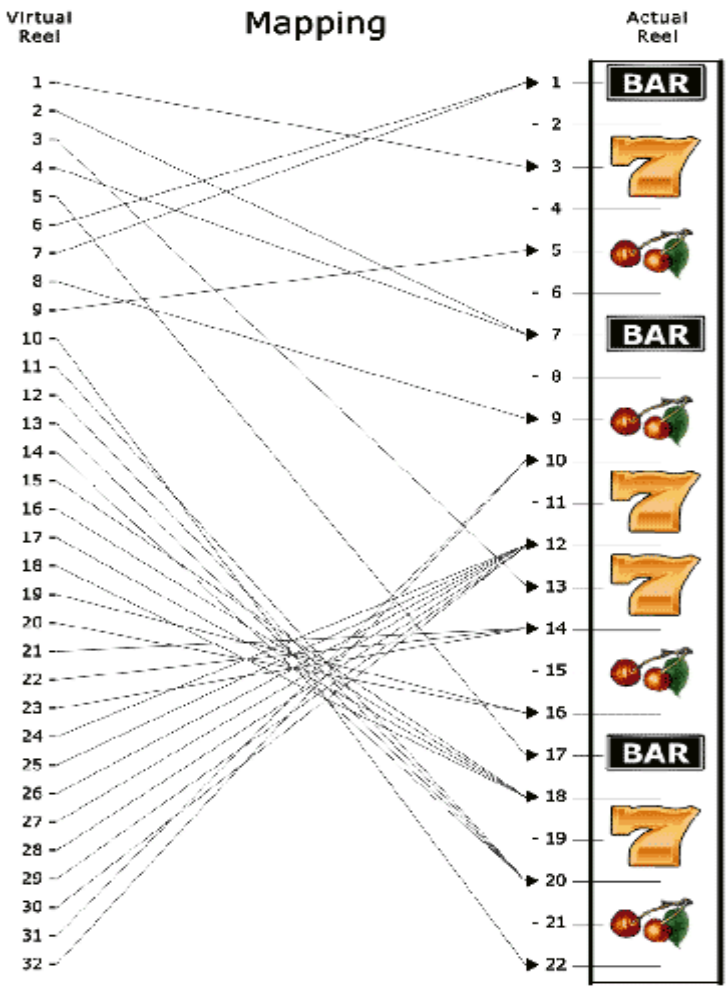

Figure 1: Example of the Mapping from Virtual reel to Actual reel. For an interactive version of the reel mapping please visit the Game Planit website.

Source: The Safe@play Slot Machine tutorial CD, Game Planit Interactive Corp. Box 1245, Elora, Ontario Canada N0B 1S0. Reproduced here with the permission of the author.

Frequently asked questions

In our efforts to treat or prevent problem gambling, a number of questions or beliefs about slot machines come up over and over again. The following is not a literal list of the questions people ask, but a list of the sorts of questions people ask:

• Are slot machines addictive?

• How can a machine be random?

• Do slots go through a cycle of numbers?

• Does the number of pictures equal the odds?

• How can weighted reels be random?

• How can you have a payout of only 90% if the machine is random?

• I started with $120, but now I only have $20 left. Where's my 90% payback?

• Is there any skill involved in slot play?

This is not an exhaustive list of questions, but gives a hint of the issues that need to be addressed. This section will be framed by these issues.

Are slot machines addictive?

The large number of cases of EGM problem gambling from around the world suggests that EGMs are among the most addictive forms of gambling. Dorion & Nicki (2001) have provided evidence that VLTs do indeed account for most problem gambling in Prince Edward Island. In Ontario, Rush, Moxam Shaw, and Urbanoski (2002) report that EGMs account for 37.7% of the treatment population, making slots the number one reason for seeking treatment. Smith and Wynne (2004) also report an elevated level of problems among VLT players. These numbers suggest that EGMs are indeed more addictive than other forms of gambling. Some people have even called EGMs the "crack cocaine of gambling" (but see Mizerski, Jolley, & Mizerski, 2002, for counterarguments).

Griffiths (1999) has argued that the addictiveness of EGMs is directly related to their structural characteristics, such as high event frequency (the speed with which you can play), frequent wins, lights, colour and sounds, game varieties, bonuses, the use of bill acceptors, and the illusion of skill. Other situational characteristics that might be important are advertising, availability, low stakes per bet, the presence of nearby cash machines, the type of establishment (raceway, casino, bar), and the presence of alcohol at the location. Some research has been conducted to explore the addictive properties of the machines (e.g., Loba, Stewart, Klein, & Blackburn, 2002; Tavares et al., 2003; see also Smith & Wynne, 2004), but there is no clear evidence about any specific property that accounts for the arrival in treatment centres of so many EGM players.

Mizerski et al. (2002) argue that, taking into account the greater market penetration of EGMs, there is no evidence that they are any more addictive than other forms of gambling. According to their assessment, the high prevalence rates of machine problem gamblers is a simple outgrowth of the fact that EGMs are the mostly widely available form of high-intensity gambling. According to their data, problem players make up a smaller portion of EGM players than racetrack bettors. EGMs are more widely available than table games or racetracks because they are so much cheaper to run. In addition, the low stakes per bet likely contribute greatly to their market penetration. Mizerski et al.'s (2002) paper was aimed at taking the heat off EGMs per se by characterizing EGM play as following the same distribution as other products. However, unlike with many other products, the most loyal EGM customers can end up with massive debt. As stated above, EGMs account for a large proportion of people in treatment for gambling problems (Dorion & Nicki, 2001; Rush et al., 2002). Mizerski et al.'s (2002) market penetration based argument inadvertently suggests that, in order to reduce problem gambling, the widespread availability and marketing of the machines should be curtailed. However, more research is needed to understand the link between EGMs and problems.

How can a machine be random?

Technically, a machine cannot be random. Slot machines in fact are pseudorandom. As stated above, RNGs use a very complex algorithm. The sequence of numbers an RNG produces is not truly random and is erratic, but predictable. However, uncertainty is added by the seed value, so that a player can never know what part of the cycle the computer is at. This is further enhanced by the continuously running nature of the RNG, which makes the outcome of an EGM completely unpredictable.

Do slots go through a cycle of numbers?

Many people believe that slot machines run in cycles. The answer is yes and no. There are four interesting answers to this question. First, one of the curious aspects of random events is that they often do seem to be evenly spaced. This is in part due to the very nature of probability. If something has a probability of 5%, it will on average occur 5% of the time. But this is simply an average. It could occur on the very next spin of the reels, or not until after 500 spins. You never know when it will occur. The human ability to see a pattern when none is present is well known. Consider how easy it is to find faces in clouds. Figure 2 illustrates this illusionary regularity. It shows the financial outcome of a number of slot bets. The wins (sudden upward jumps) seem to be evenly spaced across the figure, including the last rather large jump. The wins are not in fact evenly spaced, but are randomly spaced. But the

mind has a bias for seeing patterns, so it sees more regularity in the figure than is actually there. The belief in cycles is not unique to EGMs. Lottery and roulette players often track the numbers, looking for patterns or cycles (see Turner et al., 2003 for some examples).

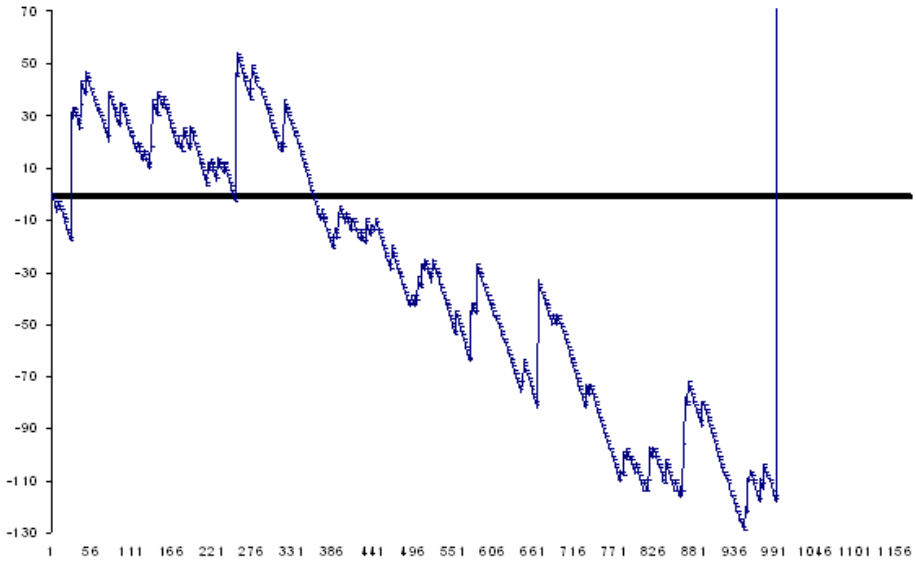

Figure 2

Outcomes on a slot machine. Notice how the wins (upward jumps) appear to be regularly spaced.

Second, this myth might to some extent be derived from actual computer knowledge. As stated above, the inherent limitation of a machine is that it cannot create true uncertainty, only complexity. The RNG does run in cycles — very long cycles. However, as we explained above, the cycle is broken up by the continuously running nature of the RNG, which means that a fraction of a second difference in the timing of the button press will result in a different outcome. Therefore, the player cannot track the cycle. With a continuously running RNG, a modulus of only seven numbers, such as shown in Table 1, might be sufficient to produce a random experience for the player, but, to be on the safe side, slots manufacturers base their RNGs on huge modulus numbers.

Third, at one time, illegal or grey-market EGMs might have operated on a cycle basis, which gave rise to this belief, which has since been carried over to modern, regulated, EGMs that work differently. Unregulated grey-market machines were not tested to ensure that they met the standards of randomness currently imposed on legal machines in North America.

Fourth, according to Griffiths and Parke (2003), EGMs in the United Kingdom do indeed run through a prize sequence over a

relatively short time frame (see also the discussion on adaptive logic fruit machines in U.S. patent #6,666,765, http://www.uspto.gov/patft/index.html). Perhaps this belief in game cycles in North America has been imported from the United Kingdom. Given these four possible sources of bias, the persistence of this belief is not surprising.

Does the number of pictures equal the odds?

On reel slots, in general, the answer is no. Working out the odds from the number of pictures is difficult for a number of reasons. First, on many reel slots, you also need to count the number of blanks between the symbols. Second, the number of winning and nonwinning symbols is not the same on all the reels. There is in fact no legal or practical reason that the symbols would have to be the same on all the reels. Third, as stated above on reel slots, the pictures are weighted so that some come up more often than others. This is accomplished through a process called mapping determined by a computer inside the slot machine. This weighting may sound unfair, but currently there is in fact no legal or practical reason that the pictures need to be equally likely. Note that the legality is being challenged in a U.S. court right now. The weighting further reduces the player's ability to crack the code of the RNG. Unequal probabilities do occur in other gambling games (e.g., instant lotteries, the Big Wheel, horse race bets, craps, baccarat). In each game, some events occur more often than other events. However, unlike with table games, the relative probabilities of different events are completely hidden, and, unlike with instant lotteries, there are no laws, other than those in Victoria, Australia, requiring the slot manufacturer to divulge the true probabilities of slot events (see AGMMA, 2002).

How can weighted reels be random?

With two dice, seven comes up six times out of every 36 rolls, while twelve comes up only one time in 36 — this is still random. Each of these 36 chances are equally likely, but if you bet on "any seven," you will win more often than if you bet on twelve. This is essentially the same as having more virtual stops mapped to pictures of bars than to pictures of sevens on the actual reel. With the game of craps, the casino does not post the true odds of rolling twelve or seven, but, with a little knowledge of math, anyone can work out the true odds.

As stated above, each stop on the slot machine's virtual reel is equally likely, but more of these virtual reel stops are mapped onto nonpaying symbols (e.g., blanks) or low-paying symbols (e.g., bars) than onto high-paying symbols (e.g., sevens and cherries). Thus, through virtual reel mapping, the outcomes are weighted in favour of low-paying outcomes. Virtual reel weights

allow the casino to offer larger prizes to the player. The downside of virtual reels is that it is virtually impossible for players to figure out their chances of winning one of the larger prizes on one of these machines. To figure out the odds, they would need to play on a particular machine for several hours and record the frequency of every symbol on every reel (see http://www.wizardofodds.com for an example).

Virtual reel weights only apply to three-reel slots, not video slots. Virtual reels are not needed on video slots because the programmer can obtain the odds needed to offer large prizes simply by making the strip of pictures longer.

How can you have a payout of only 90% if the machine is random?

Payout and game randomness are two separate issues. Randomness refers to how the symbols are selected — the stops are selected using the RNG. Payout is how much you get paid for a randomly displayed combination. Players lose in the long run because the amount the slot machine pays out for wins is insufficient to make up for the times players lose. As an illustration, suppose you were running a dice game in which you asked a player to bet $1 on any specific number (one to six). The probability of rolling a specific number on a die is one in six (1/6). Thus, the player wins one out of every six rolls on average (a hit rate of 16.6%), but he or she might win 8 times in a row or lose 60 times in a row. Suppose you paid the player $3 for a win. On average, the customer is winning back $3 for every six rolls, which means losing $6 for every $3 he or she wins. This would be a payback percentage of 50% of what he or she bet (payback = $3/$6 = 50%). After a few games, the player realizes that it's a bad deal and is about to walk away, so you now offer $7 for a win. That would be a payback of $7 for every $6 bet or 116.7%. You start to go broke, but you think the player will walk away if you cut the payback. In desperation, you change to an eight-sided die, so now the hit rate is 1/8 or 12.5% and the payback is $7 for every $8 bet (a payback of 87.5%). At this point the player might no longer notice that he or she is losing money because the wins most often seem to make up for the losses. The point is that the only difference between these three games is the amount the player is getting back relative to the chance of a win. In each case, the game is random. However, with $3 won for every $6 bet or $7 won for every $8 bet, the house is making money, but, with $7 won for every $6 bet, the player is making money. Of course no casino would offer a game with a payback of 116.7%, but this example illustrates how it is the amount of the win relative to the probability of the win that determines the payback percentage. Payback has nothing to do with randomness per se.

Slot machines have many different bets and many different ways of winning, so working out the payback percentage is much more complicated, but the same basic principle applies. Table 2 illustrates a payout table for a slot machine. This payout table is not based on any actual slot machine, but is designed to illustrate the nature of slot payout tables. You multiply the probability of a winning symbol's combination by the prize for that symbol. You do this for each line and then find the total. The last column shows the contribution of each winning symbol to the total prize. Notice that the jackpot prize (three treasure chests) has a payback percentage of only 2.9% to the payback. If this were the only winning combination, the slot machines would have a truly awful payback, but the total payback is computed by adding up each of the prizes, which totals to 88.2%. The third column indicates the chance of each of these combinations occurring. When these chances are added up, they equal p =.197 or 19.7%. This is called the hit rate. Given this set of probabilities, the player will get positive feedback nearly 20% of the time. This table may not be particularly realistic, but it does illustrate in a general way how payback works.

Table 2

Slot payout table

Symbol	Chance	Payback	Payback %
Three treasure chests	1/171,468	5000	2.9
Three sevens	1/18,224	500	2.7
Three double bars	1/1000	100	10
Three cherries	1/579	40	6.9
Three bars	1/13	4	29.6
One cherry	1/8	3	36.0
Hit frequency	1/5.1 or 19.7%	Total payback	88.2%

Note that this entire table describes one game. A player has the chance on each spin of winning any of the available prizes, so in the last column the payback for each line is added up to yield the total payback percentage, which is 88.2%.

I started with $120, but now I only have $20 left. Where is my 90% payback?

Often clients will complain that they have in fact lost a lot more than 90%. They might start with $100, lose most of it, and never win it back. They may even have played until it was all gone. To

answer this question we first have to consider what payback does not mean.

• A 90% payback does not mean you win 90% of the time.

• It does not mean you win back 90% of what you have lost.

• It does not mean that you are ever due to win.

• It does not mean that you get back 90% of what you started with.

• It means that on average you can expect to LOSE 10% of the money you bet, each time you bet.

The reason people lose all their money on a slot is that they keep playing until it is gone. The loss is due to the "churn", or the reinvestment of what they won back into the game. Thus, they are not losing 10% of what they initially fed into the machine, they are losing 10%, on average, of each and every bet. In the process of losing $100 on a 25-cent machine, a player will actually have bet around $1000. Ten percent of $1000 equals $100, so a loss of $100 is a 90% payback. In short, it's 90% of the $1000 bet, not 90% of the $120 started with. You can test this using a player's card. Since many casinos give you one point per $10 bet, if you play until you lost $100 on the same slot machine, you will earn 100 points (good for a rebate of about $5 at some casinos), indicating that you bet $1000. (Results will vary depending on the casino, the player club conditions, the payback percentage of the machine, and random chance.)

People often get confused about terms used to describe the house edge. House edge, payback percentage, and expected return are different ways of expressing the same concept. House edge is the percentage of money that you expect to lose on each bet. Expected return is the same as house edge, with a negative sign in front of it. Payback is the percentage of money you expect to get back from a bet. The relationship between house edge and payback percentage is pretty simple.

House edge + Payback percentage = 100%

100% – House edge = Payback percentage

100% – Payback percentage = House edge

For a typical slot, the payback percentage might be 90%, and thus the house edge is 10%. The expected return is –10%.

One of the puzzles about gambling is why people continue to play

a game when they are playing for a payback of less than their bet. Part of the reason is that the volatility of the game (variation from spin to spin) is very large (Turner & Horbay, 2003), making it very difficult to measure the house edge. With slots, most of the time you lose, sometimes you win a little, and occasionally you win a lot. Volatility is a natural result of the variable prize structure, but it makes it hard to determine one's actual rate of loss. The most volatile and worst payback comes with lotteries (e.g., 50%). They are also the most successful games in terms of market penetration (62% of the population in Ontario: Kelly et al., 2002). Volatility and payback percentages tend to be inversely related — even-money games such as craps have the lowest volatility (you bet $5; if you win you get back $10) but have the highest payback percent (98.6% for passline bet in craps — without free odds). The more volatile the game the harder it is to determine your rate of loss. For slots, the volatility does a very good job of obscuring the payback percentage. Even with table games, more volatile games (e.g., hardways in craps, Caribbean stud poker) have a poorer payback percentage than even-money bets. The casino needs a higher house edge on volatile games to offset the greater financial risk of offering large prizes.

Is there any skill involved in slot play?

In general, no skill is possible on slot machines. However, there is some element of skill involved in video poker play, and it would be a mistake to collapse video poker and slots into the same category of games. Video poker is a game in which a careful player can increase the payback percentage, but in most cases even with optimal play the player is still losing money over the long term. Because surveys rarely distinguish between different types of electronic games, such as slots and video poker, it is unknown if the partial skill in video poker makes it more addictive. It is most likely that the two games appeal to different people and are addictive in different ways.

There is also an element of skill involved in the search for particularly large progressives or bonus points. A player could theoretically win in the long term by looking for machines with large progressive jackpots or lots of bonus points — the odds are the same but the payoff percentage is better when the prize is large. The problems that players face in doing this are as follows:

• They do not know when the jackpot is large enough to compensate for its incredibly low probability.

• An "overdue" jackpot of $50 thousand might still have a probability of 1 in 200 thousand or even worse.

The odds of the jackpot do not change. For the mathematicians in the audience, recall that the payback percentage is based on all prizes, not just the grand prize, so, even though the prize is still less than the odds against winning, the payback percentage might be in the player's favour. But, to guarantee winning the grand prize, players will likely have to bet more than they will win. Once the prize gets large, the payback percentage of the machine might be more than 100%, but unless they actually win that bonus jackpot before someone else does, they might lose an incredible amount of money. The fact is that the risk is too great, and, as such, even hunting for bonuses and progressive jackpots on slots should be treated as a game of pure chance, not skill.

Some countries and some states in the U.S. have laws encouraging or requiring skill-like elements in slot games. Some machines have a stop button that supposedly forces the wheel to stop giving players the illusion that they can alter the outcome of the spin. Other skill features might include a hold button, a nudge button, or even a clue button (Griffiths & Parke, 2003). Most of these are pseudoskills that provide no real opportunity for skilled play or long-term wins (Griffiths, 1993). Because of bonuses and progressive jackpots, the payback percentage will vary, but in general there is simply no way to beat a slot machine except by pure random chance.

Myths

The following is a partial list of myths that people believe about gambling machines.

- Slot machines pay out when they are hot.
- Things even up in the long term.
- Casinos give better odds than lotteries.
- Playing two or more slots at the same time increases your wins.
- Some machines are set to be loose.
- Hit and run or playing until it pays out is a good strategy.
- Someone can steal your jackpot.
- Manipulating the arm or timing the button press can improve your chances of winning.
- I almost won or it was a near miss.
- You never win on one of these things.

Slot machines pay out when they are hot

Machines will vary in temperature and from time to time will feel hot. The machines are designed to operate within a wide temperature range, and, no matter how long or intensively they are played, that range is generally not exceeded. The machines are computers, so, theoretically, they could overheat, but the bottom line is that overheating will not benefit the player. Can you imagine a computer breakdown that resulted in anything as good as a win? It is very unlikely that an EGM would overheat, but, if it did, it would most likely cease to function.

The reasons for this myth are rather interesting. First, it is likely that the chance association of hot with wins forms the basis of the belief. The coins do sometimes feel quite warm after being in a machine for a long time. Many people believe that a machine that has not paid out recently is due for a win. This belief is in error, but, because wins are relatively uncommon, the player is more likely to experience hot coins when cashing out a big win than at any other time. Wins are very powerful experiences, and anything that happens at that moment will tend to be stored clearly in memory as an episode (see Tulving, 1972). So the heat of the coins becomes part of the memory. This belief also fits in with a cultural metaphor that associates hot with lucky (see Lakoff, 1987). Episodic experiences derived from chance events, and positive (win) and negative (escape from pain) reinforcements of pre-existing cultural beliefs, may explain many of the myths that people believe regarding gambling.

Things even up in the long term

There is a persistent erroneous belief that things even up in the long term. This belief comes under various names, including the law of averages. It is a widespread belief that is not restricted to EGMs.

Part of the problem indeed derives from the way in which mathematicians talk about the long term. Essentially, they are not talking about any set time period, but the situation when the average reaches its true value — and that takes as long as it takes for the values to asymptotically approach their true values. It is the point at which an unbiased coin actually rounds off to 50% heads and 50% tails. This is a hypothetical time period because, in reality, the second you set a time period it can be violated. It is (and must be) possible that a coin could come up heads 1 million times in a row (but see Orkin, 2000). This is extremely unlikely, but possible. For practical purposes, 1 million flips will nearly always be enough to achieve an average very close to 50% heads, but since it is still possible for 1 million heads to occur in a row, 1 million flips will not always work as the "long term."

A study by Turner et al. (2002) found that problem gamblers know the odds of the games as well, if not better, than nonproblem gamblers. For example, problem gamblers were significantly more likely to correctly answer questions regarding the chances of rolling a seven with a pair of dice. However, the error that problem gamblers make is that they think they can beat the odds. It is likely that this error is exacerbated by the absence of accurate information on the actual odds of slot wins.

One of the main errors people make is working backward from the long-term odds to the short term. For example, in an interview, one gambler reasoned as follows:

- In the long term, heads and tails will come up equally often.
- If you get 100 heads in a row and then keep flipping, the number of heads and tails will eventually reach 50%.
- If this is true, then surely an extra 100 tails must occur some time between now and the 1 millionth flip to even it up.
- Therefore, there must be a slight bias in favour of tails to help even it up.

This reasoning is not irrational. In fact, if the long-term outcome were exactly 50% heads and exactly 50% tails, then the theory would have to be true. The same reasoning is actually the basis of card counting and it does work in the game of blackjack (unless the casino is using a shuffling machine to keep the cards shuffled after every hand). But, with a coin flip or any game where each game is independent of all others (slots, roulette, lotteries), the gambler needs to keep in mind that the long term rounds off to 50%. After 1 million flips, 3000 more heads than tails would still round off to 50% heads.

Despite the above facts, gamblers spend a lot of time looking for short-term deviations from expected averages. For example, they might look for a machine that appears due to pay out because it has not paid out recently. If such a machine is found, this deviation from the expected payouts is then interpreted in one of two ways. The machine is either due for payment and thus the rational plan is to bet, or it is unlucky (cold or tight) or has a bias against it. The former would lead the player to play that machine. The latter would lead the player to look for another machine with a bias in the player's favour. The interesting thing about these two beliefs is that they are opposite and contradict each other such that they cannot both be true. Interestingly, the same person will often hold such opposite beliefs. Turner et al. (2002), for example, found a high correlation between people who select numbers that

have not come up for a while and those who pick numbers that come up frequently: r =.59, p <.01. In addition, in nearly all cases, one of these beliefs will be confirmed by experience. That is, the machine that has not paid out either will pay out, confirming the "due to pay out" belief, or continue to not pay out, supporting the bias theory.

Casinos give better odds than lotteries

Some gamblers believe that lotteries are a bad bet because the chance of winning is very small. The probability of winning the top prize in a lottery may be 1 in 14 million. In reality, the odds of winning a game are irrelevant. If you buy enough tickets, you can make your chance of winning up to 100%, but you will still lose money. The payback of slot machines in Ontario varies from 85% to 97%, whereas lotteries typically pay out only about 50% of ticket purchases back to their customers in prizes. As such, slot machines indeed seem to be a better buy. However, slots are far more profitable than lotteries (Statistics Canada, 2003; KPMG, 2003), but have a lower market penetration (Kelly et al., 2002; Mizerski et al., 2002). In spite of the lower house edge, people appear to lose more money on slot machines than on lotteries. This situation is related to the fact that people that play slots do not just make one or two purchases, but make a long series of bets. In addition, people churn their wins back into the game and play until a substantial amount of their money is gone. As described above, the churn is the effect of reinvesting the winnings (credits) back into the game so that a 90% payback (10% house edge) bet three times becomes a 72% payback. It is very easy to re-bet wins on an EGM because there is no distinction between credits initially placed into the machine and credits that have been won. According to Smith and Wynne (2004), when averaged across both winning and losing sessions, players lose between 30% and 40% of what they bring to a casino because of the churn. While the payback per bet is higher on a slot, the continuous play on the slot means that people lose more to a slot than to a lottery.

Playing two or more slots at the same time increases your wins

If you play on several machines at the same time, you will win more often than if you only play on one machine. However, because each machine pays back less than 100%, you will still lose more money than you would if you were only playing on one machine. A good rule of thumb is to remember that the more you bet, the more you will lose in the long term.

Some machines are set to be loose

This is the belief that some machines are set to pay out more money. One version of this belief is that machines near the entrance of a casino are set to be loose in order to entice customers into the casino. There is also a false corollary that it does not matter which machine you play. Machines do indeed vary in payout percentage and hit frequency. Players could substantially reduce their losses by playing at machines with the highest payback. However, since no information is given about the odds or payout of a particular machine, it would be impossible (except with video poker) to determine which machines were actually set to pay out more. However, all of the machines would have a negative expected return, so the best you could expect in the long term with a loose machine would be to lose a little less. What people call loose machines are most likely those machines that have paid out a lot of small prizes recently. The looseness might be merely random chance fluctuations (volatility), or the machine might be weighted more in favour of small prizes. Some machines give back more money to their customers than other machines, but, even if you were lucky enough to find a "loose" machine, it would still not result in long-term wins (see Bluejay, 2002–04 for related comments).

Hit and run or playing until it pays out is a good strategy

A strategy recommended by *A Complete Idiot's Guide to Gambling Like a Pro* is to "hit and run" (Wong & Spector, 1996). That is, try a machine for a few spins and, if you are not happy, leave and try another machine. This advice is relatively harmless, but it is significant because it is one of the few inaccurate pieces of information that we found in Wong & Spector's (1996) book. However, the opposite strategy, staying at the same machine, hour after hour, in the belief that it will eventually have to pay off, is a much worse strategy because the more you bet the more you lose. If a hit-and-run strategy reduces actual play or persistence, then it is a reasonably good strategy. However, the fact is that neither changing machines nor staying at the same machine improves your chances of winning. Both hit and run and sticking to the same machine sometimes seem to work, but neither can result in long-term wins because the wins and losses are random events and every spin is independently random.

Someone can steal your jackpot

Yes and no. Yes, if you accidentally walk away from your machine before cashing out, someone might steal your money. However, another player cannot win a prize that you might have won. Many players who have spent a lot of time at a particular machine are reluctant to leave it, even to go to the bathroom, because they believe that it's due to pay off and they do not want someone else to win their jackpot. Thus they keep feeding the same machine.

Many gamblers have told us stories about walking away from a machine and later witnessing someone else winning on that machine. These stories are no doubt true, but represent a memory bias. The reason people recall these events is that, when this does happen, it becomes a very strong memory filled with regret and perhaps anger. But when it does not happen — later players do not win — it is not a very strong memory. In short, we remember instances when this happens, but take no notice when it does not. As stated above, the RNG runs continuously and a millisecond difference in the button press will lead to a different outcome. So, even if a player had stayed at that particular machine, he or she would most likely not have won that same jackpot.

Manipulating the arm or timing the button press can improve your chances of winning

When slot machines were first invented over 100 years ago, they consisted of three fly wheels that were set in motion by the pull of the lever. The force of the pull of the lever would to some extent determine how far the reels would turn. It might have been possible to manipulate the outcome to some extent by carefully controlling the lever. Some players still believe that it is possible to win by controlling the lever or timing the press of the spin button. Modern slot machines are computers. The reels themselves are essentially decorative. As stated above, an RNG determines the wins and losses on a slot. The computer uses numbers drawn from its RNG to determine where the reel will stop before it is even set in motion. The computer determines that the reel should land on the symbol for a cherry, and it spins it to that location.

I almost won or it was a near miss

There is no such thing as a near miss on a slot machine because the symbols that come up when you do not win are simply displays of losing plays. A near miss is in fact a total miss — a loss. No game play event ever predicts wins. However, the concept of a near miss is rather controversial (see Smith & Wynne, 2004, for comments). Certain types of near misses are illegal (Rose, 1989; Bourie, 1999). Once upon a time, slot machines were programmed to produce near misses such as two win symbols on reel 1 and 2 and another winning symbol just above or below the payline on reel 3 (Bourie, 1999). What made this programming illegal was that symbols shown on the slot machine did not accurately represent the outcome of the game. The computer was programmed to first determine that the spin was a loss and then spin the reels to display what appeared to be a near win. One of the reviewers of this paper defended the industry's record of following the law regarding near misses, noting that, in virtually every jurisdiction, programming near

misses is illegal. Near-miss programming violates the independence of the three reels so that the game outcome cannot be called random. According to the gambling industry, slot machines are no longer programmed to create near misses

However, there are several different potential definitions of a near miss. The law only makes certain types of near misses illegal (Rose, 1989; Bourie, 1999). Any near miss that occurs by random chance is definitely legal. A near miss of two out of three winning symbols or a near miss just off the payline is perfectly legal if it occurs by random chance. Two out of three winning symbols occurs many times more often than a win. If a jackpot based on three reels had a probability of 1 in 1000 (e.g., 1/(10*10*10),) a two out of three near miss would occur 29 times more often than a win (e.g., (1/10*1/10)*3). If you add to that all the possible other ways in which you could define a near miss (e.g., two or three winning symbols just above or below the payline) or all the possible combinations that could be near misses (two bars, two diamonds, two treasure chests, two red sevens), near misses will happen very often purely as a result of unbiased random chance.

But slot outcomes are not unbiased. Above we described how the pictures on slot machines are not equally probable and that they are weighted in favour of nonpaying and low-paying pictures. The simple act of shrinking down 32 virtual reel stops into 22 actual reel symbols is sufficient to enhance near misses off the payline. This is because the slot is condensing a virtual reel with many low-paying or nonpaying stops (e.g., blanks) to an actual reel with somewhat fewer low- or nonpaying stops. However, since the virtual reel is random and the three reels are independent, virtual reel weights are legal. Virtual reel stops on the payline are unbiased random events. However, they do affect the probability of the pictures seen just off the payline. Near misses off the payline such as those that can be enhanced by virtual reel weights are not illegal (Rose, 1989). The Nevada Gaming Commission held extensive hearings on this subject and, on September 22, 1988, it filed a stipulation declaring it legal (Bourie, 1999). Thus it is legal to enhance near misses using virtual reel weights. The Wizard of Odds Web site reports the results of an empirical investigation of the weighting of one particular machine (http://www. wizardofodds.com/game/slotapx1.html).

Virtual reel weights only apply to three-reel slot machines. Five-reel video slots are so incredibly complex, with so many paylines (up to nine crisscrossing), that the industry does not need to use virtual mapping to create near misses. The very fact that there are five reels and multiple crisscrossing paylines greatly enhances the number of winning symbols and apparent near misses that the player will see on each spin. Another manner in which near misses are enhanced on five-reel video slots is that, on some

video slot machines, three or four winning symbols lined up from the left pays a large prize, but three or four winning symbols lined up from the right does not pay any prize.

In addition, many machines have unequal numbers of winning symbols on their reels (AGMMA, 2000). This enhances the chances of getting two out of three winning symbols. Table 3 illustrates how the chances of a near miss are affected by having different numbers of winning symbols on the three reels. The rate of near misses is lowest when all three reels have the same probability (middle row of the table, in bold font). Any deviation from equal probability appears to elevate the probability of a near miss. For example, if the big win symbol occurs with a probability of 1 in 10 (p =.10) on each reel, the chance of a jackpot win is 1 in 1000, but the chance of a near miss is 30 in 1000. If the probability of the win is 1 in 5 on the first two reels (p =.20) and 1 in 40 (p =.025) on the third reel, the chances of a win are still 1 in 1000, but the chances of a near miss are now 50 in 1000. The overall probability of a near miss is only slightly enhanced unless the reels differ by a large amount. However, placing more winning symbols on the first two reels concentrates the near-miss action to the first two reels. This is particularly important because the first two reels stop first, giving the player a period of anticipation before the third reel comes to a stop. Interestingly, having fewer win symbols on the first two reels compared to the third also enhances near misses. This form of near-miss enhancement is perfectly legal because the reels are still independently random.

In summary, slots are not programmed to produce near misses, but the setup of the reels enhances the number of apparent near misses that the player will experience. Weighting of the reels, multiple paylines, and uneven distribution of symbols across the reels might result in the illusion that the odds are more favourable than the true odds. According to Rose (1989), the gaming industry manipulates near misses because they enhance the excitement of play. The same thing occurs with many instant lotteries, where tickets will usually contain one or two large prize symbols, but almost never have three large prize symbols. It is unclear why people find nearly winning exciting. Perhaps people believe that nearly winning means they will win soon. Perhaps they believe that luck grows over time and a near miss means that you are nearly lucky enough to win. Whatever the reason, the fact is that the slot images are randomly selected before the reels spin. The reel does not almost stop on the winning symbols. The take-home message is you either win or you lose. There is no such a thing as an "almost win." A near miss is simply a loss.

Table 3

The effect of unequal symbol distributions across reels on near-

miss probability

	Reel probabilities				Near-miss probability			
	Reel 1	Reel 2	Reel 3	Jackpot proba-bility	Reel 1*2	Reel 2*3	Reel 1*3	Total near miss
Prize symbols less likely on first two reels	0.059	0.059	0.289	0.001	0.003	0.017	0.017	0.037
	0.063	0.063	0.256	0.001	0.004	0.016	0.016	0.036
	0.067	0.067	0.225	0.001	0.004	0.015	0.015	0.034
	0.071	0.071	0.196	0.001	0.005	0.014	0.014	0.033
	0.077	0.077	0.169	0.001	0.006	0.013	0.013	0.032
	0.083	0.083	0.144	0.001	0.007	0.012	0.012	0.031
	0.091	0.091	0.121	0.001	0.008	0.011	0.011	0.030
Equally probable	**0.100**	**0.100**	**0.100**	**0.001**	**0.010**	**0.010**	**0.010**	**0.030**
Prize symbols more likely on first two reels	0.111	0.111	0.081	0.001	0.012	0.009	0.009	0.030
	0.125	0.125	0.064	0.001	0.016	0.008	0.008	0.032
	0.143	0.143	0.049	0.001	0.020	0.007	0.007	0.034
	0.167	0.167	0.036	0.001	0.028	0.006	0.006	0.040
	0.200	0.200	0.025	0.001	0.040	0.005	0.005	0.050
	0.250	0.250	0.016	0.001	0.063	0.004	0.004	0.071
	0.333	0.333	0.009	0.001	0.111	0.003	0.003	0.117

Note that the numbers in this table are probabilities. Near-miss probabilities for the column labelled "Reel 1*2" are the probability of getting the jackpot on the first and second reels given the specific probability of the jackpot listed in the columns entitled "Reel 1" and "Reel 2."

You never win on one of these things

This is the first author's favourite myth and is one that he believed until his first actual casino gambling experience. This is an erroneous belief held mostly by nongamblers or perhaps by people who have not yet played on one of these machines. The simple fact is that you can win. Slot variance is much greater than with other games of chance (e.g., blackjack), so that a player has a more pronounced roller-coaster experience than with other games (slot simulation exercise 2: see note at end of paper for details). Typically, a player will lose, for example, 82% of the time, but would experience small wins perhaps 15% of the time. These will occasionally, and dramatically, be punctuated by medium and large prizes, 2% to 3% of the time. Although the player will most likely lose in the long run, the chance of long-term wins is never eliminated. In simulations of the slot machine payout table in Table 2 conducted by the first author, 7.6% of the players would be winners after 10,000 spins of the reels (see also AGMMA,

2000). The fact that long-term wins are always possible is perhaps one of the facts that keeps players at it, clinging to the belief that winning is possible.

Before a machine is licensed, its mathematical properties are tested across millions of simulated bets in order to prove (within a very small margin of error) to the casino operators that the machine will make money across players. But the chance of any specific player winning in the long term never drops to zero. Some people need to be convinced that they cannot win. For them, perhaps, pointing out the testing regimen that the machines are put through before being approved is a good strategy.

However, if naive gamblers hold the belief that they will never win before trying a slot, the shock of winning might be very powerful. The contrast between expectation (you never win) and reality (you can win) may lead to the opposite distortion in their expectations. This leads us to a recommendation regarding the discussion of wins. Rather than telling people they cannot win, explain to them that they will win occasionally and that these little wins often keep people playing so that they eventually lose that money and more.

Discussion

EGMs are computers designed to provide players with an exciting, volatile, and unpredictable experience. However, the hidden odds of the games mean that players are left guessing about their chances of winning. This problem is made worse in the case of reel slots by the mapping or weighting of the virtual reel to the physical reel so that the visual reel that the player interacts with gives a false impression about the true odds. On video slots, the pictures are not weighted, but the complexity of the game makes it very difficult to get an accurate sense of the odds of winning. With video poker, the probabilities can be determined with precision, but the mathematical skill required is beyond many gamblers.

The difficulty of figuring out the odds is also augmented by the variable prize structure itself and the resulting volatility of the game (see Turner & Horbay, 2003, for further comment). The experience of this volatility makes it very hard for the player to determine the house edge. Volatility also plays an important role in the enjoyment of the game. The player never knows what will happen and is therefore playing on an emotional and financial roller coaster.

Currently across most of North America it is only possible to determine the odds on a slot machine by playing it and recording the information for several hours (see, e.g., http://www.wizardofodds.com). But this is difficult and could cost

the player more than the information is worth. Indeed, tracking the reels to obtain the game's odds is essentially worthless because the game has a negative expected to the player regardless of recent events. The disclosure regime now in place in Victoria, Australia, and the AGMMA player information brochure (AGMMA, 2000) are clearly steps in the right direction toward eliminating hidden odds as a potential source of problems. British Columbia also now provides information to players on the hit rates and the odds of winning large prizes for various EGMs.

As we have demonstrated throughout this paper, many people misunderstand how EGMs work. The lack of accurate information on how the machines work likely contributes to this misunderstanding. The main conclusion we can draw from this discussion is "Beware of myths." However, misunderstanding is not unique to EGMs. For example, people hold a wide range of erroneous beliefs about roulette even though nothing is hidden. It is important to understand EGMs in the context of gambling in order to determine if EGMs are different from other forms of gambling. We hope we have addressed many of these issues and have advanced our field toward their greater understanding.

Addiction

Two final questions that we would like to address are why electronic gambling is addictive and what can be done to curb the addictive potential of the games. According to cognitive-behaviour theories of addiction (e.g., Marlatt, 1985), all games of chance, indeed all things that are exciting or pleasant, or provide an escape, are potentially addictive. According to this view, the heart of the addictive process is pleasure and escape from pain. Factors such as stress, a mood disorder, a breakdown in the reward system (e.g., ADHD), gambling venue availability, social encouragement, and erroneous beliefs enhance this process (Turner et al., 2002), but there is no reason to believe that anyone is immune from developing a problem. In addition, consequences of the addiction may be a key component in turning a hobby into an addiction by setting up a dynamic feedback loop (gamble for fun — win — happy — lose — depressed — gamble to escape — win — happy — and so on). It should also be kept in mind, however, that most people who gamble do not become addicted. Kelly et al. (2002) found that 22% of the population of Ontario reported playing a slot in the past six months, but prevalence studies consistently find that 1% to 2% of the population have a severe gambling problem (Ferris & Wynne, 2001; Shaffer, Hall, & Vander Bilt, 1997). However, pathological gamblers make up a disproportionately large percentage of regular gamblers and account for a disproportionately high percentage of gambling revenue (Focal Research Consultants, 1998; Smith & Wynne, 2004). In addition, many people may be at risk, unaware of the

risks, or vulnerable due to multiple risk factors, including game myths or game attributes that are potentially addictive. A comprehensive theory of gambling problems has to take into account personality, mood, life history, and possible genetic predispositions, as well as game characteristics, location, and the experience of the individual player.

There is a strong feeling among clinicians in the problem gambling field that machine gambling may be more addictive than other forms of gambling. Dorion & Nicki (2001) have provided evidence that VLTs do indeed account for most problem gambling in Prince Edward Island. Other studies by Rush et al. (2002) and Smith and Wynne (2004) also suggest that EGMs account for a large percentage of problem gambling.

Slots are designed to get people to gamble and keep them gambling. The bottom line for manufacturers, governments, and operators is money, and these machines make money. In 2003, EGMs accounted for approximately $7.5 billion in revenue (KPMG, 2003) in Canada. The very profitability of EGMs may be inherently tied to the addictive potential of the games. We do not believe that manufacturers design their games to produce problem gamblers, but their focused attention on the bottom line has led to the development of a technology that appears to be very successful at providing intense entertainment to the players, making money, and creating problems.

Griffiths (1993, 1999) and Loba et al. (2002) have attempted to determine what characteristics of slot machines may contribute to their addictive potential. The following is a list of some of the features of EGM design that might be associated with problem gambling. This list has been derived from work by Griffiths (1993, 1999), Parke and Griffiths (2003), Loba et al. (2002), Focal Research Consultants (1998), and Smith and Wynne (2004), and from our own examination of the machines and the games. This list is speculative. We do not know how these features affect play, but offer them up to encourage their scientific study. The research that has been conducted so far falls well short of providing evidence for a causal link with problem gambling because the studies examine changes to short-term behaviour. Ideally, the gambling industry will join in this study to find features that could maximize enjoyment and minimize harm (e.g., Blaszczynski & Nower, 2002). Features that could be considered include the following:

- payment: vouchers, cash, tokens
- speed of the machine
- reel slots versus video slots

- payback percentage
- frequency of wins
- lights, colour, and sounds
- game varieties (video poker versus slots lineup games)
- bonus features
- the use of bill acceptors
- the illusion of skill
- advertising
- availability
- the stakes per bet (low versus high)
- the presence of nearby cash machines
- the type of establishment (raceway, casino, bar)
- the presence of alcohol at the location
- hidden odds
- virtual reel mapping
- game volatility (variable prize structure)
- the presence of clocks, windows, and other environmental features, etc.

There is by now enough variation in game design around the world that it should be possible to research what features of the games (if any) are associated most strongly with problematic play. This would likely require the cooperation of various governments in different districts as well as the gambling industry for records on gambling behaviour on specific machine platforms to determine which sets of features are associated with problematic play.

If such research is conducted, it might lead to recommendations that could reduce the potential harm of these games. Mizerski et al. (2002) have argued that the larger number of EGM players in treatment is a simple consequence of the larger number of people that play EGMs (market penetration) compared to other forms of gambling. EGMs are the most widely available, highest intensity form of gambling. As such the most important feature might be their availability. This too needs further study.

In researching these features we need to differentiate those that

lead to greater market penetration (more people playing them) from those that lead to more problems. Theoretically, it might be possible to find features that maximize the entertainment value of the game and minimize the harm. However, positive reinforcement is one of the primary driving factors behind all addictions (see Marlatt, 1985, for a discussion of the cognitive-behaviour model of addiction), so it is unknown if it is possible to titrate the harmful and pleasurable aspects of the games.

Summary of key points

Addiction to EGMs likely results from the interaction between the player and the slot machines. An individual's risk for developing a problem is enhanced by a mix of cognitive, social, emotional, biological, and genetic predispositions (Turner et al., 2002). Myths about slot machines likely exacerbate these risk factors. The following is a summary of the main points raised in this paper.

- The continuously running nature of the RNG ensures that the outcomes of EGMs are truly random and unpredictable.
- There is no way to beat the machines. Staying at the same machine or changing machines makes no difference.
- Randomness and payback are separate issues.
- The outcome of each spin is random, but fewer random combinations pay out than not.
- The machines pay out less to players than they take in. Therefore, over time, players will most likely lose money.
- The games are so volatile that the moment-to-moment experience can be very thrilling. As a result of the volatility, it is impossible for players to determine the payback from any short gambling episode.
- Many people hold erroneous beliefs about slot machines, and these beliefs are shared among people as myths. Beware of myths.
- The true odds of winning on a slot are not easily derived from playing (hidden odds). In addition, multiple reels and paylines, unequally distributed symbols, virtual reels, and a highly volatile game can lead a player to derive a false impression of the chances of winning. Beware of random chance and hidden odds.

EGMs are potentially addictive. Like all gambling, they are addictive because of the nature of winning and losing. This may be enhanced by the myths, illusions, and structural characteristics

that we discussed above. While most people that gamble do not develop a gambling problem, it is unlikely that anyone is immune. Players need to be warned about gambling-related risk factors (e.g., stress, erroneous beliefs, impulsivity) as well as potentially addictive features of the games.

Where to get more information:

• Safe@play Slot Machine tutorial: http://www.gameplanit.com or to download the slot machine tutorials.

• Frank Scoblette's video, hosted by James Coburn (Scoblete, 1997)

• *An Idiot's Guide to Gambling Like a Pro* (Wong & Spector, 1996)

• The Wizard of Odds Web site: http:// w ww. wizardofodds.com

• Australasian Gaming Machine Manufacturers Association (AGMMA): http://www.agmma.com

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For correspondence: Nigel Turner, PhD, Scientist, Centre for Addiction and Mental Health, 33 Russell Street, Toronto, Canada M5S 2S1. Phone (416) 535-8501 Ext. 6063, fax (416) 595-6899, e-mail: Nigel_Turner@camh.net.

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Nigel Turner, PhD, is a research scientist at the Centre for Addiction and Mental Health in Toronto. He received his doctorate in cognitive psychology at the University of Western Ontario (1995) and has worked for the Centre for Addiction and Mental Health (CAMH) for the past nine years. He has extensive experience in quantitative research methods including psychometrics, surveys, experimental studies, and computer simulations. Nigel has received grants from National Center for Responsible Gaming, the Ontario Problem Gambling Research Centre and funding from the Ontario Ministry of Health. He has published in peer-reviewed journals and has given a large number of conference presentations. He is particularly interested in cognitive models of problem gambling and has authored three papers on gambling systems. Outside of CAMH, Nigel has a keen interest in history and takes part in re-enactments of historically important 19th century battles.

Roger Horbay is president of Game Planit Interactive Corp. He is a problem gambling consultant for treatment agencies and the gaming industry. He develops innovative treatment, prevention and player protection strategies, policies, and programs. He is also a recognized expert in the field of electronic gaming and electronic gaming machines and understanding how gambling technology contributes to the development and maintenance of pathological gambling. He is also a founder, past president, and vice president of the Canadian Problem Gambling Certification Board. He was an addiction therapist and trainer with the Problem Gambling Service, Centre for Addiction and Mental Health (1995

to 1999). Roger was on the faculty of George Brown College in Toronto (1991 to 1995). He is an honours graduate of the George Brown College human services counsellor program in Toronto, majoring in addiction and mental health.

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JOURNAL OF GAMBLING ISSUES

policy

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Minimising the impact of gambling in the subtle degradation of democratic systems [1]

Peter James Adams
University of Auckland
Auckland, New Zealand
E-mail: p.adams@auckland.ac.nz

Abstract

Gambling can harm a society's social and economic systems and negatively affect its political ecology. If not protected, democratic processes and institutions in jurisdictions with high levels of gambling are likely to undergo a progressive, cumulative degradation of function. These subtle, diffuse distortions result when a broad variety of individuals, working in isolation and reacting to pressures from gambling providers, incrementally compromise their roles and responsibilities. This article examines how these degradations can occur for people working in universities, government departments, media outlets, politics, and community organisations. It argues that any strategy to minimise harm from gambling should include explicit measures to protect the public from such distortions to democratic processes. The single most effective way to do this is to independently monitor people with public duties who have relationships to the beneficiaries of gambling consumption. The article concludes by proposing an international charter that sets benchmark standards for protecting a society from such degradations.

Introduction

The current rapid proliferation of gambling throughout the majority of

Western-style democratic nations poses, in the long term, a range of threats to the vibrancy and integrity of the very base that supports their democratic structures and processes. One way is via the potential alliances that can form between gambling industry providers and sections of government. The opportunity for such alliances stems from the convergence of interest for both parties in the sizeable income available from increases in gambling consumption. Governments are lured by the prospect of convenient and sizeable taxation revenues and gambling industry providers are drawn in by opportunities to influence regulation in ways that open up new and lucrative markets (Costello & Milar, 2000; Goodman, 1995). These industry-government alliances can propel liberalisation in ways that override the wishes of the majority of the population. For example, casino licensing in Australia and New Zealand has proceeded in spite of majority opposition from local communities (Adams, 1999; Doughney, 2002). A second way in which democratic systems can be threatened relates to the opportunities for a globally interconnected gambling industry to marshal the linkages and resources to influence the choices of targeted governments and their publics. The processes and strategies used have been well documented with the expansion of the tobacco and alcohol industries. These include strategies such as target marketing to vulnerable populations, strategic commissioning of research, saturation promotion of international brands, technical refinements of products, and coordinated political lobbying (Jernigan, 1997; Studlar, 2002). These have had the net effect of diminishing the ability of populations to make informed decisions about the extent of their alcohol or tobacco consumption. When it comes to the emergent global networks of the gambling industry, it makes sense to expect that what has worked so effectively for the tobacco and alcohol producers is highly likely to emerge in similar ways as the gambling providers strengthen their interconnections.

Whilst the above two threats to democracy are worthy topics for enquiry, the current paper shifts attention away from the macro processes of government-industry alliances and industry globalisation in favour of a narrower focus on the potential for gambling monies to subtly compromise the ability of individuals to participate in democratic systems. The paper argues that people at any level in society can find themselves influenced in ways that diminish their confidence to assert their views about gambling. A democratic society relies on the proactive and optimistic participation of citizens in its democratic structures and processes. People need to feel they have a say; that they have a right to take up moral stances, that their viewpoints matter and that their voices have some influence within the larger systems. Such participation in democratic processes extends well beyond the occasional opportunities to vote. It extends to a person's willingness to participate in public debates, protests, pressure groups, and government consultative processes. The rising availability of proceeds from gambling engages more and

more people in a web of benefits that in their minds and in the minds of others progressively compromises their ability to openly question the way gambling is being provided. Individuals fulfilling a wide range of roles find themselves caught between the duties of their position and their moral views of gambling. They respond to these dilemmas in a variety of ways, but a common response is to withdraw from the debate altogether and thereby effectively endorse the interests of gambling expansion. This degradation of their confidence to participate in democratic processes applies initially to gambling alone, but over time could arguably extend to their willingness to participate in democratic processes as a whole.

Gambling and harm minimisation

Substances or processes with potential to foster dependency will lead to harm at multiple levels. The term "dependency" can be interpreted in a number of ways, but is understood here to refer in a general fashion to the emergence of an intense reliance on one relationship that overshadows the potential contribution of a range of other relationships. Such reliance can occur at an individual level where an intensified relationship to, for example, alcohol eclipses the benefits of relationships with family members and friends. This amplifies the reliance, which over time emerges with features we identify as addiction. Dependency can also occur at social and societal levels. Groups, organisations, even whole societies can find themselves on a path of increasing reliance on one aspect of their development. For instance, taxation on tobacco could grow in such importance to state revenue that it is seen as a necessary part of state income (Godfrey & Maynard, 1988). The diversity and resilience of the economy is diminished and this further intensifies the reliance. While an organisation or state can benefit from the income, it carries with it associated harms that include the loss of other opportunities, losses in autonomy, and distortions in business and community relationships.

Tobacco, alcohol, and gambling comprise the major dependency-forming consumptions legally supported in most Western-style democracies. Each of these consumptions confronts the host state with a common spectrum of harms, spanning physical, psychological, interpersonal, and broader social impacts. Tobacco use has social and cultural impacts by, for example, linking its promotion with the emerging identity of younger people (Pechmann & Shih, 1999). However, tobacco's main impact is unquestionably on physical health as evidenced by the high number of people who die from smoking-related illnesses (Doll, Peto, Wheatley, Gray, & Sutherland, 1994; Lopez & Peto, 1996). Alcohol has significant impacts on physical health (Edwards, et al., 1994), but it differs from tobacco in contributing more to harm at the level of psychological impacts and social relationships (Clark & Hilton, 1991; Devlin, Scuffham, & Bunt, 1997). For example, the impacts of alcohol

dependence on family members, particularly children, can lead to enduring disruptions of psychological and social functioning (Cuijpers & Smit, 2001; West & Prinz, 1987). Gambling shares the potential for impacts on health and psychological wellbeing. For example, prolonged and intense episodes of gambling are accompanied by associated anxiety, stress, depression, and deteriorating self-care (Becona, Del, Lorenzo, & Fuentes, 1996; Crockford & el-Guebaly, 1998; McCormick, Russo, Ramirez, & Taber, 1984). The psychological processes of problem gambling lead to distortions in thinking and disrupted relationships (Blaszczynski & Silove, 1995; Lorenz & Yaffee, 1986; Williams, 1996). In addition to these, when it comes to comparing the impact of gambling with that of alcohol and tobacco, gambling stands out with a stronger zone of potential harm derived from its impact on social systems and processes (Doughney, 2002; Goodman, 1995).

The principles of harm minimisation provide a high-level framework for governments to respond to alcohol, tobacco, and other drug problems (Single, 1995). Harm minimisation philosophy remains neutral on the morality of drug use, but recognises that since most societies accept the regular use of some form of mood-altering drug, policy efforts need to focus on ways to identify harm and reduce it to tolerable levels (Hamilton, Kellehear, & Rumbold, 1998). If a society chooses to accept, for example, alcohol as a part of daily life, the task then becomes one of finding ways that predictable harms are kept to a minimum. Alcohol intoxication is known to increase the probability of road injuries; accordingly, governments might choose to minimise such harm by recording incidence figures then evaluating the impact of strategies such as designated drivers, low alcohol beer, media campaigns, and so on.

Gambling brings with it a range of predictable harms. The prevalence of problem gambling, property crime, and mental health problems is well documented (Brown, 1987; Lesieur, 2000; Volberg, 1996) and suitable intervention and prevention responses are in the process of development (Korn & Shaffer, 1999). A harm minimisation approach can also be usefully applied to gambling. In preparing populations for high levels of gambling, the challenge is to find ways to enjoy the benefits from gambling while at the same time minimising negative impacts. Despite recognition of gambling-related harm at an individual level, the broader harm gambling inflicts on social systems has so far attracted scant attention. This zone of predictable harm requires closer description before beginning the task of exploring appropriate remedies.

Threats to democratic systems

As gambling consumption rises, people with key democratic responsibilities are increasingly subject to influences associated with

the profits from gambling. These influences are typically subtle, difficult to detect, hard to measure, and problematic to report on. For instance, politicians are unlikely to speak openly about the extent to which financial contributions from gambling industry sources might influence their approach to gambling policy. Open discussion would jeopardize their credibility both with the public and with their colleagues. Similarly, gambling counselling agencies are unlikely to admit that receiving funds from gambling industry sources influences whether they would speak out about the impacts on clients. Such an admission would affect their credibility with clients and with the broader community. Since open disclosure is problematic, discussion here will seek to point out the risks to democracy by presenting a set of hypothetical scenarios. The scenarios are based on the author's ten-year involvement in the gambling field, an involvement which has provided many opportunities to discuss these issues with people in different roles and to ask them about their perceptions of the risks posed by links to gambling funding sources. Hypothetical narratives such as these have been used effectively in other fields to help highlight issues on sensitive topics (Tobin, 1997). They assist in opening up qualitative inquiry into areas of perception and morality, zones that would be difficult to explore using quantitative methodologies.

The following scenarios will focus on people in five different contexts: academic and research bodies, the media, community agencies, politicians, and government agencies. They have been composed to illustrate the potential for distortion rather than providing definitive evidence of its occurrence. They present a case for protecting democratic systems based on the plausibility of the risk.

Academic and research bodies

Universities have a major responsibility in modern democracies to support independent and critical academic scrutiny of changes and trends in social systems. Universities are also under enormous financial pressure to deliver quality teaching and research programmes. Tension persists between their duty as "conscience of society" and their need within a competitive research environment to establish stable funding. In the following scenario Jason finds himself caught in this tension:

Jason has worked for thirteen years in a university department of psychology. He had applied unsuccessfully twice for promotion to associate professor. At the conclusion of each promotion round he was told his research profile was not strong enough to qualify. During the last five years he has been working with the support of the racing industry to develop an interesting series of small studies on the cognitions heavy track gamblers use when planning their betting. The racing industry funders were happy for him to publish

the results as long as he acknowledged their contribution. Their funding had provided for two research assistants and for any material or equipment costs. Recently two representatives from the racing industry visited him to state how pleased they were with his work and to convey their willingness to fund a considerably larger three-year project. Jason is flattered by their comments and excited by the prospect of a larger project. He could begin comparing the cognitive repertoire of heavy and infrequent track gamblers. He could look more at the interplay between cognitions and perceptions of luck and skill. The research design opportunities would be enormous. He asks the racing representatives what they expect in return. They state that because the funding would, of course, be of a greater magnitude, they would prefer some control over what gets published and they would be particularly interested in research into cognitions that might have some relevance to marketing their product.

Jason is faced with a difficult and common dilemma. On the one hand, combined with the pressure to increase his research productivity, he is attracted by the opportunity to apply his hard-earned research knowledge and skills. On the other hand, the stronger the relationship he develops with gambling providers, the more his work will be seen by others as influenced by the commercial interests of the industry. Not only this, his research output will come to rely more and more on their continued support, and he will over time adapt his focus in ways that are unlikely to jeopardize future funding (see Adams et al., 2003).

Media

The media play an important role in democracies by presenting information and issues to the public that enables citizens to form views and make informed decisions. As with universities, media outlets such as television and newspapers also seek to protect their major sources of revenue, and for most of them commercial advertising is a vital contributor to funds. The person in the following scenario is caught up in the tension between the role of public informer and being part of a viable business:

A reporter, Melanie, is working late one night to meet the deadline for the morning edition of a daily newspaper. A press release is relayed by a sub-editor to her computer: "Casinos Targeting Local Asians." She pauses a moment to ponder the various angles from which she might explore such an issue. She could interview local Asian community representatives, she could examine casino practices regarding incentives such as free drinks and meals for Asian customers, she might enquire into the revenue casinos derive from Asian customers... but, hold on, putting energy into this

area would be pointless if the editors were to chop it down and bury it deep into the back-pages, or, worse, if it was rejected outright. Melanie is aware how during the last four years their newspaper has derived increasing advertising income from gambling providers. Many of these advertisements declare recent contributions by gambling providers to the public good, in activities such as cultural, charity, or sports events. The newspaper now regularly runs a half-page and sometimes a full-page advertisement for the local casino. She had seen her editor express increasing anxiety regarding threats to this income. This came to a head when six months ago she was involved in a series of four articles reviewing the debate between pro- and anti-gambling-expansion lobbies. As the flow of letters to the editor subsided, the editor received a letter of concern from a casino executive claiming that the coverage was biased and as a result likely to affect their business. The editorial next morning extolled the virtues of the casino to the local economy and the editor spoke to the staff discouraging emphasis on negative publicity regarding gambling providers.

What should Melanie do now? By not pursuing the article, she is surely preventing public access to information on the issue. Even so, the newspaper still has the occasional informative article. There are plenty of other issues that are less trouble and less likely to complicate advertising revenue.

Community agencies

Sports clubs, charities, church and school committees, work social clubs, hobby groups; from small local groups to large national non-government organisations; these all comprise the intricate web of interconnections that provide the base for social involvements. It is often through interactions in community groups that people form their views on social issues. Consequently, financial influence at a community level could go a long way in shaping public views on gambling. The person in the following scenario is feeling the pressure exerted by industry contributions to community development:

Robert is employed by a church organisation to coordinate a community project focused on youth at risk. He believes passionately in the positive impact of this project both for the many marginalized young people he encounters and for his community as a whole. He has applied each year for funding from a local gambling machine trust (a collective of several hotels with gambling machines, required by law to distribute a percentage of takings for community benefit). The amount awarded to his youth project has increased each year to such an extent that he is unsure whether the project could continue without the money. He has had little personal

exposure to gambling or to problem gambling. He is aware that increasing numbers of young people in his community regularly play gambling machines. He has also heard that the government is currently conducting a fundamental review of gambling policy. In response to this, a member of the local gambling machine trust contacts him to speak about fears that the community benefit monies could be moved from local to central distribution. He is naturally concerned that the fruitful relationship he has built up with the trust will no longer continue and he would be forced to compete nationally with dozens of similar projects. He immediately considers volunteering to compile a submission to government opposing the central distribution and praising the work of the gambling machine trust. He pauses. He has difficulty seeing himself as an advocate for communities while at the same time promoting the interests of something that people claim will harm the community.

In choosing to promote the interests of gambling machine providers he places himself in a conflicted position. He can no longer speak out credibly to question youth exposure to machine gambling. It would be inconsistent in one breath to praise their contribution and in another to criticise them. In this way the local gambling provider not only gains an advocate but also manages to effectively silence potential criticism. The charitable contributions of the gambling industry to public good activities quickly translate into community support for their developments and their recognition as responsible community benefactors.

Politicians

As elected representatives of the people, politicians have clear obligations to respond to threats to public wellbeing. This is not an easy task. Choice of the wrong issue could mean an early exit from the political arena. Judgement and skill is required in choosing social issues that are likely to attract public support while at the same time avoiding unnecessary conflict with other sources of power and influence. In the following scenario, a politician finds himself caught between the interests of the public and the influence of gambling provider contributions to political funds:

Bill was first elected into parliament twenty years ago. His party is currently the major partner in a coalition government but, due to a series of internal spats, it is now scoring poorly in public opinion polls. During the last election he won by a very slim majority and he remains concerned that he may not be re-elected. A collective of the local hoteliers who own the majority of the electronic gambling machines in his electorate had contributed a reasonable sum to his last electoral campaign. They have also been very receptive to his suggestions as to suitable charities and other community groups

they should fund with community benefit profits. This has endeared him to many organisations. A few days ago a group of local community leaders approach him regarding concerns about the spread of gambling machines throughout his electorate. They present alarming figures on increases in problem gambling, crime, and social disruption. He understands the issues and is sympathetic to their arguments. He promises to do what he can in parliament, but he stops short of openly challenging the expansion. It would be political suicide. Without the gambling machine money he would have very little chance of re-election, and, furthermore, his party would not welcome him complicating what they receive from gambling providers. Stirring up concern about gambling would most likely lead to central party bosses withdrawing any financial support for his campaign.

Bill recognises that alone, as one politician, there is little he can do in terms of advancing public disquiet about gambling. Discussion with his colleagues produced little. They feel similarly vulnerable. Progress would really require a collective and concerted response within the party.

Government agencies

Multiple parts of the machinery of government are capable of forming key linkages with the activities of the gambling industry, particularly under conditions of managed expansion. The executive of government and its departments of finance and treasury will have a keen interest in the revenue it generates. In addition many governments have their own agencies that directly provide gambling products for public consumption (e.g., state casinos and horse racing). Departments that manage development and regulation of the industry will derive increasing leverage and kudos from successful growth. Departments that respond to potential harm (e.g., health, justice, social welfare) while seeking to develop remedial programmes will be mindful of how gambling revenue contributes to their other programmes. The following scenario epitomizes the individual dilemmas faced by civil servants when they become part of these gambling industry linkages:

Karen has worked for the last year as a policy analyst for the government agency in charge of gambling policy, regulation, and enforcement. Another section of the same agency runs the national lotteries. She had previously worked in a government department in charge of social welfare. She has strong ambitions to perform well and advance in her public service career. Unfortunately profits from the national lotteries are in decline with the increase in competition from other products. Huge efforts are being made to increase participation — expensive TV advertising campaigns, promotion of

large sports events, new lottery products, and special bonus events — but participation continues to drop. The managers in her agency are becoming increasingly worried, particularly since the profits have enabled them to fund a variety of cultural, sporting, and charitable activities and they are concerned about the public response to a dip in funding. Karen's current task involves reviewing legislation on gambling advertising. She is providing the detailed analysis for the review committee of the large number of submissions from a broad range of stakeholders that include community, government, and gambling provider organisations. She is personally persuaded by the submissions that a compulsory advertising code should be introduced but is concerned about her own agency's response. The most aggressive marketing occurs in the lottery advertising that comes from her agency. Clearly, advocating for tougher advertising standards will lead to tension with other parts of the agency and she is unlikely to receive support from her immediate superiors. It would be easy to bury her position in weaker recommendations.

As with previous scenarios, Karen faces a difficult choice. If she stands up as one individual to contest positions of convenience to the organisation she risks being moved sideways and being replaced by a more compliant and perhaps less knowledgeable official. She is tempted to remain and console herself that her weakened recommendations are at least a step in the right direction, even though she knows the suggestions will be ignored.

Effects of degradation

Each of these individuals — Jason, Melanie, Robert, Bill, and Karen — shares a common dilemma. On the one hand they occupy positions of influence that could enable increased public responsiveness to the societal impacts of gambling. On the other, the small part they could play in strengthening the financial relationship of their organisation to the gambling industries in turn reduces the organisation's credibility and capacity to act on behalf of the public. Should they choose the former, they jeopardize financial gains for the organisation; should they choose the latter, they risk distortions of public awareness. They are each caught in a tangle of benefits and risks that pull them in both directions.

On closer inspection, the balance in this dilemma is not evenly weighted. The incentives in favour of the industry are typically more immediate and attractive than incentives to serve the public. For example, the researcher, Jason, will receive stronger and more immediate recognition within the university for scoring a large research grant than he would for making a stand on refusing industry funds. A few colleagues might admire his resolve, but in the context of the broader university community, his ethical stance is likely to

pass unnoticed. This contrasts with the highly visible presence of the products from industry funding. On the flip side and in a similar way, the *disincentives* to serve public interests are also typically stronger than those affecting industry involvements. For example, should the reporter, Melanie, choose not to write about casino targeting of Asian clients her decision is unlikely to be challenged, and even if questioned, she could easily rationalise it in terms of stronger stories elsewhere. It is hard to imagine her compliance sparking a formal investigation or a public scandal; it would be unlikely to attract even passing comments from colleagues. In contrast, an article critical of the industry is likely to prompt immediate and stern responses from the editor, casino executives, and possibly the newspaper owners.

With incentives and disincentives favouring linkages with gambling provider interests, individual compliance with organisational-industry involvements becomes a more probable event than attempts to challenge such connections. Individual people within this interface will feel pressure to make choices that strengthen the involvements and build collectively towards more powerful societal effects. The researcher diverts energy from understanding impacts, the reporter avoids conveying information to the public, the community worker allows good work to reinforce the public image of a gambling provider, the politician misses opportunities to champion issues, and the government worker translates industry favour into policy recommendations. Each act in itself is small and largely untraceable, but taken collectively they add to the accumulating momentum of gambling expansion and to the cumulative effect of public misinformation and, at the same time, to consequent missed opportunities for informed decision-making.

The role of modern democratic governments in these processes is complex. They certainly play a pivotal role in protecting the public from gambling-related harm, but, in most nations, governments are also major recipients of gambling revenues. As this revenue increases, their focus on the public good competes with their interest in the funds. The balance between these opposing interests can reach a point where the need for money outstrips duties of public protection. Consequently, it is important that any government that embraces rapid expansion of gambling also recognise that their democratic structures are being placed at risk. In an environment of managed expansion, this calls for strategies that not only weed out blatant distortions but also establish procedures to counteract the less visible, low-grade threats.

Minimising harm to democratic systems

The current article has argued that in an environment of rapid gambling expansion, harm to democratic processes and institutions is highly probable. It further points out that distortions are likely to be

subtle and diffuse, and are likely to remain unchecked. These distortions are generated by a broad scattering of individuals who, working in isolation, incrementally compromise their functions and thereby contribute cumulatively to a collective degradation of democratic systems. Part of a harm minimisation strategy targeting gambling should include explicit measures to protect the public from distortions to democratic processes. The key ingredient to reducing the risk of degradation will inevitably involve independent monitoring of people with public duties and relationships to the beneficiaries of gambling consumption. The following lists specific strategies that could be put in place to reduce the probability of these distortions:

Academic and research bodies

- Universities and other research organisations develop policies that restrict acceptance of direct funding from gambling providers;
- Independent, intermediary bodies are set up to receive industry contributions and manage disbursements;
- Universities in their role as "conscience of society" actively pursue critical scrutiny of the role of gambling in communities.

Media

- Media providers include within their charters a declaration of vigilance regarding independence from industry;
- National and international media organisations monitor provider adherence to standards of independence from gambling providers;
- An independent government agency is empowered to investigate complaints of undue influence on the media.

Community agencies

- Charities include within their charters or constitutions a declaration, as part of their public-good function, that restricts receiving funds directly from gambling providers;
- Gambling providers are prohibited from contributing directly to charitable, sports or other community organisations;
- The proceeds from gambling for community benefit are managed independently of gambling providers.

Politicians

- All political parties are required by law to declare sources of

income for political purposes;

- Politicians are required to declare gifts and benefits received from gambling industries (shares in race horses, overseas trips, etc);
- An independent government agency is empowered to monitor funding for political purposes from gambling providers.

Government agencies

- Formation of an independent monitoring body reporting directly to government (not through ministries or departments);
- Separation (ideally in different agencies) of the functions of policy development, regulation, and enforcement;
- Pro-active separation (subject to management audit) of agencies of government that manage or directly benefit from gambling tax revenue from those that regulate or manage associated harm.

Benchmarking international standards

Many of the strategies listed above rely on the integrity of the independence built into monitoring processes. This integrity is naturally the very subject of threat as governments step up their interest in gambling revenue. As tax revenue increases, motivation to adequately monitor systems decreases. In order to prevent progressive distortions to independence, nations undergoing rapid proliferation of gambling have a strong need for an external reference point by which they might gauge potential drifts in democratic integrity. As illustrated in the above scenarios, gradual distortions to democratic systems can be difficult to spot and consequently any remedial response is likely to come too little too late. There is, therefore, a role for an external agency to assist governments in identifying when their management of gambling is likely to compromise public interests. International bodies such as the World Health Organisation or the United Nations could perform an important function in identifying international benchmark standards and then monitoring the level of compliance of individual governments with these standards.

In 1997, at the Tenth International Conference on Gambling and Risk-Taking in Montreal, the current author co-presented the original draft of an international charter that sets out expectations for responsible governments in the provision of gambling (Adams & Gerdelan, 1997). Similar to the European Charter on Alcohol (WHO, 1995), this proposed charter is built on a set of seven ethical principles. The first ethical principle is an overarching statement that:

All people have the right to a family, community and working life protected from violence, property crime and other negative consequences of the consumption of gambling.

Two other principles identify benchmark standards for protecting the functions of democratic institutions and processes. Ethical Principle Five states:

All people have a right to participate in a democratic process in deciding the amount and type of gambling that occurs in their communities.

Ethical Principle Six states:

Governments have a duty to provide regulatory frameworks and social policy responses on behalf of citizens to maximise the enjoyment of and limit the harm from the provision of all gambling.

These or a similar set of ethical principles could form the basis for specifying clear targets and identifying compliance indicators with which to monitor the performance of individual governments. International organisations are then able to provide independent monitoring by taking the compliance indicators and developing audit processes for evaluating government compliance. The publication of the outcome of such audits will provide a reference point for governments who wish to expand gambling opportunities while at the same time preventing harm to democratic institutions.

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For correspondence: Peter Adams, PhD, Director, Centre for Gambling Studies, Faculty of Medical and Health Sciences, University of Auckland, Private Bag 92019, Auckland, New Zealand. Phone: 64 9 3737-599 ext. 6538, Fax: 64 9 3737-493, e-mail: p.adams@auckland.ac.nz

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Peter Adams is a senior lecturer in the School of Population Health at the University of Auckland, where he heads the social and community health section and is academic director of the Centre for Gambling Studies. He practiced for 13 years as a clinical psychologist, specializing in addictive behaviour and violence. He initiated, developed, and teaches in post-graduate programmes on alcohol and other drugs and teaches a post-graduate course on interventions for problem gambling. His gambling research activities have focused on the societal impacts of gambling, clinical interventions and harm minimisation strategies. For five years he chaired the Board for the Problem Gambling Foundation of New Zealand (the largest provider of gambling services in New Zealand) and in 2001 led the formation of the Centre for Gambling Studies.

Note:

1 The examples used in the article are composites contrived for the purpose of illustration. They point out possibilities in our current systems, and any resemblances to real people or situations are purely coincidental.

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research

[This article prints out to about 36 pages]

How do we know what we know? Epistemic tensions in social and cultural research on gambling 1980–2000

Virginia M. McGowan
University of Lethbridge
Lethbridge, Alberta, Canada
E-mail: mcgowanvm@csc-scc.gc.ca

Abstract

This project seeks to answer the question, how do we know what we know about gambling? With reference to a systematic review of the gambling research literature that addresses social and cultural topics and issues, this paper explores the epistemic cultures that created and gave authority to knowledge about gambling presented in scholarly research published between 1980 and 2000. From small beginnings in the 1980s, scholarly research in this area exploded during the 1990s and was dominated by surveys describing the distribution of problem and pathological forms. The trend in gambling research is towards an increasingly narrow range of topics, focused on pathology, and curiously disengaged from advances in contemporary social theory. The paper concludes with a plea for nuanced, politically engaged, and culturally informed gambling research grounded in the social, cultural, historical, and everyday contexts in which gambling is embedded. [Keywords: gambling, systematic review, social, cultural, gambling, epistemic, paradigm]

"Although we may know in part … we are also a part of what we know."

N. Frye (1963, p. 11)

Introduction

There is little doubt that gambling[1] has seized the attention of the public in recent times, evidenced in the news media by anxious discussions about hope for the economic benefits of gambling, as well as concern about the negative impacts. This wave of interest follows the increased accessibility and availability of gambling, with new forms and venues marketing to changing demographics of gamblers, such as increased involvement by women.

Paradoxically, gambling became more acceptable as a leisure activity at the same time that it gave rise to public expressions of moral panic and outrage. In Canada, interest in gambling as a leisure activity increased substantially with the "lottery amendments" to the Criminal Code in the late 1960s (Kelley, 2002). At this time, involvement in gambling by provincial and federal governments, charities, and exhibition associations was legalized (Pruden, 2002) and has since generated significant revenues for cash-strapped organizations and public institutions. The increase in gambling activity subsequent to these amendments was accompanied by growing anxiety among health professionals, community leaders, and the general public about the potential impacts of gambling on individuals, families, communities, and society.

What is not so obvious to the general public is the recent growth of scholarly interest in gambling. Studies of the gambling phenomenon have exploded onto the research scene during the past decade, with new funding agencies, monographs, reports, scholarly journals, and professional electronic mailing lists attesting to vigorous interest in gambling on a global scale. New funding opportunities established by governments in response to public concern undoubtedly gave some impetus to scholarly interest in gambling — testimony to the notion that "if you fund it, they will come." Regardless of the reason for the interest in gambling as an object of study among scholars, the latter part of the 20th century remains remarkable in the vigorous demand for and production of expert knowledge about this phenomenon.

Demand for knowledge and reliance upon experts to provide it is by no means unique to gambling. Knorr Cetina (1999) reminds us that contemporary Western societies are "ruled by knowledge and expertise" (p. 5). In these "knowledge societies," decisions and actions in everyday life are based increasingly on information produced by distinct expert systems, usually described as disciplinary or specialist groups (Knorr Cetina, 1999).

Curiously, knowledge created by expert systems is often treated as though it were only a product, free of the social and cultural contexts in which it is created. Thus, the processes by which knowledge is produced are "black-boxed" and remain largely invisible and unexamined (Knorr Cetina, 1999). Only recently, beginning in the postmodern period and continuing into the present, have scholars been challenged to lay bare how scientific knowledge is constructed and warranted, their paradigms and assumptions questioned as potentially naïve (Belenky, Clinchy, Goldberger, & Tarule, 1986; Gilligan, 1993; Guba & Lincoln, 1994; Knorr Cetina, 1999). This process of recontextualizing the knowledge that is produced by scholarly inquiry is prompted by the simple question, how do we know what we know (Denzin & Lincoln, 2003, p. 245)?

We begin to answer this question by examining the nature of expert systems and the processes by which they construct and warrant knowledge. Knorr Cetina (1999) suggests that terms such as discipline and scientific speciality adequately describe neither the degree to which expert systems "curl up upon themselves" nor "the deep social spaces" where they practise (p. 2). Such are the distinctions between various expert systems that they become deeply entrenched and internally oriented. Knorr Cetina offers the term "epistemic cultures" (1999, p. 1) to more accurately describe modern expert systems; it is within epistemic cultures that one finds paradigms (i.e., belief systems) and attendant practices and symbols (e.g., systems of classification) that construct and give authority to particular ways of knowing. She reminds us that examples can be found in the institutional structure of universities, which are fragmented into departments of physics, biology, history, sociology, psychology, etc. Each discipline is an example of an encapsulated epistemic culture, separated from others by distinct ways of knowing, objectives, expert practices, and symbolic structures.

These distinct ways of knowing create an epistemic gulf that is most often perceived to exist between the experimental laboratory-based "hard" sciences (e.g., high-energy physics, molecular biology, chemistry) and the "soft" sciences (e.g., qualitative sociology, anthropology), which are concerned with naturalistic inquiry. Differences are observable among subspecialties, however; consider the distinctions between clinical and counselling psychology, or quantitative and qualitative sociology. Historically, these differences reference modernist or constructivist perspectives, influenced by later developments in feminist, critical, or cultural theory. Further distinctions are evident within expert systems in the experimental laboratory-based sciences as well, such as between high-energy physics and molecular biology (Knorr Cetina, 1999).

Guba and Lincoln (1994), in their comprehensive comparison of positivist and naturalistic inquiry, suggest that the differences in paradigms that create the gulf between expert systems depend on conflicting sets of assumptions. One assumption concerns ontology, or what is understood as "reality," and what can be known about it. Are only measurable phenomena "knowable," for example? Yet another assumption concerns epistemology, or the relationship between the knower and what is to be known. This assumption indexes the objective or subjective understanding of "reality," where knowledge is understood to be either value-free, bounded, and distinct from the observer (objective) or deeply contextualized, multilevelled, nuanced, and influenced by the observer (subjective). Highly dependent upon assumptions of ontology and epistemology is methodology, or what will reveal what can be known to us (Guba & Lincoln, 1994); that is, how can we "capture" data? Accordingly, to understand how we know what we know in any area of knowledge is to understand these assumptions that are drawn from the paradigms, associated practices, and symbolic structures that create and warrant that knowledge.

With reference to gambling research, our question becomes, how do we know what we know about the phenomenon of gambling? Can we make explicit the assumptions and ways of knowing that have led gambling researchers in the direction they are taking at present? What does this reflective understanding presage about future developments in our understanding of gambling?

This paper begins to respond to these questions by examining the scholarly social and cultural research on gambling published between 1980 and 2000[2]. This literature is informative to the current project for several reasons. First, following earlier legalization of gambling in many Western societies, this period witnessed a proliferation of opportunities to gamble and the emergence of new forms of gambling. Second, governments began to invest heavily in gambling as a source of revenue, and funding for gambling research increased substantially. Finally, this literature includes contributions from a range of disciplines that reference highly divergent paradigms, in contrast to bio-psychological, economic, or historical literature, which tends to be less interdisciplinary.

The present study explores how researchers have addressed social and cultural aspects of gambling and situates our current knowledge about gambling in the history of its development over the past two decades of increased public involvement and intensifying scholarly interest in this phenomenon. In this review, I examine epistemic themes, patterns, and trends in the social and cultural research on gambling in search of where this research is leading us. Accordingly, this approach shifts the object of inquiry

from knowledge about gambling to the epistemic cultures that create and give authority to this knowledge.

These evaluative remarks and comments are not intended to disparage the quality of research during this 20-year period. Indeed, I believe very strongly that the significant contributions of these scholars and the impact of their studies should be acknowledged. Accordingly, these comments are intended to tease out gaps and areas where, even though some work may have been done, more substantive attention will likely lead to both a greater understanding of gambling and more effective and appropriate responses.

Twenty years of social and cultural research on gambling

Included in the annotated bibliography examined for this review were documents published during a 20-year period (1980 to 2000) in North America, Europe, and the non-European Commonwealth. Literature published in languages other than English or French was not included, and the subsequent predominance of studies by Western scholars is obvious. Studies from outside this linguistic scope are not only absent from this review but also do not contribute substantially to the dominant discourses in gambling research at the present time because, quite simply, they reside on the far side of the linguistic divide. Whether the field of gambling studies is impoverished by this is a matter of conjecture that should be explored further.

The bibliography was limited to literature based on empirical research considered to reside in the scholarly domain from peer-reviewed journals and "grey" sources (i.e., research reports generated by government agencies or nongovernmental organizations) identified by a standardized search-and-retrieval strategy described in detail in McGowan et al. (2000). This search strategy, using electronic bibliographic databases and keywords culled from the social and cultural research literature on gambling, identified nearly 300 separate documents, including prevalence, incidence, trend, and correlation studies; descriptive studies that addressed social impacts and policy implications; ethnographic studies (largely participant-observation in naturalistic settings); qualitative studies; and reviews of the empirical research literature. The final bibliographic list included 264 items after evaluation by criteria of scholarship described in McGowan et al. (2000).

This body of literature comprises studies focused primarily on patterns of play, such as frequency and distribution by gender, age, ethnicity, or other sociodemographic variable and, to a lesser degree, cultural contexts.[3] This concentration on the social and

cultural dimensions of gambling thus excludes bio-psychological and economic studies, as well as psychological studies that focus on intrapsychic phenomena.

The 1980s: Small beginnings

A small group of researchers made significant contributions to the social and cultural gambling literature of the 1980s. As Marshall (1985) noted in his review of the early research on alcohol, the gambling research literature of the 1980s was largely descriptive and atheoretical. For the most part, this literature was concerned with the observed or potential social and economic impacts of gambling, the pattern and distribution of play, parental influences on youth gambling, and association of youth involvement in gambling with other perceived deviant behaviours.[4] A few authors, taking a cultural relativist stance, treated gambling as a normalized leisure activity[5] or examined its occurrence and significance in indigenous contexts prior to European contact (Wasserman, 1982).

Although a variety of methods were used to identify pathological gamblers, the published literature of the late 1980s includes the first large-scale surveys that screened for problem and pathological gambling using a standardized questionnaire, usually the South Oaks Gambling Screen (SOGS) or a screening instrument based on criteria codified in the Diagnostic and Statistical Manual (DSM IV-TR) of the American Psychiatric Association (2000), currently in its fourth (text revised) edition. The populations of interest included adults and youth in the general population, active gamblers, and substance abuse treatment groups; a variety of quantitative research methods such as telephone surveys and self-administered questionnaires were used.[6]

Several significant reviews of the gambling literature were produced in the late 1980s and were concerned largely with methodological problems, conceptual issues, and identification of gaps in empirical knowledge. In their review of the literature on pathological gambling, Knapp and Lech (1987) described pathological gambling as a mental disorder with explicit diagnostic signs and symptoms. Further, they rang the alarm that this disorder was widely prevalent and likely to increase in the future. Two large-scale reviews of the general gambling literature (Griffiths, 1989) and studies of pathological gambling (Lesieur, 1989a,b) noted that previously published studies were plagued with methodological and conceptual problems and contradictions, however. Both reviewers called for more controlled or systematic research, particularly epidemiological research on the distribution of gambling among adolescents, ethnic minorities, and other population subgroups, and studies that would clearly demarcate the impact of gambling. Further criticism of gambling research focused on methods used to

estimate the prevalence and incidence of pathological gambling (Nadler, 1985).

The single trend study identified from this period predicted rapid growth of the gambling industry as new markets opened up. Further, the perspective of gambling as deviant behaviour became entrenched (Rosecrance, 1985). Reflecting the emergence of alternative paradigms in the social sciences, several studies explored the social and historical construction of gambling and offered alternative perspectives to pathology.[7] These studies situated gambling as a normative leisure activity amenable to the usual methods and subjects of social science inquiry.[8] The shortcomings of social policy that were intended to ameliorate the impact of gambling, especially among children, were also discussed, but comparison to other jurisdictions and approaches — the cornerstone of social scientific inquiry — is absent in this literature (Kelly, 1988).

Only a handful of ethnographic and qualitative studies appear in the 1980s, although a sprinkling of these approaches appeared across the 20-year span examined. In a special issue of the journal *Oceania* devoted to anthropological studies of gambling emerge functional descriptions of gambling in postcolonial societies in the south Pacific. These studies describe patterns of resource distribution and involvement according to gender, age, and occupation and offer sociopolitical and cultural explanations for observed patterns and meanings given to play.[9] In contrast to social epidemiological studies that problematize gambling as a deviance or disease, the ethnographic and other qualitative studies published in the 1980s present a thicker description of gambling in situ as a social form embedded in everyday life and warn against overmedicalizing such complex social forms (Hunter & Spargo, 1988). With the exception of two studies from the United Kingdom (Saunders & Turner, 1987) and Spain (Tubery, 1987), most nonepidemiological studies published during this decade are concerned with gambling among indigenous societies experiencing rapid social change.

The 1980s: Key findings and directions

By the end of the 1980s, a deviance perspective on gambling was firmly established and the clear message emerged that more information about the distribution of problem and pathological forms was urgently needed to deal with anticipated social and public-health problems. Further, retrospective reviews of research encouraged scholars to take seriously questions of survey and sample design, variation in play and pathology among subgroups of the population, and methods used to screen for pathological gambling. The literature from this period signals clearly emerging

concern about adolescent gambling and highlights the relative lack of information about diversity in the prevalence of gambling, particularly pathological forms, among subgroups. Most significantly, these early reviews and studies were unanimous in calling for better epidemiological data on gambling and predicted that increased opportunities and changing attitudes towards gambling would be accompanied by an increase in individual and social pathology. The few ethnographic studies from this decade reflect the functionalist orientation of anthropological studies of that time, with a clear focus on local settings. There is limited linkage to emerging global trends, however, and the predominantly cultural relativist stance is at odds with the position taken by the problematizing disciplines.

The 1990s: An explosion of surveys

A large body of research emerged in the 1990s, focused primarily on identifying the distribution of recreational, problem, and pathological gambling in society (McGowan et al., 2000). The largest contribution was made by quantitative sociologists and clinical psychologists who focused on problem and pathological gambling as deviant behaviours, although there is a limited representation from anthropologists, qualitative sociologists, social psychologists, and other less quantitative or pathology-oriented social scientists. Accordingly, the literature across this decade of research is dominated by prevalence studies in the form of social epidemiological surveys of the frequency and distribution of gambling (particularly problem and/or pathological forms as codified in the DSM) among representative samples of regional or national populations. Gambling for recreational purposes is given some attention, although usually as a descriptive prelude to analysis of the prevalence of problem or pathological gambling.

Prevalence of problem and pathological gambling.

Nearly half (47.5%) of the studies identified by McGowan et al. (2000) were concerned with describing the prevalence of problem or pathological gambling. Several methodological issues were addressed, including instruments used as screening tools. In short order, gambling researchers began to refer to probable or potential pathological gambling, reflecting earlier contestations of the validity of screening tools such as the SOGS, an instrument developed originally for screening individuals in clinical settings, but used increasingly in population surveys.

Seventy-eight percent of studies were concerned with estimating the prevalence of problem or (probable/potential) pathological gambling from primary data (i.e., collected by the authors for the purpose of the study, in contrast with data re-analyzed from other

studies). Problem or (probable/potential) pathological gambling was ascertained by the use of screening instruments such as the SOGS or a variant, a DSM-based questionnaire, or another instrument such as the Manitoba Gambling Pre-Screen (MGPS) or Canadian Problem Gambling Instrument (CPGI). The SOGS became increasingly popular and was employed in 58 of the studies identified from the 1990s. In contrast, DSM-based screening instruments were used in 15 studies; other instruments were used in 6.

Included in the prevalence studies published between 1990 and 2000 were surveys comprising large representative samples drawn from populations in the United States,[10] the United Kingdom,[11] Canada,[12]12 New Zealand,[13] Australia,[14] Spain,[15] Switzerland (Bondolfi, Osiek, & Ferrero, 2000), the Netherlands (Hendriks, Meerkerk, Van Oers, & Garretsen, 1997), and Turkey (Duvarci, Varan, Coskunol, & Ersoy, 1997), as well as subregions within these countries.

This body of research included studies that focused on specific social and demographic sectors, such as children or youth,[16] college students,[17] and specific ethno-cultural groups;[18] seniors (Citizen Advocacy Society of Lethbridge, 1995); persons seeking help[19] or in treatment for gambling or other problems;[20] persons residing in medical or correctional institutions;[21] service providers (Doupe, 1999); or groups such as lottery ticket buyers or other active gamblers (Hendriks et al. 1997) and casino employees (Shaffer, Vander Bilt, & Hall, 1999). A number of studies that yielded estimated prevalence rates for problem and/or (probable/potential) pathological gambling included Native American/First Nations or other indigenous peoples.[22] One third of these prevalence studies (which include both primary and secondary analyses of data) and nearly 40% of the studies concerning First Nations peoples were conducted by Canadian researchers studying regional or other populations (McGowan et al., 2000).[23]

The estimated prevalence rate for problem gambling in the general population as reported in this literature ranges from 1% to 11% for adults and from 2.3% to 21% for children and youths. Estimates of (probable/potential) pathological gambling rates range from 0% to 4.6% among adults and from 1.7% to 8.5% among children and youth, with higher estimates reported for First Nations and other indigenous populations and persons residing in correctional or treatment facilities (McGowan et al., 2000). Sampling and survey methods, screening instruments, and other factors vary widely across studies, however. Accordingly, estimates of the prevalence of problem and (probable/potential) pathological gambling should

not be consulted without reference to the methods used.

Explaining and dealing with gambling

Among the research literature concerned with problem or (probable/potential) pathological gambling published in the 1990s were studies that did not centre on estimating the distribution of problem or pathological gambling in society. A limited number, attempting to understand why people (particularly youth) gamble, explored motivation and other factors influencing involvement with gambling, such as risk-taking behaviours.[24] In addressing the question of why people become involved in gambling, this research makes reference to both internal and external processes, including theories of self-determination and risk-taking[25] and an integrated set of internal (e.g., cognition and affect) and external (e.g., peer group and family) influences and processes.[26] The consensus among these studies, if one can be had, is that involvement in gambling is associated with a complex set of motivations and influences, with both external and internal dimensions.

As public concern increased over the negative impacts of gambling expansion, more attention was paid to the impacts of public policy or studies of behaviours and attitudes relevant for public policy development.[27] These studies relied upon a combination of original research (surveys) and review of data from other studies. The ambivalence of public attitude towards gambling is made apparent in much of this research, as the balance sheet of negative versus positive returns remains unresolved. Little clear direction for future public policy on gambling emerges, although regional, demographic, and other variation in attitudes and involvement are described.

As researchers looked to the wider contexts of gambling, they explored the relationship of problem or (probable/potential) pathological gambling with peer, family, and other societal influences (Browne & Brown, 1993); developmental patterns;[28] gender;[29] and coexisting problems such as substance abuse, suicide, homelessness, and crime.[30] A number of these studies were concerned with the implications of their findings for the development of prevention and treatment services,[31] especially among youth[32] and in particular where gambling coexists with other problem behaviours or social-psychological attributes.[33]

The literature of the period 1990 to 2000, although dominated by researchers preoccupied with estimating prevalence rates, also included research on public attitudes, social and economic impacts, and other consequences of gambling in various countries.[34] Of

particular interest was the emerging concern with social and economic impacts and consequences for Native American/First Nations peoples, including public attitudes, coincident with a number of these communities investing in casino operations to revitalize their economies.[35]

The 1990s: Key findings and directions

The prevalence studies that dominated scholarly research in gambling between 1990 and 2000 give some shape to the pattern and distribution of problem and (probable/potential) pathological gambling in contemporary society. We learned that most adults and many youth have gambled at some time, but only a small proportion experienced problems associated with this activity. In these studies, Native American/First Nations and other indigenous peoples, as well as adults seeking help or in treatment for a range of other problems (e.g., mental health, addiction to alcohol or other drugs), and persons residing in correctional facilities appear to experience disproportionately higher rates of problem and (probable/potential) pathological gambling than the general population.

This literature indicates that gender and religious affiliation correlate modestly with differences in involvement in gambling. Although lower income groups tend to be less involved in gambling than middle income groups, they spend a larger proportion of their disposable income on gambling. Several significant findings emerge concerning gambling among young people. Echoing earlier studies on youth substance abuse, these findings show that younger age at initiation into gambling correlates with greater involvement in adulthood. Further, youth problem gambling is demonstrated to occur most often in the context of coexisting substance abuse and peer and family involvement with gambling. These findings suggest that further attention should be paid to age, gender, development, and social-cultural-economic contexts as societal attitudes and forms of play change and gambling opportunities increase.

As noted by McGowan et al. (2000), the literature of this period is remarkable for the relative lack of systematic research on the social and cultural impacts of gambling, which tend to be commented upon rather than analyzed. The absence of explicit social theory, either as organizing conceptual framework or as new perspectives on the social reality of gambling (Garner, 2000), is particularly noticeable. Regarding Native American/First Nations and other indigenous communities, the limited research indicates that gambling in the modern context contributes to the rapid pace of social and cultural change and is a "mixed blessing" (Hsu, 1999) with strong positive and negative impacts ranging from gambling as

the "new buffalo" that invigorates local economies, on the one hand, to a destructive force that contributes significantly to the fragmentation of communities (e.g., over on-reserve casinos), on the other.

Discussion: Epistemic cultures and tensions in scholarly interest in gambling

Social and cultural research on gambling is remarkably diverse, including a number of disciplines operating as distinct epistemic cultures. The humanities, particularly literature, have paid attention to the social and cultural contexts of gambling over a significant period of time (cf., Dostoyevsky, 1999/1866). Other disciplines were relatively ambivalent to gambling as an object of scholarly research until the 1990s, however, with the exception of some earlier works by psychoanalysts (e.g., Freud, 1928), social theorists (e.g., Goffman, 1969), and anthropologists (e.g., Callois, 1962; Huizinga, 1949). By the end of the 20th century, scholarly researchers from a variety of disciplines had embraced the study of gambling with great enthusiasm (cf., Reith, 1999).

Several contrasting epistemic cultures can be detected in this later literature, such as between perspectives focusing on gambling either as pathology or as social life writ large. The other contrast lies between positivist (or postpositivist; Creswell, 2003) and social constructivist paradigms. On the one hand, positivist/postpositivist research traditions objectify gambling; on the other, constructivists focus on the subjectivities and contexts in which gambling takes place.

Positivist/postpositivist disciplines such as clinical psychology came to dominate the scholarly literature on the social and cultural dimensions of gambling published over this 20-year span. The body of literature that emerged focused largely on describing the pattern of problem and (probable/potential) pathological gambling across sociodemographic sectors of society, with some attempts to identify associations and correlations among both discrete and continuous variables, such as diagnostic type, age, gender, type of play, frequency of play, and problems associated with gambling. Accordingly, this research exemplifies a focus on pathology within the realist tradition of modernist science, a perspective that emphasizes deductive knowledge obtained by capturing data through quantitative measurement of specific variables. From this point of view, the study of gambling emerges as an objective and value-free activity intent upon identifying and manipulating variables that may, in turn, be predicted and controlled (Guba & Lincoln, 1994). What is presented is a body of scholarly research that is rigorous in its methods and generalizable in its output, but curiously lacking social, cultural, and historical contexts of gambling

as well as the lived experience of gamblers.

Some scholars have called for a deeper mining of observed patterns of gambling among particular segments of society than has emerged to date, suggesting objects and subjects of study, theoretical frameworks, and methods that explore gambling in the context of varied and complex life experiences. For example, Lesieur and Heineman (1988) called for more contextually based research to shed light on the overlapping social worlds of the substance-abusing gambler and the gambling substance abuser. Mark and Lesieur (1992), pointing to gender biases in gambling research, noted that research concerning women's experiences of problem gambling must take into account the relationship issues that women face, citing as examples dominance, subordinate status, and social sanctions. More recently, McMillen (1996), stepping deliberately away from a focus on pathology, reminded us that gambling is a social practice ubiquitous in human social history, occurring across culture, time, and place, and requiring that context be fully comprehended.

Guba and Lincoln (1994), among others, suggested that social institutions and practices — what Rowse (1996) has called "social technologies" — must be understood as embedded in particular cultural and historical contexts. Accordingly, the meanings given to the experience of engaging in a social practice or institutional form are understood to be socially constructed. It is to these meanings that we act, rather than to the thing itself. Taking into account the social construction of gambling as a social technology suggests that different conceptual tools and explicitly political approaches are required to fully comprehend contemporary forms (McMillen, 1996), including their influencers and impacts, than are commonly applied. Other than McMillen, relatively few scholars included in this review identified the need to situate our knowledge of gambling in the contexts in which gambling takes place. These pleas for research that contextualizes and provides a "thicker description" (Geertz, 1983) of gambling index a perceived need to reexamine the relative merits of alternative perspectives (e.g., of anthropology, qualitative sociology, and social and humanistic psychology) that will broaden our understanding of this phenomenon beyond the narrow focus of objectivist research.

Tension among epistemic research cultures is neither a new nor a recent phenomenon. Within the confines of alcohol and other drug studies, this tension has been noticed and commented upon previously. For example, Room (1984) placed his finger squarely upon the issue with regard to alcohol, noting the tension between scholarly perspectives that tend to either inflate or deflate problematic aspects of drinking behaviours. In gambling studies, Reith (1999) suggests that this tension traces to two dominant perspectives on gambling that derive, on the one hand, from the

Platonic tradition, which sees gambling as a form of play that cannot be meaningfully separated from other social practices, and, on the other, the Aristotelian tradition, which perceives gambling as "essentially problematic" and as a "deliberate courting of the chaotic forces of chance [and] a threat to the moral order of society" (Reith, 1999, p. 5).

As Reith (1999) points out, the latter tradition is ascendant in the modern "risk society" and is reflected in public preoccupation with dangerous outcomes of behaviours associated with deviance and disease. Assessment of these risks is most often phrased in terms of probabilities and is depoliticized. Indeed, the "public perception of risk is treated as if it were the aggregated response of millions of private individuals" rather than a culturally standardized response (Douglas, 1992, p. 40). In its treatment of risks associated with gambling, gambling research itself, as a specific human activity, can be seen to be embedded in the same cultural systems and paradigms that inform our most mundane experiences.

Present and possible trajectories

Why is the scholarly research on gambling so quiet about the place and meaning of gambling in everyday life and about the larger societal issues and trends in which gambling and the gambler's experience are embedded? One reason may lie in tensions among and between epistemic cultures of research. In their comprehensive review of anthropological studies of alcohol and other drug research, for example, Hunt and Barker (2001) suggested that, because social science traditionally functions as cultural critique, its methods and perspectives are viewed suspiciously and resisted by disciplines that engage "traditional" empirical epistemologies. The "culturally innocent" (MacDonald, 1994), individualized, and essentialized nature of gambling as perceived through a positivist/postpositivist lens is questioned and destabilized by social science perspectives that emphasize the messy business of gambling as symbolic, political, historically situated, or culturally constructed (Hunt & Barker, 2001).

The present trajectory of social and cultural research on gambling points to increasingly decontextualized knowledge focused on pathology and deviance and disengaged from advances in contemporary social theory. This trajectory leads away from research that situates the phenomenon of gambling in the rich texture of everyday life (Smith, 1987), social structural issues (Bourgois, 2003), political and economic trends (Baer, Singer, & Susser, 1997), and the impact of misogyny and racism (Gamson, 2003; Ladson-Billings, 2003). Furthering our knowledge about gambling in contemporary society requires that the social, cultural, and historical contexts in which gambling is embedded receive

adequate attention. A socially and culturally engaged body of research will encourage critical examination of commonly used constructs (e.g., ethnicity, gender, culture) and challenge orthodoxies such as biomedical models that emphasize gambling as pathology (e.g., as per Spicer, 2001). Moreover, this approach will encourage exploration of the symbolic meanings of gambling in its diverse forms and contexts, as well as social, political, and historical analyses and comparisons with other social practices and institutions.

Unfortunately, the underlying theory is rarely made explicit in gambling research. Indeed, in the present review of 20 years of social and cultural research on gambling, few studies tested, contested, modified, or developed social science theory related to gambling, such as advances in feminist theory, queer theory, critical race theory, narrative theory, globalization studies, and political economy. Fewer still employed the hermeneutic or dialectical methods characteristic of social constructivist approaches to research.

Have the dominant epidemiological and clinical psychological paradigms provided the key to preventing problems associated with gambling? Some would argue that this has not occurred in any arena where major health problems are concerned (Hunt & Barker, 2001). What is desperately needed is nuanced, politically engaged, and culturally informed research that is grounded in the social, cultural, historical, and everyday contexts in which gambling is embedded.

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For correspondence: Virginia (Ginny) McGowan, PhD, Associate Director, External Research, Addictions Research Centre, 23 Brook St., P.O. Box 1360, Montague PE C0A 1R0, Canada. Tel: (902) 838-5903 (direct)/ 838-5900 (main), fax: (902) 838-3537, e-mail: mcgowanvm@csc-scc.gc.ca.

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Virginia McGowan, (PhD in anthropology, University of Toronto), recently joined the staff of the Addictions Research Centre on Prince Edward Island (a division of the Research Branch, Correctional Service Canada) as Associate Director, External Research. Prior to this appointment, Virginia was associate professor and founding coordinator of the Addictions Counselling Program in the School of Health Sciences, University of Lethbridge. There, among other projects, she carried out ethnographic field

research in Canada, Australia, and Aotearoa/New Zealand. Her numerous current responsibilities include a closer look at gambling among offender populations and implications for recidivism and successful reintegration.

Notes

1 There exists some controversy associated with the terms "gaming" and "gambling" among scholars. "Gaming" is generally applied, particularly in government documents, to a variety of forms of play where games of skill or chance are involved, whereas "gambling" is understood to apply to activities involving wagering of money or items of worth, with varying degrees of chance and uncertainty in the outcome of play. Reith (1999, p. 1) offers this definition of gambling: "a ritual which is strictly demarcated from the everyday world around it and within which chance is deliberately courted as a mechanism which governs a redistribution of wealth among players as well as a commercial interest or 'house.'" Although a commercial interest or house is not always involved in non-Western experiences of play, scholarly researchers most often use the term "gambling," and this is the term selected for this paper.

2 As presented in a critically annotated bibliography prepared for the Alberta Gaming Research Institute (McGowan, Droessler, Nixon, & Grimshaw, 2000).

3 Where more than one study is cited, the author reference will appear in these endnotes to facilitate the reading of the text, as suggested by an anonymous reviewer.

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[This article prints out to about 13 pages]

An analysis of self-identified speculative investors

Richard Govoni, [1,2] Robert E. Mann, [1,3] and Harold Wynne [4]

1 Department of Public Health Sciences, Faculty of Medicine, University of Toronto, Toronto, Canada, E-mail: Richard@Govoni.org

2 Department of Psychology, University of Windsor, Windsor, Ontario, Canada

3 Social Prevention and Health Policy Research, Centre for Addiction and Mental Health, Toronto, Ontario, Canada

4 Department of Education, McGill University, Montreal, Quebec, Canada

Abstract

A major survey of gamblers in the province of Ontario was reanalyzed to determine the characteristics of those respondents who identified themselves as speculative investors. Logistic regression analysis indicates that, compared to other gamblers, members of this group are more likely to be male, have a high family income, be an active gambler, and have a higher level of education. Higher frequencies of gambling-related problems were found in this group, but it was not possible to determine to what extent this was due to the presence of speculative investing. The prevalence of problem gamblers in the general population who are also speculative investors is estimated to be low compared to other gamblers. [Keywords: speculative investing, speculative investors, gambling]

Introduction

Background

Until recently, mainstream economic thought has viewed investment activity in the financial markets as an economic activity subject primarily to the models and beliefs of classical and

neoclassical economics. Classical economics is generally thought to have had its principles laid out with the publication in 1776 of Adam Smith's well-known work, *An Inquiry into the Nature and Causes of the Wealth of Nations* (Smith, 1991). Classical economists have tended to view people as individuals who pursue their own self-interests in a free marketplace. While pursuing their own self-interests, the forces within a free market — Adam Smith's invisible hand — were thought to result in the maximum good for all. Neoclassical economics was established towards the end of the 1800s. Although mathematics had been a part of classical economics, with neoclassical economics, mathematical modelling became an integral part of modern economic practice. The neoclassical economists retained many of the beliefs of the classical economists but tended to think in terms of market equilibria, i.e., that opposing forces within a market, such as supply and demand, naturally and over time, tend to a balancing point or equilibrium. The use of mathematical models required simplifying assumptions that led to a rather restrictive view of individuals engaged in economic activity. As Frey and Benz (2002) describe it:

> … modern economics has developed a behavioural model which disregards psychological factors almost completely. The "homo oeconomicus" takes decisions in a rational and emotionless manner. He or she compares the expected costs and utilities of the different alternatives at hand, and finally selects the one that benefits him or her the most. Decisions are assumed to have a high degree of rationality (cognitive limitations resulting in systematically suboptimal decisions are disregarded); they are based on unlimited willpower (self control problems and emotions do not play a role); and actions are solely guided by self-interest (the homo oeconomicus does not have pro-social preferences, i.e. the utility of other individuals does not enter into his decision calculus). (p. 3)

Although traditional economic thought has been questioned by economists such as Veblin, Galbraith, and Keynes since the 1980s, these views have faced more serious challenges. The challenges came from both economic and psychological perspectives and have led to the development of the new field of behavioural economics (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992; Shiller, 2002; Frey & Benz, 2002). Behavioural finance recognizes the role of psychological and sociological factors in determining investor behaviours.

One of the possible psychological explanations that has been put forth for some more speculative marketplace behaviour is that it may be gambling (Shiller, 1999). Although assumptions have been made by some that aggressive trading may be a form of gambling

for some traders and that speculative investing can be treated as another gambling activity, little research has been carried out on the relationship between gambling and investing.

Although the terms *general investors* and *speculative investors* are commonly used, it is important that they be clearly understood. General investors typically select reasonably conservative investment vehicles, i.e., ones with either moderate or low volatility, and hold their investments for the mid- to long term. Although general investors select their investments with the hope of doing better than the market, their investment performance generally tracks market performance. Speculative investors, on the other hand, seek to achieve significantly higher yields on their investments. To achieve these higher yields, speculative investors employ three broad tactics. First, they choose investment vehicles with high volatility. A classic example is penny mining stocks. The higher volatility reflects greater price swings and increases the potential for profit. The second approach is to trade more frequently. The time frame can vary from a few months to hours. For this reason, these investors typically refer to themselves as traders rather than investors. The reduced trading time frame produces greater opportunities to realize profits. The third approach is to borrow or leverage one's investments, a tactic that further increases the potential for profit. Such tactics are associated with much higher risk than general investing. On the one hand, they greatly increase the potential for profit, and, on the other, they greatly increase the potential for losses. It is important that the presence of risk not be automatically associated with gambling. Classical gambling activities such as lotteries and casino games have a negative expected outcome, i.e., the odds are against the player. In contrast, investing can be considered a positive-sum game overall, with the degree of risk and the potential for gains or losses left to the choice of the individual investor. The principal studies on gambling in the financial markets have been carried out by Marvin Steinberg of the Connecticut Council on Compulsive Gambling (Steinberg, 1998; Steinberg & Harris, 1994). Steinberg has undertaken two surveys to attempt to assess the extent of problem gambling in financial markets. In the first study (Steinberg & Harris, 1994), questionnaires were sent to 1000 stockbrokers in Connecticut. The following definition of problem gambling in the financial markets/stock market was provided to those surveyed:

1) Repeated speculative risk-taking, resulting in significant financial losses in relation to the person's level of assets.

2) The behaviour may appear erratic and inconsistent and/or excessively frequent.

Only 57 replies were received. The respondents identified options

and futures contracts, penny stocks, and excessive use of margins as the principal areas in which market gambling occurred. The respondents estimated that 2% of investors had a gambling problem. It was calculated that market gambling represents 13.3% of all problem gamblers in Connecticut, and 9.8% of the respondent brokers indicated that they themselves had a gambling problem.

In the second study (Steinberg, 1998), a survey was sent to the 260 members of the Connecticut Public Investors Arbitration Bar Association. The definition of problem gambling in the financial markets/stock market provided to those surveyed was as follows:

1) Engages in speculative risk-taking resulting in significant losses in relation to level of assets.

2) Chases losses through increasing speculation — difficulty stopping when losing. Investments highly leveraged.

3) Borrows money in order to invest.

4) Behaviour appears erratic, inconsistent, irrational, and/or excessively frequent.

A total of 36 replies were received. The respondents estimated that gambling was most prevalent in excessive use of margins, penny stocks, futures contracts, and options. Only 20% thought that the risk in a casino was higher than in the more speculative areas of the market.

It is important to be cautious in interpreting these findings of problem gambling in the financial markets as indicating an addictive behaviour equivalent to pathological gambling. As Shaffer (1999) has noted, the concept of an addiction among laypersons, and even professionals, is often quite loose, and the observation of what appears to the outside observer to be irrational and possibly harmful behaviour does not tell us if the behaviour is uncontrollable, and thus an addiction. A key feature of an addiction is the inability to stop the behaviour despite attempts to quit; this criterion is missing in these two studies. Nevertheless, the studies are important in that they provide an insight into the extent of possible irrational behaviour among speculative investors and point to the fact that some of these investors may share at least some of the characteristics of problem gamblers. Thus, as the view of the investor in financial markets has changed from the traditional rational economic one, to one that incorporates psychological and sociological factors, the activities of some of the more speculative investors have been viewed as less than rational. Parallels to gambling behaviours have been proposed and some preliminary

investigations undertaken. The studies that have been carried out suggest that some speculative investors may share some of the characteristics of problem gamblers. However, existing research in this area is sparse.

Research questions

In this study, we examine the prevalence of speculative investing, and its relationship to gambling and problem gambling, in a representative survey of Ontario adults. The survey contained questions on speculative investing along with the usual gambling activities. The following questions are addressed with this research:

1) What are the variables that discriminate between self-identified speculative investors and other gamblers?

2) What are the rates of speculative investing and of problems related to speculative investing in the population?

Method

Data from the Measuring Gambling and Problem Gambling in Ontario survey (Canadian Centre on Substance Abuse, 2001) are analyzed in this study. This survey was carried out by the Canadian Centre on Substance Abuse and the Responsible Gambling Council (Ontario) during the period March to May, 2001 (Wiebe, Single, & Falkowski-Ham, 2001). Stratified random sampling was used to obtain a sample of 5000 Ontario residents, aged 18 years or older. The sample was stratified by age, gender, and region to ensure adequate representation. Random-digit dialling was used and within each household the individual with the closest birthday was selected for the survey. The response rate was 37% (62% refused and 1% of the surveys were incomplete).

Survey

Gambling behaviour was assessed with the Canadian Problem Gambling Index (CPGI) (Ferris, Wynne, & Single, 1999). This instrument, designed for the general population, captures information in four broad domains: gambling involvement, problem gambling behaviours, consequences of problem gambling, and correlates of problem gambling. Problem gambling is measured by a nine-item problem gambling severity index (PGSI) addressing gambling behaviour and the negative consequences of gambling. These items are shown in Table 1. The PGSI has been extensively validated and has good psychometric properties (Ferris et al., 1999).

Table 1

Problem Gambling Severity Index items

Dimension	Variable measured	Item
Problem gambling behaviour	Loss of control	How often have you bet more than you could really afford to lose?
	Motivation	How often have you needed to gamble with larger amounts of money to get the same feeling of excitement?
	Chasing	How often have you gone back another day to try to win back the money you have lost?
	Borrowing	How often have you borrowed money or sold anything to get money to gamble?
	Problem recognition	How often have you felt that you might have a problem with gambling?
Adverse consequences	Personal consequences	How often have people criticized your betting or told you that you had a gambling problem?
		How often have you felt guilty about the way you gamble or what happens when you gamble?
		How often has your gambling caused you any health problems?
	Social consequences	How often has your gambling caused any financial problems for you or your household?

Definition of gamblers and speculative investors

Nongamblers were defined as individuals who did not endorse any form of gambling or who twice indicated that they did not gamble. Out of the 5000 respondents, 369 were incorrectly classified. For the purposes of this study, only correctly classified gamblers with complete gambling-related data were used.

Stock-market participants were selected with the following question.

> In the past 12 months, how often have you made short-term speculative stock or commodity purchases such as day trading, not including mutual funds or RRSPs?

It should be noted that this question is distinctly different from all the other gambling activity questions. First, all the other gambling questions seek to identify all who participate in an activity such as

lotteries or bingo, whereas the stock-market question seeks to identify only a subgroup. Second, there is a significant subjective component, i.e., the respondent must feel that he or she is a speculative investor. The second point is particularly significant because the question is asked in the context of a gambling survey.

For the purposes of this reanalysis of the Ontario survey, we have defined speculative investors as respondents who indicated that they engaged in speculative investing and who invested at least an average of $100 on each occasion. Brokers we have consulted have indicated that, due to the fees charged to place a stock transaction, a minimum realistic stock purchase would be $500. We have chosen to be more conservative and have set the minimum stock transaction at $100. It is most likely that respondents below this level had misinterpreted the question. This cutoff of $100 resulted in the elimination of 25 of the 294 self-identified speculative investors.

Weighting of results

The Ontario survey results were weighted according to age distribution in each of the seven Ontario Health Regions (Wiebe et al., 2001). This weighting function was also applied in the present study.

Problem Gambling Severity Index labels

In the original CPGI study, the nine items of the PGSI were scored into four categories: nonproblem gambling, low-risk gambling, moderate-risk gambling, and problem gambling (Ferris et al., 1999). The authors of the Ontario survey felt that the labels implied a progression of problem gambling and that, since little was known about the progression of problem gambling, the labels should be modified (Wiebe et al., 2001). They suggested and used the following labels: nonproblem gamblers, at risk, moderate problems, and severe problems. These labels have been used in the present study.

Results

Logistic regression analysis

To determine which factors significantly increase the odds of being in the group of gamblers who are self-identified speculative investors versus all other gamblers, a logistic regression model was developed. A logistic regression model was used because the dependent variable is dichotomous.

All of the variables were entered in one block to simultaneously

account for the interaction between the variables. The results of this analysis are summarized in Table 2; the table omits nonsignificant terms in the interests of clarity and brevity.

Speculative investors who were gamblers differed from other gamblers on several sociodemographic variables. The speculative investors were more likely to be male, to have higher income levels, and to have higher levels of education. Several differences were observed on gambling measures as well. The speculative investors reported significantly more gambling activities than other gamblers. The average number of gambling activities for this group was 4.65 (SD = 2.18) and for other gamblers was 3.14 (SD = 1.79). As well, significantly more speculative investors fell into the at-risk and moderate-risk gambler groups than other gamblers, although the groups did not differ in the proportions that would be classified as severe problem gamblers.

Table 2

Differentiating speculative investors from other gamblers: Logistic regression analysis

Independent variable	Odds ratio	Wald statistic	Significance
Gender (Male = 1)	1.54	7.95	.005
Education (High school or less = 1)			
Postsecondary education	1.81	8.97	.003
Graduate school education	2.77	22.62	.000
Employment status (Unemployed = 1)			
Student	4.58	4.07	.044
Household income (Under $50,000 = 1)			
$50,000–$80,000	1.76	6.54	.011
$80,000 & up	3.10	25.49	.000
Number of gambling activities	1.37	68.82	.000
Gambling risk (Nonproblem gambler = 1)			
Low-risk gambler	1.72	7.64	.006
Moderate-risk gambler	1.85	4.09	.043

Prevalence rates

The 264 self-identified speculative investors represent 5.7% of the general population sample. The rates of problem gambling for the self-identified speculative investors and for all other investors are shown in Table 3. About 30% of speculative investors who are gamblers have some elevation of problem gambling risk. While the proportion of those who would categorize as severe problem gamblers, at 2.1%, is small, the proportion in the at-risk and

moderate problem categories is sizeable and higher than observed in other gamblers. If we assume that the adult Ontario population is about 8,000,000 people, then there would be about 456,000 people who are self-identified speculative investors and gamblers. Of these, about 9,576 would be considered to be severe problem gamblers. A larger proportion, 37,848, would fall in the moderate problem gambling group.

However, the contribution of speculative investing to gambling problems in this group cannot be determined from the available data. It may be possible that, for example, the gambling problems experienced by this group are derived from other gambling activities and not from speculative investing. Clearly, more research is needed to clarify this issue.

Table 3

Percentages of speculative investors and of other gamblers falling in PGSI categories

Category	Speculative investors	Other gamblers	Significance [1]
Nonproblem	68.8%	85.0%	(Reference category)
At-risk gambler	20.7%	10.9%	.006
Moderate problem gambler	08.3%	03.4%	.043
Severe problem gambler	02.1%	00.8%	n.s.

1 Based on logistic regression analysis

Discussion

Several limitations must be taken into consideration when evaluating the results. First, the response rate is less than ideal, and it is possible that the sample may be biased. Because of this, the estimates of prevalence levels should be treated with caution. Second, the question regarding speculative investing was asked in the context of a gambling survey. Some speculative investors may not have considered their speculative investments to be gambling and may have responded negatively to the question. This would introduce a conservative bias and reduce the proportion of the population that would be considered as speculative investors. Although the speculative investing category is new and little research data are available, no data were collected on speculative investors only. Since most of the self-identified speculative investors seen here engage in a number of gambling activities, it is impossible to determine what proportion of the population may be

speculative investors who do not report other gambling behaviours. Because of this, we can only speak about a group of gamblers who are also speculative investors.

Nevertheless, the results presented here provide a new and important picture of this group of gamblers who are also speculative investors. Compared to other gamblers, members of this group are more likely to be male, have a high family income, be an active gambler, and have significantly higher levels of education than gamblers who are not speculative investors. Thus, gamblers who are also speculative investors are clearly from more advantaged socioeconomic groups. This observation may not be surprising in that investing in equity markets and similar activities require at least a modest amount of available capital, certainly more than would be required for most gambling activities. However, it does suggest that gamblers who are also speculative investors are more likely to be from the higher socioeconomic groups in society and differ importantly from the general population of gamblers. Thus, it may not be possible to generalize knowledge from other groups of gamblers to this group.

Some very interesting differences were observed on gambling-related measures as well. The group of speculative investors reported a larger number of other gambling activities than the other gamblers. There was a trend for speculative investors to have elevated problem gambling scores. There were significantly more of them in the at-risk and moderate-risk groups, although not in the severe problem category. The higher levels of at-risk and moderate-risk gambling-related problems are consistent with the higher levels of gambling activities in this group. However, it may be possible that these observations of increased levels of gambling activities and gambling problems are related to the method of sample selection, and a group of speculative investors who were not selected by virtue of being gamblers as well may not show similar elevations. One way to address this problem in future surveys may be to collect data on speculative investing, and problems resulting from speculative investing, separately from other gambling items.

While it is premature to assume that all speculative investors are gamblers, speculative investors who also self-identify as gamblers appear to be a very interesting and important group. They appear to differ on important sociodemographic variables from other groups of gamblers, and the level of gambling activities and of gambling problems seen in this group appears to be higher on average than those seen in other gamblers. Clearly, more research on speculative investors is needed. Such research could focus on the nature of speculative investing itself and include work to determine more precisely the proportion of speculative investors whose investing behaviour could be considered gambling. It may

well have to be targeted directly to the subgroup of speculative investors.

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For correspondence: Richard Govoni, Richard Govoni, Director, Problem Gambling Research Group, University of Windsor, Windsor Ontario, e-mail: Richard@Govoni.org

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At the time of this research, Richard J. Govoni, PhD. was a post-doctoral fellow in the department of public health sciences, University or Toronto. He is a director of the Problem Gambling Research Group and assistant professor (adjunct) at the University of Windsor. During the last five years he has developed and managed three major surveys that tracked the effects of increased gambling availability on gambling behaviour in the Windsor community. He has an interest in community-based research and in research with seniors.

Robert Mann is a senior scientist at the Centre for Addiction and Mental Health and associate professor in the department of public health sciences at the University of Toronto. His research in recent years has focused on impaired driving and the impact of prevention and treatment activities. He also has research interests in health psychology and social epidemiology, particularly as they apply to alcohol and drug problems.

Dr. Harold Wynne is a Canadian educator and researcher who has planned and implemented hundreds of social development and adult education programs. He has conducted many provincial and national problem gambling research studies and continues to advise Canadian and international governments, agencies, research organizations, and industry on gambling policy and programs. Dr. Wynne continues to lecture, and holds appointments at numerous universities and research organizations including the University of Alberta, McGill University, Canadian Centre on Substance Abuse, and the Institute for Research on Pathological Gambling and Related Disorders, Harvard Medical School.

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Loneliness and life dissatisfaction in gamblers

James Porter, Julia Ungar, G. Ron Frisch, and Reena Chopra
University of Windsor, Windsor, Ontario, Canada
E-mail: jporter@uwindsor.ca

Abstract

This exploratory study examines the manifestation of two experiential variables in undergraduate university students who gamble. The study had 829 participants (270 males and 559 females). They completed self-report questionnaires on gambling-related problems (the South Oaks Gambling Screen), loneliness (the Social and Emotional Loneliness Scale for Adults), and overall life satisfaction (the Satisfaction with Life Scale). Based on their scores on the South Oaks Gambling Screen, participants were divided into two groups: recreational gamblers and at-risk gamblers. Male participants were much more likely to be at-risk gamblers than female participants. Compared to female recreational gamblers, female at-risk gamblers were found to be less satisfied with their lives and lonelier, especially in the romantic and social realms. Male recreational and at-risk gamblers did not differ significantly on these factors. Results support the views that the internal experience of female at-risk gamblers differs from that of their male counterparts, and that loneliness is best considered as a multidimensional construct.
[Keywords: gambling, loneliness, dissatisfaction, women]

Introduction

The experiential world of individuals who are struggling with gambling problems remains sparsely mapped. The manner in which problem gamblers experience their lives and themselves in relation to others may play a crucial role in the development and/or maintenance of their gambling. Legg England and Goetestam (1991) have noted that treatment for excessive gambling should include the reduction of negative internal states. However, few studies have identified these internal states. To take

a step toward identifying problem gamblers' negative internal states, the present investigation has sought to determine whether people at risk for problem gambling tend to be lonelier and more dissatisfied with their lives than gamblers not at risk.

Loneliness and problem gambling

The retrospective literature on early interpersonal experiences suggests that there is an association between problem gambling and loneliness. This research reveals major interpersonal disturbances during childhood, such as loss of a close family member due to divorce, separation, or death (Whitman-Raymond, 1988). Experiences of abandonment, rejection, emotional neglect, and physical abuse have also been reported in qualitative studies (Rich, 1998; Whitman-Raymond, 1988). These findings are consistent with psychodynamic theories of gambling (Rosenthal & Rugle, 1994) and the Walters lifestyle model of gambling (Walters, 1994). Specifically, early parental deprivation and neglect while growing up and an ambivalent relationship with one's father are frequently noted in the psychoanalytic literature as significant aspects of problem gamblers' childhoods (Rosenthal & Rugle, 1994). According to the Walters lifestyle theory (Walters, 1994), these experiences interfere with the construction of emotional and social bonds with significant others. Insecure attachment, in turn, increases the risk of developing gambling-based relationships as an alternative to meaningful, committed ones.

Current interpersonal difficulties also seem to go hand in hand with problem gambling. The conjugal families of problem gamblers have been described as chaotic and emotionally turbulent. In addition, marital and/or family discord is a common correlate of excessive gambling (Torne & Konstanty, 1992; Tepperman, 1985; Franklin & Thoms, 1989; Lesieur, 1984; Boyd & Bolen, 1970). Compared to "normal" controls, families of pathological gamblers score lower on level of commitment, help, and support (Ciarrocchi & Hohmann, 1989). Gamblers also indicate greater dissatisfaction with their family environment compared to "normals" (Ciarrocchi & Hohmann, 1989). This literature is congruent with the notion that excessive gamblers suffer from a sense of isolation and lack of connection to others. This isolation is also a common theme in the addictive experience (Hopson, 1993).

Members of Gamblers Anonymous groups further support the idea of longing for meaningful relationships as a salient factor in problem gamblers' experience. The members have rated "the company of others who understand you" as the best feature of the self-help group (Brown, 1987). Additionally, a significant relationship exists between gambling involvement and the expectancy of a sense of belonging as a result of gambling (Walters & Contry, 1998). Other sources also report that the

opportunity to socialize with others is one of the key attractions of horse-race betting, bingo, and even slot machines (Rosenthal & Rugle, 1994; Walker, 1992). Thus, longing for interpersonal closeness while lacking the skills to achieve it might frustrate one's relational needs. This frustration creates a vulnerability to seeking solace in addictive quasi-social behaviours such as gambling.

Little is known about how problem gamblers experience their relationships and whether loneliness per se might be a factor. Nevertheless, t here are a few recent reports in support of the notion that women with gambling problems report greater loneliness than nonproblem-gambling women. In a study of women who used electronic gaming machines, Trevorrow and Moore (1998) found that problem-gambling women were lonelier than nonproblem-gambling women. Similarly, Brown and Coventry (1997) found that women who reported problems controlling their gambling on electronic gaming machines stated that loneliness, isolation, and boredom were their main motives for gambling. Finally, Boughton and Brewster (2002) reported that 54% of women problem gamblers felt that it would be very or extremely helpful for treatment programs for problem gamblers to address issues of isolation and loneliness.

The issue of gender differences remains controversial. Loneliness may be a motivating factor behind problem gambling, or a trigger to gamble, in women, but not in men (Coman, Burrows, & Evans, 1997; Grant & Kim, 2002). Although limited data are available, Ohtsuka, Bruton, DeLucia, & Borg (1997) did conclude that loneliness was not a significant predictor of pathological gambling for either men or women.

A major limitation in the research on loneliness among problem gamblers is the way in which it has been assessed. Standardized measures are often not employed, with some studies (e.g., Boughton & Brewster, 2002) simply asking participants a single question related to loneliness. Furthermore, all of the studies treat loneliness as a unidimensional construct, although current research views loneliness as a complex multidimensional factor (DiTomasso & Spinner, 1993; Russell, Cutrona, Rose, & Yurko, 1984). Loneliness has both a subjective/emotional facet and an objective/social one (Cramer & Barry, 1999; DiTomasso & Spinner, 1993). Social loneliness refers to isolation from others due to inadequate access to satisfactory social relationships. Emotional loneliness stems from the absence of a close attachment relationship, whether involving family members or a romantic partner (Weiss, 1973). To date, subtypes of loneliness have not been distinguished in research on problem gamblers.

Life satisfaction and problem gambling

The theme of escape as a motivation for engaging in games of chance is ubiquitous in the literature on gambling. Several authors assert that problem gambling develops out of the need to obtain relief from a stressed state, be it noxious feelings of inferiority, guilt, rejection, and/or inadequacy (Jacobs, 1988); recurring dysphoria/depression and chronic understimulation (McCormick, 1987; Griffiths, 1993; Carroll & Huxley, 1994); or a combination thereof (Blaszczynski, McConaghy, & Frankova, 1990). Individuals who suffer from such negative affective states may turn to gambling as an attempt to regulate their experience. The intense focus and concentration of gambling may serve to push unpleasant aspects of life out of awareness (Rosenthal & Rugle, 1994), so the activity allows gamblers to "self-medicate" or "dissociate" from the condition of stress (Murphy & Khantzian, 1995; Jacobs, 1988).

General dissatisfaction is one of the primary ingredients of both depressive states and boredom (Beck, 1976; Farmer & Sundberg, 1986), two important risk factors for the development of problem gambling. Therefore, it could be that those who feel that their daily life is unrewarding, troublesome, or lacking in complex and novel stimuli — that is, individuals who are dissatisfied with their lives — are at higher risk for excessive gambling. This connection is well established in other forms of addiction (Kaufman, 1994), but research on life satisfaction in problem gamblers is sparse and inconclusive. Ohtsuka et al. (1997) found that self-reported unhappiness is a significant predictor of gambling problems for both males and females. This finding, however, is at odds with Kusyszyn's (1984) review, which indicates that male college students who gamble generally feel happier than their nongambling counterparts. It is not known whether the same is true for excessive gamblers. Winslow (2002), in a study of the elderly, found no significant difference on life satisfaction between nongamblers, nonproblem gamblers, and problem gamblers.

The present investigation was an attempt to further our understanding of two potential components of the experiential world of problem gamblers — loneliness and dissatisfaction with life. It was hypothesized that individuals at risk for problem gambling would differ in their experience of both loneliness and dissatisfaction with life from gamblers who are not at risk. Specifically, at-risk gamblers would present as significantly lonelier and more dissatisfied with their lives than would gamblers not at risk. To improve on the methodology of previous research in this area, psychometrically validated instruments were employed, including a multidimensional measure of loneliness.

Method

Participants

For this project, we studied 829 undergraduate students (270 males and 559 females) at the University of Windsor in Ontario, Canada. They were recruited on a voluntary basis from an introductory psychology course and were offered bonus marks as an incentive for participation in the study. All 829 participants acknowledged some gambling behaviours. Their ages ranged from 17 to 47 years, with a mean of 20.12 years (SD = 3.52). Because the participants were recruited from an introductory psychology course, 78% were in their first year of university. Of the remaining participants, 13% were in their second year of study, 6% were in third year, 2% were in fourth year, and 1% were in fifth year. The study was cleared by the university's Research Ethics Board, and all appropriate ethical standards were followed.

Measures

The South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987) is a 20-item scale with the questions modelled after *DSM-III* criteria for pathological gambling. It has been used to identify gamblers in substance-abusing and psychiatric populations, as well as in community surveys. Scores correlate well with both collateral report and clinician ratings. Internal reliability was high in a combined sample of students and gamblers (a =.97), and retest reliability in a treatment sample of gamblers was.71 over 30 days. The internal reliability of the test was also good (Breen & Zuckerman, 1996). A score of five or higher on the SOGS indicates possible pathological gambling involvement. A score of zero, one or two indicates no gambling problems, and a score of three or four indicates possible problem gambling. The SOGS also contains a list of gambling behaviours (GACT), which gathers information about how frequently the respondents engaged in each gambling activity (i.e., never, less than once a week, once a week, or more than once a week). For the purposes of the present investigation, participants who obtained SOGS scores of three or higher were considered at risk for problem (or pathological) gambling and termed *at-risk gamblers.* As all participants reported some gambling involvement, participants who obtained SOGS scores of zero, one, or two were considered not at risk for problem gambling and termed *recreational gamblers.*

The Social and Emotional Loneliness Scale for Adults (SELSA) (DiTomasso & Spinner, 1993) is a multidimensional scale that measures different facets of loneliness experienced by individuals. The measure is further broken down into social loneliness (i.e., lack of friendships) and emotional loneliness. The latter can be divided into two subtypes — romantic loneliness (i.e., lack of attachment to a romantic partner) and family loneliness (i.e., lack of closeness and attachments with family members.). There are

37 items in the measure, and each item of the scale is scored on a Likert scale ranging from one to seven, with higher scores indicating greater levels of loneliness. Scores on all three subscales were found to have high internal consistencies, with Cronbach alphas ranging from.89 to.93. The SELSA produces reliable scores and has good concurrent, convergent, and discriminant validity (DiTomasso & Spinner, 1993).

The Satisfaction with Life Scale (SLS) (Diener, Emmons, Larsen, & Griffin, 1985) is a widely used five-item Likert-type scale assessing global life satisfaction. Each item is scored on a scale of one to seven, with higher scores indicating greater life satisfaction. The items of the SLS demonstrate high internal consistency (a =.87; Diener et al., 1985), and the instrument demonstrates high temporal reliability. The validity of the test has been demonstrated by correlating it to other measures of subjective well-being. S cores on the SLS were shown to correlate moderately to highly with other measures of subjective well-being, with most measures correlated at r =.50 or higher for each of the two samples from the original study. Unlike other such measures, however, the SLS does not tap relative emotions such as negative mood and loneliness. It is positively correlated with positive personality characteristics and is suitable for use with different age groups (Diener et al., 1985).

Results

First, the internal reliability (a coefficients) of the measures was examined. The three measures demonstrated adequate reliability — SOGS (a =.73), SLS (a =.85), and SELSA (a =.83). Next, descriptive statistics on SOGS scores were examined to assess the prevalence of gambling problems in our sample. The mean score on the SOGS for the entire sample was 0.78 (SD = 1.58). The frequency distribution of the scores was positively skewed, with the majority of scores located at the low end of the spectrum. That is, most of the participants did not have a gambling problem. Specifically, 529 participants (63.8%) did not endorse any of the items on the SOGS, and 228 participants (27.5%) obtained SOGS scores of one or two. Together, these 757 participants constituted the recreational gamblers group (222 males, 535 females), or individuals who participated in gambling behaviours but were deemed not to be at risk for problem gambling. Forty-three participants (5.2%) scored in the possible problem gambling range, obtaining SOGS scores of three or four. Finally, 29 participants (3.5%) earned SOGS scores of five or higher, placing them in the possible pathological gambling range. Together, the 72 participants in these latter two groups (8.7%) constituted the at-risk gamblers group (48 males and 24 females).

The two groups (recreational and at-risk) were then compared to ascertain whether they differed in age or sexual composition. Participants in the recreational gamblers group (mean age = 20.02 years; SD = 3.29) were slightly younger than participants in the at-risk gamblers group (mean age = 21.18 years, SD = 5.28), but this difference did not reach statistical significance when corrected for unequal variances (t = 1.65, df = 805, p =.10). The two groups did differ significantly in sexual composition (x^2= 41.74, df = 1, p <.001): 17.8% of the male participants were in the at-risk gamblers group compared to only 4.3% of the female participants. Males (M = 113.18, SD = 25.10) scored significantly higher (t = 2.54, df = 794, p <.05) than females (M = 108.46, SD = 24.24) on social and emotional loneliness, but there were no sex differences on life satisfaction.

The mean number of gambling activities reported for the entire sample was 8.44 (SD = 2.86). All of the participants indicated that they had engaged in some kind of gambling activity, with the number of items endorsed ranging from 4 to 20. As one would expect, participants in the at-risk gamblers group reported a greater number (t = 8.86, df = 812, p <.001) of gambling activities (M = 17.19, SD = 2.63) than did the recreational gambler participants (M = 14.21, SD = 2.67), and males reported a greater number (t = 7.80, df = 419.35, p <.001, correcting for unequal variances) of gambling activities (M = 15.61, SD = 3.12) than did females (M = 13.90, SD = 2.43).

A bivariate correlational analysis between the loneliness and satisfaction variables (see Table 1) revealed significant (p <.01) and sizable correlations between satisfaction with life and social and emotional loneliness, between social and emotional loneliness and each of the loneliness subscales, between satisfaction with life and each of the loneliness subscales, and between all of the loneliness subscales.

Table 1

Bivariate correlations between independent variables

Variable	SLS	SELSA	RL	FL	SL
Satisfaction with life (SLS)	1.00	-.55[1]	-.33[1]	-.44[1]	-.42[1]
Social & Emotional Loneliness (SELSA)[2]		1.00	.79[1]	.63[1]	.61[1]
Romantic loneliness (RL)			1.00	.13[1]	.19[1]
Family loneliness (FL)				1.00	.38[1]
Social loneliness (SL)					1.00

[1] Correlation is significant at the 0.01 level (2-tailed).

[2] Social and emotional loneliness is an overall loneliness score comprising the instrument's subscales: romantic, family, and social loneliness.

Next, separate multivariate analyses of variance were conducted for female and male participants because of the significant differences in sexual composition between the recreational gamblers group and the at-risk gamblers group (see Table 2 and Table 3). It should be noted that the purpose of these separate analyses was not to determine the interaction between gender and problem gambling as possible predictors of loneliness or life satisfaction. First, female recreational gamblers and at-risk gamblers were compared on the life satisfaction and loneliness scales. The group differences were significant overall (F = 7.31, df = 2, 529, p <.001) and for both the loneliness (F = 13.62, df = 1, 530, p <.001) and life satisfaction (F = 8.01, df = 1, 530, p <.01) scales individually. Then, female recreational and at-risk gamblers were compared on the three loneliness subscales (romantic, family, and social loneliness). Again, the group differences were significant overall (F = 4.99, df = 3, 532, p <.01). As well, the group differences were significant on two of the three subscales: romantic loneliness (F = 6.29, df = 1, 534, p <.05) and social loneliness (F = 9.18, df = 1, 534, p <.01). To correct for the unequal variances, a t -test (equal variances not assumed) was used in place of the univariate F -test for the social loneliness

subscale. The recreational gambler and at-risk gambler females did not differ significantly on family loneliness (t = 1.68, df = 24.06, p >.05). Similar MANOVAs were conducted for male participants. For males, the overall difference between recreational gambler and at-risk gamblers groups on the two dependent variables, as well as on the three loneliness subscales, failed to reach statistical significance.

Table 2

Group comparisons for the dependent variables among female participants

Variable		Total sample	RG [1] group	ARG [2] group	F (df)	p
SLS	N	555	532	23		
	M	24.70	24.85	21.17	7.98 (1, 516)	.005
	SD	6.15	6.06	7.16		
SELSA	N	536	512	24		
	M	108.46	107.63	126.33	13.54 (1, 516)	.001
	SD	24.24	23.98	23.10		
Romantic loneliness subscale	N	538	514	24		
	M	37.75	37.42	44.88	6.29 (1, 534)	.012
	SD	14.30	14.27	13.29		
Family loneliness subscale[3]	N	556	532	24		
	M	25.32	25.10	30.13	6.29 (24.1)	.105
	SD	10.54	10.30	14.47		
Social loneliness subscale	N	553	529	24		
	M	41.46	41.24	46.50	9.18 (1, 534)	.003
	SD	8.26	8.19	8.46		

[1] RG = recreational gamblers

[2] ARG = at-risk gamblers

[3] Levene's test for equality of variances was significant for the family loneliness subscale. To correct for the unequal variances, a t -test (equal variances not assumed) was used in place of the univariate F -test for the family loneliness subscale.

Table 3

Group comparisons for the dependent variables among male participants

Variable		Total sample	RG [1] group	ARG [2] group	*F* (df)	*p*
SLS	N	258	216	42		
	M	24.96	25.12	24.21	0.74 (1, 256)	.389
	SD	6.13	5.93	7.08		
SELSA	N	260	217	43		
	M	113.18	112.49	116.65	13.54 (1, 258)	.321
	SD	24.24	23.98	23.10		
Romantic loneliness subscale	N	258	216	42		
	M	40.83	40.85	40.69	.004 (1, 256)	.948
	SD	14.30	14.27	13.29		
Family loneliness subscale	N	258	216	42		
	M	25.88	25.54	27.67	1.725 (1, 256)	.190
	SD	9.61	9.57	9.73		
Social loneliness subscale	N	258	216	42		
	M	42.20	41.96	43.40	1.169 (1, 256)	.281
	SD	7.91	7.87	8.12		

[1] RG = recreational gamblers

[2] ARG = at-risk gamblers

Finally, analyses of variance were conducted to compare the two subgroups within the at-risk gamblers group (probable problem gamblers and probable pathological gamblers) on the demographic and independent variables. The subgroups did not differ significantly on age or sexual composition, on the independent variables overall, or on any individual independent variable.

Discussion

This study was designed to assess differences in certain experiential factors between recreational and at-risk gambling

undergraduate university men and women. If we are to appreciate what causes and maintains problem gambling, and what treatment approaches are likely to be successful, we will need to expand our still nascent understanding of the inner experience of problem gamblers. In this study of university undergraduates, we explored differences between recreational gamblers and at-risk gamblers on two experiential dimensions — satisfaction with life and loneliness. Upon analysis of the sample, it was determined that differences existed in the composition of these two groups, and men and women were not evenly distributed between at-risk gamblers and recreational gamblers. For this reason, all further analyses were separated for men and women. No significant differences were found between male recreational and at-risk gamblers, whereas female recreational and at-risk gamblers differed from one another on several measures.

Female recreational gamblers and at-risk gamblers differed in their experience of the constructs measured by the SELSA, while male recreational gamblers and at-risk gamblers did not. Female at-risk gamblers were significantly lonelier than their recreational-gambling counterparts. These findings are consistent with previous reports that found loneliness to be an issue for problem-gambling women (Boughton & Brewster, 2002; Brown & Coventry, 1997; Trevorrow & Moore, 1998) but not for men (Coman, Burrows & Evans, 1997; Grant & Kim, 2002). They are, however, inconsistent with an earlier report, which failed to detect a connection between self-ratings of loneliness and pathological gambling regardless of gender (Ohtsuka et al., 1997). Female recreational and at-risk gamblers also differed on two of the three individual dimensions of loneliness — social loneliness (i.e., lack of friendships, or isolation from others due to inadequate access to satisfactory social relationships) and romantic loneliness (i.e., lack of attachment to a romantic partner). The difference on social loneliness supports previous findings that the opportunity to socialize and establish a sense of belonging and group solidarity is an important motivating force behind gambling (Rosenthal & Rugle, 1994; Walker, 1992; Greenberg, 1980), at least for female gamblers. The significance of romantic loneliness might be specific to the developmental stage of most of the participants (university students), and not necessarily generalizable to other age groups. Most university students are at a stage in which they grow increasingly autonomous from their families of origin, but have not yet established families of their own (Adams, Gullotta, & Montemayor, 1992; Erikson, 1968). Because developing a romantic relationship is a more salient concern at this stage of the life cycle than in older adult gamblers, lack of attachment to an intimate partner may be experienced more deeply by university-aged women who engage in heavier gambling behaviours than their older counterparts. Despite earlier reports that family conflict and/or alienation were important in the life of problem gamblers

(Torne & Konstanty, 1992; Ciarrocchi & Hohmann, 1989; Whitman-Raymond, 1988; Green 1844), family loneliness was not found to be a significant issue for individuals at risk for gambling problems among our participants. However, caution is needed in generalizing this finding to the larger population of at-risk problem gamblers; the developmental stage of most of our participants might have played a part here, too. As other adults are much more likely than university students to have established families of their own, loneliness within the family might well be an important factor in the experience of problem gambling in the general population.

The mechanism by which loneliness and at-risk problem gambling might be related is poorly understood. Interviews with individuals in recovery from addictive behaviours suggest that those who enjoy confiding, supportive relationships are disinclined to seek out activities such as gambling that alter the mental state (McCartney, 1995). Lonely individuals, on the other hand, not only lack the buffering effect of interpersonal support, but face the pain of social isolation, which may motivate them to seek escape from this negative affect through gambling (Rosenthal & Rugle, 1994). Gambling may legitimize the time spent in the company of others and provide a sense of belonging and group solidarity through engagement in a parallel activity with other players (Walker, 1992). Unlike committed interpersonal relationships, however, this camaraderie makes no claims for intimacy, which might cause discomfort in gamblers with underdeveloped skills in seeking social and emotional support (Rosenthal & Rugle, 1994; Greenberg, 1980; McCormick, 1994).

How should we understand that male recreational and at-risk gamblers did not differ in their levels of loneliness? Loneliness carries a wealth of subjective meanings. For example, Moustakas (1957) differentiates between existential loneliness, the anxiety of loneliness, the loneliness of solitude, and the loneliness of a broken life. The measure used in the present study employed a precise, and therefore constrained, definition of loneliness that is blind to many of the nuances inherent in the experience. It might be that male at-risk gamblers tend to suffer from a type of loneliness not measured. Alternatively, it could be that loneliness is simply not a factor in problem gambling among men, or at least among university-aged men.

Female recreational and at-risk gamblers also differed on the SELSA, while male recreational and at-risk gamblers did not. Female at-risk gamblers expressed greater dissatisfaction with their lives than did their recreational-gambling peers. The sparse literature specifically on life satisfaction in problem gamblers is inconsistent. Life satisfaction has been found to be a significant predictor (Ohtsuka et al., 1997) or not to be a significant predictor (Winslow, 2002) of problem gambling for both men and women.

The finding of the present study, at least for women, is consistent with the view that there is a direct relationship between gambling involvement and negative emotional states (e.g., Carroll & Huxley, 1994). Our failure to find a relationship between satisfaction with life and at-risk gambling among men is puzzling. The notion that problem gambling develops as an attempt to escape from a distressed state is found repeatedly in the literature (Blaszczynski et al., 1990; Carroll & Huxley, 1994; Griffiths, 1993; Jacobs, 1988; McCormick, 1987; Murphy & Khantzian, 1995; Rosenthal & Rugle, 1994). However, the SLS used in this study measures a global and trait-like construct (Diener et al., 1985) rather than specific negative emotions. It is possible that gamblers experience dysphoric and positive emotional states simultaneously, and only the former plays a role in gambling pathology. This interpretation is consistent with evidence that positive emotionality and negative emotionality are relatively independent factors that can coexist simultaneously (Diener & Emmons, 1984; Tellegen, 1985). Men may be generally satisfied with their lives in spite of experiencing a variety of negative affective states from which they try repeatedly to escape through excessive gambling. Or it might be that dissatisfaction with life is not a factor in problem gambling for university-aged men. Factors such as sensation seeking (Langewisch & Frisch, 1998; Coventry & Brown, 1993; Kuley & Jacobs, 1988) or a desire to increase one's level of arousal (Leary & Dickerson, 1985) might be more salient for males in this age group.

Our participants appear to be typical of university students with regard to gambling problems. We found an 8.8% prevalence rate for at-risk gambling, which is generally consistent with the range set out in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) (American Psychiatric Association, 1994) for pathological gambling and with rates reported in the literature (e.g., Shaffer & Hall, 1996; Govoni, Rupcich, & Frisch, 1996; Marshall & Wynne, 2003). The prevalence rate for at-risk gambling that we found for males (17.8%) is considerably higher than what we found for females (4.3%). This is also consistent with previous research that males gamble considerably more than females (Govoni et al., 1996; Ladouceur, Dube, & Bujold, 1994) and that this sex difference is particularly great for people in their teens and early 20s (Lesieur et al., 1991/1992).

This study is not without limitations. Participants were not formally diagnosed for the presence or absence of gambling pathology. The SOGS by itself is insufficient for making formal diagnoses. Rather, participants who scored in the probable problem gambling and probable pathological gambling ranges on the SOGS were considered to be at-risk gamblers. Further research is needed to determine whether diagnosed pathological gamblers respond as our at-risk gamblers did on loneliness and life satisfaction

questionnaires. In addition, caution should be employed in generalizing the present findings beyond university-aged students. Developmental stages may play an important role in differentiating the motivations and affective experiences of problem gamblers of different ages. Being cross sectional, our study does not do justice to the dynamic nature of experiential phenomena but provides only a snapshot of the relationships between at-risk gambling, life satisfaction, and loneliness. For example, the fact that loneliness in the family was not significantly different for the at-risk and recreational gambling groups in university-aged women should not lead one to discount the possibility that it might be an important factor later in life. Various factors may wax and wane at different stages of the gambler's "career," and cross-sectional research cannot elucidate these dynamics. Due to the nature of the study, the important question of directionality remains unanswered. Does loneliness increase the risk of problem gambling among women, or does problem gambling result in loneliness as the gambler's resources (emotional, financial, and temporal) are diverted from relationships to gambling? Furthermore, the sample size was not large enough to assess differences in inner experience between problem gamblers who prefer different types of gambling activities. The need for the company of others, for instance, may be a salient factor in table players, but less so in those choosing solitary forms of gambling, such as playing slot machines. Finally, as discussed earlier, the nature of the loneliness and life satisfaction scales employed may have prevented us from examining other important types of these experiences.

Further research is needed to cross-validate our findings on the relationship between problem gambling, life satisfaction, and loneliness among university students and to extend our research to adults of all ages. A host of other experiential factors need to be investigated before we can develop a more fully textured appreciation of the factors that characterize, lead to, and maintain at-risk problem gambling in men and women. It is clear from this study that research on problem gambling must take into account gender differences as well as the multidimensional nature of loneliness. Finally, longitudinal research is needed to investigate the issues of directionality and differences in developmental stages.

The present study also has implications for clinicians working with problem gamblers. Clearly, excessive gambling causes serious problems by itself. Nevertheless, the gambling behaviour may also be seen, at least in some cases, as a symptom of experiential dysfunction that must be addressed along with the problematic behaviour. Furthermore, the clinician should not assume that the same experiential factors underlie problem gambling in all people. The importance of addressing particular experiential issues such as life dissatisfaction, loneliness of various kinds, sensation

seeking, and other negative affective states will most likely vary between men and women, and between people across the lifespan. In particular, issues of life dissatisfaction and social and romantic loneliness will likely need to be addressed in the treatment of university-aged female problem gamblers, but not necessarily in the treatment of problem gamblers of other demographic groups. Sensitivity to individual differences is critical.

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For correspondence: James Porter, PhD, CPsych., Associate Professor of Psychology and Director of Clinical Psychology Training, University of Windsor, Department of Psychology University of Windsor, Windsor, Ontario, Canada N9B 3P4, telephone: (519)-973-7012, fax: (519)- 973-7021, e-mail: jporter@uwindsor.ca

Contributors: JP (statistical design, data analysis, write-up), JU (research design and data collection), GRF (study coordinator, write-up), and RC (data analysis, final text revisions).

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Dr. James Porter received his PhD in clinical psychology from the University of Windsor, Ontario. He is an associate professor and

director of clinical training in the graduate clinical psychology programme at the University of Windsor, where he teaches clinical practice and supervises psychotherapy. He has also worked as a school psychometrist and as a psychologist in an adolescent inpatient facility. Dr. Porter maintains a private practice in adult psychotherapy and, together with his associates and graduate students, has published in the areas of psychotherapy, eating disorders, alcoholism treatment, and learning disabilities

Julia Ungar received her MEd. from Hardin-Simmonds University, Texas. She is currently a doctoral student in the adult clinical program at the University of Windsor. She is completing her internship at the Grand River Regional Hospital, Kitchener-Waterloo, Ontario.

Dr. G. Ron Frisch received his PhD in clinical psychology from the University of Tennessee. He is a professor in the graduate clinical psychology programme and director of the Problem Gambling Research Group at the University of Windsor. Along with his associates and graduate students, he has been actively involved in the study of identification, classification, and prevention of problem gambling since 1993. In addition to his research, private practice in adult psychotherapy, and training of doctoral psychology students, Dr. Frisch is a councillor with the College of Psychologists of Ontario. He is currently chair of the board of directors of the Ontario Problem Gambling Research Centre.

Reena Chopra received her MA from Lakehead University, Thunder Bay, Ontario. She is currently a doctoral student in the adult clinical program at the University of Windsor and is interning at the Upstate Medical University of the State University of New York, Syracuse, N.Y.

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clinic

[This article prints out to about 2 pages]

A brochure on Internet risk awareness and prevention

Bill Ursel and Dave Morgan, Problem Gambling Community Program, Regina, Saskatchewan, Canada.
E-mail: comdvp@accesscomm.ca

The increase in the number of gambling venues is evident in most jurisdictions. Casinos, video lottery terminal site holders, and lottery kiosks are ever present in rural and urban settings. However, the Internet is the greatest area of current gambling growth.

Risks for the online player are unique and the isolation of the online player can be profound. For these players, there is the inability to track time lost and money spent. Yet while absorbed in play the risks seem so distant.

The Regina Committee on Problem Gambling has developed a brochure to address the risks and some ways to reduce the risks of online gambling. Our committee is part of the Problem Gambling Community Program. This program has a mandate from Saskatchewan Health to deliver the public education and community development components of Saskatchewan 's problem gambling program. Links within the text direct the reader to our Web site and the Saskatchewan Health site.

If any portion of the brochure is used, please credit the Regina Committee on Problem Gambling.

The brochure may be found online at:
http://www.cmhask.com/gambling/InternetGambling.pdf

(The PDF file requires Adobe Reader.)

The Regina Committee on Problem Gambling developed the Internet Risk Awareness brochure. The committee provides for a forum for the sharing of problem gambling information, networking opportunities for members, and opportunities to work collectively

to address problem gambling issues.

For correspondence: Bill Ursel, Canadian Mental Health Association (Saskatchewan Division), 2702 12 th Avenue, Regina, SK. S4T 1J2 Canada, telephone: (306)-525-5601, fax (306)-569-3788, URL www.cmhask.com, e-mail: comdvp@accesscomm.ca.

Competing interests: None declared.

Bill Ursel (MCD University of Illinois, MA, community development) is director of the Problem Gambling Community Program. Bill brings 25 years of community development experience to the program.

Dave Morgan is assistant director of the Problem Gambling Community Program in Saskatchewan. A graduate of the University of Regina, Dave has been employed in problem gambling and chemical dependencies awareness for almost thirty years.

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service profile

[This article prints out to about 6 pages]

The Gambling and Other Impulse Control Disorders Outpatient Unit in São Paulo, Brazil : Integrating treatment and research

Hermano Tavares, Universidade de São Paulo, São Paulo-SP, Brazil
E-mail: hermanot@uol.com.br

Program background

Gambling is deeply rooted in Brazilian culture, despite its partial prohibition in 1946 by President Dutra's conservative government. The presidential decree banned casinos, but kept lotteries and horse races. In the early 1990s, gambling machines were slowly reintroduced through breaches in a new law that allowed bingo games to foster amateur sports. Currently the bingo label covers a diverse array of electronic devices offered in venues of various sizes (from 20 machines up to 400) that largely resemble casinos, except for the absence of card games and roulette wheels. In the current year, a political scandal involving undeclared funds for electoral campaigns forced a temporary closure of bingo venues. The future of legal gambling in Brazil is an open question and the current debate is intense.

While some pathological gamblers feel relieved at the closures, some have already turned to illegal alternatives. Despite these concerns, initiatives to produce epidemiological data on gambling are just beginning.

Regarding service demand, we observed a natural growth of

treatment-seeking for gambling problems in the mid 1990s. This phenomenon resulted in the opening of the Gambling and Other Impulse Control Disorders Outpatient Unit (in Portuguese AMJO) in 1997. AMJO is located at the Institute of Psychiatry at the University of São Paulo Medical School, the largest university medical center in Brazil with 200 beds and 70,000 outpatient appointments a year. It is one of only two centers specializing in gambling and behavioral addictions in Brazil. AMJO's services are divided into three major areas: research, treatment, and teaching.

Research lines

AMJO has counted on the support of the National Council of Research and Development (CNPq) and the São Paulo State Research Foundation (FAPESP). Our research lines include psychopathology and clinical research, neuropsychology, neuroimaging, and genetics. Since its foundation, the group has produced two PhD theses (Tavares, 2000; Martins, 2003), the former being the recipient of the National Council on Problem Gambling Doctoral Dissertation Award in June 2002 in Dallas, Texas. AMJO currently supports five graduate students completing two doctoral dissertations and three masters theses.

Treatment delivery

Our service is located in the city of São Paulo, the second-largest city in the world. The Greater São Paulo area, which includes four cities contiguous with São Paulo, comprises around 18 million people. Hence, treatment demand far exceeds treatment availability. Our first program was based on brief individual psychotherapy with a total of 40 sessions of 45 minutes each. Since the primary background of the majority of psychotherapists in Brazil is in psychoanalysis, sessions were psychodynamically oriented and therapists were either psychologists or psychiatry residents supervised by senior psychoanalysts. The first outcome measures of this program are under analysis, but the global impression is that this has been as effective as the cognitive-behavioral approaches described abroad. However, the individual approach has obvious quantitative constraints, hence our efforts to develop group therapies.

Two new programs are under evaluation. One is a group cognitive-behavioral therapy (CBT). The group CBT is based on general principles of behavior therapy and Ladouceur's cognitive restructuring therapy (Tavares, Zilberman, & el-Guebaly, 2003). The original program was developed at the Addiction Centre of the University of Calgary during 2001 and 2002, where Dr. Tavares developed his postdoctoral fellowship in collaboration with Drs. Nady el-Guebaly and David C. Hodgins. The program consists of

12 sessions of 90 minutes each with some necessary adaptations to Brazilian realities. For example, the original set of 12 sessions had to be made flexible. The number of sessions that introduce the cognitive approach to gambling (originally 5), as well as the sessions on relapse prevention (originally 2), may take up to 10 and 4 sessions, respectively, as long as the whole program does not exceed the maximum of 18 sessions. Brazilians have a taste for polemics, and compared to North Americans, some feel that we lack objectivity and thrive on argumentation. Besides, although our clients accept a rational approach, most of them arrive expecting moral judgment, emotional suasion, and explanations based on childhood trauma. It takes time to deal with the concept that one has to analyze his or her present reactions and conscious thoughts in the search for the reasons for gambling persistence. Yet, we do not discard the beliefs that a patient may hold about remote causes for gambling problems, although we try to check with the client how such causes could be in action at the present time. Our experience tells us that a 16- to 18-session length is ideal. Further adaptations included replacing references to North American games with culturally compatible options, using proper idiomatic expressions and popular sayings to illustrate cognitive distortions, making analogies between electronic generation of random numbers in gambling machines and dice throwing, actual dice throwing to explain the generation of random number series, and role-playing with fake cash and scratch tickets.

The other program offers a psychoeducational approach based on four sessions with the gambler and four sessions with a relative or a significant other appointed by the gambler. The sessions are based on self-help manuals developed by Hodgins, Currie, & el-Guebaly (2001), translated and adapted for Brazilian patients by AMJO's staff.

All three programs are complemented by regular psychiatric assessments and the treatment of comorbid psychiatric conditions. A comparison of treatment efficacy between the programs is under development. Combining the three programs, AMJO has assessed and treated an average of 150 patients per year.

Teaching and training

Possibly our most important mission in AMJO is dedicated to teaching and training young mental health professionals in the recognition, diagnosis, and treatment of impulse-control disorders with a special focus on pathological gambling. The current staff has five senior professionals (three psychiatrists, two psychologists), seven recently graduated psychologists, and three undergraduate students. An equal number of different professionals have worked with us in the past. The goal is to raise clinical awareness and

treatment capacity of professionals initiating in the mental field, aiming at the creation of new services.

Future directions

Considering the current state of gambling studies in Brazil, we believe the next natural steps should be the opening of new research lines focusing on epidemiology, public health, and pharmacologic treatment of impulse-control disorders. With this in mind, AMJO is pursuing partnerships with universities in Brazil and abroad and with the pharmaceutical industry.

Brazil has continental dimensions with 170 million people. Therefore, the treatment of pathological gamblers cannot rest entirely on the shoulders of a few mental health professionals. Since its beginning, AMJO has supported all initiatives directed to self-help by trying to facilitate the opening of new Gamblers Anonymous (GA) chapters. Recently, we purchased the basic materials of the Self-Management and Recovering Training program (SMART® Recovery, 2004). Efforts for a fundraising campaign are starting. The goal is to produce low-price editions of AMJO's CBT Therapist Manual, the Client Manual, and the Concerned Family Member Manual. The manuals as well as the SMART® and GA basic literature would be made available through mail by phone request.

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For correspondence: Hermano Tavares, Ambulatório do Jogo Patológico e Outros Transtornos do Impulso, Instituto de Psiquiatria do Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo, Rua Ovídio Pires de Campos s/n, São Paulo – SP, Brazil, CEP 05403-010, phone/fax: 55-11-30837816, e-mail: hermanot@uol.com.br.

Competing interests: None declared.

Hermano Tavares is a psychiatrist who completed his training at the Institute of Psychiatry-Hospital Clinics, São Paulo, where in 1997 he founded the Gambling and Other Impulse Control Disorders Outpatient Unit. He completed his doctorate in 2000 with research on pathological gambling and the impulsive-compulsive spectrum of disorders. His doctoral dissertation received the Doctoral Dissertation Award from the National Council on Problem Gambling in Dallas, Texas. Dr. Tavares was a postdoctoral fellow at the University of Calgary (2001–2002), with shared funding by the Alberta Gaming Research Institute (AGRI) and the National Council on Research and Development, Brazil. He recently returned to São Paulo and is a supervisor of the postgraduation program of the Department of Psychiatry, University of São Paulo.

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first person

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first person account

A First Nations hand game: Gambling from supernatural power

Phil Lange, Centre for Addiction and Mental Health, Toronto, Ontario, Canada.
E-mail: Phil_Lange@camh.net

In 1969 I was fortunate to experience the verve and the warmth of traditional native gambling as an indirect result of a federal cabinet decision. That summer two representatives from British Columbia 's First Nations advocacy groups came to our department at the University of British Columbia to ask for volunteers from among us graduate students. They explained that the federal government had just tabled a White Paper that threatened to deprive them of their aboriginal rights as enshrined in the British North America Act of 1867. They asked us to help them to defend their rights by working with them on research and to prepare briefs and position papers.

Three of us volunteered and that week began working under the direction of our First Nations colleagues. By day we researched archives; on evenings and weekends we caucused to help draft position papers and to plan strategy. As we collaborated with our native colleagues, we became good friends. Eventually, they commented with some sadness that we didn't really know them. As an elderly matriarch put it, "We must seem like really *uptight* bureaucrats from the reserve just fighting those white bureaucrats in Ottawa." She turned to me. "Did you ever have smoked salmon and bannock? And see the hand game? That's how we gamble, you know. Only we call it *slahál* in our language. My family has some songs for that, we're pretty strong." She and the other women laughed.

That was our invitation to the Cultus Lake Indian Festival. During the two-hour drive from Vancouver our native friends mentioned that the lake wasn't their favourite place. The park did have enough space for hundreds of people to cook, visit, race war

canoes, and gamble. But *cultus* means *no-good* in the Chinook language. They knew that this lake was bottomless, that monsters swam between it and other lakes miles away, setting up dangerous currents.

But for me, the park setting was shaded and quiet, considering the hundreds of people there. The calm lake seemed timeless. A peaceful setting, sunshine, a few clouds. Soon we were ambling through scattered crowds, meeting our friends' families. In the quietest, most gracious way we were offered scrumptious baked salmon, potato salad, fresh-made bannock, soft drinks, and dried candlefish. There were few non-aboriginal people and they fit in quietly.

But when the huge war canoes began racing, each canoe with 11 men paddling with gusto, there were problems. White men speeding in powerboats cut in so close to take movies of the paddlers that their rooster-tail wakes filled the canoes. The announcer asked the power boaters to please stay clear of the racing area. They ignored him. Some canoes won their heat because a competitor was swamped, dead in the water. There was much outrage at such blatant fouling of an athletic event.

After the war canoe fiasco, I wondered if native people who didn't know about us and our advocacy work would resent our being there and might object to our watching their gambling? More than ever I was conscious that, "You are walking on Indian land" (as it was phrased in the 1960s). This beautiful park was now theirs to enjoy only for this weekend and only on the sufferance of a provincial agency. Yet everyone was friendly and smiled when they asked me if I was going to see the hand game.

Just before we left our comfortable campfire, an athletic Salish man in his forties explained to us how they play *slahál.* The two opposing teams sat facing each other across a fire. The *holders* had two pairs of short bones, each bone was about the size of an adult's thumb. One bone per pair was marked with designs and one wasn't. Players hid the bones in their closed fists. They sang and drummed for supernatural power to confuse the other side's *guesser* who had to guess which hands held which bones. The prize, or the *pot* was a bundle of cash. Then our friends asked us to go along to the game.

We found a clearing where a fire was burning between the two teams facing each other. Each team had a straight line of players, perhaps two-thirds of them were men, who knelt or sat facing the other team. Onlookers gathered behind them, at least a hundred in all.

A round of play began with a man circulating and gathering bets, while a young woman carefully wrote down in a notebook the amount that each person contributed. When all who wanted to bet had placed their money, a man from each side met his counterpart and they compared amounts. One side was short a few dollars, so he went back to his people to raise enough so that each side placed equal amounts. Then the pot was tied up in a scarf and placed in the middle, off to one side, away from the fire, and from anyone.

The side with the bones began drumming and loudly singing a melody that was pure and haunting, soaring and strong. Each drummer held his own instrument, sometimes heating the skinhead over the fire to tighten it. The song radiated confidence and an upbeat attitude. The music was the first thing to impress me. I had expected to hear high-pitched, keening songs like those of the First Nations of the Plains. But these songs were pitched in a speaking voice range and were as melodious as a choral composition. Even now, 34 years later, the beauty of their songs and drumming so fill my memory that it's difficult to write.

The team leader sat in the middle of the line holding the two pairs of bones that his side would hide. He sometimes rolled them in his hands, rolled them on the blanket or on a wooden plank or passed them to people on his side to roll around and handle. Finally, he handed them to two men who were on either side of him and they did the same for a while, then finally hid their hands behind a drum or a Cowichan sweater as they switched them to a final position, one bone in each fist. Then they still moved their hands and arms around. A holder sometimes stretched his hands toward the opposing side, sometimes crossing them in front of his chest. The leader was calm and serious. I found myself hypnotized by song, drumming, and rhythmic movements, and remembered our friend saying that songs have power.

The side that would guess the positions of the bones was silent, unmoving, and totally absorbed in looking for clues to which hands held the unmarked bones. The slightest movement of eye, hand, or body could be read to tell which hand held the important bone. Possibilities included false signals. As the bone-holding side sang and drummed, a few onlookers held up coins, smiled, and sought eye contact with anyone on the other side willing to make a side bet.

Suddenly, the singers and drummers ceased. Abrupt silence. Previously, everyone's attention had been on the side that was singing, drumming, and moving the hidden bones around. Now, in a heartbeat all eyes were on the guesser. He hesitated dramatically before revealing his choice, indicating by a hand gesture where he thought the two unmarked bones were. Whoops

of victory by the successful side and the bones were handed over with dignity, even by a side that had lost often.

Next, someone from the winning side stabbed a one foot-long, painted marker stick into the earth, leaning toward the other side. And the next round began with the former guessers now singing, drumming, and hiding the pairs of bones.

I was appalled to see one of my non-aboriginal colleagues pull out a tape recorder and turn it on. For the Salish, as for other First Nations peoples of the Northwest Coast, not only songs, but the rights to lands, resources, myths, dances, masks, and countless other treasures are gifts of supernatural origin for specific individuals or families. Only the owners can offer them to someone. I was trying to decide how to stop her when two older Salish women moved in so close to her that they blocked off the recorder's built-in microphone. She moved away to get clear, and they boxed her in again. Yet all was genial, the cultural guardians even smiled at her once. She finally put the recorder back in her handbag.

Eventually, after numerous rounds, one side won the game, and with cheer, but not gloating, divided the pot. Each person won twice his or her original bet, double or nothing. People chatted, some joked as they paid up or collected their side bets. Elders talked in Salish.

The games went on until early morning. I was disappointed when they ended; for I felt that I had seen something timeless and important, although there was much that I had not understood..

Later, from friends and by reading, I learned about details of the game that had baffled me in the dark and the confusion. Question: What did the guessing really involve? (In the dark, with the campfire flaring, I could barely see the bones, but sometimes one man showed one or both bones and sometimes two men showed all four bones.) Answer: Two men each handled one pair of bones and each man's pair had a marked "male" bone and an unmarked "female" bone; for the female bones were the ones identified by the guesser. One clear gesture by the guesser indicated which hands he felt held the unmarked bones. Sometimes showing only one bone out of the four showed the guesser's error. To avoid showing all of the bones often made strategic sense; for if one holder allowed even a slight giveaway – the barest indication by eye, hand or body – the guesser might then realize it on finally seeing where all of the bones really were. I also wondered if the game had always been like this. I read that it was structured like many other Salish gambling games.

Academics who research gambling debate whether a given game is based on skill, on luck, or a combination of the two. From a western science perspective, my vote is to see this as nearly totally a game of skill with little luck involved. I also respect and accept the Salish perspective that this is a game from supernatural powers; the power of the leader, of the collective strength of each side, and the power of their songs.

Our First Nations friends saw how much I enjoyed watching *slahál* and so either took me to games or told me where to find them. I always felt welcome, but I didn't gamble. For me, it was enough to witness the drama and to hear such powerful singing and drumming.

One final, very personal memory from that game. The next morning, after no sleep and the excitement of such hauntingly beautiful songs and drumming, I struggled to stay awake as we drove home. While dozing, I imagined a young aboriginal man of 200 years ago:

I paddle my small dugout canoe home tonight, starlit, no moon, close to shore and quite near our slahál game. To my right, far up the bank, a fire outlines my family and our very welcome visitors, singing, drumming, gambling: hope and disappointment. To my left, in unfathomable depths, monsters scheme and coil in cold waters.

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For correspondence: Phil Lange, MA, editor, *Journal of Gambling Issues*, Centre for Addiction and Mental Health, 33 Russell Street, Toronto, Ontario M5S 2S1, Canada, telephone: (416)-535-8501 ext. 6077, fax: (416)-595-6399, e-mail: Phil_Lange@camh.net.

Competing interests: PL is editor of the Journal of Gambling Issues.

Phil Lange (MA, social anthropology, University of British Columbia) has carried out community development, ethnographic fieldwork, and qualitative research in Canada and elsewhere.

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JOURNAL OF GAMBLING ISSUES

opinion

[This article prints out to about 4 pages]

Gambling on the Internet: Some practical advice

Mark Griffiths, Nottingham Trent University, Nottingham, U.K,
e-mail: mark.griffiths@ntu.ac.uk

Jonathan Parke, Nottingham Trent University, Nottingham, U.K.

In the U.K., Internet gambling is one of the fastest growing forms of gambling, and we have seen a large rise in the number of Internet gamblers seeking counselling for their problem. If Internet gamblers claim they cannot stop, we should at least be giving them information that can limit their losses. This short article outlines some practical advice that can be given to those who gamble on the Internet. Much of it is (we hope) common sense but could be an additional resource to other harm-minimisation approaches. In short, Internet gamblers should follow these guidelines.

Gamble on activities that are unlikely to be rigged or preprogrammed. In short, Internet gamblers should limit themselves to activities where the outcome can be verified. Sports

betting is a good option because the Internet gambler will know (or can check) who won the basketball match or the football game. Gambling on Internet slot machines or simulated roulette wheels is a little like playing with imaginary dice! Players have no idea how much the activity is biased towards the operator.

Beware 'practice' and 'free-play' modes. One of the most common ways that gamblers are sucked into playing online is when they try out games in the 'practice' or 'free-play' mode. It is not uncommon to win while 'gambling' on the first few goes on a free-play game, or to have extended winning streaks if a gambler has prolonged periods playing. Obviously, once the gambler starts to play with real money, the odds of winning are considerably reduced.

Gamble with well-known companies. In most commercial domains, 'name' brands are typically much more expensive than the same items without the brand name. This provides an implicit assumption that better value can be found by avoiding the biggest and most well-known names. When it comes to gambling on the Internet, this is not the best strategy. In the online business community, a high-profile brand name often equates with accountability. Many people worry that, when they gamble on Internet gambling sites that operate out of Caribbean countries, they will not see their money if they win. It is therefore better to gamble with well-known companies that have a history of reputable gaming in the offline world.

Gamble with companies who advertise heavily. Another possible sign of legitimacy and accountability is to gamble at sites that advertise heavily. Obviously, high-profile advertising does not automatically legitimise the operator, but there is some accountability in the outlet that carries the advertisements. It is not uncommon for those who have been ripped off by a company to gain some leverage by contacting the outlet that carried advertisements for the Web site. Furthermore, most disreputable operators keep a low profile when it comes to advertising.

Gamble at places recommended by reputable friends and colleagues. If an Internet gambler has friends who gamble online, he or she should check out what they are saying. As with any other product that involves the exchange of money, a gambler needs to do research to establish the best deals. In short, Internet gamblers should always research the gambling sites on which they are considering playing for money.

Set limits. As with all forms of gambling, it is important to impose limits on time and money spent. However, this is particularly important when gambling online. Using e-cash can temporarily disrupt the gambler's financial value system (i.e., suspension of judgement).

Beware of 'bogus' players. Internet gamblers need to be aware of bogus players making claims about particular sites. A common practice by many commercial operators is to generate hype by having people disguised as unbiased players rave about online gambling sites in online forums. Such operators may also generate mass e-mails and instant messages with typical claims like '*I just found the greatest online casino on the Net. You should check it out'* The bottom line is that Internet gamblers should try to get the views of others they know (as above) rather than a claim from someone they do not know who says that it is a great site.

Disregard rumours. Online gaming can often invoke certain urban myths, such as 'your first bet after opening your account is always a winning one'. Banking on such speculation when conducting online gaming is a recipe for disaster. Only the factual information published on the site should inform decision-making.

Read the rules and policy page(s). By reading the gambling sites' small print, an Internet gambler can determine whether the game rules are to their liking. They can also assure themselves that the operators of the site stand behind what they are selling.

Select sites with secure servers for financial transactions. Internet gamblers should not submit any of their credit card or banking details until they have verified that the registration is carried out on a secure server. Gamblers should check that the gambling site has been validated as a VeriSign secure site. This is a security precaution allowing gamblers to learn more about a Web site before they submit any confidential information or deposit any funds. This facility offers information on licensing and ownership and verifies that the confidential information that gamblers provide is encrypted to protect against disclosure to third parties.

Check the site's privacy policy. Before disclosing any personal and contact information, Internet gamblers should make sure the site has an acceptable privacy policy. If the site does not have a policy, gamblers will leave themselves open to masses of junk mail, for personal details are likely to be sold by the host site. Also, Internet gamblers should be careful not to unknowingly opt into mailing lists of which they want no part.

Avoid gambling sites that do not make it easy for the gambler to contact them. One way to check is for Internet gamblers to telephone or e-mail them to verify their accessibility and helpfulness. If this is impossible or very hard to do, avoid gambling on the site.

Know the pay-out rates. As with offline gambling, Internet gamblers should make sure they are fully aware of the pay-out

percentages that are offered. Failure to let gamblers know what they are getting for their money suggests a less than reputable company to gamble with.

Look for third-party approval of the gambling site. There are many things that an Internet gambler can look for at the site. Is there verification that the gambling site's software has been audited by a reputable third-party firm? Has the gambling site been government approved or licensed?

Check out the small print for using free credit. For example, an operator may offer to match an Internet gambler's first deposit of (say) £100. However, gamblers are often required to play several times this amount before they are permitted to make a withdrawal of funds. Consequently, gamblers may be winning initially but have to gamble for longer to satisfy financial withdrawal criteria. This form of 'pushed' loss can perpetuate chasing behaviour and hence problematic gambling.

Play openly. Internet gamblers should avoid 'hidden play,' which can often occur at work or in a disapproving home environment. Players who try to gamble and conceal their actions simultaneously may lose concentration, affecting judgement and risk-taking. Apart from the negative consequences of meeting with disapproval (or worse) from work or at home, the ability to take a sensible and responsible approach to gaming is also compromised.

Avoid gambling sites with offers that seem too good to be true. They usually are!

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For correspondence: Professor Mark Griffiths, International Gaming Research Unit, Psychology Division, Nottingham Trent University, Burton Street, Nottingham, NG! 4BU, U.K., telephone: 0115-8485528, fax: 0115-8486826, Webpage: http://ess.ntu.ac.uk/griffiths/, e-mail: mark.griffiths@ntu.ac.uk.

Competing interests: None declared.

Dr. Mark Griffiths (BSc, PhD, PGDipHE, CPsychol) is professor of gambling studies at Nottingham Trent University. He is internationally known for his work in gambling and gaming addictions and was the first recipient of the John Rosecrance Research Prize for "Outstanding scholarly contributions to the field of gambling research" (1994), winner of the CELEJ Prize (1998) for best paper on gambling, and winner of the International

Excellence Award (2003) for "outstanding contributions to the prevention of problem gambling and the practice of responsible gambling." He has published over 120 refereed research papers, two books, numerous book chapters, and over 350 other articles.

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JOURNAL OF GAMBLING ISSUES

opinion

[This article prints out to about 13 pages]

Rolling the dice on casinos in Florida: Will residents view legalized casino gaming as a cure for a financial crisis?

Peter Ricci, Dana V. Tesone, and Po-Ju Chen, University of Central Florida, Florida, U.S.A.
E-mail: pricci@mail.ucf.edu

Abstract

This article considers the viability of casino gaming as one potential solution for Florida's current lackluster financial condition, due to declines in tourism revenues and increased education costs. The article suggests that similar conditions have motivated voters to set aside personal disdain for legalized forms of gambling in the interest of financial gains. It concludes with the next logical step of condoning casino gaming as a means to solve current budgetary woes and considers potential research to predict such an event. [Keywords: casino, gaming, Florida, budget, gambling, legalized]

Introduction

While casino gambling has proliferated in the United States over the past three decades, Florida remains one of the few states without legalized full casino operations. Indeed, forty-eight of fifty states have legalized gambling in some form. By 1995, twenty-two states featured full-fledged casino operations, up from just one state in 1975 (Au & Hobson, 1997; Mason & Stranahan, 1996). Recent events such as the U.S.-led war on Iraq, the September 11th tragedy and the poor economy have all caused a significant reduction in visitor-related tax collections in Florida. At the same time, huge increases in state expenditures are on the horizon resulting from recent voter-approved amendments to the state constitution. Citizens and leaders must consider different options for luring visitors back to the state. One city in the state continues to be ranked as the number one visitor destination in America – Orlando – offering visitors a choice from over 109,000 hotel rooms

(Orlando Convention and Visitors Bureau [CVB], 2003). Orlando's tourism industry provides jobs to over 25 percent of the local workforce (Orlando CVB, 2003). Even small cities in Florida boast large tax collections from the visitor industry. The state tourism industry will surely falter without the return of visitors. And, without visitors, tax collections will continue to dwindle.

This article considers the viability of casino gaming as one potential solution for the state's lackluster financial condition. Historically, voters have held firm in the conviction that gaming is not a welcome industry in their state. However, the residents have been known to approve the introduction of lottery games in response to the inability to adequately finance the state education system. Ironically, the passage of one recent amendment to the state constitution requiring limits on class sizes in state run schools has created significant budget deficits beyond the allocated funding provided by lottery revenues. Further, the decline of tourism revenues is placing a burden on all other aspects of the state budget. This article suggests that similar conditions have motivated voters to set aside personal distaste for legalized forms of gambling in the interest of financial gains. It concludes with the next logical step of condoning casino gaming as a means to solve current budgetary woes and recommends future research aimed at predicting the probability of such an occurrence.

The state of the state

Florida. The name alone conjures images of palm trees, oranges, theme parks, and sandy beaches. Florida – the Sunshine State – a state where tourism is the number one industry with over 72 million people arriving in the year 2000 alone (FLAUSA, 2003).

A more current image of Florida might be: Florida, a state facing substantial budget deficits; Florida, a state with unemployment on the rise; Florida, a state with its number one industry, tourism, in jeopardy. Recently, the global economic downturn has led to a decrease in the number of Florida visitors along with their tax-producing dollars (Snyder, 2003). Compared to the year 2000, visitor arrivals in 2001 fell 4% (FLAUSA, 2003a). While 2002 visitor arrival numbers were more positive than 2001 by 8% (Pitegoff, 2003), the continued national economic downturn and start of the war on Iraq has dampened 2003 visitor arrival estimates. Further, the 2002 gains may have been triggered by a one-time investment of over $20 million by state government funds and $25 million by tourism industry organizations.

Barry Pitegoff, vice president of research for VISIT FLORIDA suggests: “We suspect this small spike in the number of visitors

was due largely to the massive advertising and promotional campaign that got underway in the final month of 2001 and continued through the first half of 2002" (Pitegoff, 2003). With such a high price tag, neither state government nor tourism industry organizations have continued utilization of such a campaign in 2003. The extremely costly endeavor and limited return on investment (8% increase in year-over-year arrivals) can be interpreted as cost-prohibitive for any government or private industry organization to continue for any extended period of time. This is especially the case when one acknowledges the fact that increased visitation does not automatically mean increased tax collections. Substantial discounting by hotels, attractions, restaurants, added a comma and airlines diluted the gains expected from the greater number of visitors. Moreover, this massive advertising effort was only one possible cause for the slight increase in 2002-over-2001 visitor arrival numbers. Other variables may have included: weather, pent-up travel demand I eliminated 9/11 reference here, normal cyclical travel patterns, or a host of other options. Hence, implementation of excessively high-cost programs cannot be continued in a state which is suffering from decreased tax collections; to continue to do so would exhaust the already-shrinking tourism promotion budgets.

Not alone in the current downturn in tourism, Florida is one of many states facing a severe budget crisis with no foreseeable cure on the horizon. A voter-mandated amendment for smaller class size has exacerbated the situation. The amendment has led to a substantial increase in state funding. This amendment will be implemented while visitor-generated tax receipts continue their downward spiral, potentially leading to a dire financial scenario in government coffers. Tourism has been and continues to be the state's number one industry; yet, decreases in visitor arrivals may significantly affect the state's tax base for the foreseeable future. One of only seven states in the country without personal income tax as a funding source, Florida is chiefly reliant upon visitor-generated tax dollars (GovSpot, 2003). In a press release to the citizens of Florida, Governor Jeb Bush spoke of the current state of financial affairs in Florida: "I'm proud that Florida is one of the few places in the country that will see increases in education, child welfare and services for the elderly. At the same time, cost pressures related to the constitutional amendments as well as a still recovering economy, will force us to make some very difficult choices" (Bush, 2003). One should note that this quote was delivered to the citizens of Florida in late January, 2003 – prior to the United States' entrance of war with Iraq. This war has led to an even further reduction in state visitor arrivals as well as a continuation of state and national economic woes and rising unemployment. A recent news report sheds light on the accommodations tax collection in Greater Orlando: "A lengthy war with Iraq or continued economic woes could further suppress

those numbers, making even those in charge of cheerleading tourism question when the visitors will come back to their historic levels" (Hunt, 2003). Although they are still somewhat optimistic, many of Florida's citizens, tourism executives, and government leaders have narrowed their hopes for continued visitor growth. With the nation at war, rising unemployment, fear among travelers and deep discounting omnipresent among hospitality companies, Florida's tourism leaders are thrust into an era of uncertainty about visitor tax collections.

A historical perspective

Florida's history has shown a lack of interest to gain any economic benefits via legalization of casino gaming operations. By 1993, ten states already had gaming revenues of at least $45 million per year with Nevada's revenues surpassing $6 billion annually (Kilby & Fox, 1998, p.11). Florida chose not to participate in potential earnings from taxation of casino operations in 1993, and its voter base still rejects full-fledged casinos. The state's voters have rejected an amendment to the state constitution that would provide the addition of casino gambling to Florida's repertoire of attractions three times over the past twenty-five years. The voters rejected an amendment to add full casino operations in 1978 and again in 1986; yet, in 1986 the voters approved an amendment that authorizes the Florida Education Lotteries, from which the State Legislature deposits the net proceeds into a trust fund for appropriation toward educational purposes. In 1994, gaming proponents tried once again with great fervor to secure an amendment to the constitution by state voters (MyFlorida, 2003). Instead, "Florida voters crushed a gaming proposition by a two-to-one margin, even though the proponents outspent opponents fifteen to one" (Glenn, 1995, p. 12).

One cannot ignore the fact that Florida did indeed experiment with casino operations in the period 1879 – 1895. Casinos, however, never caught the attention of mainstream Floridians at that time and Florida swung to the anti-gaming camp until the late 1920s. Tourism, an already significant industry in Florida, was severely impacted by the destructive forces of two strong hurricanes that slammed South Florida in the summer of 1928. Tourist arrivals all but halted as word spread that Ft. Lauderdale and Miami had been destroyed. As a push to return tourists to Florida after the negative publicity, a state-regulated system for pari-mutuel dog racing, jai alai, and horse racing was passed (UNLV, 1996). While a return to 19th century full casinos was not authorized, pari-mutuel gambling became a mainstay under the Florida sunshine.

Pari-mutuel gambling remained as Florida's stronghold gambling venture without competition from other forms of land-based

gaming until the 1986 passage of the Florida Education Lotteries. Emerging on the scene during the 1980s, multiple gambling cruises began to sail from Florida's ports. Today, casino ships sail from over 25 cities in Florida (Awesome Florida, 2003). Many locations feature multiple vessels sailing several times daily from the same port, greatly increasing the gaming revenues of the cruise ship operators. All vessels are completely free from taxation by the state of Florida. One vessel advertises itself as the largest casino cruise ship in the world and its immense size has been a major factor in pushing its home port to become the number two multi-day cruise port in the world based upon passenger activity (Port Canaveral, 2003).

While casino cruises have contributed no tax dollars to the state's coffers, the Florida Education Lotteries have produced funding for state education. The Florida Education Lotteries amendment permits lawmakers to use the lottery collections to supplant education dollars which may be shifted elsewhere in the state's budget with a net effect of no “real” gain for educational activities. Although the ubiquitous lottery billboards, television advertising and Web site proudly proclaim “Florida lottery has contributed more than $13 billion for education in our state” (Florida Lottery, 2004), one must realize that original education dollar appropriations were shifted to other areas based upon budget needs – the lottery collections are not additional tax dollars used to enhance state education programs, they merely replace funding levels. With the 1986 amendment passed to legalize lottery in this manner, it is no wonder many of the state's citizens only see minimal return on investments in the education arena and often question where the money goes.

Beyond the pari-mutuel and cruise ship gaming activities, one finds Native American tribal gaming activities in the State of Florida. In reality, this is where one finds the “big bucks” in the state's gaming activities. Two main tribes, the Seminole Tribe and the Miccosukee Tribe have grown their operations considerably during the past two decades. Once again, the state receives nothing from these legal casino operations. The Miccosukee Resort and Gaming Center brings in an estimated $75 million a year in gaming revenues (Barlett & Steele, 2002). “Few tribes are more powerful than Florida's Seminoles, who pioneered high-stakes bingo and won Supreme Court approval for Indian Gaming everywhere” (Barlett & Steele, 2002, p. 56). In 2001, the Seminole Tribe's casinos made combined profits of $216 million on revenue of $254 million – this equals an astronomically high profit rate of 85%. General Electric, Microsoft, and many other Fortune 500 companies are lucky to break 10-25% return on revenue (Barlett & Steele, 2002). Once again, the state's tax dollars collected from the Indian tribal casinos located in Florida: zero.

Providing even more evidence of the anti-gaming sentiment in the state of Florida legislature and among its citizens, most states usually have no jurisdiction over sovereign Indian reservations, yet Florida is trying to prevent at least one of its tribal casino operators from growing to high-stakes games. If a tribe wants to offer Atlantic City or Las-Vegas-fashioned games such as blackjack, slot machines, roulette, craps, etc. the tribe must have an agreement with the state known as a regulatory compact. These high-stakes types of games are known as Class III gaming. Florida, which does not permit high-stakes operations, claims that the Seminole Tribe's current slot machines are illegal, resembling too closely the Las Vegas-style machines (Barlett & Steele, 2002). Class II games, which include bingo, pull-tab slips and low-stakes table poker are, as one would suspect, not as high in revenue generation as a casino. Class II games are justified by the state of Florida and the Seminole Tribe indeed claims to be using Class II slot machines - electronic versions of bingo and pull-tab games. The state of Florida claims otherwise stating that the machines in use are illegal and the casinos should be closed down. “The Seminoles claim the machines are not slots but ‘electronic terminals,' so the tribe needs no compact. The Clinton Administration, in one of the decisions made as it was turning out the lights on Jan. 19, 2001, issued an order approving the Seminole operation. The incoming Bush Administration promptly rescinded the order pending further study” (Barlett & Steele, 2002, p. 56).

The Seminoles seem unfazed and continue on with “business as usual” while waiting for a federal government go-ahead. To show the strength of their stance and their commitment to the land-based casino business, the Seminole Tribe has recently expanded and greatly upgraded both its Hollywood, FL and Tampa, FL casinos to be full Las Vegas style venues. While restricted to the current Class II games, these venues have added deluxe hotels, top-name entertainment, and upscale dining. They have partnered with Hard Rock Café International in both venues. The Hollywood, FL facility had an estimated expansion and development cost of over $279 million (Bell, 2004). “The casino-resort, which will also have convention facilities, a beach club and a spa, will add to the Seminoles' lucrative gaming business” (Barlett & Steele, 2002, p. 56). With an 85% return on revenues in 2001, it seems easy to justify such expansion costs.

This plethora of gaming activities operates in all corners of the state of Florida. Whether a vessel sailing from Ft. Lauderdale, a Native American tribal reservation in Tampa, or a lottery ticket sold in Pensacola, Florida's citizens seem apathetic to the impact of gaming in their state. In reality, the worst-performing sector of the gaming industry is indeed the state-approved pari-mutuel system. Although the dog racing tracks, horse racing tracks and

Jai alai frontons pay a portion of their gaming revenues as tax collections to the state of Florida, none of these facilities has grown its user base over the past decade and many of these facilities are in disrepair and have fallen out of the limelight for potential gamblers. Jai alai has been experiencing an annually decreasing rate in betting amounts of 12% since the year 1977 (Florida Gaming, 1998). During the 1997-1998 state fiscal year in Florida, the state enacted a tax reform to offset losses from the particularly bleak environment in which jai alai frontons were operating. The downward spiral in betting and attendance was so severe that the state took action to protect the jai alai frontons by giving them a tax reform for future years preventing at least a handful of jai alai frontons from shutting their doors (Florida Gaming, 1998a). Then chairman of the Florida Gaming Corporation, Bennett Collette, stated: “This legislation will have a dramatic positive impact on our future revenues” (Florida Gaming, 1998a).

With the state of Florida offering tax rebates to pari-mutuel operators whose businesses are experiencing year-by-year downturns, receiving no tax collections whatsoever on the millions of dollars in gaming revenues generated by vessels and Native American tribal casinos, and experiencing a severe economic downturn and current war affecting visitor arrivals, it is no wonder why the Governor, the citizens and the state legislature may slowly concede to the option of land-based casinos that would be legalized, regulated and assessed for tax collection. Bernard Goldstein, CEO of Isle of Capri Casinos corporation, agreed: “Tough budget decisions have already softened some governors' stances on gaming revenue. In Florida, for example, a new law requires Governor Jeb Bush to reduce K-12 class sizes by 2010, which could mean that Florida will have to hire 25,000 new teachers this year” (Sherwood, 2003, p. 16). As an indication of the possible change in position, Governor Jeb Bush recently proclaimed, “I'm opposed to the expansion of gambling, but I'm also opposed to raising taxes” (Sherwood, 2003, p. 16).

The state of other states

The three leading casino gaming destinations in the country all faced similar economic challenges prior to instituting legalized and regulated casino operations. Las Vegas, Atlantic City and the Mississippi Gulf Coast (Gulfport/Biloxi) all have benefited economically from the arrival of casino gaming operations. Mississippi, the newest of the mega-gaming destinations has a history glaringly similar to current-state Florida. The 1980s was a rough decade in Mississippi with its public education rated as lowest in the nation, poor environmental quality, and a low rating on overall general welfare of its citizens accompanied by severe economic stress (Clynch, 1988). Rivenbark (1998) describes the

economic conditions in Mississippi at the close of the 1980s:

> *Taxpayers demanded an increase in governmental services but simultaneously balked at the idea of higher taxes. In 1990, to avoid a mandatory tax increase and to abate fiscal stress, the Mississippi legislature passed the Gaming Control Act legalizing dockside casino gaming as a surrogate tax system for the state…During fiscal years (FYs) 1993, 1994, and 1995, the state collected a combined total of $256.9 million in gaming fees and taxes from the casino industry. The $128.6 million received in FY 1995 equated to a rather remarkable 5.04% of the state's general fund revenue* (p.583).

Mikesell (1995) noted that state lotteries rarely generate more than 2% of general fund revenues for states featuring such games. Further, he noted that many analysts expected the same or less for casino gaming in Mississippi.

Currently, Mississippi continues its gaming industry growth with the Gulf Coast creating jobs and increasing its tourism tax base. Conventions and conferences that previously visited states with larger facilities now have meeting space on the Mississippi Gulf Coast. A $10 million expansion of the area's Mississippi Coast Coliseum & Convention Center took place in 1999 as demand has increased (Hardin, 1998). Other improvements in the community gained through the accumulation of gaming tax contributions include a new runway at the Gulfport-Biloxi Regional Airport, a beachside boardwalk, a widening of the area's main highway, Beach Boulevard, and the addition of at least 15,000 jobs directly related to the gaming industry (Hardin, 1998).

On the Atlantic coast of New Jersey, Atlantic City demonstrates the economic benefits and job creation features of the gaming industry. The first casino in Atlantic City opened in 1978. Between the years of 1975 and 1980 construction, transportation, communications, public services and general services all added jobs to the workplace – in total 33,000 jobs, far more than the casino had promised (Browne & Kubasek, 1997).

During fiscal year FY 1997 alone over $940 million was generated in gaming revenues in New Jersey of which 31% came from casinos in Atlantic City (the only in-state location for full casino operations). During the first 18 years of operation (1978-1996), the casino industry paid almost $5 billion dollars in fees and taxes to the state of New Jersey. Casino tax revenues grew from $1.5 million in fiscal year FY 1978 to $288.8 million in FY 1995 even though gaming expanded across the United States at a frenetic pace (Madhusudhan, 1996).

Las Vegas remains the big player in the casino gaming business. Nevada became the first state to legalize casinos statewide in 1931 (Madhusudhan, 1996). In the 1900 census the city of Las Vegas was comprised of 17 people compared to its current population which is well over two million; many attribute this explosive growth to an economy sparked by the gaming industry (Doppelt & Schwer, 2002). Today, one of every three jobs in Las Vegas is in hotel, recreation, and gaming. These jobs also support other jobs in the community directly and indirectly. Seventy-five percent of the state's tax income comes from gaming. Las Vegas alone contributed over $7.6 billion in 2002. Unlike other states, Nevada does not limit the number of gaming properties, yet Las Vegas remains far ahead of any other city in the state (Doppelt & Schwer, 2002). The Las Vegas experience is often used as a glowing example of the economic growth and revitalization generated by casinos and gambling (Gross, 1998).

There are many examples of successful economic impacts from gaming in areas such as Black Hawk, Colorado, New Orleans, Illinois, and Iowa (Jang, Lee, Park & Stokowski, 2000; UNLV, 1996). However it is also important to mention the numerous reports in the literature regarding negative aspects of gaming. Gross (1998) offers a comprehensive summary of several studies analyzing gambling as a stimulus for economic development. Several problem areas are illuminated: public officials have little objective research on which to make decisions about legal gambling, gambling is sold as a painless way to raise revenues, legal gambling may result in cannibalization of the local economy siphoning consumer spending from other businesses, and increased crime and/or larger police budgets may result. Gross analyzed and expanded Goodman's (1994) United States Gambling Study. In his United States Gambling Study, Goodman analyzed existing gaming literature, examined and compared press clippings from across the United States, met with elected and appointed officials, and interviewed both those inside and outside the casino industry who resided in areas where casinos were in operation. These analyses provide indications of potential financial rewards that Florida may achieve from tax collections on legalized casino operations.

Conclusion

The examination of the gaming literature, in particular, those studies focused on Mississippi, which closely mirrors the demographic and economic composition of Florida, provide impetus for empirical studies on the potential probability of casino gaming in the “Sunshine State.” In light of current events taking place in Florida, the timing is right for new sources of tax revenues. The downward spiral in tax collections driven mainly from decreasing visitor arrivals, the national and statewide

economic downturn, the current U.S.-led war with Iraq, and the recent amendment to shrink K-12 classroom size at a huge cost to taxpayers, make the environment ripe for a panacea to the state's financial woes. Indeed, “In an era of property tax revolt and government cutbacks, gambling has become an easy ‘sell' to cash-strapped communities” (Gross, 1998, p. 205).

The next step is for researchers to engage in focus groups, data collection, and data analysis for the purpose of predicting the probability that Florida residents will be willing to ‘roll the dice' on casino gaming in their state. Future findings on citizen readiness may range from the category of ‘long-shot' to one of ‘sure bet' in gaming parlance. No matter what future research will uncover regarding Florida's readiness to acquire casinos, the success of casino gaming in the State of Florida will be more of a ‘gamble' today than it would have been twenty years ago. The sheer number of casino operations already flourishing across the United States make for a challenging environment.

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For correspondence: Peter Ricci, CHA, University of Central Florida, Rosen College of Hospitality Management, University of Central Florida, P.O. Box 161450, Orlando, Florida 32816-1450 U.S.A., phone:(407) 823-0545, fax:(407) 823-1110, URL: http://pegasus.cc.ucf.edu/~pricci, e-mail: pricci@mail.ucf.edu.

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Peter Ricci, CHA is an assistant professor of lodging management at the University of Central Florida's Rosen College of Hospitality Management.

Dana V. Tesone, PhD is an assistant professor of technology and human resources at the University of Central Florida's Rosen College of Hospitality Management.

Po-Ju Chen, PhD is an assistant professor of human resources and tourism management at the University of Central Florida's Rosen College of Hospitality Management.

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JOURNAL OF GAMBLING ISSUES

opinion

[This article prints out to about 9 pages]

Why don't adolescents turn up for gambling treatment (revisited)?

Serge Chevalier, McGill University, Montrea, Quebec, Canada
E-mail: Scheva2@po-box.mcgill.ca

Mark Griffiths, Nottingham Trent University, Nottingham, U.K.

Abstract

In a previous issue of the *Electronic Journal of Gambling Issues,* Griffiths (2001) raised 10 speculative reasons as to why so few adolescents enrol for treatment programs when compared with adults. This paper explores the issue a little further with another 11 possible reasons. These are (i) adolescents don't seek treatment in general; (ii) adolescents may seek other forms of treatment, but gambling problems are less likely to be seen as requiring intervention; (iii) treating other underlying problems may help adolescent gambling problems; (iv) a dolescent gambling 'bail-outs' can mask gambling problems; (v) a ttending treatment

programs may be stigmatising for adolescents; (vi) adolescents may commit suicide before getting treatment; (vii) a dolescent gamblers may be lying or distorting the truth when they fill out survey questionnaires; (viii) a dolescents may not understand what they are asked in questionnaires; (ix) screening instruments for adolescent problem gambling are being used incorrectly; (x) adolescent gambling may be socially constructed to be nonproblematic; and (xi) adolescent excesses may change too quickly to warrant treatment.

Introduction

It has been well established that prevalence rates of pathological gambling are reportedly higher among youth than adults (e.g., Shaffer & Hall, 1996; Shaffer, Hall, & Vander Bilt, 1999; Jacobs, 2000). In a previous issue of the *Electronic Journal of Gambling Issues,* Griffiths (2001) outlined 10 speculative reasons as to why adolescents may not seek out help for their gambling problem. Very briefly, the possible reasons were

- denial by adolescents of having a gambling problem
- adolescents not wanting to seek treatment even if they admit to themselves that they have a problem
- the general lack of adolescent treatment programs available for adolescents
- treatment programs not being appropriate and/or suitable for adolescents
- the occurrence of spontaneous remission and/or maturing out of adolescent gambling problems
- the possibility that adolescents are constantly being 'bailed out' by parents
- the negative consequences experienced by adolescents not necessarily being unique to gambling
- lying or distortion by adolescents on self-report measures when being researched
- the possibility of invalid screening instruments for measuring problem adolescent gambling specifically
- the possibility that some researchers may be exaggerating the adolescent gambling problem to serve their own career needs

Griffiths (2001) concluded that there did not appear to be any

empirical evidence for at least three of the speculations (i.e., denial by adolescents of having a gambling problem, adolescents not wanting to seek treatment, and researchers exaggerating the adolescent gambling problem to serve their own career needs). Of the remaining speculations, some were not unique to adolescents (e.g., invalid screening instruments for measuring problem gambling, lying or distortion by participants on self-report measures, denial of having a gambling problem, and not wanting to seek treatment). What was quite clear was that there is no single speculation that provides a definitive answer to the question of why adolescents don't seek treatment. In this paper, we present some other reasons and observations related to this issue.

Adolescents don't seek treatment in general. In the previous paper by Griffiths (2001), all of the speculations were drawn from within the gambling field. However, there is also the broader perspective. Why — in general — don't adolescents seek treatment? One might say that, apart from life-threatening traumas and extremely severe acne, young males will rarely contemplate seeking treatment for anything. Young females are a little more likely than young males to consult health professionals (especially for gynaecological reasons). The reasons why adolescents in general do not consult health professionals are their perceived invincibility, invulnerability, and immortality. In addition, adolescents are constantly learning and want to resolve their own problems rather than seek help from a third party. Who better than themselves knows what to do with their lives and whatever problem they are facing? They might experience more denial then adults, but come to the conclusion that others (usually adults) do not understand them. Ultimately, if adolescents rarely present themselves for any kind of treatment, it would be surprising to see them turn up for very specific treatments such as for problem gambling.

Adolescents may seek other forms of treatment, but gambling problems are less likely to be seen as requiring intervention. Adolescent problem gambling is associated with many comorbid behaviours, e.g., alcohol and drug abuse (Griffiths, 1994; Griffiths & Sutherland, 1998; Griffiths, Parke, & Wood, 2002; Chevalier, 2003). Therefore, the few adolescents who do seek treatment may do so for a comorbid behaviour rather than for problem gambling. In most Western societies, gambling is not perceived as a real problem, especially when compared with problems related to alcohol or substance abuse.

Treating other underlying problems may help adolescent gambling problems. Gambling problems could be (and quite often are) symptomatic of an underlying problem (e.g., depression, dysfunctional family life, physical disability, lack of direction or purpose of life) (e.g., Griffiths, 1995; Darbyshire, Oster, & Carrig,

2001; Gupta & Derevensky, 2000). Therefore, if these other problems are treated, the symptomatic behaviour (i.e., problem gambling) should disappear, negating the need for gambling-specific treatment.

Adolescent gambling 'bail-outs' can mask gambling problems. Griffiths 's previous paper speculated that adolescent problem gamblers may be constantly 'bailed out' of trouble and therefore do not require treatment. To add to this, adolescents are bailed out and forgiven when young. The older someone gets the less likely this is to happen. Turner and Liu (1999) highlighted differences between treatment seekers and problem gamblers who do not seek treatment. This shows that people seek treatment when the consequences of their behaviour are more severe, especially with regard to their finances and their families. Adolescents are protected from many consequences (no mortgage or rent to pay, no angry spouse or kids to support), and have not had the time or the resources to build up the kind of debt that brings people in for treatment. Young people will automatically be less likely to be in treatment, considering the average amount of time people have had a problem before they seek treatment.

There is another possibility somewhere between 'bail-out' and spontaneous remission. Problem gambling can be addressed by support (as self-help groups such as Gamblers Anonymous have demonstrated). Adolescents are more likely to get support than adults. For instance, parents often do not quit on their child and will give support whether or not it is needed or wanted.

Attending treatment programs may be stigmatising for adolescents. Adolescents might not seek treatment because of the stigma attached to such a course of action. Seeking treatment may signify that they can no longer participate in the activities by which they and their group define themselves. Furthermore, it may draw attention to a failure.

Adolescents may commit suicide before getting treatment. Suicide rates among adolescents are comparatively high (Duchesne, 2002; World Health Organization, 2002). Suicide is often attributed to adolescence itself (i.e., a host of reasons not always well defined by medical examiners) (Gould, 2003). Gambling might be one of the reasons associated with suicide without anyone ever realising the true cause.

Adolescent gamblers may be lying or distorting the truth when they fill out survey questionnaires. It has been asserted by Stinchfield (1999) that the prevalence rates for adolescent problem gambling are not real and are due to youth exaggerating their involvement in gambling. Furthermore, truths are multiple. It

could be that, while answering truthfully from their standpoint, they are giving researchers answers that we would not think suitable. An example could be in response to a question such as 'Did your gambling ever get you in trouble with your parents?' For instance, an adolescent boy might have a problem with parental curfews. One day he might be late because he missed the bus home, the next day he might be late because he went to a long film at the cinema. On the third occasion he might be late because he was gambling and lost track of time. If the parents told him off on this occasion, it would be an example of gambling getting the boy in trouble with his parents. However, is this response really a valid example of getting into trouble with parents due to gambling?

Adolescents may not understand what they are asked in questionnaires. Another reason that the prevalence rates of adolescent problem gambling are elevated may be due to measurement error. If adult instruments are administered to youth (which some researchers have done, including the second author!), they may endorse items they should not, doing so because they do not understand the item. For instance, Ladouceur et al. (2000) showed that many of the SOG-RA items were misunderstood, with only 31% of students understanding all of the items correctly.

Screening instruments for adolescent problem gambling are being used incorrectly. With measures developed for adolescents, as with those for adults, there may be incorrect use of screening instruments. Stinchfield (1999) asserts that this is one possibility for elevated prevalence rates. He further claims that there may be a lack of consistency in methodology, definitions, measurement, cut scores, and diagnostic criteria across studies, and particularly in the use of lenient diagnostic criteria for youth in some studies. For example, some studies use the SOGS but lower the cut score, and some studies use DSM criteria but lower the cut score, all of which tend to inflate the rate of pathological gamblers.

Adolescent gambling may be socially constructed to be nonproblematic. Problems, whether they are medical or otherwise, are socially constructed (Castellani, 2000). For example, denial may not be experienced because there is no perception of a problem. For instance, if the peer group, school class, and/or the family of the adolescent is progambling, actively engaged in gambling, and shows signs of problems, it may appear to the adolescent that it goes with the territory. Playing the guitar is hard on the fingers, playing football is hard on the shins, and playing poker is hard on cash flow, nerves, sleep, digestion, friends, mood, family, school, job, and much else. Therefore, it may not be perceived as a medical, psychological, and/or personal problem, but merely a fact of life.

Adolescent excesses may change too quickly to warrant treatment. Adolescence is sometimes about excess and many addictions peak in youth (Griffiths, 1996). It could be that transfer of excess is a simpler matter for adolescents. They might have an excess 'flavour of the month' syndrome, where one month it is binge alcohol drinking, one month it is joyriding, and one month it is gambling. Adolescents may not seek treatment not because of spontaneous remission in the classical sense, but because of some sort of transfer of excess.

Concluding comments

As with the previous speculations (Griffiths, 2001), many of the possibilities outlined here are also speculative and many of the original conclusions are applicable here as well. However, there are clearly some research questions that need answering. For instance, why do youths appear to be reluctant to seek help for gambling problems? What is the true prevalence of problem gambling among youth? Are the available statistics inflated by a lack of understanding of the survey questionnaire items, too liberal cut-offs, etc.? Where does problem gambling fit among the many difficulties young people face during the developmental process? Are the heightened rates of pathological gambling among youth the result of having grown up during times of such extensive availability (i.e., a cohort effect)? Or is it merely a reflection of adolescent experimentation that they will grow out of (or a combination of the two)?

Research needs to address directions and magnitudes of causality among problem-gambling behaviours and other health and social problems, such as cardiovascular disease, psychiatric disorders, and social problems (e.g., divorce, domestic violence, bankruptcy, etc.). The question of where problem gambling comes in the chain of negative events in the life of each case, such as before or after the onset of depression or drug abuse, needs to be studied. Such research would inevitably feed into the area of youth gambling. The evidence is overwhelming that most cases of problem gambling have their origins in the developmental period. One study asked patients to specify when their gambling and drug-taking began and it emerged that gambling follows some forms of drug abuse and appears to emerge simultaneously with others (Hall et al., 2000). Hall and his colleagues reported that gambling problems precede addiction to cocaine but seem to emerge simultaneously with opiate dependence. As can be seen, there is large scope for future research in this area. We hope that articles such as this may provide the impetus for such research.

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For correspondence: Professor Mark Griffiths, International Gaming Research Unit, Psychology Division, Nottingham Trent University, Burton Street, Nottingham, NG! 4BU, U.K., telephone: 0115-8485528, fax: 0115-8486826, Webpage: http://ess.ntu.ac.uk/griffiths/, e-mail: Mark.Griffiths@ntu.ac.uk.

Competing interests: None declared.

Serge Chevalier is a sociologist with the Montreal Public Health Department. He is currently spending a year as an invited researcher at McGill's International Centre for Youth Gambling Problems and High-Risk Behaviours. More recently, he was involved in Quebec-wide studies of gambling behaviour and problems with adults and high-school populations. He has

directed or contributed to much research on gambling. He was the principal researcher for many segments of the evaluation of the services offered to pathological gamblers and their relatives in Quebec. As well, he has published papers on public policies on gambling in the province.

Dr. Mark Griffiths (BSc, PhD, PGDipHE, CPsychol) is professor of gambling studies at Nottingham Trent University. He is internationally known for his work in gambling and gaming addictions and was the first recipient of the John Rosecrance Research Prize for "Outstanding scholarly contributions to the field of gambling research" (1994), winner of the CELEJ Prize (1998) for best paper on gambling, and winner of the International Excellence Award (2003) for "outstanding contributions to the prevention of problem gambling and the practice of responsible gambling." He has published over 120 refereed research papers, two books, numerous book chapters, and over 350 other articles.

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JOURNAL OF GAMBLING ISSUES

review

video review

[This article prints out to about 5 pages]

Dreamland (2000): Personal gambling stories add depth to academic approach

Reviewed by William Thompson, University of Nevada at Las Vegas , Las Vegas , Nevada , U.S.A.
E-mail: wthompsn@ccmail.nevada.edu

The film *Dreamland* offers perhaps the most personal assessment to date of the elements of problem gambling. It is on target all the way. It should be recommended to students of the subject but also to therapists and to the victims of problem gambling who are struggling to find the answers to guide them toward recovery.

The film goes to the Mecca of gambling, Las Vegas. There it takes an up-close look at three residents who have developed serious gambling problems. The commentary could come right from problem gambling textbooks, but its strength is that it comes from the lips of real people.

Dreamland was filmed over a two-year period in the late 1990s. It examined, through vignettes, the three gamblers and eight of their acquaintances. It is difficult to discern if the filming was staged or if the time lapses were genuine in all cases. The effect this viewer received was that the subjects were followed over the time of the filming. The vignettes of the three are mixed with each other and with those of other people. There is no formula presented for guiding the viewer. The scenes and stories allow a poignant interpretation of gambling experiences. The film yields great insights into motivations for gambling, coping mechanisms for inevitable losses, and the quest for finding "solutions" for gambling problems. All three make the ultimate choice to stop gambling, and two are guided to recovery through Gamblers Anonymous groups.

The subjects' narratives provide substance for anyone wishing to learn about human behavior. The three lead characters are Lou, Dorothy, and Carol. All moved to Las Vegas from some distance

away. The two women are employed single mothers. Lou is a retired tailor from Los Angeles who must keep working because of his gambling losses. All face loneliness in their private lives as well as other stressors. Gambling becomes an effective source of relief from their loneliness and stress.

Dorothy recalled that she had friends in her hometown, but that Las Vegas was different and she felt “left out.” When she gambled she forgot about her loneliness and her bills and debts, which were mostly caused by gambling. In the casino she found that the machines were the "happiness" of her life. She felt good when she won and she felt good when she lost. She called her machine her "iron pimp" and commented that "the machine talks to me." Dorothy recalled with pride how she had only $20 one Christmas Eve. Fearing her children would not have an enjoyable Christmas, she ventured to the casino and won $520. The day was saved.

Lou felt comfortable at the Horseshoe Casino in downtown Las Vegas . They gave him coffee, meals, and cigarettes. "What more does one need?" he asked. The 75-year-old recalled that he felt he was 29 when he was gambling. He was young again. At the tables, blackjack was "his game" and he was critical of "ignorant" tourists who would laugh and carry on as if play was not serious business. For Lou it was very serious. He considered himself a "card counter" and gambling was work, between him and the dealer. He completely cut himself off from all other players and his surroundings. However, he remained aware that he could switch tables and get extra packs of free cigarettes, and that eight hours of play allowed him to have a "free" meal.

Lou was rather cerebral in his analysis of gambling. He looked for patterns, but his comments belied intelligent observations. He told about how he won a lot of money and then lost it the next day. His conclusion: "I have to lose before I can win." He kept track of his loses and when he felt that a table was going against him, he knew it was time to quit. He would go have a cup of coffee, and then he would return to another table. In fact the casino knew that he was a "table jumper," a "rabbit." With 55 tables, there had to be a lucky table somewhere. He recalled his fondest memory with laughter. Once he started with $200 and gambled it down to $10. He announced to the table that he was going to win his money back and leave with $100 in his pocket. And he did just that.

Carol never played table games, because she did not want people to think that she did not know what she was doing. After trying several types of machines, she discovered video poker machines, which gave her instructions each step of the way. As a working single mother, she had great stress in her life. However, she found that all her feelings were suspended at the poker machines. Life was fun when she was playing. Then she discovered that she

could not stop playing. She began to neglect her children and she gambled away her rent money even while facing an eviction order.

The members of the supporting cast included Arnold and Ella. Arnold gambled because it reminded him of times his father took him to the arcades when he was a child. Now he didn't have to gamble only pennies. He could gamble large sums of money and he never had to go home. The couple did caution viewers to be skeptical about all stories of players claiming that they won. "They never say how much they lost, before they had their big win."

Milton is a cab driver who once had a problem. Now he just gamblers "recreationally"-- only on sports parlay cards. He stays away from craps because he can lose control too fast. His son David has been a dealer at several casinos. Once he was reprimanded for suggesting that a player who had lost too much quit. He never did that again. While David watched others experiencing gambling passions, he himself once got into an argument with his girlfriend and took his frustration to the blackjack tables. He lost $7000 at one sitting. He quit gambling.

Lem Banker is a noted authority on sports gambling. He made a successful career analyzing the odds and playing games in a highly calculated way. He also is paid for his advice, offering his picks to the public. He finds winning to be difficult and slow. He is a self-proclaimed tortoise in his race to success. He admires his parents and a grandfather who came to America from Russia and gambled on the American Dream by working hard and developing a business that supported ten children.

Joan is a casino dealer and reformed alcoholic. She is not a gambler, but she advises fellow dealers when they need to stop and get help. Joe is Lou's boss at a tailor shop. He cautions that a person in Las Vegas with a family and a business does best not to gamble at all. Robert Hunter, one of the world's most renowned gambling therapists, advises that there is a big difference between recreational or social gamblers and problem gamblers. Social gamblers do not borrow money to gamble, and they do not allow gambling to interfere with financial or time obligations to families and friends. He laments that the old Vegas is gone. In the old Vegas, local residents were warned not to gamble. The city now has a set of casinos that market specifically to local residents and even the 7-11s and supermarkets have slot machines. While Joan and Carol try to advance the notion that Las Vegas is in most ways "just like any other city," that viewpoint is roundly challenged by David and by Robert Hunter.

The three main players reached a bottom stage in their gambling behavior. Their roller coaster rides recall accounts from Henry Lesieur's classic *The Chase: Career of the compulsive gambler* .

One player gave serious consideration to suicide; all came to a financial dead end. Lou resisted Gamblers Anonymous because he was reluctant to talk to strangers. Dorothy made a shy entrance to a group meeting and after several meetings opened up and admitted her need for the help of a higher power. Carol had actually quit gambling in 1990 using the power of GA. She is now actively helping other problem gamblers and advises casinos how they can help.

There is a large body of serious literature on problem gambling. Unfortunately, while it should be widely disseminated, much of it is written in an academic style that causes it to be overlooked. *Dreamland* puts flesh and bone, muscle and blood on the academic treatments given to this important topic. This film is a vitally needed vehicle that can bring a needed dose of reality about problem gambling to wide audiences. I recommend it for all.

Dreamland, (2000), U.S.A. , Director: Lisanne Skyler, Producer: Greg Little, Runtime: 57-minute (this review) and 71-minute versions are available, Distributor: First Run /Icarus Films, Inc. 32 Court Street, 21st Floor, Brooklyn , NY , U.S.A. 11201, telephone: (718) 488 8900 / (800) 876 1710, fax: (718) 488 8642, e-mail: mailroom@frif.com , Web: http://www.frif.com .

For correspondence: William Thompson, PhD, Department of Public Administration, University of Nevada at Las Vegas, Las Vegas, NV, U.S.A. 89154-6026, e-mail: wthompsn@ccmail.nevada.edu , phone: (702) 895-3315, fax: (702) 458-1838,

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William N. Thompson, (PhD, political science, University of Missouri) is professor of public administration at the University of Nevada-Las Vegas . He wrote *Legalized gambling: A reference handbook* (1994,1997) and *Native American issues* (1996). He co-authored: *Over the top: Solutions to the Sisyphus dilemmas of life* (2003), *Gambling in America: An encyclopedia* (2001), *Crime and casinos in Wisconsin* (1996), *The social cost of gambling in Wisconsin* (1996), *The economic impact of Native American casinos in Wisconsin* (1995), *Casino customer service = The WIN WIN game* (1992, 1996), *International casino law* (l99l, 1999). He and John Dombrink were consultants to the President's Commission on Organized Crime. They wrote *The last resort: Success and failure in campaigns for casinos* (l990). Dr. Thompson is widely published in scholarly gambling journals, has testified as an authority on gambling, is widely quoted in the news

media, and has served internationally as a gambling consultant.

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JOURNAL OF GAMBLING ISSUES

review

movie review

[This article prints out to about 4 pages]

Owning Mahowny (2003): A gambler without emotion

Reviewed by Jeffrey I. Kassinove, Monmouth University, West Long Branch, New Jersey, U.S.A.
E-mail: jkassino@monmouth.edu

When I was asked to write a review of *Owning Mahowny* directed by Richard Kwietniowski, I did not realize how much luck would play a role my ability to view the film. Following a quick Internet movie search, I learned that not one theatre along the eastern seaboard was showing it—not even New York City where I reside. Yet luck was on my side. In August 2003, I was at a convention in Toronto and a colleague informed me that it was playing at a local theatre. Without haste, I dragged a colleague with me and we caught the matinee.

In many ways *Owning Mahowny* reflects the persistence of a pathological gambler who, like someone addicted to drugs, is motivated by the internal anxiety and irrational cognitions related to missing a thrilling opportunity. In the present review, I will provide a brief synopsis of the film, insight into the psychological aspects of the film, and my perceptions.

Synopsis. Owning Mahowny was inspired by Gary Stephen Ross's 1987 best seller *Stung: The Incredible Obsession of Brian Molony.* It provides an account of a Toronto assistant bank manager, who in the early 1980s embezzled CDN $10.2 million from the bank where he worked to fund his gambling habit. When the film begins, Dan Mahowny, played by Philip Seymour Hoffman, is already heavily involved with a loan shark and betting wildly on various sporting events. In one scene, Dan bets on all of the home baseball teams just so he can have some action. As the film progresses, Dan pilfers increasing amounts of money from the bank to wager large sums of money in Atlantic City and Las Vegas. He becomes a “whale” to casino management and is treated as such, being offered grand suites, prostitutes, and gourmet meals. However, Mahowny has no interest in the

amenities afforded to him by his high-rolling behavior. His only desire is to gamble above all other activities such as sleep, spending time with his girlfriend, or sex. In this way, he flawlessly represents an individual who is hooked on an intermittent schedule of reinforcement.

Psychological aspects. Interestingly, when he gambles, he shows little variability in his affect when compared to his work and personal life. He expresses his life with flat emotions, rarely presenting a facial expression of happiness, elation or despair. He always looks bored, an expression commonly witnessed among social gamblers in casinos. He is also persistent, focused solely on the next generating event, and shows little overt change when he wins or loses. Like other pathological gamblers, his disinterest in the money is exemplified when he goes on a “hot” streak and wins millions from the casino. The casino's foot soldier, who follows Dan to fulfill his every whim, advises him to stop while he is ahead. Dan's response is, “I just got here,” which is certainly perplexing to any rational person. Dan completes the characteristics of a pathological gambler by denying his gambling addiction when confronted by his girlfriend, played by Minnie Driver.

Personality disorders abound. In addition to showing flattened affect, Dan Mahowny is portrayed as being emotionally cold and secretive, appearing indifferent to praise or criticism and, often, choosing solitary activities. For example, when he gambles he doesn't like to communicate with people. This cluster is more akin to someone who has a schizoid personality (American Psychiatric Association, 1994), and is not often associated with pathological gamblers. Yet, he also exhibits behaviors in line with antisocial personality disorder, such as deceitfulness, failure to maintain consistent work habits, impulsivity, and lack of remorse, which are often comorbid with pathological gambling.

Perceptions. In many ways the film accurately depicts a pathological gambler. His lack of emotion is common for both social and pathological gamblers. However, many pathological gamblers tend to gamble because when they win, they feel increased self-esteem. This character does not overtly reflect this. Instead, I believe that the film overstates the flat affect. When gamblers win large sums of money, they tend to spend it and feel a sense of power, unlike Mahowny.

The end of film depicts the difficulty clinicians have when working with pathological gamblers. After Mahowny is apprehended, he is mandated to receive psychological treatment. During one scene, he is asked to rate, from 1 to 100, the thrill that gambling provides him. He responds “100.” In contrast, he is asked to rate the most exciting event he has ever experienced outside of gambling. He

responds “20.” The question remains whether or not he can learn to live without experiencing thrills higher than 20.

Summary. It is unlikely that the film was intended to reflect a pure pathological gambler, for in treatment we often see secondary and tertiary problems. Regardless of the film's lack of complete authenticity in representing a pathological gambler, it was personally moving. Every time Mahowny bet or stole money I felt a huge pit in my stomach. I wanted to jump into the screen and make him stop, suggesting the power of this film.

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Submitted: October 3, 2003. This movie review was not peer reviewed.

For correspondence: Jeffrey I. Kassinove, PhD, Department Of Psychology, Monmouth University, West Long Branch, New Jersey, U.S.A., 07726, telephone: (732)-571-4446, e-mail: jkassino@monmouth.edu.

Competing interests: None declared.

Jeffrey Kassinove, PhD, has studied gambling and other addictive habits (e.g., alcohol use and day trading) in the United States and abroad since 1996. At Monmouth University 's Gambling and Addictions Research Laboratory, he has focused on understanding the factors that lead to gambling persistence. Specifically, he has studied both the cognitive and behavioral elements that increase slot machine play. He has developed cognitive scales for understanding attitudes toward gambling as well as tools to assess such mediating factors as illusions of control. He has lectured in Russia, India, and Poland on the problems associated with gambling and is a consultant with St. Petersburg University in Russia. Dr. Kassinove also has a small practice where he treats people who have problems with gambling or drug and alcohol use.

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JOURNAL OF GAMBLING ISSUES

review

movie review

[This article prints out to about 4 pages]

Owning Mahowny (2003): Fiction no match for the reality of gambling

Reviewed by Chris Irwin, IT World Canada, Toronto, Ontario, Canada,
E-mail: cirwin@itworldcanada.com

The Responsible Gambling Council (Ontario) screened *Owning Mahowny* in late September as part of its Discovery 2003 conference. Perhaps due in part to its limited release, many attendees had not yet seen the film. As an added bonus for the event, the council arranged an introductory talk by Gary Stephen Ross, author of *Stung: The incredible obsession of Brian Molony* (1987), the non-fiction account upon which the movie is based.

As the writer, researcher, and consultant on the movie, Ross had some fascinating insights to share:

"People always ask me if I like the movie," he began, "Well, it's not the kind of movie that you really 'like.' " *Owning Mahowny* is far from a "feel-good flick," and Ross went on to recount some of his experiences from the set. The movie's lead, Philip Seymour Hoffman, shut himself in a room with the real Brian Molony, and "completely absorbed" the characteristics and mannerisms of his subject. Ross described some of the physical resemblances between actor and subject, but emphasized the extent to which Hoffman replicated Molony's idiosyncrasies. (Hoffman may become a master of mannerism of the same league as DeNiro's physical chameleonism.) Ross also shared how Minnie Driver's girlfriend-of-the-gambler role related to her real-life experiences with an ex-boyfriend.

My interest in this movie spans business and pleasure: I then worked at the Responsible Gambling Council, and I have always enjoyed film. (Reviewer's caveat: to the detriment of my objectivity, I remain convinced that Philip Seymour Hoffman can do no wrong.)

The story intrigued me, as do many of the issues around gambling. The mild-mannered reclusive bank manager Dan Mahowny, played by Hoffman, racks up unauthorized borrowings (*embezzled funds* seems so strong for such a nice guy!) of more than $10 million. The police interrogation brings out the ripping irony that Mahowny's "luck" in stealing money enabled him to attain such an astronomical sum!

Hoffman is best known for supporting roles, and this is his first time playing the lead in a film. He excels in subtlety, and *Owning Mahowny* was a perfect forum for Hoffman to stage his specialty in a central capacity. The entire film is an examination of the psyche of a man who is normal and boring in almost every way, except that he is a compulsive gambler. To borrow from the observations of elated casino manager Victor Foss, played by John Hurt, Dan Mahowny is a "purist."

Two pivotal scenes in the movie demonstrate the subtlety with which Hoffman masterfully conveys sheer human emotion:

Scene 1 (The beginning of the end)

Mahowny sits at his desk having just had a visit from his bookie. His very unwanted visitor demanded settlement and now waits on the parking level for $10,400; Mahowny says he needs a few minutes.

In a scene that unfolds over an eternity of tight shots that alternate from blank loan application to furrowed brow, Mahowny "creates" a client who will "borrow" the necessary funds. His face, his breathing, his fiddling with his pen all paint the picture of a man who sees his solution, and ever so slowly prepares himself to follow it through.

Scene 2 (A close call)

Mahowny stands in an elevator with his boss and his boss's superior on the way to visit the wealthy father of Mahowny's biggest client. The bank has uncertainties around an overextended credit limit; Mahowny has skimmed over $3 million from the account.

The ride in the elevator likens to a walk toward the gallows: the truth will come out; the deceit will be exposed… the pressure is unbearable. Nonchalantly, the senior boss reveals his strategy for the meeting: the bank will leverage the overextension to pressure the father into personally securing his daughter's debt. His direction to "not mention any numbers" in the meeting is the most obvious break to go Mahowny's way. Hoffman, again with utter

subtlety, exudes the bitter sweetness of knowing that this journey is not over… not just yet.

In conclusion, I confess to liking this movie. These are two scenes that stand out, but Hoffman's performance is superb from beginning to end. More than entertaining, this film is gripping. *Owning Mahowny* is another example of the notion that fiction is no match for the wackiness of reality, which points to the work of a fellow Seymour Hoffman fan, Paul Thomas Anderson, whose movie *Magnolia* declares:

> "There are stories of coincidence and chance, of intersections and strange things told, and which is which and nobody knows; and we generally say,'Well, if that was in a movie, I wouldn't believe it.'"

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For correspondence: Chris Irwin, Strategic Account Manager, IT World Canada Inc., 55 Town Centre Court, Suite 302, Toronto, ON M1P 4X4 Canada, (416) 290-0240 x580,

E-mail: cirwin@itworldcanada.com

Competing interests: None declared.

Successfully balancing family (and film viewing) priorities, Chris Irwin's career-to-date has covered "large C" Communications (sales/marketing, internal communications, writing/translating and public relations) in corporate and not-for-profit environments. In addition to Gary Ross' introduction, a highlight of the Responsible Gambling Council conference movie screening was seeing *Owning Mahowny* on an actual "screen," a rarity for this father of three!

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JOURNAL OF GAMBLING ISSUES

review

movie review

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The Cooler (2003): Film perpetuates faulty thinking about gambling

Reviewed by Thomas Appleyard, Toronto, Ontario, Canada
E-mail: appleyardtom@hotmail.com

What happens when a film makes the reification of a gambling cognitive distortion its central premise?

Wayne Kramer's *The Cooler* explores connections among luck, love, and gambling in this tale about the staff of an old-fashioned Las Vegas casino. William H. Macy plays Bernie Lootz, a former gambler who embodies bad luck. The background to the narrative is his gambling losses and debts to the casino manager of over $100,000. He was only able to stop gambling when the manager of the casino broke his legs. Whenever he's tempted, Lootz reaches down and feels his mangled cartilage.

The premise of the movie is that Lootz still has such rotten luck that he can actually cool off other player's winning streaks simply by being present. "I do it by being myself," he claims. The casino manager to whom he is indebted hires him to do exactly that. Lootz is directed to stand near players who are winning, as a method of "protecting the casino's investments." Lootz is the adult equivalent of the win/lose switches that the casino operators in *The Flintstones in Viva Rock Vegas* use to manipulate the games. Nigel Turner (2001) reflected on the win/lose switch in that film:

[The film] suggests that casinos cheat players. The movie shows Fred lose it all, not because of random chance and a house edge, but because of cheating. Will kids come away believing it is possible to win if you can figure out the casino's scheme and quit before the 'Lose' switch is pulled? [1]

The mythology of *The Cooler* suggests that the trick to winning in casinos is figuring out who the cooler is, and the casino's job is to hide this.

Wayne Kramer, the film's director, has said in an interview that the inspiration for this movie was the feelings associated with losing:

My co-writer on the project, Frank Hannah, goes to Vegas all the time and loses a lot of money and he doesn't want to blame it on himself. He always feels there has to be a negative element that enters the room. [2]

Kramer's comments on Hannah's inability to blame losing on house odds and randomness are telling in the light of a film that spreads misinformation about wining and losing in casinos. Hannah redirects blame on other people, instead of on the games. His comments suggest his ambivalence about how realistic this concept is:

There probably are ringers that have an ability to kill a table, but perhaps not as pronounced as Bernie Lootz. [3]

The messages about gambling in the film become more crystallized when Lootz's luck changes: Relapses can pay off. You can successfully chase your losses. If Lady Luck is on your side, nothing can get in the way.

The film exposes and satirizes casino construction, with Macy stating that he wants to move to a city with clocks and the manager's suggestion that coolers should be replaced with subliminal messages of "lose, lose, lose, lose."

This clearly is a fiction film, not a documentary, and has no obligation to present accurate gambling information. However the film's attempts to walk a tightrope on the fantasy/ reality continuum are not always successful. The fantastic depiction of a cognitive distortion that would have fit in a film such as *Angels in the Outfield* here plays along with the gritty realism of harsh violence, substance abuse, frank nudity, and unsatisfying sex. The casino manager exposes cheaters by using X-ray vision, but uses a metal pipe as a weapon in retaliation — and the characters in this movie bleed.

The Cooler is destined to be the topic of much discussion after successful screenings at the Sundance Film Festival and the Toronto International Film Festival. It provides another opportunity for problem gambling clinicians and educators to raise the issues of faulty thinking and gambling with the public.

The Cooler (2003), U.S.A., Director: Wayne Kramer, Cast: William H. Macy, Alec Baldwin, Maria Bello, Ron Livingston, Paul Sorvino, Joey Fatone, Shawn Hatosy, Estella Warren, Producer: Sean Furst, Michael A. Pierce, Screenplay: Wayne Kramer, Frank Hannah, Runtime: 103 minutes, Distributor: Lion's Gate Entertainment.

Endnotes

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Submitted: September 10, 2003. This article was not peer reviewed.

Competing interests: None declared.

Thomas Appleyard received his Bachelor of Science with a minor equivalency in Cinema Studies and Masters in Social Work at the University of Toronto. He was senior project coordinator for the Problem Gambling Project at the Centre for Addiction and Mental Health in Toronto from 2003–2004.

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letters

Letters to the Editor

We invite our readers to submit Letters to the Editor on gambling topics. Please note that we can publish only a fraction of the letters submitted. All letters must be signed. We cannot publish anonymous letters, or those of a libellous nature. Letters to the Editor are reviewed and chosen by the editor and members of the editorial board. Letters may be sent to either the e-mail or the regular mail address given below. Once a letter has been accepted, we will request an electronic version. Each published letter will include the writer's first and last names, professional title (s) if relevant, city, province or state, and country. We reserve the right to edit each submission for uniform format and punctuation.

Phil Lange, Editor,
Journal of Gambling Issues
Centre for Addiction and Mental Health
33 Russell Street
Toronto, Ontario M5S 2S1 Canada
E-mail: Phil_Lange@camh.net
Phone: (416)-535-8501 ext.6077
Fax: (416) 595-6399

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submissions

Invitation to contributors

We welcome contributions on gambling and gambling-related issues. Prospective authors should always read the last issue of the *JGI* for the latest version of Invitation to Contributors. We encourage electronic submission and accept mail submissions, but cannot accept fax submissions. For details, please see the submission process below. All authors whose manuscripts are accepted will receive a standard legal form to complete, sign and return by mail.

The review process

All submitted manuscripts (except Reviews) are reviewed anonymously by at least two people. Each reviewer will have expertise in the study of gambling and will assess and evaluate according to the criteria listed below. The editor will mediate their assessments and make the final decisions.

Submissions are either

1. accepted as is, or with minor revisions;
2. returned with an invitation to rewrite and resubmit for review, or
3. rejected.

Decisions of the editor are final and cannot be appealed.

Authors will receive an e-mail copy of their manuscript before publication, and must answer all queries and carefully check all editorial changes. Please note that there will be a deadline for a response to queries and no corrections can be made after that date. Authors are responsible for the specific content of their manuscripts.

Feature articles

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Research

We invite researchers to submit manuscripts that report new findings on gambling. All submissions will be peer-reviewed in confidence by at least two reviewers for their scientific merit, and mediated by the editor.

Policy

We invite manuscripts that examine policy issues involving gambling. All submissions will be peer-reviewed in confidence by at least two reviewers and mediated by the editor. The editor will evaluate how successful the author is in exploring how gambling affects public life and policy, historically and currently.

Clinic

All submissions will be peer-reviewed in confidence by at least two clinicians and mediated by the editor for their soundness and value to practicing clinicians.

First person accounts

These narratives will show how gambling affects the author and others (perhaps as family, friends, gambling staff, or clinicians). Submissions will be reviewed in confidence by at least two reviewers and mediated by the editor. The editor will evaluate how successful the author is in making gambling issues come alive to the readers. First person accounts do not need abstracts or references.

Reviews

Reviewed by the editor, these brief summaries and discussions will evaluate gambling-related books, videos, Web sites and other media. Reviews should have references if cited, but do not need abstracts.

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Journal of Gambling Issues
Centre for Addiction and Mental Health
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Lesieur, H.R. (1984). The Chase: The Career of the Compulsive Gambler. (2nd ed.). Rochester, VT: Schenkman Books, Inc.

Book chapters

Shaffer, H.J. (1989). Conceptual crises in the addictions: The role of models in the field of compulsive gambling. In H.J. Shaffer, S.A. Sein, B. Gambino & T.N. Cummings (Eds.), Compulsive Gambling: Theory, Research, and Practice (pp.3-33). Lexington, MA: Lexington.

Journal articles

Gupta, R., & Derevensky, J. (1997). Adolescent gambling behavior: A prevalence study and examination of the correlates associated with problem gambling. Journal of Gambling Studies, 14 (4), 319-345.

Miscellaneous articles, including government publications

Ontario Ministry of Health. Schedule of Benefits, Ontario Health Insurance Plan. Kingston, Ontario: Ontario Ministry of Health; April 1987.

Papers presented at a conference, meeting or symposium presentation

Ganzer, H. (1999, June). A seven session group for couples. Paper presented at the 1999 13th National Conference on Problem Gambling, Detroit, MI.

Signed newspaper article

Brehl, R. (1995, June 22). Internet casino seen as big risk. The Toronto Star, pp. D1, D3.

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NEW http://www.gamblingresearch.org

Ontario Problem Gambling Research Centre: this centre disseminates research results, calls for research proposals on specific topics, sponsors research awards, awards fellowships, and conference grants. Check the bibliography, inventory, research reports, and webcasts.

NEW http://www.addiction.ucalgary.ca/

Addictive Behaviours Laboratory, Department of Psychology, University of Calgary: offers original information on self-help treatment for gambling problems, an overview of the instruments used to assess gambling problems, and links to their clinical, and research sites.

http://www.gamb-ling.com

A multilingual gambling information Web site in 11 languages (Arabic, Chinese, English, Farsi, Hindi, Italian, Portuguese, Russian, Somali, Spanish and Urdu). Information in audio formats and through these click-on topics: "What's problem gambling?," "Do I have a problem?," "Get help," "Ethno-cultural resources," "Library" and a help-line number.

http://www.ncpgambling.org

National Council on Problem Gambling : to increase public awareness of pathological gambling, ensure the availability of treatment for problem gamblers and their families, and to encourage research and programs for prevention and education.

http://www.gov.ab.ca/aadac/addictions/subject_gambling.htm

Alberta Alcohol and Drug Abuse Commission: information, brochures and survey results

http://www.responsiblegambling.org

Responsible Gambling Council (Ontario): information, publications and calendar of international gambling-related

events

http://www.ncrg.org

National Centre for Responsible Gaming: funding for scientific research on problem and underage gambling

http://www.problemgambling.ca

Problem Gambling: A Canadian Perspective Website (Gerry Cooper): annotated international links.

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