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Table of Contents

clinical corner

reviews

The new reviews editor of the *Journal of Gambling Issues*: Marianna Toce Gerstein

It is our pleasure to welcome Marianna Toce Gerstein as our reviews editor. She will help facilitate swifter publication of reviews and more reviews per issue. With her assistance, we will continue to offer reviews of books, educational materials, movies, plays, Web sites, DVDs, videos, and other media that we hope are of interest to the gambling studies community.

Marianna has a solid background in gambling research. In her current role as a doctoral student, she is studying how recovering problem gamblers in an online support group use language to model their identities and attempt to reshape those of newcomers to facilitate indoctrination into the group and, ultimately, abstinence from gambling. Prior to this work, she was a survey researcher for more than 8 years at the National Opinion Research Center at the University of Chicago, where her main areas of study were problem gambling and substance abuse. Among other projects, she designed the questionnaire for the recent California problem gambling prevalence survey, worked on an NIAAA grant on gambling among women, and was involved in all phases of the 1999 national survey sponsored by the National Gambling Impact Study Commission.

We look forward to working with Marianna.

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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.

Disclaimer: The opinions expressed in this journal do not necessarily reflect those of the Centre for Addiction and Mental Health.

Ethics and accountability

The *Journal of Gambling Issues* is a member of the International Society of Addiction Journal Editors and supports the Farmington Consensus statement on ethical standards in publishing:http://www-users.york.ac.uk/~sjp22/isaje/farmington.htm

Reviewers

A study of differences in Canadian university students' gambling and proximity to a casino

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Abstract

Gambling behavior and problem gambling of college students were investigated in universities far from and close to a large casino. A survey of 17 gambling activities was given and the South Oaks Gambling Screen was completed by 1579 students. Approximately half of the students were enrolled in universities near a casino and the other half far from a major casino. Gender and proximity differences were hypothesized and observed. Males engaged in more gambling activities than females. Students close to a casino manifested more serious problem gambling than students far from a casino. Gender by proximity interactions are reported. This investigation supports the idea that context and proximity to gaming venues may have exposure or accessibility effects on university students' gambling behavior. **Key words**: university student gambling, problem gambling, gender and gambling, proximity of casino to university and gambling behavior

Introduction

Various policy statements and essays have called for the advancement in problem gambling research from general population prevalence studies to investigations of risk and protective factors that influence gambling behavior (e.g., Shaffer, LaBrie, LaPlante, Nelson, & Stanton, 2004). Korn and Shaffer (1999) have urged researchers to examine vulnerable populations such as youth and various contexts that involve accessibility or overexposure and corresponding community problem gambling. The Canadian Public Health Association and others (e.g., Korn, 2001) have indicated specific concern for gambling-related problems for adolescents and emerging adults (also referred to as youth). This study examines university students, as a vulnerable group, and differences in gambling behaviors and gambling problems in settings where high-profile casinos are either near to or far from university campuses.

Accumulating evidence reveals that college students are experiencing gambling problems. For example, Ladouceur, Dubé, and Bujold (1994) report that 2.8% of one university student sample were pathological gamblers. In another investigation involving college students in five states in the US, between 4% and 8% were classified as problem gamblers. Jacobs (2000) reports historical trends toward greater frequency of gambling and gambling problems over the 1990s as more legalization and expansion of gambling has occurred. A variety of studies demonstrate that college-age students, as emerging adults, are an at-risk population for gambling problems (e.g., see Shaffer et al., 2004; Welte, Barnes, Wieczorek, Tidwell, & Parker, 2002) and other unhealthy behaviors that can accompany problem gambling (e.g., see Giacopassi, Vandiver & Stitt, 1997; LaBrie, Shaffer, LaPlante, & Wechsler, 2003; Oster & Knapp, 2001; Proimos, Durant, Pierce, & Goodman, 1998; Volberg, 1998, 2002; Winters, Stinchfield, Botzet, & Anderson, 2002).

Volberg (2004) and others (Gerstein et al., 1999; Shaffer et al., 2004) indicate that accessibility or availability (Gilliland, 2003; Marshall, 2005) of gambling activities is linked to higher rates of problem and pathological gambling. Addictions researchers are beginning to investigate the ecological and geographic factors contributing to gambling behavior and pathology (Welte, Wieczorek, Barnes, Tidwell, & Hoffman, 2004) and find that a casino within approximately 10 miles of a typical household is positively related to problem or pathological gambling. Although there is mixed evidence for an exposure effect (Shaffer et al., 2004), it remains uncertain if university student gambling is at all linked to the accessibility of a casino. Further, while gender differences are often reported in general-population prevalence studies, with males manifesting more frequent gambling activities and problems, little is known about gender differences among Canadian university students in Ontario.

This investigation is based on two principal hypotheses. First, male university students are hypothesized to manifest a wider range of gambling behaviors and gambling problems than female university students. Second, both male and female university students attending a school with a high-profile and close casino, versus students on campuses farther from a casino, are hypothesized to engage in a wider range of gambling behaviors and manifest a greater prevalence of problem and pathological gambling. These hypotheses include gambling in a casino and other forms of gambling in the community (e.g., lottery tickets, horse racing, Internet gambling). It is speculated that the power of influence due to proximity to a casino may heighten all forms of gambling due to exposure and accessibility.

Methods

Participants

Four medium-size Ontario university campuses were selected for this research based on proximity to a major casino that is visible in the immediate or local community. Participants were solicited from the University of Guelph, Wilfrid Laurier University, the University of Windsor, and Brock University. The sample included 1579 enrolled university students. Data were gathered in the Fall semester of 2001 and Winter semester of 2002.

Ethics review

Each university investigator submitted an ethics protocol to his or her university review board. Approval was obtained with the understanding that the student had the right to participate and to withdraw or refrain from completing any aspect of the survey. The student's name was never connected to the survey and all information was kept confidential. Although participating universities are acknowledged in this study, only aggregate data are reported.

Procedure

The data were collected using a variety of techniques, including a mailed survey, administration of the survey in classroom settings, collection of data from psychology research pools, and approaching students in public settings at the university. To be specific, the University of Guelph obtained a random mailing list of 1200 students. Males were oversampled given the ratio of male to female students on campus. There were equal numbers of students for each year of university. Further, the questionnaire was administered in a number of classes that included students from a variety of degree programs at the university. At Wilfrid Laurier University and the University of Windsor, the Office of the Registrar compiled a random list of 200 students from each of second, third, and fourth year.

The first-year students registered in Introductory Psychology were also asked to complete the questionnaire to meet the requirements for research participation. At Brock University the questionnaire was administered in large introductory courses and a table was set up in a common area of the university where students were solicited for participation. The most representative samples come from the three universities that used a random list and the least representative from the university that included participants from only classroom and solicitation settings. None of the investigators, however, claim that the sample for each university is representative of the complete campus. However, the sample from each university included participants from a wide variety of degree programs.

Measures

Data were gathered on gender, forms of recent gambling, and level of problem gambling. Sociodemographic data were determined and included specification of gender. The nine items of the South Oaks Gambling Screen (SOGS) were used to assess four levels of gambling: no problem (0), mild problem (1–2), problem (3–4), and pathological gambling (5 or higher). Although recent analyses of different instruments to assess problem gambling indicate measurement and methodological concerns (e.g., Derevensky & Gupta, 2000; Ladouceur et al., 2000), we selected and used the SOGS given its wide use in studies of adolescents and college-age populations (e.g., Proimos, Durant, Pierce, & Goodman, 1998; Volberg, 1998; Giacopassi, Stitt, & Vandiver, 1997). Students were also asked to report if they had engaged in a series of gambling activities in the last month. A list of gaming activities was selected from previous research by Vitaro, Ladouceur, and Bujold (1996). The 17 forms of gambling that can be legitimately engaged in through the province are instant game tickets, LOTTO 6/49 or similar lottery tickets, break-open tickets, Pro-Line, video lottery machines, bingo, casino slots, casino table games, casino blackjack, card games, dice games, raffles or fundraising, skill games, sport pools, horse races, speculative investing, and Internet or online gambling. Students were asked to indicate either yes or no to engaging in each of the 17 forms of gambling over the last month.

Results

Gender differences were hypothesized for gambling activities. Table 1 summarizes the percentage of involvement for males versus females. A chi-square was computed to determine if differences were significant for each of the 17 types of gambling for gender. Comparisons were made using chi-squares with Bonferroni corrections for the number of computed comparisons. There were no significant differences between males and females for only four types of gambling—break-open tickets, video lottery machines, horse races, and Internet gambling. Male university students, when compared to their female peers, engaged in more LOTTO 6/49 or similar lottery tickets, Pro-Line, casino table games, casino blackjack, card games, dice games, skill games, sport pools, and speculative investing. Females participated more often in such activities as instant game tickets, bingo, casino slots, and raffles. Overall, male students engaged more often in nine types of gambling with females engaging more often in only four types of gambling.

Table 1.
Percent engaging in each of 17 types of gambling by gender

		Males	Females	All
1	Instant game tickets	38.8	52.6	49.4*
2	LOTTO 6/49 or similar lottery tickets	27.8	19.1	21.1*
3	Break-open tickets	7.5	9.4	9.0
4	Pro-Line	27.8	2.2	8.2*
5	Video lottery machines	4.3	2.6	3.0
6	Bingo	7.0	14.7	12.9*
7	Casino slots	30.7	41.1	38.7*
8	Casino table games (except blackjack)	20.8	6.4	9.7*
9	Casino blackjack	16.4	5.0	7.6*
10	Card games for money	23.5	7.3	11.1*
11	Dice games for money	6.7	2.4	3.4*
12	Raffles or fundraising tickets	34.2	46.5	43.6*
13	Skill games for money	24.0	3.7	8.5*
14	Sports pools	29.1	4.1	10.0*
15	Horse races	8.9	7.1	7.5
16	Speculative investing	16.4	6.4	8.8*
17	Internet or on-line gambling	1.6	0.4	0.7

Note: Chi-square significant at *$p < .0006$ (.01 adjusted for the number of tests).

Proximity of a university student population to a major casino was hypothesized to be associated with engagement in more types of gambling and greater problem gambling. Wilfrid Laurier University and the University of Guelph were categorized as being far from a major casino and the University of Windsor and Brock University were categorized as being near a casino. Percentages engaging in each of the 17 types of gambling for students near to versus far from a casino were tested using chi-square analyses, again using Bonferroni corrections. Results reported in Table 2 reveal only two statistically significant differences: casino slots and table games were more frequent among students attending a university near a casino.

Table 2.
Percent engaging in each of 17 types of gambling by proximity to a casino

		Near	Distant	All
1	Instant game tickets	48.7	49.8	49.4
2	LOTTO 6/49 or similar lottery tickets	24.1	19.4	21.1
3	Break-open tickets	8.7	9.1	9.0
4	Pro-Line	10.6	6.9	8.2
5	Video lottery machines	4.2	2.3	3.0
6	Bingo	15.9	11.1	12.9
7	Casino slots	55.3	29.1	38.7**
8	Casino table games (except blackjack)	14.2	7.2	9.7**
9	Casino blackjack	8.8	7.0	7.6
10	Card games for money	10.7	11.3	11.1
11	Dice games for money	2.9	3.7	3.4
12	Raffles or fundraising tickets	40.2	45.5	43.6
13	Skill games for money	8.1	8.6	8.5
14	Sports pools	10.4	9.7	10.0
15	Horse races	9.5	6.4	7.5
16	Speculative investing	9.5	6.4	7.5
17	Internet or on-line gambling	1.2	0.4	0.7

Note: Chi-square significant at **$p < .0006$ (.01 adjusted for the number of tests).

Using SOGS to assess the four levels of problem gambling, all of the university students (n = 1579) were categorized into a problem level. In this sample 1219 (77.2%) had no gambling problems, 293 (18.6%) had mild problems, 52 (3.3%) had moderate problems, and 15 (0.9%) had pathological problems. Data were incomplete for four students that were not included in further analyses. A chi-square was computed for a 2 (near versus far) × 4 (four levels of problem gambling) contingency table. The chi-square was significant (χ^2 = 23.21, df = 3, p = .00004). For the no-problem group 66% were in universities far from a casino with 34% being enrolled in universities near a casino. Mild problems were greater for far (57.3%) versus near campuses (42.7%). Moderate gambling problems were of similar percentages for the universities near to (48.1%) and far from (51.9%) a casino. Students categorized as pathological were more likely to be enrolled in universities near to (80%) than far from a casino (20%).

A final set of chi-square analyses was computed for gender × proximity to casinos (χ^2 = 5.36, df = 1, p = .021) and for gender × level of gambling problems (χ^2 = 60.41, df = 3, p = .00001). More males (41.5%) than females (34.9%) were enrolled in a university near a casino. In contrast, more females (65.1%) than males (58.5%) attended universities far from a casino. In the gender × level of gambling interaction, more females (81.4%) than males (63.5%) have no gambling problems. For the three levels of gambling problems males had higher percentages of problems than females (mild problems: 27.3% males versus 15.9% females; moderate problems: 6.8% males versus 2.2% females; pathological problems: 2.4% males versus 0.5% females).

Discussion

Prior research in Canada (e.g., Gupta & Derevensky, 1998; Ladouceur et al., 1994; Poulin, 2000) using samples of youth indicates that 2.2% to 3.3% of students have serious gambling problems. Although attempts were made to get a representative sample of university students in this investigation, university policies and procedures required the use of multiple methods of data collection. In that our sample had only 0.9% pathological problem gamblers, which is considerably lower than the range often reported, the data are not useful to estimate population prevalence rates but remain useful to test for gender and location of university differences. It is worth noting, nonetheless, that in addition to the 0.9% pathological gamblers, 23.9% of the sample reported mild to moderate gambling problems. Given the consequences of each item measured in the SOGS instrument, this is no small number of problem gamblers, though the 0.9% of pathological problem gamblers is small. It is possible that our sample techniques did not adequately represent the full populations at the four universities but it is also possible that the SOGS may provide different results from other assessment tools (e.g., Derevensky & Gupta, 2000; Ladouceur et al., 2000) such as the Canadian Problem Gambling Index (CPGI). Further, longitudinal research would be necessary to determine if some or most of the mild to moderate university student problem gamblers become pathological gamblers over time. Nothing is known about this possibility among university students in Ontario.

Our evidence is similar to that of most studies that indicate that the frequency of gambling problems is greater for males than for females (Hayer, Griffiths, & Meyer, 2005). Our findings reveal that most but not all of the gambling problems are found among the male students. There are many explanations of why gender makes a difference. However, most studies simply test for gender differences and fail to go beyond this simple comparison to study the reasons for these differences. Gender differences may reflect differential validity in assessment tools for measuring male and female gambling problems. There may be different biological mechanisms in brain development or hormonal patterns that account for gender

differences. It is even possible that gender differences are based on gender-role identity differences associated with masculinity and femininity. Gender differences can be due to differential socialization of behaviors, attitudes, or dispositions that stimulate gambling behavior. This investigation, like many others, does not examine gender differences in any depth beyond the documentation of individual differences. There is considerable need to develop a sound theoretical framework for the study of gender differences in gambling behavior. Do gender roles, gender identity, or some form of biological differences between males and females account for the often reported gender differences in problem gambling? It could also be noted that the types of gambling engaged in by males and females may reflect more casual gambling on the part of females (e.g., instant game, bingo, raffles) and/or limited skills (e.g., slots) than gambling that has more organized rules or knowledge to engage in it (e.g., dice, blackjack, or skills games), which attracts greater male participation. In future investigations one might ask participants why they engage in one or more types of gambling as opposed to another.

As Griffiths (1999; 2003) has indicated, there are situational and structural characteristics within a community that can enhance access to gambling venues and gambling behavior. Attending a university close to a major casino, or possibly other gambling venues, appears to create an ecological condition in which the location of school and casino merge to create a setting that encourages gambling behavior and possibly problem gambling. Proximity between institutions can set an exposure effect that heightens one's awareness and increases exposure to acceptable behaviors with each institution. Therefore, universities close to casinos may have accessibility that encourages gambling behaviors through repeated exposure and desensitization to the costs of gambling. Likewise, this exposure effect may result in problems in gambling in the casinos, but our findings do not support the original speculation that it could also enhance other forms of non-casino gambling in the community. The potential power of casino location on students in educational institutions may only increase problem gambling within a casino, and our initial hypothesis of the radiating effect on gambling outside the casino may not be borne out.

As new casinos are built, consideration should be given to the meaning and implications of casino location for adolescents and young adults. Gambling corporations should recognize that location has a powerful effect on both profit and potential problems for students in close proximity. Perhaps casinos should provide monies to local schools for prevention and treatment programs among students for problems that might emerge due to exposure and accessibility effects.

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Contributors: GA developed the research idea, received funding, helped gather data, solicited others' involvement, analyzed data, and wrote the report. AMS, as the graduate student research assistant, coordinated the project, collected data, and assisted in the preparation of the data set. KDH gathered data at Wilfrid Laurier University. RM gathered data at the University of Windsor. AMG gathered data at Brock University

Competing interests: No known competing interests.

Ethics approval: The Ethics Review Committees at the University of Guelph, Brock University, the University of Windsor, and Wilfrid Laurier University approved this project for completion at each university campus. Approval was obtained from each university in September or October 2001. Data were gathered in Fall 2001 and early Winter semester 2002.

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Gerald R. Adams (PhD, family relations and human development, Pennsylvania State University) is a distinguished professor of teaching for the College of Social and Applied Human Sciences at the University of Guelph. He is a professor in the Department of Family Relations and Applied Nutrition in the Program in Family Relations and Human Development. He has masters and doctoral degrees in family studies, child psychology, human development, and education. His interests include the study of adolescent normal and dysfunctional development, parent-child relationships, primary prevention, and gambling problems in youth and emerging adults. His most recent book, the *Blackwell Handbook of Adolescence*, was co-edited with Michael Berzonsky.

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The addictive potential of lottery gambling

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Abstract

Objective: Lottery gambling has enjoyed great popularity around the world for many years and is generally seen as a socially acceptable form of gambling. Apart from aspects such as effects on charities, pathological lottery gambling and its addictive nature have often been discussed recently but rarely investigated. **Methods**: In the present study lottery gambling was investigated with respect to criteria of pathological gambling and addiction using a standardized questionnaire on gambling behavior that also assesses diagnostic criteria of addiction according to the DSM-IV. **Sample**: 171 active lottery gambling subjects (40 females, 131 males) participated in the present study. **Results**: 15.2% of the subjects fulfilled the criteria of pathological lottery gambling. Pathological lottery gamblers differed significantly from nonpathological lottery gamblers concerning the diagnostic criteria for addiction. **Conclusion**: An extension of the diagnosis "pathological gambling" to "behavioral addiction" seems to be appropriate for excessive lottery gambling.
Key words: behavioral addiction, lottery, pathological gambling, German numbers pool lottery

Introduction

Gambling is a popular leisure activity—60% to 90% of adults have gambled at least once in their lives (Ladouceur, 1991). On one hand, gambling is an enjoyable popular activity, but on the other hand, it is well known that excessive pathological gambling leads to health, financial, and social problems. Studies have shown that the current prevalence of pathological gambling varies from 1% to 2% in the US (Shaffer, Hall, & Vander Bilt, 1997), in different parts of Canada (Ladouceur, 1996, 2004), and in Europe (Becoña, 1996). The lifetime prevalence rate of pathological gambling in the US was measured using the DSM-IV and found to be 5.1% (Petry, 1999).

Decreasing numbers of casino visitors are contrasted with increasing users of national lotteries (Miyazaki, Lagenderfer, & Sprott, 1999; Wolfson & Briggs, 2002). This could be seen as a decrease in the popularity of casino gambling.

Lottery gambling has enjoyed appeal around the world for many years and is very popular (Brenner & Brenner, 1990; Wolfson & Briggs, 2002). It is relatively inexpensive to play and offers enormous and attractive jackpot prizes, but with very low odds of winning. Furthermore, it is generally seen as a socially acceptable form of gambling.

Apart from aspects such as effects on charities and redistribution of money, pathological lottery gambling as well as the addictive nature of lottery gambling are topics of recent discussions (Rogers, 1998; Welte, Barnes, Wieczorek, & Tidwell, 2004). With respect to problematic and pathological gambling, lottery ranked high compared to other games (Johannson & Gotestam, 2003), and scratch/lottery gamblers experienced some severe problems along several dimensions. Petry (2003a) showed that lottery gamblers, compared to slot machine, horse/dog track, and sports gamblers and card players, gamble more frequently and show severe alcohol and psychiatric problems.

To date in Germany there is a lack of data and only little acceptance of the classification of pathological gambling as an addiction. In general, data concerning neither the consumption level of the different gambling activities nor the number of problematic gamblers are available. Only a few studies provide data on pathological slot machine or casino gambling. Therefore, little knowledge or salience about the addictive potential of lottery gambling exists at this time.

The German Head Office for Dependency Matters presumes 180,000 gamblers who need counseling or treatment (Meyer, 2006). This corresponds with a proportion of the German population of 0.1% to 0.2%. However, these are only rough estimates. Taken together with all existing types of gambling activities (e.g., lottery, cards, sport betting, slot machine, casino) the actual prevalence of pathological gambling is probably higher. In Germany slot machine gambling is available in both casinos and public locations (e.g., bars). Two types of lottery gambling exist in Germany: German numbers pool lottery is more common than lottery gambling by drawing a lottery ticket. The lottery is exclusively offered by state-regulated providers. German numbers pool lottery and sport betting account for 30.8% of the total business volume of gambling activities in Germany, and lottery gambling by drawing a lottery ticket is responsible for an additional 5.1%. Casinos have a share of 38.4% and slot machine gambling makes up 21.3%.

Since 1980 pathological gambling has been included in the *Diagnostic Manual of Mental Disorders* (current version DSM-IV-TR, APA, 2000). Pathological gambling is listed in the category of "abnormal habits and impulse control disorder" and is currently classified with, for example, trichotillomania, pyromania, and kleptomania. Subjects have to fulfill five of ten criteria to receive the diagnosis "pathological gambler." Most of these criteria are comparable to the criteria for addiction: e.g., lack of control; development of tolerance; gambling to avoid negative feelings; neglect of occupational, social, and recreational activities and duties; and withdrawal symptoms (arousal and aggression). In addition, chasing after previously lost money, illegal activities, lying, and a strong mental involvement in lottery gambling are diagnostic criteria for pathological gambling. Furthermore, pathological gamblers expect that other people will lend them money.

There are seven diagnostic criteria for addiction (DSM-IV-TR, 2000), three of which must be fulfilled to receive the diagnosis "substance dependence." A characteristic feature of addictive behavior is the lack of control over this behavior. Subjects cannot control the beginning and end of their consumption nor the amount they consume, and they cannot stop their drug intake. In addition, drug craving is a central criterion that has recently been intensely discussed in the literature about the mechanisms underlying the development and maintenance of addictive behavior.

Currently, gambling-related disorders are being discussed more in the context of addictive behavior (Shaffer & Kidman, 2003). Biobehavioral researchers in neuropsychological, psychophysiological, neuroimaging, neurochemical, and genetic studies have been investigating biobehavioral dysfunctions in pathological gamblers as well as the mechanisms underlying the development and maintenance of pathological gambling. Results of these studies fit in with recent theoretical models of addiction, which stress the role of the reward system and the frontal cortex (Everitt, Dickinson, & Robbins, 2001). Moreover, the described concept of response inhibition fits in with models of pathological gambling as well as addiction (for an overview see Goudriaan, Oosterlaan, de Beurs, & Van den Brink, 2004; Potenza, 2002; Potenza & Winters, 2003). Furthermore, understanding the neural mechanisms of decision-making has direct implications for understanding disorders of pathological gambling and addiction. The same is true for the switch from controlled to

noncontrolled compulsive behavior (Bechara, 2003). Therefore, the disorder may not be entirely or accurately characterized by DSM criteria for pathological gambling (e.g., Lesieur & Rosenthal, 1991; Petry, 2003b).

To date, "non-substance–related behavioral addictions" (Holden, 2001; Marks, 1990; Shaffer & Kidman, 2003) are not listed in the two international diagnostic manuals for mental disorders, neither in the DSM-IV-TR (2000) nor in the ICD 10 (World Health Organisation, 1992), which is similar to the DSM-IV-TR (2000) with the exception of a few criteria.

However, based on the internationally established diagnostic criteria of addiction, only a few studies focus on the particular aspect of the addiction potential of these gambling activities, especially with regard to Europe (e.g., Grun & McKeigue, 2000; Lesieur & Rosenthal, 1991; Petry, 2003b; Potenza, 2002; Reid, Woodforst, Roberts, Golding, & Towell, 1999; Shaffer & Kidman, 2003). Therefore, the objective of the present study was to examine the gambling behavior of lottery gamblers concerning the German numbers pool lottery and to investigate if pathological lottery gamblers (PLG) fulfill the diagnostic criteria of addiction.

Method

Sample

171 adult subjects (23.6% females, 76.4% males) gambling the German numbers pool lottery ("Lotto") participated in this study (age in years M = 40.28, SD = 13.22). 42.1% of the subjects (N = 72) participated only in the numbers pool lottery and 57.9% were involved in sport betting activities as well. We excluded subjects with regular slot machine or casino gambling activities. Participants were randomly recruited in major streets in Berlin (Germany). The inclusion criterion was regular lottery gambling (at minimum once a week). Lotto drawings are conducted twice a week. Most of the gamblers playing Lotto regularly participate in one drawing a week. Therefore, we chose lottery activity of at least once a week as the inclusion criterion. Nevertheless, lottery tickets can be purchased every day, independent of the drawing. About 72% of the contacted regular lottery gamblers agreed to participate in the study. Subjects were remunerated for their participation with 10 Euros. Neutral locations such as cafés were chosen to conduct the interviews in order to avoid any influence by surroundings (e.g., stimuli-induced conditioned reactions) associated with lottery gambling.

Measures

Non-substance-related addiction was determined according to the internationally established criteria for addiction and pathological gambling of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR, 2000) using the Questionnaire of Differential Assessment of Addiction (QDAA, Grüsser, Wölfling, Düffert, Mörsen, & Flor, 2004). The QDAA is a valid and reliable self-rating instrument for assessing the criteria for addiction, patterns of addictive behavior, and addiction-related variables such as current mood state, current stress perception, and addiction-related beliefs. The diagnostic criteria for substance dependence—craving, withdrawal symptoms, tolerance, lack of control, neglect of social or occupational commitments and other leisure activities, and ongoing substance use in spite of aversive consequences—are assessed according to the DSM-IV and ICD-10. The QDAA also includes a submodule assessing different aspects of craving such as the intention to carry out the addictive behavior/use the substance (compulsive craving, almost irresistible urge to carry out the addictive behavior/use the substance) and expectation of positive

reinforcing effects (reward craving, euphorigenic effects) and of negative reinforcing effects (relief craving, avoiding withdrawal symptoms, tension reduction). The subscales show good internal consistency ranging from .82 to .92 and adequate validation coefficients (r = .72–.95 for the diagnostic scale and r > .40 for different subscales; Grüsser et al., 2004). In order to assess non-substance-related addictive behavior, the QDAA was modified for pathological gambling regarding the subscales to diagnose addictive behavior. Further questions assessing the criteria of pathological gambling according to the DSM-IV and questions assessing specific gambling aspects were added (DSM-IV-TR, 2000). The specific questions refer to gambling-related cognitive factors such as the belief that the chance of winning is better compared to other games, that lottery gambling is less harmful than other gambling, and that "lucky" numbers (e.g., the gambler's own birth date) have a better chance of winning; the tendency to change the pattern of numbers when playing the lotto; and the expectation of the addictive potential of playing Lotto. Furthermore, arousal during the drawing of the numbers and during thinking about lottery gambling is assessed retrospectively. The gambling version of the QDAA has not yet been validated for use in clinical groups of pathological gamblers. None of the dependent participants fulfilled the criteria for addiction to a psychotropic substance, except for tobacco smoking.

Data analyses

Data were analyzed with the Statistical Program for Social Scientists (SPSS, 11.0). In order to analyze continuous data, group differences were calculated using T-tests for independent samples. The Chi-square test for independent samples was used to analyze the categorical data.

Results

According to the criteria of pathological gambling (DSM-IV-TR, 2000), 26 subjects (15.2%) of the sample fulfill the criteria of pathological lottery gambling, since five or more questions of the QDAA referring to these criteria were answered positively. Regarding sociodemographic variables, PLG and nonpathological lottery gamblers NPLG do not differ significantly concerning age and net income. Gender, educational levels, and marital status are equally distributed across the groups (all p > .05).

Compared to NPLG, PLG gamble significantly more times a week, place significantly more bets per drawing, and have significantly higher monthly debts. Furthermore, significantly more PLG tried to win back the money they had lost previously in lottery gambling (chasing). PLG are significantly more strongly involved in lottery gambling and are significantly more aroused when they think about lottery gambling, or while lottery numbers are being drawn, than NPLG (see Table 1).

NPLG and PLG differ significantly with respect to cognitive factors related to lottery gambling: the belief that their "lucky" numbers have a good chance of winning and the thought that compared to other games the chances of winning are better. However, PLG and NPLG do not differ significantly in the tendency to use the same pattern of numbers when playing Lotto. Compared with NPLG, significantly more PLG are likely to believe that lotteries are less harmful than other types of gambling. However, the expectation of an addictive potential of playing the lottery is equally distributed among NPLG and PLG (see Table 1).

PLG meet the addiction criteria in the following list significantly more often than NPLG: 1. craving for lottery gambling (PLG: 92.3%; NPLG: 46.8%; $\chi^2(1) = 18.29$, $p < .01$), 2. loss of control over the gambling behavior regarding time and amount of money (PLG: 88.0%; NPLG: 31.6%; $\chi^2(1) = 27.89$, $p < .01$), 3. development of tolerance (PLG: 95.0%; NPLG: 26.6%; $\chi^2(1) = 35.24$, $p < .01$), 4. neglect of social or occupational obligations (PLG: 54.2%; NPLG: 8.6%; $\chi^2(1) = 31.56$, $p < .01$), 5. negative social consequences (PLG: 15.4%; NPLG: 1.4%; $\chi^2(1) = 12.26$, $p < .01$), and 6. two or more withdrawal symptoms developing within hours or days (e.g., restlessness, irritability, being in low spirits) when gambling activities were reduced (PLG: 72.0%; NPLG: 12.9%; $\chi^2(1) = 42.41$, $p < .01$). While NPLG report anger and being nervous on the day of the drawing when they had missed that game, PLG report nervousness and arousal, restlessness, stress, and even panic as withdrawal symptoms, even if they had intended not to play. With respect to craving and craving-related processes, PLG report a significantly stronger craving for gambling, stronger intention to gamble, stronger expectation of reinforcing effects such as a positive outcome, and stronger avoidance of negative feelings or withdrawal symptoms (see Table 1). Comparisons of the measure of the diagnostic criteria for pathological gambling and of criteria for addiction revealed that all PLG fulfill three or more diagnostic criteria for addictive gambling according to the diagnostic criteria of addiction. Analysis of the sample of NPLG shows that an additional 14.3% ($N = 20$) do not fulfill the criteria of pathological gambling.

Table 1.

Comparison between PLG and NPLG concerning gambling-associated variables

N = 171	**NPLG** *n* = 145	**PLG** *n* = 26		
	M (*SD*)	*M* (*SD*)	*t* (*df*)	*p*
Gambling frequency (times/week)	1.43 (0.78)	1.87 (1.32)	–2.16 (143)	.032
Amount of placed bets (/drawing)	2.48 (2.50)	3.94 (3.09)	–2.15 (142)	.034
Monthly debts due to lottery gambling (in Euros)	0.21 (1.43)	46.75 (113.97)	–4.09 (145)	< .001
Preoccupation with lottery gambling[1]	21.04 (25.61)	56.08 (32.34)	–6.02 (159)	< .001
Arousal while lottery numbers are being drawn[2]	40.51 (30.97)	72.12 (28.89)	–4.82 (160)	< .001
Belief in "lucky" numbers[3]	21.69 (26.83)	34.04 (37.67)	–2.01 (161)	.047
Belief in better chances of winning[4]	36.79 (36.80)	61.31 (36.44)	–2.12 (160)	.036

Tendency to use the same pattern of numbers[5]	62.07 (35.18)	62.85 (34.12)	–0.10 (153)	.918
Craving for gambling[6]	31.17 (25.44)	65.50 (25.14)	–6.33 (163)	< .001
Intention to gamble[7]	37.99 (29.74)	69.12 (25.49)	–5.00 (162)	< .001
Expectation of positive reinforcing effects[8]	36.85 (33.056)	68.40 (27.15)	–5.16 (38.14)	< .001
Expectation of negative reinforcing effects[9]	21.38 (27.31)	43.50 (29.58)	–3.74 (162)	.003
	N (%)	*N* (%)	χ^2 (*df*)	*p*
Ever tried to win back previously lost money (yes/no)	20 (13.79)	19 (73.08)	41.68 (1)	< .001
Belief that lottery is less harmful than other gambling (yes/no)	69 (40.35)	16 (61.53)	4.10 (1)	.042
Expectation of an addictive potential of playing the lottery (yes/no)	98 (57.34)	15 (58.33)	0.01 (1)	.931

[1] How strongly are you preoccupied with lottery gambling during a normal day

(e.g., thinking about the numbers or the drawing)? (visual analogue scale, 0 = "never" to 100 = "the whole day")

[2] How strongly are you usually aroused while lottery numbers are being drawn?

(visual analogue scale, 0 = "not at all" to 100 = "very strongly")

[3] How strongly do you believe that a special set of numbers ("lucky numbers") has a better chance of winning?

(visual analogue scale, 0 = "not at all" to 100 = "very strongly").

[4] How strongly do you believe that the chance of winning the lottery is higher than that of other gambling activities?

(visual analogue scale, 0 = "not at all" to 100 = "very strongly")

[5] How strongly did you tend to use the same pattern of numbers in each drawing?

(visual analogue scale, 0 = "not at all" to 100 = "very strongly")

[6] How strong is your craving for gambling? (visual analogue scale, 0 = "not at all" to 100 = "very strong")

[7] How strong is your intention/plan to gamble? (visual analogue scale, 0 = "not at all" to 100 = "very strong")

[8] Do you expect a positive effect by playing the lottery (e.g., euphorigenic effects)?

(visual analogue scale, 0 = "not at all" to 100 = "very strongly")

[9] Do you expect relief from withdrawal symptoms or aversive affective states by playing the lottery

(e.g., lower stress experience)? (visual analogue scale, 0 = "not at all" to 100 = "very strongly")

Discussion

Data analyses of the present study revealed that all PLG fulfill three or more diagnostic criteria for addiction in addition to the diagnosis of pathological gambling. Compared with the group of NPLG they differ significantly concerning all of these criteria (craving; lack of control; development of tolerance; neglect of occupational, social, and recreational activities and duties; and withdrawal symptoms). Furthermore, with respect to craving as a central criterion of addiction, PLG show significantly higher scores regarding these subscales. PLG report that their motivation for gambling is derived more from the perceived positive aspects than from the negative aspects (to avoid negative feelings). Miyazaki et al. (1999) stated that the desire to win is the most important purchase motivation of lottery gamblers. The negative reinforcing aspects (e.g., avoiding aversive feelings such as stress and sad mood) of lottery gambling are presumably not in the foreground of verbal reports. This may be because the positive effects of the gambling behavior to avoid something unpleasant are not conscious. Furthermore, due to the slow development or increase of aversive consequences, they do not serve as something unpleasant to be avoided by gambling behavior. Only 15.4% of the pathological gamblers reported that they experience negative social consequences from gambling. Nevertheless, 54.2% of them reported a neglect of social or occupational obligations due to lottery gambling.

However, the assessed negative (avoidance of negative feelings or withdrawal symptoms) and positive (expectation of a positive outcome) reinforcing aspects of lottery gambling reflect the expected function of the gambling activity. Based on integrative learning and biological models that explain the underlying mechanisms of addiction (Everitt et al., 2001; O'Brien, Childress, McLellan, & Ehrman, 1992; Robinson & Berridge, 1993), one can assume that lottery gambling becomes a misappropriated function for PLG, i.e., an inadequate stress-coping mechanism. Subjects learn to reward themselves by gambling the lottery. Repeated gambling behavior induces neuroadaptive processes of the mesolimbic reward system. As a result, the reward system becomes sensitized for this behavior and is powerfully activated only with respect to lottery gambling, which could be seen as the underlying mechanism for the development and maintenance of addictive behavior (Holden, 2001).

Gambling-related cognitive factors in pathological gamblers such as various biases and irrational thinking patterns are well described (e.g., Ladouceur, 2004; Rogers, 1998; Wolfson

& Briggs, 2002). In the present study PLG believe that playing the lottery is less harmful than other types of gambling. They believe that their "lucky" numbers have a good chance of winning and that, compared with other games, the chances of winning are better.

Several authors suggest that gamblers are motivated by the need for excitement and arousal. The risk and the potential monetary loss or gain can be highly arousing (Coventry & Hudson, 2001; McDaniel & Zuckermann, 2003). In the present study PLG are strongly involved in lottery gambling and are significantly more aroused than NPLG when they think about lottery gambling or while lottery numbers are being drawn.

Presumably, some aspects of quantity and frequency are connected with the development and severity of gambling-related problems (Petry, 2003b). The present study has shown that PLG gamble significantly more frequently during a week than NPLG and significantly more PLG purchased more than one lottery ticket per drawing. Griffiths (1999) assumes that event frequency, the interval between gambling and outcome, is based on reinforcing mechanisms of operant conditioning and possibly related to the addictive properties of different forms of gambling. However, as mentioned in the introduction, Petry (2003a) showed that lottery gamblers gamble more frequently than slot machine, horse/dog track, and sports gamblers and cards players. It is still unknown how event frequency in relation to stress reduction after filling out a lottery ticket—which can be done every day independent of the event of drawing the lottery numbers—affects the reward mechanisms that lead to pathological or addictive behavior.

The fact that in the present study an additional 14.3% of the NPLG do not fulfill the criteria of pathological gambling but do fulfill the criteria of addiction points to the statement that the disorder may not be entirely or accurately characterized by DSM criteria for pathological gambling (e.g., Lesieur & Rosenthal, 1991; Petry, 2003b). The use of neurocognitive criteria could point to more accurate subtyping of addictive disorders. They may serve as a guide for more specific, and thus possibly more successful, pharmacological and behavioral interventions (Bechara, 2003). Further studies are necessary to characterize the pathology of gambling and especially of lottery gambling.

Finally, it is important to note that we do not need to know the number of criteria but which criteria are fulfilled by abnormal pathological gambling activities in order to come to an adequate diagnosis (Rosenthal, 2003). Despite the criteria for disorders, which serve as a guideline, clinical judgment must be exercised. Therefore, it is important to detect the dominance of the gambling behavior as well as negative and adverse consequences of gambling behavior in the life of the gambler that are not covered when using only the criteria of pathological gambling.

The fact that only a relatively small percentage of problematic lottery gamblers are involved in treatment may be due to diagnostic difficulties, the low cost of lottery tickets, and a lack of dominance of negative consequences that may motivate seeking treatment. Furthermore, the lottery is very popular and generally seen as a socially acceptable form of gambling (Brenner & Brenner, 1990; Wolfson & Briggs, 2002). Therefore, no awareness of the addictive potential exists.

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An exploratory investigation into the erroneous cognitions of pathological and social fruit machine gamblers

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Abstract

Although the literature concerning the association between irrational thinking and gambling continues to grow, a number of methodological problems raise questions about the validity of such findings. The present research examined the cognitions and beliefs of a small convenience sample of pathological (*n* = 5) and social (*n* = 5) fruit machine gamblers using a within- and between-subjects design, employing the think-aloud method, the Gambling Beliefs Questionnaire, and a semistructured interview. Pathological gamblers were found to display greater levels of irrationality than social gamblers on all three measures. However, by undertaking a methodology more rigorous than that of previous research, this study found that irrational thinking may not be as prominent a reason behind gambling as has been suggested.
Key words: erroneous cognitions, fruit machines, multiple assessments

Introduction

Erroneous cognitions related to gambling behaviour have been noted for some time, with Bolen & Boyd (1968) stating that the 'astonishing, illogical conviction that the gambler will eventually win frequently defies comprehension and certainly defies the laws of probability' (p. 622). Cognitive theories of gambling are evident within the gambling literature, with some researchers favouring a cognitive model of gambling in which winning money is the predominant factor underlying gambling behaviour (Walker, 1992b; Ladouceur & Walker, 1996; Sylvain, Ladouceur, & Boisvert, 1997). Aside from the growing body of research providing support for the importance of cognitive factors in those with gambling problems, the effectiveness of treatment interventions aimed at cognitive correction of randomness and chance adds credence to the usefulness of a cognitive model of gambling for research and treatment purposes (Ladouceur, Sylvain, Letarte, Giroux, & Jacques, 1998; Ladouceur et al., 2001; Ladouceur et al., 2003).

A number of methods can be used to assess cognitions and beliefs in gambling samples, with Joukhador, MacCallum, & Blaszczynski (2003) examining the cognitive distortions of 56 problem gamblers and 52 social gamblers using a new instrument they devised called the Gambling Beliefs Questionnaire (GBQ). They found that on all measures (except denial) problem gamblers displayed significantly greater cognitive distortions than social gamblers, e.g., superstitious beliefs about gambling, the illusion of control, and the gambler's fallacy. Such results indicate that pathological gambling is related to a broad range of mistaken beliefs and distorted cognitions. Similar results are reported by studies using the 'think-aloud method' (TAM), which is a different method of investigating gambling thoughts whereby the individual has to speak aloud while gambling (Coulombe, Ladouceur, Desharnais, & Jobin, 1992; Griffiths, 1994; Coventry & Norman, 1998). These studies have found that regular or problem gamblers are significantly more likely to make erroneous verbalisations while gambling than nonregular or social gamblers. Erroneous verbalisations include statements such as ‘This machine is making me mad on purpose’ [personification] or ‘I haven’t won for a while, so I must be due a win’ [not understanding probability]. In terms of the strategic

thinking of gamblers, i.e., thoughts related specifically to gambling, other studies using the TAM have found irrational thinking to be particularly high—ranging from 75% to 86% (Delfabbro & Winefield, 2000; Walker, 1992a; Gaboury & Ladouceur, 1989). Other methods of assessing gambling thoughts such as observation and interviews with gamblers similarly reveal cognitive distortions to be present (King, 1990; Toneatto, Blitz-Miller, Calderwood, Dragonetti, & Tsanos, 1997).

From the above research it could be argued that erroneous cognitions are integral to problematic gambling behaviour. However, it has to be noted that there are several methodological problems inherent in the techniques used by these earlier studies which have to be addressed before any conclusive argument can be made for the role of distorted cognitions in the development and maintenance of gambling behaviour.

Problems with gambling instruments measuring cognitions and beliefs

Only a handful of instruments assessing gambling-related thoughts exist and most remain untested, such as the Gambling Related Cognitions Scale (Raylu & Oei, 2004). The Gambling Attitudes and Beliefs Scale (GABS; Breen & Zuckerman, 1999) measures gambling attitudes as well as erroneous cognitions and beliefs, although Strong, Breen, & Lejuez (2004) found that only 15 (of the original 35) items effectively discriminated between students and clinical gambling samples. Of these 15 items only a limited number of questions relating to erroneous beliefs or cognitions remain, many addressing similar cognitions or beliefs. The Gamblers' Beliefs Questionnaire (Steenbergh, Meyers, May, & Whelan, 2002) is a 21-item scale measuring gambling-related thoughts, with all items loading upon two factors: Illusion of Control and Luck/Perseverance. Similarly, the 22-item Drake Beliefs about Chance Inventory (DBC; Wood & Clapham, 2005) loads upon only two factors—Illusion of Control and Superstition—and collectively the GABS, Gamblers' Beliefs Questionnaire, and DBC are limited in that they only measure certain gambling-related cognitions. Finally, the GBQ appears a promising instrument as it has questions relating to a wider variety of cognitive distortions than these previous instruments. Of course, it may be that the quantity of irrational beliefs assessed by any of these instruments is not informative of the strength of these beliefs (Delfabbro, 2004), and there is an a priori assumption that the items on these screens are correctly understood.

Problems with sample

A second methodological issue which has to be addressed in the area of erroneous beliefs and gambling is the type of gamblers researched. For example, all the problem gamblers in Joukhador et al.'s (2003) study were seeking treatment at the time of the study, which may have had an impact on the study's findings. Assessing gamblers at an advanced stage of their gambling careers, where treatment is necessitated, may not be representative of the wider population of active gamblers and therefore such findings should be treated cautiously. The reliability of studies examining cognitive processes associated with gambling can also be questioned where there is a reliance on students (Walker, 1992a; Kweitel & Allen, 1998; Côté, Caron, Aubert, Desrochers, & Ladouceur, 2003) or use of retrospective data (Toneatto et al., 1997). Furthermore, Walker (1992a) questions the use of low-frequency gamblers as participants, which is evident in a number of studies (Gaboury & Ladouceur, 1989; Benhsain, Taillefer, & Ladouceur, 2004; Ladouceur & Sévigny, 2005). It could be argued that findings from such samples could not be generalised to a frequent gambling population. In addition, assessment of a single group of gamblers prohibits

comparison and therefore does not enable differences between gambling groups to be elucidated.

Problems with TAM

In earlier studies, Griffiths (1994) and Coulombe et al. (1992) used the TAM to examine gambling beliefs over a short time, less than 10 min per participant on average. The regular gamblers in Griffiths's (1994) study had an average of only 61 shots on a fruit machine, which is clearly not representative of the prolonged gambling sessions of problem gamblers. Participants were also paid to play the machine and it is questionable whether this would accurately reflect the actions of gamblers using their own money. Other studies examining gambling-related beliefs do not even involve the staking of money, which would suggest they are not gauging cognitions in relation to gambling per se (Langer & Roth, 1975; Coventry & Norman, 1998; Dixon, Hayes, & Ebbs, 1998; Teed, Finlay, Newby-Clark, & Marmurek, 2006). Financial concerns aside, it is insufficient for research in this area to examine the issue of mistaken gambling beliefs by using a limited number of statements made via the TAM and spanning only a short period of time.

Apart from the methodological issues surrounding the TAM, there is a serious problem with the TAM technique itself. Researchers employing this technique develop coding schemes in order to make sense of the thoughts elicited during the course of the study, which in itself could be construed as problematic given the inherent complexities in attempting to translate these utterances into meaningful psychological constructs (Dickerson & Baron, 2000). This has led researchers to develop often very different coding schemes (e.g., Walker, 1992a; Griffiths, 1994; Coventry & Norman, 1998), making the utility of comparative analysis between different studies using this method questionable. Griffiths's (1994) coding scheme 'was intuitively constructed by the author' (p. 357). Examples of statements categorised as rational include swearing, but those categorised as irrational include swearing at the machine. It does not seem justifiable to label either swearing as rational or swearing at a machine as irrational. In fact, many of the verbalisations considered rational by Griffiths (1994) or irrational by Coulombe et al. (1992) were neither rational nor irrational, but simply commentaries on the event (Coventry & Norman, 1998). Irrationality is a term used vaguely by gambling researchers (Neal, 2005) and the appropriateness of this terminology has to be questioned given that participants are never offered the opportunity to explain the reasoning behind their supposedly illogical beliefs.

Ecological validity

The importance of ecological validity in such studies cannot be overemphasised as attempting to unravel the true extent to which erroneous cognitions maintain gambling involvement can never be realised in laboratory settings. The use of laboratory settings to assess erroneous cognitions (e.g., Kassinove & Schare, 2001; Ladouceur & Sévigny, 2005; McGrath, Finlay, Kanetkar, Londerville, & Marmurek, 2006) is a further methodological issue which has to be addressed. Apart from the problem of reduced participant motivation (Walker, 1992a), laboratory settings are unrealistic environments for gambling research. This is particularly true in the case of Coventry & Norman's (1998) study in which testing took place in a soundproof darkened laboratory. This would be inappropriate for many forms of gambling, particularly fruit machines where the stimulus characteristics of amusement arcades such as the cacophony of noise and the flashing lights play an integral role in the gambling experience (Fisher & Griffiths, 1995). Coventry & Norman's (1998) laboratory setting and other similar settings are completely devoid of such stimuli.

A methodology, which may address the above-mentioned research issues in the area of gambling and erroneous beliefs, is to adopt a multifaceted approach, employing the TAM (in an ecologically valid setting), a relevant gambling questionnaire, and a semistructured interview. This would enable a more accurate assessment of gamblers' thoughts while gambling and while not gambling and the identification of the most prominent features of their thinking in relation to their gambling. The major aim of this exploratory study was to advance the knowledge of the association between gambling behaviour (specifically fruit machine gambling) and gamblers' mistaken beliefs by undertaking a methodology more rigorous than that of previous research. The study involved an intensive examination of gamblers' beliefs both within and outside a gambling environment using the TAM, the GBQ, and a postexperimental semistructured interview. It was hypothesised that pathological gamblers would display a greater number of mistaken beliefs than social gamblers during the TAM, and also in the GBQ and interview. It was also hypothesised that a number of the so-called erroneous cognitions identified by the TAM and the GBQ would be adequately explained in the interview.

Method

Design and participants

The experiment employed a three-phase within- and between-subjects design, in which participants engaged in the TAM while gambling, completed the GBQ several days later, and finally participated in a semistructured interview 4 weeks later. A total of ten fruit machine gamblers (five pathological and five social gamblers) were recruited, predominantly from the arcade, with there being no refusals. Most fruit machine gamblers were male (*n* = 7), although this is not uncommon in this form of gambling (Griffiths, 1994). The average age of the sample was 24.4 years of age (*SD* = 3.2; range 21–32); pathological gamblers 24.2 (*SD* = 1.9; range 22–27), social gamblers 24.6 (*SD* = 4.4; range 21–32). The average South Oaks Gambling Screen (SOGS) score was 7.0 (*SD* = 6.3; range 1–18); pathological gamblers 12.2 (*SD* = 4.6; range 7–18), social gamblers 1.8 (*SD* = 0.8; range 1–3). No participants had previously sought treatment for gambling problems. In order to avoid the possibility of confounding influences on dysfunctional beliefs, it was ensured that no one was currently receiving selective serotonin reuptake inhibitors (SSRIs) or undergoing psychotherapeutic treatment (see Anholt et al., 2004).

Materials

The revised edition (48 items) of the GBQ (Joukhador et al., 2003) was employed along with the SOGS (Lesieur & Blume, 1987), which is a reliable and valid instrument that has been widely used. A Sony minidisc recorder (MZ-NH900) attached to a small unobtrusive microphone was used to record the participants' verbalisations while gambling. A similar apparatus was used during the semistructured interview.

Procedure

Ethical approval was obtained from the Psychology Department in Glasgow Caledonian University, and permission to approach potential participants was secured from the manager of the gambling arcade. The experimenter previously conducted research in this arcade (Moodie & Finnigan, 2005), going into the arcade on a daily basis for a period exceeding 4 months before the onset of this previous study. During this time, the experimenter was able to observe the gambling behaviour of fruit machine gamblers, from those gambling

frequently and excessively to those gambling either frequently or infrequently, but in a controlled manner. By following the methodology of King (1990), through observation and conversation the experimenter was able to identify and recruit a number of gamblers who appeared to either show signs of pathology or to gamble socially. This form of recruitment is of greater value than the reliance on a gambling screen, although the SOGS was employed to verify pathological or social gambling status. Before the onset of the study potential participants were informed that the study involved three separate but interrelated stages. All participants were given a £20 disturbance fee on completion of the study.

Phase 1 (TAM)

In the first phase of the study the experimenter arranged to meet participants before a gambling session. The verbal instructions the participants received were similar to those used in past research (Gaboury & Ladouceur, 1989; Walker, 1992a), but with subtle differences:

> *State everything that comes to mind during the gambling session, no matter how unimportant you consider it to be. Do not censor your thoughts and do not attempt to justify statements. You do not have to speak in complete sentences, and don't worry if you feel that what you're saying does not make sense. Just act as you normally would when gambling and try to speak in a clear voice. For the task you should try to speak as often as possible, although you do not have to speak continuously.*

In order to enhance ecological validity it was beneficial to remain with the gamblers for a longer period of time than previous research in this area has managed. This was advantageous as it allowed the cognitions displayed throughout the entire session or a significant part of it to be monitored, rather than simply trying to gain an insight into the thinking of gamblers during a brief period of a gambling session. The recording was made via a small microphone attached to a light, small minidisc recorder. Although previous studies (Griffiths, 1994; Coventry & Norman, 1998) have requested participants to speak continuously during the task, this was not considered appropriate on the grounds that it may actually induce irrational statements and therefore inadvertently affect the results. Furthermore, as the intention was to have the participants perform the task for approximately 90 min, this would have been an arduous task. Instead, participants were asked to speak as frequently as possible and were prompted to do so if silent for a minute or so during the task. If the recording was not of a sufficient time, participants were asked if they would consent to being recorded in a subsequent gambling session. This only applied to three pathological gamblers who had lost their money quickly on the first occasion, but who willingly agreed to do the TAM again.

Coding scheme

A coding scheme similar to that of Walker (1992a) was used as it appears potentially more informative than others employed. The verbalisations made fell into one of the following categories:

Inadequate verbalisations included predictions or confirmation of predictions or systems employed; references related to personal control or skill, mentioning cause and effect; references relating to a lack of understanding of probability; and statements regarding personification.

Adequate verbalisations included statements relating to lack of personal control, knowledge of probability, and stating that although their luck should change it does not necessarily mean they are going to win anything.

Descriptive verbalisations included statements describing some aspect of the game. This category seems appropriate where fruit machines are involved, given the high degree of player involvement that exists in modern fruit machines.

Other verbalisations included all remaining verbalisations not classified as adequate, inadequate, or descriptive.

The verbalisations were transcribed within 12 hours of the completion of the TAM and coded according to the previous coding scheme. Ten percent of verbalisations were subsequently independently rated, with 45% being rated identically, indicating a low degree of interrater reliability. As with Griffiths's (1994) study, the naivety of the second rater in terms of fruit machine gambling and associated terminology may account for this. As was also the case with Griffiths (1994), given the experimenter's familiarity with fruit machine terminology and the TAM, the initial codings were subsequently used for analysis.

Phase 2 (GBQ)

Each participant was given the GBQ several days after completing the first phase (the TAM) and asked to carefully complete it and return it at a mutually convenient time. The GBQ was not given directly after the first phase of the study because questionnaires given directly before or after a gambling occasion may not be the most accurate way of studying cognitive activity (Gaboury & Ladouceur, 1989).

Phase 3 (Semistructured interview)

After the participant returned the completed GBQ, a semistructured interview was arranged for a later date, at least 4 weeks after the return of the GBQ. The reasoning behind this delay was to ascertain a temporal view of cognitions, assessed in different ways over a period of time. For this final phase of the study, all participants were given the same questions related to early experiences of gambling and fruit machine gambling, winning, skill, strategies, near misses, probability, reasons behind gambling, etc. All questions were related to experiences of gambling and as they required some thought they were provided a week in advance of the interview. The semistructured interview consisted of these questions and at least 25 additional questions that the participants were unaware of. These additional questions were related to the items initially asked, but tailored specifically for each participant's responses on the GBQ and recorded verbalisations during the TAM. In this way, the interview allowed a degree of internal triangulation, where consistencies or inconsistencies across assessments could be established or addressed.

The main reason behind the interview was to establish the degree to which erroneous cognitions actually exist in fruit machine gamblers. The participants were given the opportunity to provide explanations for statements in the TAM that past studies have deemed irrational. Joukhador et al. (2003) highlight a justifiable criticism that could be directed at this approach, which is that subjective interpretation is required in order to analyse the findings. Without allowing the participant to explain such statements, and no matter what criteria are used to categorise verbalisations, the participant is not given the chance to adequately explain statements made. This is equally true for the GBQ, or any

similar questionnaire, where the participant is not given the chance to adequately explain why they endorsed particular items, or if they understood all of the items. The effectiveness of each of the three methods (TAM, GBQ, interview) used to capture gambling-related thoughts is an important issue where past and future research is concerned and was also discussed in the interview. This allowed participants the opportunity to identify the strengths and weaknesses of each of these methods, which may be more informative than having researchers retrospectively describe the problems they considered particular methods to have.

Results

Phase 1 (TAM)

The 10 participants gambled for a total of 1017 min (mean = 101.7; range 67–147) and produced a total of 2814 verbalisations (mean = 281.4; range 149–377); see Table 1. The five pathological gamblers produced an average of 322.8 statements, which was significantly more than that of the five social gamblers, who produced 240.0 statements (t = 2.4, df = 8, $p < .05$). The types of verbalisations made were predominantly in the descriptive category. The sample averaged 13.5 adequate and 22.2 inadequate verbalisations, with social gamblers more likely to make adequate verbalisations and pathological gamblers inadequate verbalisations (Table 1).

Table 1.

Time gambled and number (SD and range) and type of verbalizations made by pathological and social gamblers

	Total sample	Pathological gamblers	Social gamblers
Time gambled (minutes)	101.7 (25.8, 67-147)	115.6 (30.5, 67-147)	87.8 (9.3, 75-96)
Verbalisations made*	2814.0 (66.9, 149-377)	322.8 (41.2, 278-377)	240.0 (63.8, 149-310)
Types of verbalisations			
Adequate verbalisations	13.5 (6.2, 6-25)	13.2 (6.1, 6-20)	13.8 (7.0, 6-25)
Inadequate verbalisations	22.2 (12.6, 7-44)	29.6 (13.7, 8-44)	14.8 (6.0, 7-20)
Descriptive verbalisations	214.3 (57.0, 79-280)	243.8 (22.9, 218-280)	184.8 (68.0, 79-254)
Other verbalisations	31.4 (21.1, 10-82)	36.2 (27.5, 14-82)	26.6 (13.8, 1-42)

*Statistically significant as tested by t-tests ($p < 0.05$).

Percentage of inadequate verbalisations: Using the same method employed by Walker (1992a), the percentage of inadequate, adequate, descriptive, and other verbalisations made were calculated (Table 2). All four categories of verbalisations were always included in the bottom line of the expression, and the type of verbalisation examined determined what was on the top line of the expression.

For example, the following expression was used to calculate the percentage of inadequate verbalisations produced:

$$\frac{I}{I+A+D+O}\times 100,$$

where *I* = inadequate verbalisations, *A* = adequate verbalisations, *D* = descriptive verbalisations, and *O* = other verbalisations.

Table 2.

Mean percentages of verbalisations made by social and pathological gamblers

	Inadequate	Adequate	Descriptive	Other
Social	6.2%	5.8%	77.0%	11.1%
Pathological	9.2%	4.1%	75.5%	11.2%

Types of inadequate statements made: *Among the sample, predictions or confirmation of predictions were the most common form of inadequate statement made (34.5%), followed by not understanding probability (24.5%), personification (21.4%), cause and effect (13.6%), and finally references to skill or personal control (6.0%). Table 3 provides examples of each type of inadequate verbalisation.*

Table 3.

Examples of inadequate verbalisations made in the TAM

Skill
1) I'm impressed with that, pure skill on my behalf (participant 2).
2) Oh, this is a skills one, skills (participant 6).
3) Oh, as usual my skill never fails to impress me (participant 10).
Predictions
4) I'm predicting this could cost me another 20 pounds for my jackpot (participant 3).
5) The jackpot is guaranteed (participant 3).
6) I'm starting to predict the way it's playing, it's let me back on the board again, I need a red boost, but I don't think it'll give it to me (participant 5).
Cause and effect

7) It's dropping down the back which is a good sign (participant 5).

8) So far so good, landed on a question mark, shouldn't have jinxed myself and said that (participant 7).

9) 9) Feeling confident here, I reckon, I think I'll get £1.70 (participant 10).

Personification

10) Another one in it, gee (*give*) me another red streak, I know you want to, it has to do it, it just has to do it, the machine makes you put another pound in it (participant 4).

11) And again, another true skill, it (*the machine*) must have heard me (participant 8).

12) It (*the machine*) gees (*gives*) you a hold when you're down to your last ten pence just so you keep playing it (participant 9).

Not understanding probability

13) It (*the machine*) will have to do better than that (participant 1).

14) I should be winning here (participant 2).

15) I've only got five pounds for more than fourteen, it has to give me something better, so I'll keep playing it (p.5)

Phase 2 (GBQ)

The average GBQ score, which can range from 0 to 192, was 61.2 (*SD* = 28.3, range 23-117); pathological gamblers 76.2 (*SD* = 28.4; range 50–117); social gamblers 46.2 (*SD* = 21; range 23–78). Although the mean GBQ scores were higher for pathological gamblers, *t*-tests revealed no significant differences between the social and pathological gamblers on the GBQ.

Phase 3 (semistructured interview)

The sample was asked which of the three methods used in the study was most effective in terms of capturing gambling-related thoughts (Table 4). The TAM, GBQ, and interview were difficult to separate, although all participants rated the GBQ as the best or second-best way of capturing their gambling-related thoughts.

Table 4.

Effectiveness of the TAM, GBQ, and Interview for assessing gambling-related thoughts

Participant	Gambler type	Best method	Second-best method	Third-best method
1	Social	TAM	GBQ	Interview
2	Pathological	GBQ	Interview	TAM
3	Pathological	GBQ	TAM	Interview
4	Social	Interview	GBQ	TAM
5	Social	Interview	GBQ	TAM
6	Pathological	TAM	Interview + GBQ*	---
7	Pathological	GBQ	TAM	Interview
8	Social	GBQ	Interview	TAM
9	Pathological	TAM	GBQ	Interview
10	Social	Interview	GBQ	TAM

*The interview and GBQ were considered joint second-best methods for participant 6.

Predictions: Statements in the TAM regarding predictions, personification, and skill made up more than 60% of all the statements categorised as inadequate, and participants were asked in the interview to explain such statements. Predicting what will happen or confirming predictions in a chance situation would logically be considered irrational, although most of the sample (n = 8) did exactly this. However, regardless of gambling group, participants indicated that it was 'just down to experience' (participant 8), with fruit machines being no more than computerised programmes—'it's a programme at the end of the day; it does the same things' (participant 6). Participants did not indicate that they could 'predict 100%' (participant 1) exactly what is going to happen while playing fruit machines, but most believed that after 'you play the machines for so many years' (participant 3) and 'so many times' (participant 6), they have come to know what to expect. As it happened, many of the predictions made by the participants in the TAM were accurate.

Personification: Statements regarding personification were made by all but one of the sample. Only one social gambler failed to satisfactorily explain a statement involving personification, perhaps due to the fact that she had only recently started playing fruit machines and had appeared on many occasions to be uncertain about what to do during the TAM. Perhaps the confusion shown while playing fruit machines was also evident in the interview. The participants were asked in the interview to explain statements they had made during the TAM, such as 'Something about this machine doesn't like me' (participant 2) or 'The machine makes you put another pound in' (participant 4). The participants responded 'I'm not saying the machine has emotional feelings towards me [laughing]' and 'I'm not saying the machine is forcing me to do it, it's just a machine', with both stating that it is just phraseology used within a gambling context. Other common examples of personification

were statements such as 'Stupid thing' (participant 1), 'What are you all about machine' (participant 6) or 'It [the machine] must have heard me' (participant 8). Participant 9 actually had 23 statements categorised as inadequate due to personification, although 22 of these statements were 'Come on machine'. Participants were alike in their responses, explaining personification as nothing more than statements made within a gambling establishment, which 'do not mean anything' (participants 1, 6, 8, and 9).

Skill and strategies: Skill and strategies contribute to the illusion of control and therefore erroneous beliefs. The six participants who considered themselves to be more skilful than others elaborated by saying that this was due to 'experience' (participants 5 and 6), or was 'mostly knowledge and understanding' (participants 1, 2, 3, and 4). For the few participants that stated they had strategies in the interview, such strategies were not actually specific strategies at all, with descriptions of strategies being 'I just stick to what I know' (participant 6), or 'I just make sure I play the ones I know' (participant 7). The last participant claiming to have strategies failed to elaborate on what these strategies actually were and rationally stated, 'bear in mind it's a machine at the end of the day; you're still going to either lose to it or come out winning' (participant 2).

Other inadequate responses addressed in interview: The sample were asked to explain other statements on the TAM or responses on the GBQ that were deemed inadequate, such as those relating to superstition (hunches, lucky signs, rituals), the gambler's fallacy, near wins, cause and effect, and flexible attribution. For example, participant 7, who said 'I shouldn't have jinxed myself and said that' during the TAM, and participant 3, who indicated on the GBQ that 'I believe rituals can help me win', were asked to explain their comments regarding superstition in the interview; see Figure 1. Figure 1 displays brief examples from the semistructured interview, and the response from participant 7 does not suggest that the participant held any superstitious beliefs, and participant 3 was clearly talking about rituals in relation to his Chinese cultural heritage, as opposed to do with gambling. These brief examples reflect many of the responses given by the sample when asked about possible erroneous cognitions that had been identified in the study.

Figure 1.

Sample of interview for participants 7 and 3 (researcher (R:) in plain, subject (S:) in **bold***).*

Participant 7
R: At one point during the gambling phase you said 'so far so good' and then when you landed on a question mark you then said 'I shouldn't have jinxed myself and said that'. Do you have any superstitious beliefs about gambling?

S: Em, not really, no.

R: Anything you can think of?

S: Just don't think you're, as they say don't think you've won until you've actually won, although I suppose that's not really superstitious.

Participant 3
R: You circled 2 for the item on the questionnaire 'I believe rituals can help me win', suggesting that this means something. So what are these rituals you're referring to?

S: Well, you see Chinese have, Chinese people have a saying of rituals right, as in like if you pray to this kind of, eh, Buddha statue, it brings you good luck, where if you do this by the New Year, the day before New Year, all the luck brings, it brings you all the good luck to you, that's what I meant by that.

R: Are you saying that's more a religious thing, rather than to do with gambling?

S: It is, it's more a, how would you say, it's like more of a, eh, tradition, you know, to other cultures, not really gambling.

Comparisons between pathological and social gamblers in terms of explaining inadequate statements: It was hypothesised that pathological gamblers would make more inadequate statements than social gamblers during the TAM and have higher scores on the GBQ, which they did. As a result they were asked more questions in the interview relating to these inadequate responses than were social gamblers. Comparisons, however, can be made between the two groups, with the pathological gambling group adequately explaining 61.0% (36 of 59) of responses categorised as inadequate, compared to the social gambling group who adequately explained 68.1% (32 of 47) of responses categorised as inadequate.

Reasons behind gambling: All five social gamblers indicated that they gambled mainly because of boredom, with two mentioning that they also gambled for excitement (participants 5 and 10). For the five pathological gamblers, three mentioned that they felt they were 'addicted' to gambling (participants 2, 3 and 9), one stated that he gambled because of the urge, i.e. impulsivity (participant 6) and the final gambler claimed to gamble for social reasons (participant 7). Mentions of escape, from boredom, problems in life and also from depression, were also made by four of the pathological gamblers (participant 3, 6, 7 and 9).

Discussion

In keeping with previous findings, pathological gamblers displayed a greater number of erroneous cognitions than did social gamblers in the TAM, GBQ, and interview, although in no case reaching significance. Coventry & Norman (1998) employed tighter criteria than previous studies and found that most verbalisations were neither rational nor irrational, but fell under the 'other' category. The present research employed a more comprehensive examination of gambling-related cognitions and likewise found that most statements made while gambling could not be viewed as irrational, but were simply descriptive. Furthermore, each individual was given the opportunity in the subsequent interview to explain responses that were deemed inadequate; e.g., if the participant had alluded to predictions or the confirmation of predictions during the TAM, or had repeatedly indicated that skill was important on the GBQ, then they were asked to explain why they had done so. When provided with this opportunity, the pathological and social gamblers were able to give adequate explanations for more than half of these supposedly irrational beliefs. What was clear from the study, even given the small sample size, was that multiple assessments are necessary to assess so-called erroneous cognitions.

The interview allowed participants the opportunity to highlight the advantages and disadvantages of the various methods of assessing erroneous cognitions, which may be beneficial for future research in this area. The TAM was considered a natural method for capturing exact thoughts instantaneously, which incontrovertibly is the main strength of this method. However, more than half the sample (n = 7) raised concerns about its usefulness,

considering it to be an 'anxiety-provoking', 'unfamiliar experience' requiring time to become accustomed to. Given that many studies are completed within about 15 minutes or less, with limited or no preparation time (Delfabbro & Winefield, 2000; Griffiths, 1994; Coulombe et al., 1992), it is questionable as to whether the participants had a suitable period of time to get adjusted to speaking aloud. To highlight this point, two of the participants made significantly more statements after the first 20 minutes of the study, explaining that only after this period of time had elapsed did they feel at ease with the TAM.

Other comments about the TAM included the difficulty associated with the knowledge of being recorded, and the fact that things may be said simply to fill in time. If participants in such experiments are simply saying anything to satisfy demand characteristics then irrationality may well be artifactual (Walker, 1992a). As the TAM is reliant upon the assumption that statements made are directly related to the gambler's thinking then such statements are not accurately measuring thoughts. Highlighting the potential problems associated with this approach, only three participants thought that the TAM was not difficult, and only one person considered their utterances to be completely reflective of their normal thoughts while gambling. Two pathological gamblers claimed in the interview that they did not think while gambling and described gambling as a form of escape from boredom and problems in life. Such gambling may function to fulfil escape as a maladaptive coping strategy employed to avoid thinking about life's problems, or anything else for that matter. As such the TAM may not be particularly revealing for this subset of pathological gamblers. In support of a criticism raised by Joukhador et al. (2003), the TAM was also deemed difficult because some people find it easier to instantly verbalise and express their thoughts than others.

The general consensus of the sample for the GBQ was that it was a useful instrument, being considered accurate and relevant to participants' gambling. It was viewed favourably as it allows the participants time to think about their responses (unlike the TAM) and it has a wide variety of choice. Therefore the GBQ was viewed by some as exploring a range of gambling beliefs including those which may not arise during a single gambling session and would not be captured by the TAM. However, a number of participants (n = 3) did indicate problems. One social gambler believed that some questions could be misinterpreted, and this point is supported by two pathological gamblers who thought that the questionnaire was alluding to a single gambling session. When asked in the interview why the two participants highly endorsed the items 'Eventually I can come out ahead from gambling' (item 3), ‘I’ve lost so much money I might as well keep going’ (item 36) and 'I can get my losses back' (item 41), both explained that a lot can happen in a single gambling session and they may be able to get their initial stake back, and possibly even more. Although it has been previously mentioned that timing may be an important factor in relation to responses on the GBQ, it may be that certain questions have to be phrased differently to ensure accurate responses. When subsequently informed that the questionnaire was referring to recouping the gambling losses they had accrued through their lives, both pathological gamblers responded that this would never happen. An important point to note is that although the items were clearly and rationally explained in the interview, they would have been deemed irrational in its absence. This echoes many of the statements made during the TAM and suggests that the high levels of so-called irrationality found in many studies may not be entirely accurate. Although there is no currently accepted instrument for measuring cognitive gambling beliefs (Joukhador, Blaszczynski, & MacCallum, 2004), the GBQ appears to be useful with it being considered either the best or second-best way to assess thoughts by all participants.

Regular gamblers have been found to make more references to skill or are more likely to consider themselves more skilful than nonregular gamblers (Coulombe et al., 1992; Griffiths, 1994). The same number of pathological and social gamblers (*n* = 3) in the study considered themselves to have greater skills than others, although two of the social gamblers also admitted having fewer skills than those with more experience of fruit machines. This was a common theme where skill was concerned, with participants often saying that skill was to a large extent the equivalent of experience or knowledge of machines, with one participant saying 'knowledge of the machine is a skill in itself'. Langer (1975) noted that success in skill tasks is controllable whereas success in luck or chance situations (such as gambling) is uncontrollable. The belief that the opportunity to utilise greater skill or knowledge will allow frequent fruit machine gamblers to win more money than less knowledgeable fruit machine gamblers could be construed as a prime example of the illusion of control. However it is accurate to an extent, with Moodie & Finnigan (2005) finding that in a sample with an equal amount of money provided to each participant, that frequent fruit machine gamblers (*n*=21) won more money than infrequent fruit machine gamblers (*n*=21) who in turn won more than non-gamblers (*n*=21). This would not be expected in a totally random situation.

It has to be stressed that fruit machines are not the equivalent of the video lottery terminals, slot machines, and poker machines found in Canada, the United States, and Australia, respectively, in which outcomes are randomly determined. There is a degree of skill (and predictability) involved in British fruit machines (Moodie & Finnigan, 2005; Parke & Griffiths, 2006), which does give the player a slight element of control. Parke & Griffiths (2006) provide a comprehensive overview of the structural characteristics of British fruit machines, highlighting both the skill involved in playing the machine and also in identifying which machine to play. This means that the amount of money won or lost on most fruit machines can be affected by how the individual plays the machine. Therefore, the problem with the pathological fruit machine gamblers in the present research is not that they are unable to discriminate between chance and skill situations, but as Griffiths (1994) points out, it seems that they believe there to be more skill involved in this form of gambling than there actually is.

Parke & Griffiths (2004) describe a derivation of the near miss called 'credit teasing', where a fruit machine player is confronted with an inviting situation on the last credit and is therefore encouraged to insert more money. Such inviting situations are numerous, including any repeat chances on cash awards or feature awards, and also trail holds and third holds (Parke & Griffiths, 2006). This idea of credit teasing appears to be a common feature of modern fruit machines, being mentioned by a social gambler and a pathological gambler. The pathological gambler made reference several times to the fact that he thought the machine was deliberately inducing him to put more money in to get a repeat or a third hold. Verbalisations such as 'it gees [gives] you a hold when you're down to your last 10 pence just so you keep playing it' were further investigated in the interview when once again the participant stated about the machine, 'I think it does that on purpose'. Griffiths (1994) categorised statements such as these as 'personification', which falls into the irrational category, as suggesting that a machine is intentionally doing something to someone gives it a human quality. When further explored the participant stated that he thought that fruit machines 'were rigged that way'.

Similarly, a social gambler often personified, or attributed human qualities to, a machine by suggesting it's 'having a laugh' or is 'at it' when in a losing situation. However, when given the opportunity in the interview to explain why he considered machines to have human-like qualities, the participant replied that 'the machine is programmed by a human, therefore it

must have human qualities to draw and attract humans'. These statements concerning personification were not deemed irrational as fruit machines are obviously cleverly designed, utilising psychological knowledge concerning the near miss, etc., to attract and be as engaging as possible for gamblers. In fact, most statements regarding personification were more straightforward than the examples previously mentioned, such as 'stupid thing', 'come on machine', and 'what are you all about machine'. These statements were adequately explained in the interview, and it is difficult to justify why they would be construed as irrational in the first place. This, however, is exactly what has been done in previous research.

Cognitive explanations of gambling suggesting that it is sustained by either the belief in winning (Walker, 1992b) or cognitive errors (Coulombe et al., 1992; Breen & Zuckerman, 1999) did not receive support in the study. As an example of this, all pathological gamblers rationally stated in the interview that they would never recoup their losses. Of the three pathological gamblers that stated that they felt they were addicted, one said 'when you're addicted you're not trying to win', with another saying 'sometimes you win, but mostly you're thinking I'm going to lose here'. Aside from mentioning addiction, the reasons underlying gambling behaviour predominantly centred on relieving boredom or escaping from problems. This merits attention because although the reward of winning money is central to cognitive theories, it has been found that only distraction from everyday problems significantly differentiates pathological from subthreshold gamblers (Cox, Enns, & Michaud, 2004). Gambling to relieve dysphoric states is frequently noted in the literature (Specker, Carlson, Edmonson, Johnson, & Marcotte, 1996; Blaszczynski, Wilson, & McConaghy, 1986), and importantly those gamblers seeking relief or escape often have little interest in winning (Rugle, 2004). Therefore, although cognitive factors seem to play a significant role in the development of gambling behaviour (Moodie & Finnigan, 2006; Delfabbro & Thrupp, 2003), they may be less salient in the maintenance of such problems. Once a person has reached a stage where gambling has a detrimental impact on areas of his or her life, escapist reasons may sustain the behaviour.

Limitations

The study has a number of limitations that may have affected the findings, such as the very small sample size employed, the uneven gender distribution, and the limited age range of the sample. The sample was also restricted to fruit machine gamblers, obtained from a single arcade in Glasgow, and as such the results cannot be generalised to other forms of gambling. The sample cannot be considered representative of those gambling on non-British electronic gaming machines either, as the outcomes on these machines are randomly determined.

Conclusions

The study found that although distorted cognitions or erroneous beliefs are evident within fruit machine gamblers, they are not as prominent as researchers favouring a cognitive model would suggest. Most studies assessing gambling-related thoughts falter through a number of methodological weaknesses (single forms of assessment, lab settings, use of only students or occasional gamblers, etc.), which limits the generalisability of their findings. Many studies only use the TAM, and problems with this method have been found with students (Walker, 1992a), nonstudents (Delfabbro & Winefield, 2000), and now active social and pathological gamblers. Little support was found for the notion that gamblers are

predominantly concerned with winning, and for pathological gamblers escapist reasons appeared to have a greater influence on gambling maintenance. Cognitive biases and erroneous beliefs do indisputably have a role in gambling, and any theoretical model of gambling (Sharpe, 2002; Blaszczynski & Nower, 2002; Griffiths & Delfabbro, 2001) not incorporating distorted cognitive biases would have limited explanatory power and as such could be considered untenable. It could be argued, however, that the reliance on a unitary cognitive model is equally untenable. Perhaps cognitive explanations of gambling should supplement alternative gambling theoretical models (Frank & Smith, 1989). Similar larger-scale future research thoroughly investigating erroneous cognitions and beliefs in different forms of gambling, using multiple assessments, could provide an insight into the true role they have in the development and maintenance of gambling behaviour.

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I. Adolescent problem gambling: Developing a gambling expectancy instrument

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Abstract

Positive and negative outcome expectancies have been found to play a significant role in adolescents' decisions to engage in drug and alcohol use. In light of the parallel risk and protective factors among high-risk behaviors, youth gambling outcome expectancies were explored through the development of the 23-item Gambling Expectancy Questionnaire (GEQ) using a sample of 1,013 students aged 12 to 18. The resulting GEQ consists of three positive expectancy scales (enjoyment/arousal, self-enhancement, money) and two negative expectancy scales (overinvolvement, emotional impact). The potential utility of this scale is discussed.
Key words: youth gambling, outcome expectancy, perceived benefits and risks

Introduction

Given the negative psychological, social, and economic consequences of gambling problems, it is essential to identify the factors that contribute to problem gambling behavior among youth. What is attracting young people to gambling activities and why do some develop problems when others do not? Jessor's (1998) *Adolescent Risk Behavior Model* conjectures that engagement in high-risk behaviors is determined by an interplay between psychosocial instigators (i.e., risk factors) and controls (i.e., protective factors), which can lead to health/life-compromising outcomes. These risk and protective factors interact in and across various domains—biology, social environment, perceived environment, personality, and behavior. The risk factors associated with adolescent high risk behaviours in general, and youth gambling problems in particular, have been well documented (Derevensky & Gupta, 2004; Gupta & Derevensky, 1998b; Hardoon, Derevensky, & Gupta, 2002; Langhinrichsen-Rohling, Rohde, Seeley, & Rohling, 2004; Stinchfield, 2000, 2004).

The common risk factors, however, cannot fully explain why some adolescents gamble excessively, just as they cannot fully explain why other youth develop drug or alcohol problems. As such, there must be specific reasons why an adolescent engages in gambling behavior. Social cognitive models of health behavior (e.g., Health Belief Model, Becker, 1974; Theory of Planned Behavior, Ajzen, 1991) place importance on proximal predictors of behavior, specifically the subjective cognitions related to behavior choice. As Osgood, Johnston, O'Malley, and Bachman (1988) suggest, each individual high-risk behavior, whether it is gambling, substance use, tobacco use, or unprotected sex, likely has its own specific determinants. The influence of risk and protective factors (i.e., common determinants) is thought to be mediated through these behavior-specific cognitions (Fishbein & Ajzen, 1975). As delineated in the substance use literature, the specific determinants of high-risk behavior often include the perceived positive and negative outcomes of behavior; personal, peer, and public approval/disapproval; and perceived role model behavior and accessibility (Johnston, 2003).

Within the gambling literature, the discussion of the specific determinants of youth gambling behavior has largely focused on societal attitudes and environmental characteristics. Wynne, Smith, and Jacobs (1996) attribute accessibility, availability, and acceptance as factors that account for the high prevalence rates of youth problem gambling. Wynne et al. (1996) propose that the multiplicity of gambling venues, lax regulations regarding proof of age to gamble, advertising that encourages gambling and minimizes its potential harmful effects, and adult attitudes that minimize the dangers of youth gambling are specific determinants that likely promote gambling among youth. In general, adults condone youth gambling, particularly the purchase of lottery tickets, as a harmless activity (Felsher, Derevensky, & Gupta, 2004; Gupta & Derevensky, 1997; Winters, Stinchfield, & Kim, 1995). Similarly, public policy and regulatory legislation foster an environment where gambling activities are socially accepted, encouraged, and actively promoted (Nower & Blaszczynski, 2004).

In contrast, little research has directly explored adolescents' beliefs about the consequences of gambling behavior, and, in turn, how these positive and negative outcome expectancies influence their gambling participation. In general, adolescents frequently disregard the potential negative consequences of high-risk behaviors (Clayton, 1992). Furthermore, they have been shown to be more attuned to the positive consequences that such experiences may yield (e.g., pleasure and excitement, peer approval, relaxation) (Moore & Gullone, 1996). Research in addictive behaviors suggests that the positive outcomes of addictive behaviors are often associated with perceived immediate positive outcomes and hence are more influential (Stacy, Widaman, & Marlatt, 1990). In keeping with social cognition theories, an individual's decision to engage in gambling activities may, to a certain extent, reflect the salience of their perceived positive outcomes and the denial of negative outcomes.

Outcome expectancies: Implications from drug and alcohol research

Findings from drug and alcohol research validate the importance of understanding the role of outcome expectancies in adolescents' decisions to engage in high-risk behavior. Perceptions of the harmfulness of a drug tend to be a leading indicator of future changes in use among young people. In many cases, shifts in the perceived risk of a drug, as recorded by the National Institute on Drug Abuse's large-scale *Monitoring the Future* surveys, have preceded inflections in actual use (Johnston, 2003). Similarly, a moderately strong correlation between the degree to which a substance is seen as dangerous and the percentage of youth that use it has been found (Johnston, O'Malley, & Bachman, 2001). Trends in perceived risks associated with a particular behavior have been touted as playing an important role in the decline of marijuana use in the 1980s and its increase in the 1990s (Johnston, 2003). Adolescents who see less risk of addiction to drugs are more likely to report experimentation and problems with drug use (Goldberg & Fischhoff, 2000). In comparison, in alcohol studies, beliefs about the beneficial effects of alcohol have been shown to be an important predictor of teen alcohol consumption (Goldberg, Halpern-Felsher, & Millstein, 2002). The perceived benefits of alcohol represent the strongest predictor of actual drinking among adolescents, above and beyond other factors, including the perceived risks of alcohol consumption, chronological age, and experience (Goldberg et al., 2002). Positive outcome expectancies have been found to be significantly and substantially better predictors of alcohol use than negative outcome expectancies (Stacy et al., 1990).

Related findings on gambling motives and risks

While the predictive utility of expectancy models has been examined within the alcohol and drug literature, related research in the field of gambling has largely focused on gambling motives. In general, the results of a number of studies suggest that individuals gamble for a variety of reasons. In particular, money, enjoyment, excitement, and social reasons are often cited as primary motivators and thus may be conceptualized as being strong positive outcome expectancies for adolescents and young adults (Gupta & Derevensky, 1998a; Neighbours, Lostutter, Cronce, & Larimer, 2002). Moreover, while the motives of enjoyment, money, and excitement were highly endorsed by all gamblers, more adolescent problem and pathological gamblers reported gambling to escape problems, to alleviate depression, to cope with loneliness, to relax, and to interact socially with others. However, these positive outcome expectancies may depend on an individual's level of gambling severity. The findings support the need for further exploration of how positive outcome expectancies may vary as a function of gambling severity.

Adolescents' beliefs regarding the risks associated with problem gambling have not been clearly delineated in previous research. The prevailing belief is that gambling is a mode of entertainment and that it has very few negative consequences (Winters, Arthur, Leitten, & Botzet, 2004). While the risks of gambling are extremely salient to researchers and clinicians working with pathological gamblers, it is likely that they are perceived quite differently among adolescents. The diagnostic criteria for gambling problems (e.g., DSM-IV) speak to the harm related to pathological gambling behaviors: significant financial losses, preoccupation and chasing behavior, cognitive and emotional turmoil, relational disruptions among friends and family members, stealing and other criminal acts, etc. (APA, 1994; Fisher, 2000). Whether or not adolescents are aware of these negative outcomes, however, remains unknown.

Developing a gambling expectancy questionnaire (GEQ)

By extrapolating from the gambling literature, as well as from the adolescent alcohol and drug literature, it seems plausible to suggest that adolescent gambling expectancies may encompass a diverse array of discrete biological, psychological, and social outcomes. From a biopsychosocial perspective, the expected positive outcomes of gambling likely include biological and arousal-related benefits (e.g., excitement, boredom, interest), cognitive and mood-related benefits (e.g., desire to win, enjoyment, coping, escape), and social benefits (e.g., money/power, conformity, autonomy) (Griffiths & Delfabbro, 2001). As noted, these themes have been endorsed as significant gambling motives in both adolescent and adult gambling studies (Gupta & Derevensky, 1998a; Neighbours et al., 2002; Platz & Millar, 2001). In contrast, the reality that gambling may be a costly activity, that it can promote negative feelings and thoughts, and that it can take a toll on one's relationships with friends and family members may be acknowledged by adolescents as well. The negative outcomes of financial costs, detrimental emotional effects, preoccupation, and relational disruptions should be considered as potential risks of gambling involvement, as they are empirically recognized as harmful consequences of problem gambling.

In order to assess the influence of outcome expectancies on gambling behavior, it is first necessary to develop a gambling expectancy instrument. Considering the success with which alcohol expectancy instruments have delineated the positive and negative outcome expectancies of adolescent drinking behavior (e.g., Alcohol Expectancy Questionnaire—Adolescent Version (AEQ-A), Brown, Christiansen, & Goldman, 1987; Comprehensive

Effects of Alcohol (CEOA), Fromme, Stroot, & Kaplan, 1993; Outcome Expectancy Questionnaire (OEQ), Leigh & Stacy, 1993) (see Table 1), they provide a useful framework for the development of a GEQ.

Table 1.

A comparison of scales used in alcohol expectancy instruments

	AEQ-A (Brown et al., 1987)	CEOA (Fromme et al.,1993)	AEQ (Leigh & Stacy, 1993)
Positive Expectancy Scales	• changes in social behavior • relaxation & tension reduction • enhanced sexuality • increased arousal • improved cognitive and motor abilities • global positive changes	• sociability • tension reduction • liquid courage • enhanced sexuality	• social gains • fun • tension reduction/ negative reinforcement • enhanced sexuality
Negative Expectancy Scales	• cognitive and motor impairments	• impairment • risk and aggression • self-perception	• social problems • emotional problems • physical problems • cognitive/performance difficulty

As such, a youth GEQ should incorporate the key features of previous expectancy measures used in alcohol research, in keeping with themes found in the current gambling literature. Many of the gambling expectancy themes (e.g., excitement, enjoyment, social enhancement, escape, social and emotional impairment, cognitive difficulties) are similar to those found in alcohol expectancy measures. Before the relationship between gambling outcome expectancies and gambling severity can be evaluated, a GEQ that effectively represents the positive and negative effects of gambling on adolescent behavior, mood, and emotions needs to be developed.

Method

Participants

Participants were 1,013 students [males = 432 (42.6%); females = 581 (57.4%)] from grades 7 to 11 (age range = 11–18; mean age = 14.77 years; *SD* = 1.52). The majority of these students lived in the greater Montreal area, with approximately 6% of the sample being obtained in the Ottawa area. The majority (99.1%) of the sample was 17 years of age or younger; these adolescents were legally prohibited from gambling on provincially regulated forms of gambling. Only 0.9% of the sample was of legal age to participate in provincially regulated gambling activities. Of the total adolescent sample, 70.3% of adolescents reported having gambled with money during the past 12 months. Of those participants who reported gambling, more males (82.4%) reported gambling than females (61.3%).

Approval was requested and obtained from four school boards in the greater Montreal area for participation. Individual high schools were then approached with a detailed proposal once school board approval was granted. In total, nine public high schools approved their students' participation in the study. In addition, students from three private schools in Montreal and one private school in Ottawa were included. A total of 13 schools, located in both urban and suburban areas and representing considerable variability in socioeconomic and cultural backgrounds, were included in this study.

Procedure

Derived from the gambling and alcohol literature, 48 items, referring to the multifaceted consequences of gambling, were presented in questionnaire form to students (see Appendix A). These risk and benefit items addressed the psychological, physiological, and behavioral outcomes associated with gambling involvement. Among statements considered to be benefits of gambling, items were created pertaining to one of seven themes that were empirically supported in the literature regarding gambling motives (Gupta & Derevensky, 1998a; Neighbours et al., 2002; Platz & Millar, 2001): money, mood enhancement/enjoyment, excitement/arousal, relief from boredom, social interaction, escape/tension reduction, and independence/autonomy. Among the risk statements, items pertained to one of four themes, created based on knowledge of adolescent gambling awareness, consequences associated with excessive gambling, and developmental concerns (APA, 1994; Fisher, 2000): financial cost, negative emotions, preoccupation, and relational disruptions. A 7-point Likert scale was employed to capture a wide range of expectancy strength: (1) no chance, (2) very unlikely, (3) unlikely, (4) neither likely nor unlikely, (5) likely, (6) very likely, and (7) certain to happen. Furthermore, items were pilot-tested for readability with a sample of 10 students (mean age = 16).

It should also be noted that a total of 34 focus groups (198 students, ages 12–18) were conducted in Ontario and Quebec to validate the themes represented by the gambling expectancy items before the final testing of the scale. Groups consisted of between four and nine students at the same grade level. The objectives of the focus groups were to explore the awareness of and participation in gambling activities, to identify the benefits that adolescents associate with gambling, and to identify the risks that adolescents associate with gambling. Adolescents cited a variety of benefits related to gambling; their responses were often characterized by complex combinations of several benefits. Money, excitement, enjoyment, boredom, competition/independence, social opportunities, and "coolness" were all suggested by adolescents. Although most youth did not cite escape as a benefit of gambling, a few youth did indicate an understanding of using gambling to cope or escape from problems. In addition, adolescents were able to enumerate several risks associated with gambling. Adolescents discussed the financial costs and potential illegal activity related to gambling, personal loss of control and preoccupation, relational problems, and gambling's toll on one's emotional and psychological wellbeing. Overall, the focus group discussions endorsed the salience of the seven risk and benefit themes originally generated for use in the questionnaire.

The questionnaire was group-administered to participants in classrooms and/or conference rooms by several trained research assistants. Groups ranged from 10 to 60 students, with the number of research assistants varying according to group size. Students were given a brief description of the types of questions that would be asked (e.g., "Some questions will ask you about your gambling behavior; some questions will ask you about what you expect to happen when you gamble") as well as instructions regarding the completion of the

questionnaire ("Please make sure to take your time and read all the questions and instructions carefully. Also make sure to fill in the circles completely with the pencil that has been provided"). Students were also given a definition of gambling to keep in mind when they responded ("Gambling is any activity that you play in which you are putting money, or something of monetary value, at risk since winning and/or losing is based on chance").

Research assistants were present at all times to answer all questions and concerns. Participants required approximately 35 minutes to complete the questionnaire. The remaining class time was used to debrief the participants about the aims of the study. During the remaining class time, research assistants also facilitated discussion about excessive gambling and its potential risks and negative consequences.

Results

Data analyses

The 48 gambling expectancy items were included in a principal components analysis (PCA) to reduce the items to a smaller number of variables. A Varimax rotation was used to simplify factors by maximizing the variance loadings across variables, with the spread in the factor loadings being maximized (Tabachnick & Fidell, 1996). Varimax rotation also reapportions variance among factors such that they become relatively equal in importance. PCAs were performed with expectancy items being removed until the criterion of simple structure was met, whereby several variables correlated highly with each other and only one factor correlated highly with each variable. Simple structures are beneficial as they allow for a more definite interpretation of factors. In addition, correlations between items were observed in order to further reduce the linearity between factors. Cronbach alphas were then calculated as an index of internal reliability for each factor/scale.

PCAs

All 48 gambling expectancy items were entered into the first PCA. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was estimated as .93, a value deemed excellent by Kaiser (1974). Large values of the KMO suggest that data reduction via factor analysis or PCA is beneficial, as observed correlations between pairs of items are likely explained by overarching variables. The PCA extracted seven factors with eigenvalues > 1. An examination of the rotated component matrix identified 17 items that loaded roughly equally (within 0.20 of each other) on more than one factor. These included items reflecting the themes of escape (five items), negative emotions (one item), relational disruptions (two items), financial costs (four items), boredom (one item), independence (one item), social interactions (one item), and arousal (two items). Again, these items were removed to avoid ambiguity in the interpretation of the factors (Tabachnick & Fidell, 1996).

A second PCA was performed using the 31 items that remained. This PCA extracted five factors with eigenvalues > 1. Examination of the rotated component matrix identified two items that loaded roughly equally (within 0.20 of each other) on more than one factor and one item that minimally loaded on one factor (< .50). These three items, which were removed from the analysis, reflected feeling sad or depressed and feeling like one's own person. A third PCA was run on the remaining 29 items, once again resulting in a five-factor model. However, correlations between created factors were found to be high (> .50) and thus bivariate correlations between items loading on different factors were analyzed in order to reduce linearity between factors. Six additional items were removed from the model

because their presence inflated correlations between scales. These items reflected themes of parental disapproval (two items), cognitive preoccupation, stress, financial losses, and boredom.

A final PCA was performed on the remaining 23 items, confirming a final model consisting of five factors. The five factors retained accounted for 66.8% of the overall variance in GEQ item scores, with three to eight loadings on each factor. The overall solution has a simple structure (Tabachnick & Fidell, 1996) and the final KMO was estimated as 0.90. The rotated principal components matrix is presented in Table 2.

Table 2.

Rotated factor loadings on the GEQ

	Component				
GEQ Items	**1**	**2**	**3**	**4**	**5**
I have fun.	**.736**			–.223	.247
I feel more relaxed.	**.634**	.206			.114
I stop being bored.	**.744**	.101	.153		
I feel excited.	**.790**	.159	.152		
I spend time with people I like.	**.615**	–.210	.118		
I feel a rush.	**.575**	.183	.212	.371	
I enjoy myself.	**.703**		.255	–.272	.153
I have a good time.	**.704**		.234	–.281	.215
I only want to spend time with people who gamble.		**.718**	.152	.117	
I feel like gambling all of the time.	.150	**.835**	.108	.114	
I want to gamble more and more.		**.864**	.184	.206	
I get hooked.		**.853**	.141	.22	

				2	
I'm not able to stop.		**.774**	.205	.221	
My friends and classmates think I'm cool.	.222		**.715**		.129
I feel powerful.	.206	.285	**.757**	.108	.172
I feel in control.	.243	.220	**.703**		.183
I'm more accepted by people.	.131	.204	**.717**	.133	
I feel guilty.	–.176	.200		**.834**	–.110
I feel in over my head.		.311		**.815**	
I feel ashamed of myself.	–.236	.352		**.738**	
I make a profit.	.406				**.742**
I win money.	.286		.119		**.812**
I get rich.			.305		**.754**

1 = enjoyment/arousal, 2 = overinvolvement, 3 = self-enhancement, 4 = emotional impact, 5 = money
Only factor loadings >│.1│ are displayed.

Based on the rotation sums of squares loadings, the first factor accounted for 18.9% of the variance in item scores. Variables that loaded onto the first factor mainly reflected the gambling benefits of enjoyment, arousal, and entertainment. This factor was labeled *enjoyment/arousal*. The second factor accounted for 16.9% of the variance in item scores. Items that loaded highly on this factor reflected the gambling risks of cognitive, affective, and social preoccupation with gambling. This factor was termed *overinvolvement*. The third factor accounted for 11.3% of the variance in item scores. This factor reflected the gambling benefits of feeling in control, feeling powerful, and feeling more accepted by peers; it was labeled *self-enhancement*. The fourth factor accounted for 10.8% of the variance in item scores. This factor reflected negative emotions (guilt, shame, loss of control) as a result of gambling; it was labeled *emotional impact*. Finally, the fifth factor accounted for 8.9% of the variance in item scores, reflecting the benefit of financial gain as a result of gambling; it was labeled *money*. A correlation matrix of the five factors is provided in Table 3.

Table 3.

Correlation matrix for the five factors of the GEQ

	Enjoyment / Arousal	Self-Enhancement	Money	Over-involvement	Emotional Impact
Enjoyment/ arousal	1	.479**	.495**	.186**	–.177**
Self-enhancement	.479**	1	.432**	.441**	.155**
Money	.495**	.432**	1	.120**	–.166**
Over-involvement	.186**	.411**	.120**	1	.498**
Emotional impact	–.177**	.155**	–.166**	.498**	1

** Correlation is significant at the .01 level (2-tailed), *N* = 1004.

Internal consistency

Cronbach alpha coefficients were calculated for each of the five factors: enjoyment/arousal (α = .86), overinvolvement (α = .91), self-enhancement (α = .81), emotional impact (α = .85), and money (α = .78). Each of these interitem alpha coefficients represents adequate to good internal reliability (Cronbach, 1951).

Examination of frequencies revealed a significant positive skew for self-enhancement, overinvolvement, and emotional impact. However, the transformations applied to these distributions (logarithmic and square root transformations) could not establish univariate normality.

Discussion

The primary goal of this study was to develop an instrument to measure youth gambling outcome expectancies. Forty-eight gambling expectancy items representing 11 benefit and risk themes—money, excitement/arousal, enjoyment, boredom, social interaction, independence, escape/tension reduction, financial costs, preoccupation, negative emotional effects, and relational disruptions—were presented to participants. The resulting 23-item GEQ consists of three discrete scales of positive outcome expectancies (enjoyment/arousal, self-enhancement, money) and two discrete scales of negative outcome expectancies (overinvolvement, emotional impact). The retained items of the GEQ are presented in Table 4.

Table 4.

GEQ items

Positive Outcome Expectancies		
Enjoyment/Arousal	Self-Enhancement	Money
• I have fun. • I feel more relaxed. • I stop being bored. • I feel excited. • I spend time with people I like. • I feel a rush. • I enjoy myself. • I have a good time.	• My friends and classmates think I'm cool. • I feel powerful. • I feel in control. • I'm more accepted by people.	• I make a profit. • I win money. • I get rich.
Negative Outcome Expectancies		
Overinvolvement	Emotional Impact	
• I only want to spend time with people who gamble. • I feel like gambling all the time. • I want to gamble more and more. • I get hooked. • I'm not able to stop.	• I feel guilty. • I feel as if in over my head. • I feel ashamed of myself.	

Scale construction

The original 48 gambling expectancy items used to develop the GEQ touched upon a diverse array of bio-psycho-social outcomes empirically related to gambling involvement. While alcohol expectancy scales were used as a template (AEQ-A, Brown et al., 1987; CEOA, Fromme et al., 1993; OEQ, Leigh & Stacy, 1993), gambling items were chosen based on the clarity with which they depicted the target theme, as well as their consistency with related items. Items reflecting seven gambling benefit themes—money, excitement, enjoyment, boredom, escape/tension reduction, social interaction, and independence—were originally selected based on their endorsements as gambling motives in both adolescent and adult gambling studies (Gupta & Derevensky, 1998a; Neighbours et al., 2002; Platz & Millar, 2001). Similarly, items reflecting four gambling risk themes—financial cost, negative emotional effects, preoccupation, and relational disruptions—were used as they denoted the recognized signs of problem gambling (APA, 1994). Of the 48 items entered into the original factor analyses, 23 items were retained and included in the GEQ.

The three positive expectancy scales of the resulting GEQ reflect a combination of the benefit themes originally suggested to participants. In keeping with previous research (Gupta & Derevensky, 1998a; Neighbours et al., 2002), adolescents viewed money as a distinct positive outcome of gambling; all three items that were used to denote money-making possibilities remained representative of the construct and encompassed the money scale. The complexity of items found within the enjoyment/arousal and self-enhancement scales, however, suggest that other positive outcome expectancies of gambling are not as discrete. The enjoyment/arousal scale includes items denoting enjoyment, excitement, relief from boredom, escape/tension reduction, and social interaction. The structure of the enjoyment/arousal scale suggests that adolescents anticipate and view gambling as a socially acceptable form of entertainment, an activity that holds the potential to stimulate high levels of excitement while simultaneously relieving stress as a form of escape. Adolescents positively perceive gambling as a diversion from the tediousness of daily life. Moreover, gambling activities serve to facilitate social interactions with friends and/or family. The self-enhancement scale includes items reflecting potential outcomes of social gains as well as independence. The composition of the self-enhancement scale suggests that adolescents further perceive gambling as providing an opportunity to feel good about themselves and to assert their own importance by impressing others and/or by establishing autonomy from others. The self-enhancement scale represents a new way of viewing gambling from an adolescent perspective, one that was not fully identified in previous research with adolescent and college-age samples (Gupta & Derevensky, 1998a; Neighbours et al., 2002; Platz & Millar, 2001).

Noticeably absent from the positive expectancy scales of the GEQ are five of the six escape/tension reduction items thought to be an important determinant of problem gambling. At the outset of the analyses, escape-related items loaded equally on both positive and negative expectancy scales and therefore were removed. On one hand, "escape" was perceived as a negative outcome of gambling, as adolescents perceived potential danger in being able to escape problems through gambling; on the other hand, adolescents also perceived the benefit of escaping problems through such an activity and entering into a dissociated state as a positive attribute. Since the measure was developed based on the pooled responses of all adolescents, it is likely that these discrepancies are a result of the divergent perceptions of non-problem gamblers and problem gamblers (Gupta & Derevensky, 1998a). Due to factor analytic techniques employed in the development of the GEQ, differences based upon degree of gambling severity on such escape-related items were not examined. Further research is therefore warranted to define their perceived meaning as an expectancy construct among adolescents.

The two negative outcome expectancy scales represent both the cognitive-behavioral and emotional risks associated with gambling. The overinvolvement scale includes items originally conceptualized as representing the themes of preoccupation and relational disruptions. The scale generally reflects a loss of control over gambling, behaviorally, psychologically, and socially. In comparison, the emotional impact scale consists of items representing the negative emotions resulting from excessive gambling. The scale reflects the toll gambling may take on an individual's emotional wellbeing, sense of self, and mental health (Potenza, Kosten, & Rounsaville, 2001).

Surprisingly, adolescents did not perceive the financial costs of gambling as a discrete negative outcome expectancy. Items reflecting the risk of losing money loaded approximately equally on all negative outcome expectancy scales at the outset of the analyses and were therefore removed. These analyses suggest that adolescents perceive

the risk of losing money as being parallel to the cognitive, behavioral, and emotional risks of gambling. Intuitively, the financial cost of gambling is a negative outcome, yet the results of the factor analysis suggest that it may not be distinct from other types of negative gambling outcomes in the minds of adolescents. Similar conclusions can be made for items targeting the risk of relational problems. Items reflecting the loss of trust and approval from family and friends loaded equally across the negative outcome expectancy scales; the items failed to fall within one scale. One can propose that although adolescents perceive the negative impact that gambling can have on one's relationships with family and friends, it is also subsumed within other negative gambling outcomes.

The resulting GEQ includes many of the same themes found in alcohol expectancy scales (AEQ-A, Brown et al., 1987; CEOA, Fromme et al., 1993; OEQ, Leigh & Stacy, 1993). Adolescents expect similar positive outcomes from gambling as they do from drinking alcohol—social interactions and peer acceptance, entertainment, relaxation, and increased arousal and excitement. Likewise, they also perceive comparable negative outcomes—emotional and social problems and cognitive and behavioral difficulties. In contrast, money and independence outcomes were found to be specific to gambling activities.

The GEQ provides us with a better understanding of how adolescents perceive both the positive and the negative outcomes of gambling behavior. Although some of the original risk and benefit themes are not included within the final instrument, the clustering of items within each scale meaningfully represents the complexity of adolescents' perceived outcome expectancies. For example, adolescents do not simply perceive excitement in gambling, nor do they discretely perceive the potential for social interactions or enjoyment. Instead, as demonstrated by the enjoyment/arousal scale, they perceive a complex combination of positive outcomes that are related to each other and cannot be teased apart. Therefore, not only are the internal and empirical validities of the measure intact, but the external validity of the GEQ is strong as well.

These findings support the need for further research in the area of youth gambling outcome expectancies. In particular, it is important to explore the salience of these positive and negative outcome expectancies across age, gender, and degree of gambling-related problems. It is likely that using this scale provides a viable method of understanding and explaining why some individuals engage in gambling to excess, why most gamble responsibly, and why others choose not to gamble at all.

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Appendix A

Benefit Themes

Money

1. I get rich.

2. I win money.

3. I make a profit.

Enjoyment

1. I enjoy myself.

2. I have fun.

3. I feel good.

4. I have a good time.

Excitement/Arousal

1. I feel a rush.

2. I get a thrill out of gambling.

3. I feel excited.

Boredom

1. I will pass time.

2. I will deal with boredom.

3. I will stop being bored.

Social Interactions

1. I spend time with friends and family.

2. I am surrounded by similar people.

3. I spend time with people I like.

4. I feel more accepted by people.

5. My friends and classmates think I am cool.

Escape/Tension Reduction

1. I feel more relaxed.

2. I take my mind off my problems.

3. I escape my problems.

4. I shut the world out.

5. I am distracted from my life.

6. I forget things I want to forget.

Independence/Autonomy

1. I feel independent.

2. I feel in control.

3. I feel powerful.

4. I feel like my own person.

Risk Themes

Financial Costs

1. I lose all my money.

2. I spend more money than I want to.

3. I spend more money than I should.

4. I have no money left.

Negative Emotional Effects

1. I feel ashamed of myself.

2. I feel guilty.

3. I feel sad or depressed.

4. I feel anxious or tense.

5. I feel stressed.

Preoccupation/Loss of Control

1. I want to gamble more and more.

2. All I think about is gambling.

3. I get hooked.

4. I'm not able to stop.

5. I feel in over my head.

6. I want to gamble all the time.

Relational Disruptions

1. My family gets upset.

2. I lose friends.

3. I lose the trust of my friends/family.

4. I only want to spend time with people who gamble.

5. My parents do not approve.

II. The utility of outcome expectancies in the prediction of adolescent gambling behaviour

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Abstract

The Gambling Expectancy Questionnaire (GEQ; Gillespie, Derevensky & Gupta, 2006, previous article) suggests that adolescents hold a variety of positive and negative outcome expectancies related to gambling. Significant age, gender, and DSM-IV-MR-J gambling group differences were identified on the scales of the GEQ (i.e., enjoyment/arousal, self-enhancement, money, overinvolvement, emotional impact) in this study. Direct logistic regression among adolescent gamblers was performed separately for males and females to predict group membership in either social or problem gambling categories. The results provide insightful information suggesting that non-gamblers, social gamblers, at-risk gamblers, and probable pathological gamblers (PPGs) differ in the strength of their expectancies of both the positive and negative outcomes of gambling behaviour. In particular, PPGs highly anticipate both the positive and negative outcomes of gambling. Among males, these perceptions differentiate those who gamble excessively and those who do not. For females, outcome expectancies may have less predictive value. These findings were interpreted in terms of their implications for prevention, treatment, and future research.
Key words: youth gambling, outcome expectancy, perceived benefits and risks

Introduction

Social cognitive models of health behaviour (e.g., Health Belief Model, Becker, 1974; Theory of Planned Behavior, Ajzen, 1991) place importance on the subjective cognitions implicated in behaviour choice. Some researchers have argued that youth engage in potentially risky behaviours, like gambling, primarily because of the perceived benefits (e.g., pleasure, entertainment, excitement, peer approval, and relaxation) (Moore & Gullone, 1996). Accordingly, adolescents may fail to consider the potential costs and negative consequences of such behaviour, thereby underestimating the related risks (Clayton, 1992). Thus, in keeping with social cognition theories, an individual's decision to engage in gambling likely reflects the differential salience of its positive and negative outcomes. What youth expect to gain (i.e., positive expectancies) as well as what they expect to lose (i.e., negative expectancies) from their gambling is likely to play a significant role in their decisions to initiate and maintain their gambling behaviour.

Recent studies of drug and alcohol outcome expectancies suggest that the beliefs and perceptions an adolescent holds about the positive and negative outcomes of drugs or alcohol use play a critical role in their decisions to initiate and to maintain these high-risk behaviours (Brown, Christiansen, & Goldman, 1987; Fromme & D'Amico, 2000; Goldberg & Fischhoff, 2000; Goldberg, Halpern-Felsher, & Millstein, 2002; Johnston, 2003; Johnston, O'Malley, & Bachman, 2001; Leigh & Stacy, 1993; Stacy, Widaman, & Marlatt, 1990). In particular, outcome expectancies have been shown to play an integral role in the maintenance of alcohol use, and they have been used to predict how serious an individual's involvement in a high-risk activity may become (Brown et al., 1987; Fromme & D'Amico, 2000; Goldberg & Fischhoff, 2000; Leigh & Stacy, 1993; Stacy et al., 1990). More

specifically, much of the adolescent alcohol literature highlights positive expectancies (i.e., beliefs about the beneficial effects of alcohol) as better predictors of teen alcohol consumption than negative expectancies (Goldberg et al., 2002; Stacy et al., 1990). The more positive one's expectations of the outcome of drinking behaviour, the more heavily one drinks, and the greater the likelihood for alcohol-related problems (Fromme & D'Amico, 2000).

To date, little research has explored adolescents' perceptions of the consequences of gambling behaviour. Likewise, very few studies have directly examined how these positive and negative outcome expectancies influence adolescent gambling participation. Although the identification of gambling outcome expectancies is only one small piece of the much larger puzzle of predicting and preventing problem gambling, it is a piece that is currently missing. As such, its exploration as a line of inquiry may have the potential to inform future prevention and treatment initiatives.

As a means to extend outcome expectancy research into the field of youth gambling, Gillespie, Derevensky, and Gupta (2006, previous article) recently sought to develop a Gambling Expectancy Questionnaire (GEQ) that could evaluate the strength of adolescents' positive and negative outcome expectancies of gambling. Alcohol expectancy instruments served as a template for the development of the instrument. From an analysis of adolescents' endorsements of 48 gambling expectancy items, representing the diversity of gambling's biopsychosocial risks and benefits (American Psychiatric Association, 1994; Fisher, 2000; Griffiths & Delfabbro, 2001; Gupta & Derevensky, 1998a; Neighbours, Lostutter, Cronce, & Larimer, 2002), five distinct outcome expectancy constructs emerged and thus were represented as the five scales of the GEQ. Adolescents perceived enjoyment/arousal, self-enhancement, and money as salient yet discrete positive outcomes of gambling. In other words, youth anticipate a combination of enjoyment, excitement, and social opportunities from gambling (i.e., enjoyment/arousal). They also perceive gambling as an opportunity to feel good about themselves, either by impressing their peers or by establishing autonomy from others (i.e., self-enhancement). Moreover, they anticipate making money from gambling activities (i.e., money). Conversely, adolescents also perceived two distinct negative outcomes associated with gambling. Adolescents' responses reflected their understanding of the potential for preoccupation with gambling and the relational disruptions that may take place as a consequence (i.e., overinvolvement). They also clearly anticipated a potential negative emotional impact from gambling (i.e., emotional impact).

The recent development of the GEQ provides an opportunity to explore the salience of these outcome expectancies for adolescents differing in age, gender, and gambling severity. While the predictive utility of expectancy models has been well documented in relation to alcohol and drug use, both from an applied and a preventative research perspective, virtually no studies have empirically examined how outcome expectancies operate to predict gambling severity among adolescents. Given the commonalities found in the risk and protective factors among adolescent alcohol use, drug use, and gambling behaviour (Dickson, Derevensky, & Gupta, 2002), it is reasonable to suggest that the positive and negative effects that adolescents associate with gambling may help predict excessive gambling behaviour. It is expected that youth gambling outcome expectancies will differ among those who gamble excessively, those who are able to gamble responsibly, and those who choose not to gamble at all. Similarly, these behaviour-specific cognitions may differentiate social gamblers (i.e., non-problem gamblers) and problem gamblers.

Method

Participants

Participants were 1,013 students (males = 432 (42.6%); females = 581 (57.4%)) from grades 7 to 11 (age range = 11–18; mean age = 14.77 years; *SD* = 1.52). The majority of these students resided in the greater Montreal area, with approximately 6% of the sample being obtained in the Ottawa area. The majority (99.1%) of the sample was 17 years of age or younger, and thus legally prohibited from gambling on provincially regulated forms of gambling. Only 0.9% of the sample was of legal age to participate in provincially regulated gambling activities.

Approval was requested and obtained from four school boards in the greater Montreal area for participation. Individual high schools were then approached with a detailed proposal once school board approval was granted. In total, nine public high schools approved their students' participation in the study. Students from three private schools in Montreal and one private school in Ottawa were also included. A total of 13 schools, located in both urban and suburban areas and representing considerable variability in socioeconomic and cultural backgrounds, were included in this study.

Measures

Gambling Activities Questionnaire—Adapted (GAQ) (Gupta & Derevensky, 1996). The GAQ is designed to assess four general domains related to gambling behaviour: descriptive information including prevalence, types of activities, frequency of gambling, amount wagered, and social factors; cognitive perceptions about the amount of skill and luck involved in various gambling and nongambling activities; familial gambling and parental gambling behaviour; and comorbidity with other addictive and delinquent behaviours. For this study, a modified version of the GAQ was employed that included descriptive information regarding the frequency of gambling behaviour across various types of activities.

DSM-IV-MR-J (Fisher, 2000). This 12-item, 9-category instrument is a screen for pathological gambling during adolescence. It has been modeled upon the DSM-IV (APA, 1994) criteria for diagnosis of adult pathological gambling. An earlier version (DSM-IV-J) (Fisher, 1992) has been used by several researchers and was found to be the most conservative measure of pathological gambling among adolescents (Derevensky & Gupta, 2000; Gupta & Derevensky, 1998a, 1998b; Marget, Gupta, & Derevensky, 1999; Powell, Hardoon, Derevensky, & Gupta, 1999; Volberg, 1998). The revised version, DSM-IV-MR-J (MR = multiple response, J = juvenile) was developed for use with adolescents that have gambled over the past year. It assesses a number of important variables related to pathological gambling: progression, preoccupation, tolerance, withdrawal, loss of control, escape, chasing losses, deception, illegal activity, and family/school disruption.

GEQ (Gillespie et al., 2006). The 23-item GEQ comprises five discrete scales representing three positive outcome expectancies—enjoyment/arousal (α = .86), self-enhancement (α = .81), and money (α = .78)—and two negative outcome expectancies—overinvolvement (α = .91) and emotional impact (α = .85). For each scale, items are scored on a 7-point Likert scale ranging from 1 (no chance) to 7 (certain to happen), with a neutral middle point 4 (neither likely nor unlikely). The enjoyment/arousal scale consists of eight items denoting enjoyment, excitement/arousal, boredom, escape/tension reduction, and social interaction.

The self-enhancement scale includes four items representing the themes of social acceptance and independence, while the money scale consists of three items denoting the theme of gambling to make money. The overinvolvement scale is composed of five items representing the negative themes of preoccupation and relational disruptions and the emotional impact scale is composed of three items denoting gambling's negative emotional effects. As a result of the combination of benefit and risk themes comprising each of its five subscales, the GEQ reflects the intricacy of adolescents' gambling outcome expectancies.

Procedure

The GEQ was group-administered to participants in classrooms and/or conference rooms by several trained research assistants. Groups ranged from 10 to 60 students, with the number of research assistants varying according to group size. Students were provided with a brief description of the types of questions that would be asked (e.g., "Some questions will ask you about your gambling behaviour; some questions will ask you about what you expect to happen when you gamble") as well as instructions regarding the completion of the instrument ("Please make sure to take your time and read all the questions and instructions carefully. Also make sure to fill in the circles completely with the pencil that has been provided"). Students were also given the following definition of gambling to keep in mind when they responded: "Gambling is any activity that you play in which you are putting money, or something of monetary value, at risk since winning and/or losing is based on chance."

Results

Data analyses

The prevalence of gambling participation among adolescents was analyzed using descriptive statistics. For these analyses, the age variable was recoded into two categories: younger adolescents (11–14 years; n = 391) and older adolescents (15–18 years; n = 617). A 2 (gender) × 4 (DSM groups) × 2 (age) factorial analysis of variance was performed in order to assess group differences on the five scales of the GEQ: enjoyment/arousal, self-enhancement, money, overinvolvement, and emotional impact. The Dunnett's C Post Hoc test, which does not assume equality of variances, was used to compare mean differences between students based upon four gambling categories: non-gamblers, social gamblers (DSM-IV-MR-J = 0–1), at-risk gamblers (DSM-IV-MR-J = 2–3), and probable pathological gamblers (PPGs) (DSM-IV-MR-J ≥ 4). Since one factorial ANOVA was performed for each scale (total = 5), the alpha level was set at $p < .01$ for each analysis. Nonparametric tests were used to validate the findings of the univariate analyses due to the nonnormal distributions of the five GEQ scales. The Kruskal–Wallis statistic was used to test differences based on the severity of gambling problems, and a two-sample Kolmorov–Smirnov test was used for gender and age variables. All of the nonparametric tests yielded the same results as the parametric tests.

The final goal of this research was to begin to identify which outcome expectancies differentiate youth who gamble with no associated difficulties from those who are developing or have gambling problems. Therefore, for youth participating in gambling activities, direct logistic regression analysis was performed using the scales of the GEQ to predict group membership: social gambler (DSM-IV-MR-J = 0–1) or problem gambler (at-risk gamblers and PPGs, DSM-IV-MR-J = 2–9). Direct logistic regression was undertaken to evaluate the contribution made by each predictor over and above that of the other predictors (Tabachnick

& Fidell, 1996). Given that the criterion variable, group membership, is dichotomous and that the distributions of the independent variables (the five scales of the GEQ) are not likely to satisfy the assumptions of normality, logistic regression analysis is preferred to discriminant analysis (Tabachnick & Fidell, 1996). It should be noted that when used with dichotomous variables, like diagnostic categories, discriminant analysis tends to overestimate the magnitude of association (Davis & Offord, 1997) and may lead to the inclusion of too many predictor variables in the regression equation.

Prevalence findings

Of the total adolescent sample, 70.3% reported having gambled with money over the past 12 months. Of those participants who reported gambling, more males (82.4%) reported gambling than females (61.3%). Based upon gambling behaviour and the DSM-IV-MR-J criteria, overall, 5.0% of youth met the criteria for probable pathological gambling (scores of ≥ 4), 10.9% of the sample were considered at risk for pathological gambling (scores of 2–3), and 54.4% were considered to be social gamblers (scores of 0–1). More males gambled than females, and they also exhibited a higher prevalence of gambling-related problems: the rates for probable pathological gambling (9.3%) and at-risk gambling (18.3%) among males were greater than those for females (1.9% and 5.3%, respectively). Similarly, the rates of probable pathological gambling (6.5%) and at-risk gambling (11.5%) among older adolescents were higher than those for younger adolescents (2.8% and 9.7%, respectively). Gambling participation rates are reported in Table 1.

Table 1.

Gambling participation rates (past year) for the total sample

	Non-gambler		**Social**		**At-Risk**		**PPGs**	
Total sample	29.7%		54.4%		10.9%		5.0%	
	n	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Male	76	17.6	237	54.9	79	18.5	40	9.3
Female	225	38.7	314	54.0	31	5.3	11	1.9
Ages 11–14	139	35.5	203	51.9	38	9.7	11	2.8
Ages 15–18	161	26.1	345	55.9	71	11.5	40	6.5

An independent samples *t*-test was performed to test for age differences across gender. Although the mean difference of .12 was statistically significant [$t(953) = 3.82$, $p < .05$], its clinical meaningfulness is questionable, as it is most likely attributable to the large sample size of the study.

Factorial ANOVA among DSM gambling groups, gender, and age groups

Significant main effects of gambling severity were found on all scales of the GEQ: enjoyment/arousal [$F(3, 986) = 23.29$, $p < .01$, partial $\eta^2 = .066$], self-enhancement [$F(3, 986) = 5.70$, $p < .01$, partial $\eta^2 = .017$], money [$F(3, 986) = 18.34$, $p < .01$, partial $\eta^2 = .053$], overinvolvement [$F(3, 986) = 4.99$, $p < .01$, partial $\eta^2 = .015$], and emotional impact [$F(3, 986) = 26.21$, $p < .01$, partial $\eta^2 = .074$].

On each of the three positive expectancy scales, PPGs and at-risk gamblers endorsed items on the enjoyment/arousal, self-enhancement, and money scales more highly than social gamblers and non-gamblers. Similarly, social gamblers endorsed the enjoyment/arousal and money scales more positively than non-gamblers. In terms of negative expectancies, non-gamblers endorsed the emotional impact scale more highly than social gamblers, at-risk gamblers, and PPGs; non-gamblers also endorsed the overinvolvement scale more highly than social gamblers. PPGs differed significantly from social gamblers and at-risk gamblers in their endorsement of the overinvolvement scale. Mean scores of the Dunnett's C Post Hoc results are summarized in Table 2.

Table 2.

DSM gambling group differences on the five scales of the GEQ

	Non-gamblers (1)		Social (2)		At-Risk (3)		PPGs (4)		Post Hoc
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
Enjoyment/ arousal*	3.97	1.25	4.55	1.12	5.09	.93	5.40	.99	4, 3 > 2 > 1
Self-enhancement*	2.78	1.27	2.88	1.28	3.36	1.16	3.59	1.41	4, 3 > 1, 2
Money*	3.27	1.12	3.66	1.11	4.27	1.16	4.59	1.25	4, 3 > 2 > 1
Over-involvement*	2.89	1.63	2.47	1.45	2.58	1.27	3.58	1.49	4 > 2, 3 1 > 2
Emotional impact*	4.18	1.68	2.97	1.60	2.72	1.48	3.00	1.80	1 > 2, 3, 4

*$p < .01$
Range of scores: 1–7

A significant main effect of gender was found for enjoyment/arousal [$F(1, 986) = 16.89$, $p < .01$, partial $\eta^2 = .017$], money [$F(1, 986) = 12.28$, $p < .01$, partial $\eta^2 = .012$], and emotional impact [$F(1, 986) = 16.74$, $p < .01$, partial $\eta^2 = .017$]. Males were found to have endorsed the two positive expectancy scales, enjoyment/arousal and money, more positively than females. On the negative expectancy scale of emotional impact, however, females reported higher scores than males (see Table 3 for the means for both males and females on all scales).

Table 3.

Gender differences on the GEQ

	Male		Female	
	M	*SD*	*M*	*SD*
Enjoyment/arousal*	**4.78**	**1.16**	**4.26**	**1.19**
Self-enhancement	2.96	1.33	2.92	1.25
Money*	**3.92**	**1.24**	**3.46**	**1.09**
Overinvolvement	2.46	1.36	2.81	1.60
Emotional impact*	**2.71**	**1.58**	**3.74**	**1.69**

*$p < .01$
Range of scores: 1–7

Developmentally, statistically significant differences were found among adolescents for enjoyment/arousal [$F(1, 986) = 8.94$, $p < .01$, partial $\eta^2 = .009$] and emotional impact [$F(1, 986) = 12.58$, $p < .01$, partial $\eta^2 = .013$]. Older adolescents endorsed the positive expectancy scale of enjoyment/arousal more highly than younger adolescents, who were more perceptive of the negative outcome of emotional impact (see Table 4 for age differences).

Table 4.

Developmental differences on the GEQ

	Ages 11–14		Ages 15–18	
	M	*SD*	*M*	*SD*
Enjoyment/arousal*	**4.13**	**1.29**	**4.71**	**1.09**
Self-enhancement	2.88	1.34	2.97	1.26
Money	3.50	1.26	3.76	1.11
Overinvolvement	2.66	1.60	2.66	1.46
Emotional impact*	**3.69**	**1.81**	**3.05**	**1.61**

* $p < .01$
Range of scores: 1–7

A significant interaction between gender and age was found on the enjoyment/arousal scale [$F(1, 986) = 20.73$, $p < .01$, partial $\eta^2 = .021$]. A significant difference was found between female adolescents aged 11–14 years and those aged 15–18 years. Older females (M = 4.61) endorsed items significantly more highly on the enjoyment/arousal scale than younger females (M = 3.82).

Logistic regression analyses

Direct logistic regression was used to identify which combination of scales of the GEQ best predicts category membership; social gambler or problem gambler. Separate direct logistic regression analyses were performed for males and females because of their distinct behavioural characteristics. For these analyses, the DSM criteria for social gamblers and problem gamblers (i.e., at-risk gamblers and PPGs) served as the criterion variable while four of the five GEQ scales and the age variable (two levels: 11–14, 15–18) were used as the predictor variables. In keeping with the previous univariate analyses, in which there were no significant differences found among social gamblers, at-risk gamblers, and PPGs mean scores on the emotional impact scale, the emotional impact variable was considered unrelated to the dependent variable of problem gambling group membership and was therefore not included in the logistic regression analyses discussed here. Age was included in the analysis because some developmental differences were observed in the univariate analyses. The age variable was entered into the analysis as its own block (block 1), while the remaining predictor variables were entered simultaneously into the logistic regression analysis as block 2. A less stringent criterion for significance was used, in the range of .05 to .10, as recommended by Hosmer and Lemeshow (1989).

For males, the results of the direct logistic regression indicated that the GEQ scales of enjoyment/arousal, self-enhancement, money, and overinvolvement all significantly contribute to the prediction model. The Hosmer–Lemeshow goodness-of-fit statistic indicated that the model fit was adequate ($\chi^2(8, N = 354) = 9.12$, $p = .33$). The contribution of each of the predictors is summarized in Table 5.

Table 5.

Direct logistic regression predicting gambling severity among male gamblers

	Odds ratio	95% C.I.	*p*
Age (2 category)	0.77	0.44–1.32	.339
Enjoyment/arousal	1.64	1.22–2.20	.001
Self-enhancement	1.25	0.99–1.57	.062
Money	1.45	1.15–1.83	.002
Overinvolvement	1.34	1.10–1.63	.004

Emotional impact was not included in the analysis.

In the prediction model, expectancies of enjoyment/arousal proved to be the strongest predictor: an increment of 1 on the enjoyment/arousal scale results in that individual being 1.6 times more likely to be a problem gambler. Similar increments on the money and self-enhancement scales are associated with males being 1.5 and 1.3 times (respectively) more likely than their peers to be problem gamblers. High scores on the negative expectancy scale of overinvolvement also served as a predictor of problem gambling, with males endorsing overinvolvement as a probable outcome being 1.3 times more likely to be problem gamblers. The resulting logistic regression equation classified 72% of cases correctly. It should be noted that this is a marginal increase in the overall classification rate (66%) had all of the gamblers been classified as social gamblers. Therefore, of greatest significance is the number of problem gamblers correctly classified; 39% of problem gamblers (*n* = 46) were predicted using these four scales (see Table 6).

Table 6.

Classification table for direct logistic regression model for male gamblers

Observed	Predicted		
	Social gambler	Problem gambler	Percentage Correct (%)
Social gambler	209	27	88.6
Problem gambler	72	46	39.0
Overall %			72.0

Social gambler = social gambler on DSM-IV-MR-J (scores 0–1)
Problem gambler = at-risk gamblers + PPGs on DSM-IV-MR-J (scores ≥ 2)

The analysis was repeated for females, and the results of this direct logistic regression are presented in Table 7.

Table 7.

Direct logistic regression predicting gambling severity among female gamblers

	Odds ratio	95% C.I.	*p*
Age (2 category)	1.32	0.66–2.64	.43
Enjoyment/arousal	1.43	0.95–2.15	.09
Self-enhancement	0.84	0.62–1.13	.25
Money	1.36	0.96–1.94	.08
Overinvolvement	1.08	0.86–1.36	.511

Emotional impact was not included in this analysis.

For females, expectancies of enjoyment/arousal and money were the only significant predictors of gambling group membership within the model. An increment of 1 on both the enjoyment/arousal and money scales resulted in females being 1.4 times more likely to belong to the problem gambling group. The Hosmer–Lemeshow goodness-of-fit statistic was nonsignificant ($\chi^2(8, N = 351) = 7.80$, $p = .45$), suggesting adequate goodness-of-fit. Despite 88% of the cases being classified correctly, however, this logistic regression model resulted in all problem gamblers being inappropriately classified (see Table 8). Therefore, for females, the predictive value of outcome expectancies is very low.

Table 8.

Classification table for direct logistic regression for female gamblers

Observed	Predicted		
	Social gambler	Problem gambler	Percentage correct (%)
Social gambler	309	0	100.0
Problem gambler	42	0	0.0
Overall %			88.0

Social gambler = social gambler on DSM-IV-MR-J (scores 0–1)
Problem gambler = at-risk gamblers + PPGs on DSM-IV-MR-J (scores ≥ 2)

Discussion

The predictive utility of outcome expectancies has been previously examined within the drug and alcohol literature (Brown et al., 1987; Fromme & D'Amico, 2000; Goldberg & Fischhoff, 2000; Goldberg et al., 2002; Leigh & Stacy, 1993; Stacy et al., 1990). Given the commonalities found in the risk and protective factors of alcohol use, drug use, and gambling behaviour (Dickson et al., 2002), the need for an exploration of adolescents' gambling outcome expectancies was clear. Using the newly developed GEQ, results indicated that non-gamblers, social gamblers, at-risk gamblers, and PPGs have different outcome expectancies for gambling involvement. Moreover, among males, the perceptions of positive and negative outcomes differentiated those who gambled excessively and those who did not. For females, on the other hand, outcome expectancies had less predictive value. This may be due to the relatively small sample, and thus requires further exploration.

Prevalence of gambling

The prevalence findings were in keeping with previous prevalence estimates (Derevensky & Gupta, 2004; NRC, 1999; Shaffer & Hall, 1996). Within the total adolescent sample, 70.3% of adolescents reported gambling in the past year. Overall, approximately 5% of youth met the diagnostic criteria for probable pathological gambling on the DSM-IV-MR-J. Similarly, 10.9% of youth were considered at risk for problem gambling, while 54.4% of youth were viewed as social gamblers who exhibited few gambling-related problems. As expected, more males than females participated in gambling activities over the course of the past year, with more males gambling excessively than females. Finally, there were higher rates of problem gambling among older adolescents (ages 15–18) than among younger ones (ages 11–14), a finding that was not unexpected, as gambling problems are a progressive disorder. As youth gain greater access to gambling opportunities and have more gambling experiences, more problems are likely to develop.

Outcome expectancies and gambling severity

The significant differences found between gambling groups on each of the five scales of the GEQ suggest that gambling outcomes are perceived quite differently by those who gamble excessively, those who gamble responsibly, and those who do not gamble at all. PPGs and at-risk gamblers endorsed items on each of the three positive expectancy scales more highly than social gamblers and non-gamblers. They more heavily anticipated pleasure and excitement from gambling (enjoyment/arousal), they were more likely to expect to feel good about themselves as result of gambling (self-enhancement), and they were more likely to anticipate winning money from gambling participation (money) than those who gambled less excessively or not at all. Compared to non-gamblers, social gamblers perceived significantly more enjoyment and arousal as a result of their gambling. They also reported financial gains from gambling as being more likely than non-gamblers. In sum, the positive outcomes/benefits of gambling are more salient for adolescents who gamble than for those who do not, likely resulting in their maintenance of this behaviour.

The findings for negative outcome expectancies, however, reflect different patterns of endorsement. PPGs were more likely to expect to lose control of their gambling (overinvolvement) than social gamblers and at-risk gamblers. One can surmise that the PPGs' relatively high score on this scale represents their awareness of their own preoccupation with gambling; they perceive the risk of overinvolvement in gambling because they are currently experiencing accompanying negative gambling-related consequences. Yet non-gamblers did not differ significantly from PPGs on the overinvolvement scale. They too perceived the potential problem of gambling preoccupation, even significantly more so than social gamblers, despite their lack of gambling behaviour. Non-gamblers were also more likely to anticipate negative emotional consequences to gambling (emotional impact) than social gamblers, at-risk gamblers, and PPGs. It seems counterintuitive that PPGs and non-gamblers could have something in common (i.e., their negative outcome expectancies of overinvolvement). However, in one case, this perception of risk may have developed as a result of personal experience, while in the other, it may be a deterrent to experimentation. In comparison, at-risk gamblers and social gamblers appear to be less aware or failure to acknowledge this risk, despite their own gambling behaviour. Adolescents who perceived less likelihood of negative gambling outcomes are those who currently gamble but who have not yet fully experienced the negative consequences of gambling firsthand.

The results of these analyses underscore one important point: positive outcomes are most likely anticipated by youth who are currently experiencing gambling-related problems. Despite suffering negative consequences associated with excessive gambling (spending increasing amounts of money to gain excitement, spending more money than planned, chasing losses, lying to family members, truancy, conflict, etc.), problem gamblers continue to expect (and likely perceive) benefits from gambling. Evidently, the benefits of gambling are clear, considerable, and encouraging to these adolescents. Yet these are the same adolescents who are most likely to anticipate becoming preoccupied with gambling as well.

How is it possible that adolescents who gamble excessively simultaneously anticipate positive and negative outcomes? An explanation may be found in the immediacy assumption theory. This theory, commonly cited within the alcohol literature (Goldberg et al., 2002; Stacy et al., 1990), conjectures that positive outcomes are more immediate and therefore more powerful in influencing behaviour than are long-term negative outcomes. Feeling good, getting excited, being entertained, socializing with friends (enjoyment/arousal), impressing others, feeling in control (self-enhancement), and making

money (money) are all immediate benefits of gambling. They have the potential to occur soon after a decision to gamble has been made. In contrast, feeling guilty (emotional impact), becoming preoccupied, and not being able to stop one's gambling behaviour (overinvolvement) are all delayed costs. Despite recognizing and experiencing the negative consequences of gambling, PPGs may believe that the potential benefits outweigh the potential costs of gambling because of their temporal characteristics. This decision-making process may be further hampered by impulsivity, of which studies have shown PPGs to demonstrate elevated levels (Blaszczynski, Steel, & McConaghy, 1997; Nower, Derevensky, & Gupta, 2004; Vitaro, Arseneault, & Tremblay, 1999; Vitaro, Wanner, Ladouceur, Brendgen, & Tremblay, 2004), as well as heightened sensation-seeking (Gupta & Derevensky, 1998b; Nower et al., 2004; Powell et al., 1999). Moreover, a low level of deferment of gratification appears to be an important risk factor of pathological gambling (Parke, Griffiths, & Irwing, 2004). Hence, PPGs may be unable to resist the urge to gamble when the potential benefits of gambling are so immediate and so great. According to the encoding specificity principle (Tulving, 1983), positive outcomes such as enjoyment, excitement, and financial gains are likely initially encoded during previous gambling episodes but are enhanced each time these memories are retrieved (Stacy et al., 1990).

Overall gender and developmental differences

Although males exhibited higher rates of problem gambling than females, significant gender differences existed on the GEQ above and beyond those of gambling severity. Males were more likely to expect that gambling would provide both pleasure (enjoyment/arousal) and money-making opportunities (money) than females. In contrast, females were more perceptive of the risk of emotional upheaval (emotional impact) than males. These findings, to a certain extent, may explain prevalence estimates that show a greater proportion of males participating in gambling activities than females. Females' anticipation of more negative emotional outcomes associated with gambling may loom larger than beliefs about enjoyment and financial gain in their decisions to gamble.

The study's developmental findings are also of note. Young adolescents anticipated greater negative emotions resulting from gambling. In contrast, older adolescents reported a greater likelihood of positive outcomes, specifically those of enjoyment and excitement, from gambling. Young adolescents typically have had less experience with gambling. As they proceed through adolescence and gain greater access to gambling opportunities and venues, they may become more aware of the diversionary benefits of gambling. Similarly, as they fail to experience negative consequences, their expectancies regarding the emotional risks of gambling may weaken. This increasing awareness of the positive outcomes of gambling appears to be greatest for girls, as represented by the significant interaction between gender and age on the enjoyment/arousal scale.

The utility of outcome expectancies in the prediction of problem gambling

Since significant differences existed among gambling groups on the positive and negative outcome expectancy scales of the GEQ, an investigation of the predictive utility of these outcome expectancies was of critical importance. Based on the results of these analyses, one can conclude that the value of using outcome expectancies to predict gambling severity may differ considerably for males and females.

For males, outcome expectancies were found to be a relatively strong predictor of problem gambling. Male problem gamblers were characterized by greater outcome expectancies of

enjoyment/arousal, self-enhancement, money, and overinvolvement than their non-problem gambling counterparts. High scores on these GEQ scales indicated problem gambling; the higher an individual scored on these scales, the more likely he was a problem gambler. The percentage of problem gamblers correctly classified by these outcome expectancies was surprisingly high (39%), considering that no psychosocial variables of importance (Derevensky & Gupta, 2004; Dickson et al., 2002; Jessor, 1998; Stinchfield, 2004) were included in the model. That four related social-cognitive variables could predict such a proportion of problem gamblers, in the absence of risk and protective factors, is a substantial finding, given that the prediction of problem gambling is very difficult (Derevensky & Gupta, 2004). The implications for future research are therefore evident. The accuracy of the prediction of male problem gambling can only increase when psychosocial variables and outcome expectancies are considered together. Moreover, these findings advocate for the use of the GEQ in combination with other screening measures for both prevention and treatment initiatives, particularly among males.

While the combination of four outcome expectancies was found to predict problem gambling for males, the best prediction model for females only included expectancies of enjoyment/arousal and money. High scores on the enjoyment/arousal and money scales indicated problem gambling for females. Unfortunately, as predictors, these expectancy scores failed to distinguish any problem gamblers from social gamblers. The inaccuracy of classification is likely due in part to the small number of female problem gamblers in the sample. As a result, the value of outcome expectancies with respect to female gambling has yet to be confirmed. Male and female problem gamblers have been recognized as having different characteristics; their disparate reliance on outcome expectancies may be an additional distinguishing factor. Based on these results, the use of the GEQ as a screening instrument may do little to facilitate the identification of female problem gamblers. Future research must attempt to clarify why this is the case. Yet despite obvious differences among the male and female prediction models, the overall findings of this study suggest an interesting trend: those who overemphasize the potential positive outcomes of gambling appear to be more prone to developing gambling problems. This finding is consistent with alcohol expectancy studies (Brown et al., 1987; Fromme & D'Amico, 2000; Goldberg et al., 2002; Leigh & Stacy, 1993; Stacy et al., 1990).

Implications for prevention

In light of all of these findings, adolescent decision-making may seem irrational, as they engage in gambling behaviour despite an awareness of its risks. These findings suggest that knowledge of negative outcomes alone is unlikely to deter excessive gambling.

Problem gamblers continue to view gambling in a positive light, in the face of negative consequences. However, from an alternative perspective, adolescents can be viewed as making rational decisions, with the positive outcomes weighing heavily on their decision-making (Goldberg et al., 2002). Youth gambling prevention messages must focus on how adolescents can obtain related benefits in safer ways. Overall, positive expectancies were found to be significantly better predictors of gambling severity than negative expectancies.

Although prevention messages often focus exclusively on the risks inherent to high-risk behaviour, the results of this study, in keeping with those from alcohol research, suggest that it is not the knowledge of these risks that predicts behaviour. Instead, an individual's perceptions of the positive outcomes of gambling behaviour are far more important.

Ultimately, it is those who do not gamble and those who gamble excessively who are most aware of the risks of gambling. Additional risk messages will do little to change their current behaviour. Moreover, for social and at-risk gamblers, the strength of risk messages may diminish over time as these adolescents experience the positive outcomes of gambling, in the absence of negative ones. As discussed by Goldberg et al. (2002), initiatives that focus solely on the risks may cause both the messenger and the message to lose both credibility and influence on future health decisions.

When considering the influence of positive outcome expectancies on gambling behaviour, it seems essential that prevention initiatives discuss both the positive and the negative outcomes of gambling. Prevention messages must address positive beliefs about gambling, instead of ignoring them altogether. It is critical that prevention messages inform adolescents about how the short-term benefits of gambling can turn into long-term costs. This idea of "perceiving the risks in the benefits" has been discussed as a major prevention issue within the alcohol and drug literature, as being able to perceive how positive outcomes may be dangerous is considered to serve as a protective factor (Goldberg & Fischhoff, 2000; Goldberg et al., 2002). In turn, expectancy challenge interventions (which highlight the risks while undermining the anticipation of related benefits) have been used to educate both children and adolescents about the effects of alcohol. To date, these interventions have been successful in decreasing alcohol use in youth (Darkes & Goldman, 1993) and appear to reduce the likelihood of early alcohol use among children (Cruz & Dunn, 2003). The results of this study suggest that expectancy challenge interventions should be considered as part of future gambling prevention programs and fit well with a harm minimization paradigm.

Implications for treatment

The high endorsement of positive expectancies by problem gamblers has implications for treatment as well. Although the clinical portrait of adolescent problem gamblers is much more complex than aspirations of monetary gain and erroneously positive beliefs (Gupta & Derevensky, 2004), it may be quite beneficial to use gambling expectancy scales to assess treatment effectiveness. It is important that clinicians help adolescents perceive the chain reactions that initiate and maintain these expectancies over time (Gupta & Derevensky, 2004). Adult cognitive-behavioural interventions highlight the perceived benefits and costs of gambling as part of a treatment plan to enhance motivations to change (Hodgins & Makarchuk, 1997). The study's findings promote the use of such strategies with adolescents. Similarly, therapeutic interventions may need to address positive expectancies of enjoyment/arousal, money, and self-enhancement, in an effort to guide adolescents to seek out related benefits from other, less harmful, activities.

Conclusions

This study is the first to identify the positive and negative outcome expectancies that adolescents associate with gambling. As an exploratory study, it has established a role for examining outcome expectancies in the prediction of gambling problems, while also emphasizing their potential place in the development of prevention and treatment initiatives. Although the utility of outcome expectancies has been explored in this study, research in this area is in its early stages. Both the structure and the content of the GEQ should be validated by additional samples of adolescents. Future research must aim to develop a comprehensive model delineating direct and mediational links between outcome expectancies, gambling severity, and other psychosocial risk and protective factors.

Youth problem gambling is a complex issue, as it is influenced by a number of biological, psychological, and social-cognitive factors; it is a multidimensional activity that cannot be explained by one single theory (Derevensky & Gupta, 2004; Griffiths & Delfabbro, 2001). Although the findings and implications of this study warrant consideration, future research must identify how outcome expectancies fit into the larger biopsychosocial framework.

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brief report

Maternal gambling associated with families' food, shelter, and safety needs: Findings from the Pacific Islands Families Study

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Abstract

From a cohort study of Pacific families with children resident in Auckland (*n* = 983) we examine the association between maternal gambling over the previous 12 months and families' food, shelter, and safety needs. Overall, 666 (68%) mothers reported no gambling, 267 (27%) reported gambling but receiving no criticism, and 50 (5%) reported both gambling and receiving criticism. Compared to those with nongambling mothers, households with gambling mothers were more likely to have both food and housing issues related to a lack of money but no excess in physical intimate partner violence.

Introduction

Gambling-related harm has emerged worldwide as a significant social and health issue, but the full extent of this harm in general populations remains largely unknown (Brown & Raeburn, 2001). Building upon our previous work, which identified risk factors for maternal gambling (Bellringer, Perese, Abbot, & Williams, 2006), we relate maternal gambling to Pacific families' basic human rights and needs for food, shelter, and safety.

Methods

Data arose from the Pacific Islands Families study, which follows a cohort of families with mothers delivering Pacific infants at Middlemore Hospital between March and December 2000 (Paterson et al., 2006). Approximately 6 weeks postpartum, female Pacific interviewers conducted home interviews with mothers.

Gambling was defined as betting activities or games with an element of luck or chance. Mothers were asked whether they had gambled within the last 12 months and whether people ever criticised their involvement in any gambling activities. We define a trichotomous gambling variable: those who did not gamble (reference); those who did gamble but were not criticised (labelled 'uncriticised gambling'); and those who gambled and were criticised (labelled 'criticised gambling'). Experience of physical intimate partner violence was elicited using Form R of the Conflict Tactics Scale (CTS) (Straus, 1990).

Binary logistic regression analyses related gambling to dichotomised housing, food, and safety variables and were adjusted for maternal age, ethnicity, parity, social marital status, education, household income, country of birth, suffering of postnatal depression, traditional gifting obligations, maternal alcohol consumption, and cigarettes smoked yesterday. Associations between food, shelter, and safety variables were assessed using the phi (φ) coefficient.

Results

Overall, 983 mothers who delivered a Pacific infant at Middlemore Hospital between March and December 2000, and who already had another child or children, participated in this study. In the previous 12 months, 666 (68%) mothers reported no gambling activities, 267 (27%) reported gambling but had not received any criticism, and 50 (5%) reported both gambling and receiving criticism. Table 1 presents percentages, adjusted odds ratios (aOR), and associated 95% confidence intervals (95%CI) of the trichotomous gambling variable associated with food, shelter, and safety variables. Associations between the food, shelter, and safety variables ranged from $\varphi = 0.06$ to $\varphi = 0.70$, with median $\varphi = 0.15$.

Table 1.

Percentage of mothers responding affirmatively to issues relating to food, shelter, and safety for gambling levels: None (n = 666), Uncriticised (n = 267), and Criticised (n = 50), with adjusted odds ratios (aOR) and associated 95% confidence intervals (95%CI)

Gambling	%	aOR	(95%CI)
Level of financial difficulty with housing costs: a great deal			
None	7		
Uncriticised	13	1.1	(0.6, 1.8)
Criticised	22	1.4	(0.6, 3.3)
Extent of overcrowding as a problem in your home: a great deal			
None	6		
Uncriticised	13	1.5	(0.9, 2.6)
Criticised	18	1.5	(0.6, 3.8)
Satisfaction of home meeting needs of family: dissatisfied/very dissatisfied			
None	5		
Uncriticised	13	2.7	(1.5, 4.6)
Criticised	16	3.1	(1.2, 7.7)
Run out of basic foods due to a lack of money: sometimes/often			
None	47		
Uncriticised	46	0.9	(0.7, 1.3)
Criticised	62	1.5	(0.7, 2.7)
Skip or have smaller meals due to lack of money: sometimes/often			
None	40		
Uncriticised	40	0.9	(0.7, 1.3)
Criticised	56	1.4	(0.7, 2.5)
Variety of foods eaten limited by a lack of money: sometimes/often			
None	37		
Uncriticised	55	1.5	(1.1, 2.1)
Criticised	68	2.0	(1.1, 4.0)
Feeling stressed due to lack of money for food: sometimes/often			
None	35		
Uncriticised	42	1.1	(0.8, 1.6)
Criticised	60	1.7	(1.0, 3.2)
Victim of any intimate partner physical violence:[a] *yes*			
None	23		
Uncriticised	24	0.7	(0.5, 1.1)
Criticised	30	0.9	(0.4, 1.9)

[a]162 missing observations: 152 single mothers and 10 incompletely answering CTS questions.

Compared to those with nongambling mothers, Table 1 shows that households with gambling mothers were more likely to have both food and housing issues related to a lack of money but no excess in physical intimate partner violence. Although criticised maternal gambling households were 2.0 times as likely as households with nongambling mothers to eat limited food varieties and 1.7 times as likely to feel financially stressed about food, they were no more likely to rely on others to provide food (aOR = 1.3) or rely on sources such as food grants or food banks (aOR = 1.2) when lacking money.

Discussion

Maternal gambling, especially with mothers criticised for their gambling, was significantly associated with poorer basic household nutritional variety and stress due to lack of money. Food insufficiency has been associated with poor health and academic, psychosocial, and suicidal symptoms in children and adolescents (Alaimo, Olson, & Frongillo, 2002). Maternal gamblers were also significantly less satisfied with their home meeting their families' needs than nongambling mothers. Contrary to the anecdotal evidence reported elsewhere (Tu'itahi, Guttenbeil-Po'uhila, Hand, & Htay, 2004), we found no evidence to suggest that maternal gambling was associated with significantly increased partner abuse.

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clinical case corner

The role of mindfulness in the cognitive-behavioural treatment of problem gambling

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Abstract

Recent years have witnessed the emergence of mindfulness meditation as an important intervention in the alleviation of illness-related disability and distress. Although originally developed within the context of physical illnesses such as chronic back pain, recent years have seen mindfulness meditation effective in the alleviation of emotional distress, especially anxiety and depression. Mindfulness meditation assists the individual in learning more adaptive ways of responding to aversive mental states by encouraging a focus on remaining present, non-judgement, and acceptance towards all mental states. Unlike cognitive therapy there is no attempt to directly challenge or restructure cognition. Given the prominence of distorted thinking among problem gamblers and the difficulty in modifying them, mindfulness meditation holds promise as an adjunctive intervention to help problem gamblers learn to cope with gambling-relevant cognitive distortions. A case study is presented illustrating the integration of mindfulness meditation into treatment for problem gambling.
Key words: gambling, mindfulness meditation, treatment

Introduction

Cognitive-behavioural therapy (CBT) is the main evidence-based treatment for pathological gambling, a condition characterized by difficulty controlling impulses to engage in repeated, persistent gambling. Primary treatment targets in CBT are the gamblers' cognitive distortions, or irrational beliefs regarding the extent to which gambling outcomes can be predicted and controlled (Kahnemann & Tversky, 1982). Although CBT has been shown to benefit problem gamblers (for instance, to reduce the frequency of gambling and to produce better rates of abstinence from gambling than no treatment at all (Toneatto & Millar, 2004)), rates of relapse and treatment nonresponse to CBT remain high. Given the limitations of purely cognitive-behavioural approaches for the treatment of pathological gambling, it is important to consider alternative therapeutic strategies that could enhance clinical outcomes (Toneatto & Millar, 2004). Mindfulness is a meditation practice derived from Eastern spiritual training that has been integrated increasingly into CBT for a number of mental health and addiction problems. When integrated into CBT, mindfulness may provide clients with a unique practice that can assist them in reacting less impulsively to their own thinking, especially gambling-related cognitive distortions.

Cognitive distortions in pathological gambling

A substantial body of work has described the role of cognitive factors in problem gambling (e.g., Petry, 2005; Toneatto, 1999; Griffiths, 1995). Problem gamblers have been distinguished from social gamblers on the basis of having a number of cognitive distortions (e.g., Joukhador, Maccallum, & Blaszczynski, 2003). Two of these major cognitive distortions are beliefs that gambling outcomes can be (i) predicted and (ii) controlled (Letarte, Ladouceur, & Mayrand, 1986). Even games that are ostensibly completely random, such as slot machines and bingo, elicit irrational beliefs about control and prediction (e.g., Toneatto, Blitz-Miller, Calderwood, Dragonetti, & Tsanos, 1997; Langer, 1983). These core beliefs form the basis for a wide array of irrational or maladaptive beliefs about gambling outcomes that have been well described in the literature (e.g., Toneatto & Nguyen, in press (a); Petry, 2005). Some frequently observed cognitive distortions among pathological gamblers are the following:

- *Illusions of control:* These are beliefs that the probability of winning is greater than would be dictated by random chance. Such beliefs may be more apparent in games where skill or knowledge may operate (e.g., horse racing, cards, sports lotteries; Ceci & Liker, 1986) but may also be present in nonskill games (e.g., bingo, lotteries; Griffiths, 1993; Langer, 1983).

- *Superstitious beliefs/illusory correlations:* Included among these are *talismanic superstitions*, which are beliefs that objects (e.g., a hat) or qualities (such as the color green) increase the probability of winning (Toneatto et al., 1997). Alternatively, numbers can take on talismanic properties (Rogers, 1998). Another category, referred to as *behavioural superstitions*, includes beliefs that certain actions or rituals increase the probability of winning (Bersabe & Arias, 2000). One widespread behavioural superstition is entrapment (Walker, 1992), the belief that one must continue to gamble or wager in the event that the winning outcome takes place. A third category, *cognitive superstitions*, includes beliefs that mental states such as prayer, hope, and positive expectations can influence the probability of winning (Gaboury & Ladouceur, 1989).

- *Interpretive biases:* The problem gambler expends considerable effort to explain gambling losses in ways that justify continued gambling. *Attributional biases* are the tendency to overestimate dispositional factors (e.g., skill, ability) to explain wins and to underestimate situational factors (e.g., luck, probability; Gaboury & Ladouceur, 1989) to explain losses. "Near misses," in which a gambling outcome falls just short of a win (e.g., one number missing from a winning lottery number), are common in many gambling types (e.g., slot machines, VLTs) and are often reframed as near wins rather than as losses (Parke & Griffiths, 2004). The *gambler's fallacy* refers to another set of beliefs that positive gambling outcomes are more likely to occur simply because they have not occurred for a period of time and are therefore "due" (e.g., Rogers, 1998). The gambler's fallacy also includes beliefs that (i) even a brief sequence of gambling events will express a random process (Spanier, 1994), (ii) chance is self-correcting so that losses and wins balance over time (Spanier, 1994), and (iii) gambling outcomes are not independent of each other but can affect each other, such as with coin tosses and roulette spins (Ladouceur & Dubé, 1997). Finally, *chasing* refers to the tendency of gamblers to respond to serious losses by continuing to gamble based on their belief that this will assist them in recovering their financial losses (Walker, 1992).

Cognitive-behavioural treatments for problem gambling work directly with the content of cognitions. Thoughts, beliefs, and attitudes are identified, examined carefully, restructured or revised, and tested in the natural environment. A variety of techniques are used to challenge the contents of cognitions, such as questioning the evidential or formative basis of the irrational belief, modifying self-dialogue, reframing explanations of gambling outcomes, considering neglected evidence, detecting occurrences when the expectations did not match the gambling outcomes, and urging open-minded observation of gambling outcomes.

Mindfulness meditation

While CBT is focused on challenging the content of the cognitive distortions associated with mental health problems, mindfulness is focused on assisting clients in examining how they relate to their thoughts. Mindfulness asks clients to learn to observe their own mental processes openly, without censure, judgment, or restriction, and without getting caught up in the actual content of their thoughts. As defined by Segal, Williams, & Teasdale (2002), the core skill in mindfulness is the capacity to respond to aversive cognitions, sensations, and emotions with an attitude of nonjudgmental, accepting, present-moment awareness. In other words, the content of the thought is less important than how the individual responds to the occurrence of the thought, as well as other mental content, such as images and memories. Mindfulness is believed to enhance skills in both recognizing and disengaging from self-perpetuating mental states characterized by ruminative and negative thought (see Segal et al., 2002).

Mindfulness can best be considered a form of behavioural, cognitive, and affective self-regulation. Individuals are asked to maintain a decentred awareness of mental content without "reacting" to the mental event (e.g., elaborating or becoming preoccupied with the thought). Instead, mental content is allowed to arise within conscious awareness and to subside as a natural mental process. As an initial step in their training in mindfulness, meditators are asked to maintain awareness of their breathing and to return to this awareness when their attention is drawn to any thoughts, feelings, or bodily sensations. By repeatedly returning awareness to the breath, clients are assisted in learning about the nature of mental activity and in distinguishing mental activity from responses to such activity. Shifting awareness away from mental content to the breath also interrupts the flow of ruminative thought processes and has the effect of reducing the potency of mental events, thereby reducing impulsive, reactive, or automatic reactions to these events. Individuals are asked to simply note the occurrence of the event and return their attention to their breathing. No attention is paid to the specific content, validity, veridicality, or significance of the mental event itself. With practice, clients learn to observe sensations, feelings, and thoughts, and the process of thoughts coming and going. Simply put, thoughts, feelings, and perceptions (and all other mental events) are viewed as "just thoughts," not to be believed, judged, suppressed, prolonged, dismissed, manipulated, or, most importantly, acted upon. Within a mindfulness meditation perspective, mindfulness interrupts the cognitive chain reaction that usually occurs in response to spontaneously emerging cognitions, which left unchecked initiate distressing emotions and behaviours, including pathological gambling (Toneatto, 2002).

Mindfulness practices, as described in Kabat-Zinn (1990), include systematic, guided meditations practised daily for approximately an hour, and also during sessions with a therapist. During these practices, the client learns to bring present-moment, nonjudgmental awareness to bodily sensations, feelings, and thought contents and processes. Specific

mindfulness meditation practices include

- sitting meditation, which involves bringing awareness back to the breath each time attention drifts to other sensations, feelings, and thoughts;
- the body scan, which involves scanning for physical sensations from the toes, up through the body to the head, and gently guiding awareness back to sensations when attention drifts to other aspects of experience;
- mindful yoga, which involves attending fully to gentle yoga postures and movements;
- everyday mindfulness, which involves bringing awareness to everyday activities, such as eating, walking, washing the dishes, and having a shower, and to the full range of sensations, thoughts, and feelings as they arise.

Gradually, awareness is expanded so that it encompasses all aspects of experience. For instance, while doing the sitting meditation, meditators will note where their attention goes and observe how sensations, feelings, and thoughts arise and pass. By observing and noting these everyday aspects of experience, clients gain skills in knowing and noting experience without impulsivity or reactivity. Clients who gain the skill of observing and noting experience without getting caught up in reactions gradually become less reactive to more emotionally laden sensations, feelings, and cognitions, including those sensations, feelings, and cognitions in the chain of events that lead to discrete episodes of problem gambling.

In sum, rather than reacting to thoughts and attempting to control them directly, for instance by altering their content as in standard CBT, individuals are encouraged to passively but alertly observe their mental activity. Individuals are guided in observing that the process of cognition is automatic, conditioned, and autonomous (Toneatto, 2002). Through the cultivation of mindful attention the links between thinking and impulsive acting out, which are usually automatic and out of awareness, are gradually deconditioned. With sustained practice, the mindful meditator learns that the content and process of mental activity is:

(i) incessant, insofar as the conscious mind is always producing some kind of mental activity;

(ii) unpredictable, given that it is impossible to predict what kinds of cognitive events will emerge within consciousness;

(iii) uncontrollable, insofar as efforts to suppress or eliminate cognitive activities will only be met with failure; and, finally,

(iv) impermanent and transient, as they arise, abide, and cease within awareness without any apparent conscious involvement of the individual.

Application of mindfulness to the treatment of problem gambling

Distinguishing mental events from the responses to them provides a choice to the gambler regarding how to best respond, rather than react, to gambling-related cognition. Learning to relate differently to gambling cognitions may be as important as, if not more important than, challenging the specific contents of the thoughts. In a sample of video lottery players, Ladouceur (2004) showed that the raw frequency of erroneous perceptions related to gambling did not distinguish problem from non-problem gamblers. Instead, problem

gamblers were more convinced of, or attached to, the seeming truth of their erroneous gambling-related perceptions than non-problem gamblers. Thus, whereas the problem and non-problem gamblers were similar with respect to the number of cognitive distortions they endorsed, only the problem gamblers responded in a way that indicated an investment in, or attachment to, these thoughts. Ladouceur's findings suggest that it is not the thoughts themselves, but rather the gamblers' *relationship* to gambling-related thoughts and tendency to fixate or ruminate on these cognitions, that contribute most significantly to the thoughts' maladaptive behavioural consequences.

Although it is unlikely that mindfulness meditation is sufficient as a standalone intervention for treating problem gambling, it may have utility as a component of cognitive-behavioural treatment as has been found in the treatment of severe mental health problems involving disordered emotion regulation (such as self-harm and borderline personality disorder; Linehan, 1993), or as a relapse prevention strategy following standard CBT (as in the treatment of depression; see Segal et al., 2002). In considering a mindfulness meditation intervention for problem gambling, it is critical to continue to provide treatments that have been shown to be effective. The benefits of mindfulness training might best be realized when delivered concurrently with other therapies, or when delivered as an adjunct to help clients better cope with persisting urges and cravings and prevent the risk of relapses.

Since gamblers may initially be unaware of the degree to which their gambling behaviour is associated with irrational beliefs, many of the standard intake assessment and self-monitoring processes used in CBT are important as a component of a mindfulness-based approach to working clinically with the problem gambler. To increase clients' awareness of gambling-related cognitions and beliefs, several methods are utilized:

(i) A detailed lifetime history of the gambling behaviour is obtained to highlight key gambling-related automatic thoughts. As part of this assessment, information is obtained on the onset of problem gambling, basis of gambling preferences, motivation for gambling, adoption of special rituals or strategies to increase the chance of winning, the way losses are accounted for, and so on.

(ii) Clients can be taught to self-monitor their gambling cognitions. To elicit cognitive distortions prior to gambling episodes, gamblers can be asked for thoughts pertaining to the probability of winning, how lucky they believe they are, specific cues or signs that might predict their success, how the decision of how much money to wager was made, specific rituals or superstitious behaviours, and so on. Following gambling episodes, gamblers can be asked to explain why they think they won or lost, the impact of the outcome on the next episode of gambling, how they would have bet or gambled differently, why the special ritual or superstitious behaviour did not succeed, and so on.

(iii) Many of the distorted cognitive processes common in gambling can often be elicited in the office by asking clients to imagine a characteristic gambling episode and, with the prompting of the therapist, describe the cognitive processes guiding gambling-related behaviours, decisions, and consequences.

Clinical case

Mr. S is married, in his sixties, and the father of four adult children, and has gambled most of his life. His game of choice has been roulette. When casinos arrived in his community 5

years ago, he began gambling more compulsively. Over the past 5 years, he had been visiting the nearest casino upon the monthly arrival of his pension cheque, which he immediately spent on gambling. While waiting for his cheque, he experienced a pattern of preoccupation with gambling consisting of fantasies of winning large sums of money, feeling "like a winner," and paying off his debts. He believed that, unlike other patrons, he had a special skill at playing roulette and was able to control the outcome of a game that he otherwise saw as influenced by random chance. While playing, his conviction that he could win strengthened and overwhelmed any incompatible beliefs. When he gambled, he inevitably lost the money he brought with him (approximately $2,000) within an hour of his arrival, prompting him to chase his losses by immediately withdrawing funds from the ATM on-site. During the course of a 24-hour period he typically lost $10,000. Physically and emotionally exhausted and full of self-loathing and guilt he would return home to face the anger of his family. A month later, the cycle would repeat itself. When he finally presented for treatment he was highly motivated to resolve this problem.

Based on a detailed examination of his gambling episodes, several cognitive distortions were identified: illusions of control, in which he believed that he could improve his chances at winning and that he could identify or develop unique "systems" to win; assumptions that discrete plays of roulette were connected and that losses would be diluted with wins if he persisted in playing; and pervasive feelings of superiority to other gamblers. Through a cognitive analysis Mr. S was able to clearly recognize these beliefs about gambling and to benefit from straightforward cognitive techniques that undermined the confidence with which he held these beliefs. He was able to entertain doubt about each of these beliefs and rationally understand their fallibility. Furthermore, Mr. S also became acutely aware of the consequences of his chronic gambling on the mental and physical health of his wife and children. Instead of dismissing their concerns, he felt guilty and remorseful that their wellbeing was being so severely affected by his gambling behaviour.

Despite these cognitive insights and understanding, Mr. S nevertheless found it difficult to refrain from gambling and had barely reduced his involvement after several months of treatment. He reported that he was able to circumvent his clinical understanding by entertaining beliefs that the "next time" he would win, or that "one more time won't hurt." He continued to fantasize about winning, generating very intense urges and leaving him vulnerable to returning to the casino once his cheque arrived. His awareness of the psychosocial consequences of his gambling diminished during these periods, especially when his cravings to gamble were intense and compelling.

As an additional component of treatment, Mr. S was agreeable to learning mindfulness meditation. He was presented with a rationale for this technique that focused on learning to attend to gambling-related thoughts and feelings with an attitude of discovery, observation, and dispassionate awareness. Over the course of several weeks Mr. S mastered the basic techniques of mindful meditation and breath control and committed himself to a daily practice routine of 45 minutes. Specifically, he was taught to permit thoughts related to gambling to arise and subside, initially only while meditating but eventually throughout the day. He was instructed neither to "cling" to a thought nor to elaborate it (e.g., fantasize) but to simply observe that the thought had occurred and to become aware of his breathing. He was encouraged to note that all thoughts, gambling-related or not, were very brief, transient, and impermanent, rather than to "react" by fantasizing, distorting, suppressing, or dismissing. Instead, he was encouraged to observe his thoughts in the same way he might observe waves crashing on a shore or clouds drifting across the sky. Mr. S was instructed to refrain from judging any specific thought or feeling as desirable or not, watching all of his

mental events emerge into his conscious awareness and as rapidly disappear. Through such practice, he was able to clearly distinguish himself as the "observer" from the activity of his consciousness, the "observed."

Equally importantly, his mindfulness skills led him to be more aware of the thoughts and feelings he had about the consequences of his gambling. These tended to be dismissed or rationalized away when he was caught in a strong urge to gamble and would completely disappear while at the casino. By applying mindfulness skills, he became and remained aware of the harms his gambling had caused for his significant others. Mr. S also found that as he diligently practised his mindfulness skills, he was able to apply his attitude of uninvolved observation of his gambling-related cognitive processes throughout the day. He found himself responding to gambling thoughts with amusement, curiosity, and amazement but with reduced conviction in their validity or, most importantly, the need for a behavioural reaction on his part. He noted that this attitude generally led to a rapid dissolution of these thoughts and the elimination of any strong urges or temptations to gamble. He acknowledged that the gambling thoughts continued to occur at approximately the same frequency as before treatment but their intensity or salience in his awareness was much diminished (analogous to reducing the volume on the radio), and as a result he was able to make more adaptive decisions (i.e., not gamble).

Discussion

The case of Mr. S was presented to illustrate the utility and limitations of a cognitive approach. Although intellectually able to restructure his cognitive distortions related to gambling, during standard CBT, Mr. S found it difficult to actually modify his gambling behaviour. This is not an uncommon occurrence in the treatment of gambling. Recently, Williams and Connolly (2006) found that educating university students on probability theory (e.g., odds) through the use of gambling examples produced differences in the ability to calculate gambling odds and resistance to irrational gambling-related mathematical beliefs compared to those who were instructed on probability theory generically (i.e., without the aid of gambling-related examples). However, there was no effect on gambling behaviour, leading Williams and Connolly (2006) to conclude that learning mathematical knowledge related to gambling was unrelated to gambling behaviour.

A missing element of the traditional cognitive therapy approach supplied by mindfulness training is the practice of a critical metacognitive skill. The metacognitive skill imparted to Mr. S is an experientially based mindfulness practice, which demonstrated to Mr. S that his gambling-related cognitions, which appeared to emerge independently and spontaneously, were distinct from his mental responses to them. Mr. S was taught a series of skills, including body scan, mindful yoga postures, sitting meditation, and mindful eating and walking. He was taught to expand these skills to specific gambling-related sensations, feelings, and cognitions. Over the course of the therapy, he learned to replace reacting as he normally would (with excessive preoccupation and engagement in feelings, sensations, and cognitive distortions about gambling) with allowing cognitive events to rapidly arise and subside as they normally do when they are observed, but not interfered with. The development of this metacognitive skill essentially liberated Mr. S from the "compulsion" to react to his distortions with actual gambling behaviour. It also simultaneously allowed him to remain aware of the negative consequences of his gambling to a greater degree than he would have otherwise.

The most significant limitation in advocating for the inclusion of a mindfulness meditation component in treatment for problem gambling is the lack of empirical evidence. There is considerable research demonstrating the benefits of mindfulness meditation for other emotional disorders, such as anxiety, depression, and stress (Toneatto & Nguyen, in press (b)). There are also a number of treatment programs for more severe mental health issues, including self-harm and personality disorders, that make cogent arguments for mindfulness as a clinically potent tool for enhancing self-awareness and emotion regulation (e.g., Linehan, 1993). Given the potential benefits of mindfulness for reducing distress and maladaptive engagement in other impulsive, maladaptive behaviours, mindfulness could conceivably provide similar benefits to patients engaging in pathological gambling, a group for whom problem gambling is usually one of a number of mental health or addiction concerns.

Another important consideration is that for it to be effective, the instructor must have considerable personal experience with, and maintain an active practice in, mindfulness meditation. Not all clinicians and, likewise, not all problem gamblers, can be expected to find the techniques of mindfulness meditation, which include sitting meditation and the practice of an attitude of dispassionate observation, desirable or easy to learn. Such challenges may be particularly evident when working with highly impulsive or comorbidly diagnosed problem gamblers. To be effective, mindfulness meditation needs to be practised regularly, on a daily basis if possible, and over an extended period of time. The problem gambler needs to be willing to maintain consistent practice to gain the potential benefits of mindfulness meditation.

In conclusion, mindfulness meditation interventions are compatible with other psychotherapies, especially the cognitive-behavioural approaches, with which they share many similarities. Mindfulness also introduces unique strategies that might serve to enhance the benefits provided by standard CBT. Mindfulness interventions are likely to continue to attract clinical and scientific interest and become an additional therapeutic option for the clinician treating individuals with problem gambling.

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counselling guidebooks review

Problem Gambling: The Issues, the Options

(2005). Toronto, ON: Centre for Addiction and Mental Health, 36 pp.,
ISBN 0-88868-470-3 (softcover).

Problem Gambling: A Guide for Families

(2005). Toronto, ON: Centre for Addiction and Mental Health, 44 pp.,
ISBN 0-88868-472-X (softcover).

Problem Gambling: A Guide for Financial Counsellors

(2005). Toronto, ON: Centre for Addiction and Mental Health, 56 pp., appendices/handouts,
ISBN 0-88868-494-0 (softcover).

Problem Gambling: A Guide for Helping Professionals

(2005). Toronto, ON: Centre for Addiction and Mental Health, 48 pp.,
ISBN 0-88868-495-9 (softcover).

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In the haze-shrouded seascape of educative brochures, booklets, and pamphlets designed to inform members of the community and their families of the signs and symptoms of problem gambling, and of the opportunities for assistance, this series of guides shines as a bright beacon. It is clear from first sight that a substantial amount of thought and effort has gone into all aspects of its spiral-bound production. This is reflected not only in the content of the guides but also in their succinct yet informative writing, layout, format, design, and quality of publication. Although the set of guides is specifically prepared for and incorporates statistical data and mental health resources limited to the province of Ontario, in Canada, it serves as an exemplary template upon which others can or should develop similar guides for other jurisdictions (with appropriate copyright acknowledgements).

As a clinical researcher treating pathological and problem gamblers over almost 20 years, often criticized as a critical and hard to please reviewer of resource materials, I found this publication to be refreshingly praiseworthy. Were its extensive list of treatment service providers and resources appropriate to my local practice, I would freely distribute the material to all clients and their families seeking advice or counselling on problem gambling, and to colleagues for their edification and for placement in waiting rooms.

Each guide in the series has been compiled with a distinct audience in mind: the gambler, the family member, the financial counsellor, and the helping professional coming to grips with problem gambling and its management. The first element that strikes the reviewer is the colourful graphic designs on the covers. These are attractive and contain themes subtly linked to the contents, with the title clearly describing the purpose and contents of the relevant guide. While the label 'Problem Gambling' is prominent, it is not intrusive, with the overall end result being an eye-catching product that obviates the need for a gambler to hide it in a brown paper bag and read it alone in the protection of a dark corner of the waiting room.

Secondly, the guides are separated by tabs bearing the chapters' titles, a very useful and practical layout that adds that little extra detail to functionality. The reader is able to access the relevant section of interest in a direct and speedy manner.

Thirdly, the style of writing is succinct, with simple information presented in a format that is easy to read and digest at a glance. Bullet points to highlight key information accompanied by coloured boxes drawing attention to descriptive statistics, definitions, and suggestions work exceptionally well.

Now let me to turn to the content and substance of each guide. *The Issues, the Options* defines gambling and lists its various manifestations, although some would question the validity of including stock market speculation. This is followed by an exposition of the meaning of low-risk and harmful gambling; the Canadian Problem Gambling Index (CPGI) for self-classification, risks, and rewards; and the impact of excessive gambling on families and anxiety and depression. Suicide is only briefly mentioned, but this mention is accompanied by a direct list of instructions and contact details (Ontario-based) to gain immediate assistance. The 'Getting Help' chapter describes the nature and benefits of counselling with a statement that the outcomes of abstinence and control are to be determined by negotiation between the individual and the counsellor. Recommendations and suggestions are offered in a simple manner that covers the general principles rather than a set of self-help procedural steps to follow. This is not a criticism, given that the guide is not intended to be a brief self-help intervention but to serve as a basic educational tool. The list of available services is of use to Ontarians only, a limitation, as noted earlier, of the series in general.

The first three chapters of *A Guide for Families* are essentially similar in content to the one written for the problem gamblers. The next chapter is geared toward a description of the stages of change and readiness-to-change conceptual models and is particularly useful in informing family members of the relative responsibilities of each party—gambler and family member—in effecting change. Fundamental steps in protecting money are outlined in addition to strategies to restore normal functioning and healing relationships. Again, it is emphasized that in keeping with the aim of the series, the suggestions offered are basic principles in the absence of practical 'how-to-achieve' steps. For example, in referring to the potential need for 'tough love', the guide hastily acknowledges that its application is fraught with the prospect of causing harm in some cases and, if this is the case, seeking additional professional advice is imperative before acting. But no information is given to assist the family member in deciding who is or is not at risk of responding in a negative fashion.

There are few available guides written for financial counsellors that I am familiar with, although I am sure that these do exist. The first few chapters of *A Guide for Financial Counsellors* are devoted to an overview of basic statistics related to the extent of gambling in the community and an outline of the dimensional classification of gambling, from non- to pathological, and information that parallels and complements that contained in the other guides in the series.

While overall the series maintains a neutral nonjudgemental and atheoretical tone, it can be argued that statistics listed in the text box on 'Facts about Problem Gambling' are marred by dramatic seepage. It is stated that 4.8% of adults have moderate or severe problems, with an additional 9.6% at risk. This figure of 14% is somewhat high and should be supplemented by a reference or at a least clear definition of what is being referred to.

Chapters directed to the financial counsellor outline an extremely useful approach peppered with practical tips that a counsellor should follow in managing problem gambling. Setting aside a few instances that border on telling a financial counsellor how to do his or her work and which may thus be interpreted as paternalistic, the contents ably serve as an introduction to the signs, behaviours, and reactions of problem gamblers for the counsellor who is not familiar with the topic and impact of problem gambling. The set of foldout sheets accompanying this guide provide an additional resource that includes the CPGI and a monitoring sheet. For the more experienced financial counsellor, the guide is perhaps too light on substance to be of value. However, family members will undoubtedly find useful instructive hints as to matters financial.

A Guide for Helping Professionals is a useful resource for general practitioners requiring an overview of basic strategies that can be effectively applied to their clientele. It is pleasing to read the inclusion of the recommendation to routinely discuss gambling with every client presenting to their service; often the encouragement to include a probe question on gambling alongside questions on drugs and alcohol falls on deaf ears. While the guide does not cover topics in substantive depth, the breadth of coverage is pertinent to the needs of health professionals and will provide them with sufficient understanding of problem gambling and its implications to intervene in a timely and effective manner. Risk groups, risk factors, and the impact of problem gambling orient the clinician, while the chapters on engagement, motivation, and stages of change offer useful advice. These are supplemented by the client handouts and list of resources and Ontario treatment services.

As a series of educative booklets, this set of guides accomplishes its objectives with style and panache. Its strengths reside in both its content and its presentation. Gamblers wishing to gain an understanding of the concept of problem gambling and its relevance to them, family members wishing to obtain useful strategies to intervene while becoming cognizant of the limitations in their capacity to force change on unwilling recipients, financial counsellors naïve to problem gambling, and general health practitioners of all disciplines will benefit substantially from this simple but well-written and concise resource. I can highly recommend this series as a useful resource material for clinical practice and an adornment to any waiting room coffee table.

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Cutting the Wire: Gaming Prohibition and the Internet

By David G. Schwartz (2005). Reno, NV: University of Nevada Press, xi, 282 pp.,
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Abstract

Cutting the Wire examines the American experience with gambling through the lens of the 1961 Wire Act. The book is a well-researched history of federal gambling policy, focusing on the Wire Act as part of Robert F. Kennedy's initiative against organized crime. The evolution of gambling, illicit and legal, in the U.S. is traced from premodern times through the advent of the Internet, with a discussion of the Department of Justice's reliance on the Wire Act in its response to this development. Professor Schwartz's well-researched study of the Wire Act is a unique and valuable contribution to the literature. His careful examination of (unsuccessful) Congressional attempts to ban interstate wagering on horse races in 1910 and again in the early 1950s is particularly useful. This often forgotten legislation is the precursor of not only the Wire Act of 1961 but also the Interstate Horseracing Act (1978) and the Unlawful Internet Gambling Enforcement Act (2006).
Key words: Wire Act of 1961, Robert F. Kennedy, Internet gambling

This book examines the American experience with gambling through the lens of the 1961 Federal Wire Act (18 U.S.C. § 1084). The author, David Schwartz, is the director of the Center for Gaming Research at the University of Nevada, Las Vegas. *Cutting the Wire* presents a history of federal gambling policy, focusing on the creation of the Wire Act during Robert F. Kennedy's tenure as United States Attorney General as part of his anti-organized crime initiative, with a summary of this law's enforcement history. The Wire Act is placed in the context of the evolution of gambling, illicit and legal, in the U.S., through the advent of gambling on the Internet and the Department of Justice's reliance on this law in its response to this development.

Histories of gambling are available elsewhere, but Professor Schwartz's well-researched review of the Wire Act and antecedent legislation is a unique and valuable contribution to the literature. His careful examination of (unsuccessful) Congressional attempts to ban interstate wagering on horse races in 1910 and again in the early 1950s is particularly useful. This often forgotten legislative history is the precursor of not only the Wire Act of 1961 but also the Interstate Horseracing Act of 1978 (15 U.S.C. §§ 3001–3007) and the Unlawful Internet Gambling Enforcement Act of 2006 (18 U.S.C § 5361 *et seq*.). Lawyers and legal scholars dealing with these laws would do well to consult Professor Schwartz's book.

Cutting the Wire is narrowly focused on gambling and the history of a particular statute, but it illustrates recurring patterns in American history: the use of criminal laws as instruments of social control and their concomitant use to regulate markets, the tendency to demonize activities perceived to violate religious beliefs, attempts to combat these demons with unenforceable laws, and the changing targets of such laws as new demons emerge.

As Professor Schwartz shows, the Wire Act was intended as a tool for Robert Kennedy's Justice Department to use against organized crime: "Robert Kennedy believed that in dismantling the race wire he might fight a decisive battle in his war on organized crime, and he successfully pressed Congress for such a law … the framers of the [Wire Act] realized that information is essentially power, and they hoped that without access to information organized [illegal] gambling would die, taking with it organized crime." The Wire Act was enacted for a secular purpose, combating organized crime, not the moral/religious purpose of combating gambling.

Judging from the continuing presence of mob figures and drug lords in newspaper headlines, this purpose has not been realized. This is partly due to the evolution of gambling in the U.S. described in *Cutting the Wire*. In 1961 organized gambling was, Nevada excepted (an exception Kennedy's Department of Justice might not have allowed), organized *illegal* gambling. By the time the Internet materialized, organized gambling was, with the exception of the sports betting the Wire Act prohibits, *legal*, conducted by governments and legitimate businesses pursuant to state licenses or the federal Indian Gaming Regulatory Act (IGRA) (25 U.S.C. § 2701 *et seq*.). As gambling operations passed from organized crime to regulated, publicly traded corporations doing business on the Internet Wire Act enforcement efforts were expanded from the mafia bosses who were Robert Kennedy's concern to include the managers of these corporations. The Wire Act combined with technological change to create a new class of criminals.

The Internet created a borderless global marketplace for gambling services; this borderless marketplace invalidated one of legal gambling's fundamental predicates: licensing. Without borders there is no jurisdiction, and without jurisdiction there are no gambling licenses. Governments around the world, including the government of the United States and the governments of its constituent states, were unprepared for this unintended consequence of an advance in information technology and are now in the process of responding to it. Many developed nations, including the United Kingdom, France, Germany, Italy, Sweden, Austria, Australia, and Hong Kong, and most of the world's national lotteries permit Internet gambling, including gambling on interactive television and mobile telephones, either by licensing and regulating private-sector operators that include computer technology and telecommunications companies to conduct interactive gambling, or by allowing government-owned gambling operations to offer products and services on interactive platforms.

Licensed private-sector, publicly traded companies, such as Britain's High Street bookmakers and entrepreneurs with no prior gambling experience, entered the Internet gambling marketplace, and many prospered. In 2005 a dozen of the largest Internet gambling firms went public, listing their shares on the London Stock Exchange or the London AIM and raising billions of pounds sterling in the process. With a publication date of 2005, Professor Schwartz concludes his book at this pregnant moment, unsure of what the United States will do next but skeptical that "Americans, confronted by a world in which the prerogatives of nations to regulate their own citizens' conduct are eroded [by the Internet], will suddenly decide to gather a consensus and rationally administer the world of gaming offered by the Internet."

Professor Schwartz's skepticism proved to be well founded. The United States is not responding to the new market conditions created by new information technology by "rationally administer[ing] the world of gaming offered by the Internet," the course adopted by other countries, but by prohibiting it. Within a year of *Cutting the Wire*'s publication

federal agents arrested two British executives, David Carruthers, CEO of BetonSports plc (on July 16), on federal charges including violating the Wire Act, and Peter Dicks, the nonexecutive chairman of SportingBet plc (on September 6), on a warrant issued by the State of Louisiana. Mr. Carruthers is free on bail but unable to leave the United States pending trial; Mr. Dicks was freed on a technicality and has returned to the United Kingdom. Then, on September 30, 2006, minutes before recessing for the fall election campaign, Congress passed the Unlawful Internet Gambling Enforcement Act of 2006, barring the use of wire transfers, electronic funds transfers of other kinds, credit cards, and checks for Internet gambling transactions as part of unrelated legislation intended to improve the security of U.S. ports. The long federal effort to regulate American gambling behavior with criminal law that *Cutting the Wire* recounts had borne its latest fruit.

Globalization is a two-way street, and shock waves from the Unlawful Internet Gambling Enforcement Act's passage were felt around the world. Two publicly traded companies, World Gaming plc and BetonSports plc, effectively shut down; the market capitalization of the 10 largest on-line gambling concerns was cut in half, with investor losses exceeding $7 billion. All of the publicly traded Internet gambling suppliers announced that they would cease taking bets from the United States. In Israel IM Intermedia, which supplies services for on-line marketing and data mining for on-line gaming companies in the United States, dismissed half of its 100 workers; Israel has other on-line gambling companies and *Haaretz* (October 10, 2006) expected the layoffs to be the first of many. In Britain FireOne Group plc, which processes on-line credit card payments for the on-line gambling industry, said it would immediately stop processing transactions originating from the U.S.; as a result the company announced that it was "restructuring its business and cost base." Across the Channel OPAP S.A., a publicly traded Greek firm, asked the Greek government to adopt laws like "those adopted by the US Congress in order to ban payments to online gaming companies" and called for the European Union and/or member states to implement similar measures. And in Washington's backyard tiny Trinidad said it would move to outlaw gambling on the Internet.

The Congressional action was unexpected by investors and financial analysts in other countries, many of whom had predicted that the United States would stop short of prohibition on the grounds that it is unenforceable. In the sense that the new law is unlikely to prevent privately owned (i.e., not publicly traded) companies from continuing to supply Internet gambling services to Americans this will almost certainly prove to be true. The sale (on October 13, 2006) by SportingBet plc of its U.S.-facing sports betting and casino business to privately owned Jazette Enterprises for a token $1 was followed by a spate of announcements from privately owned Internet gambling operators affirming commitments to the U.S. market, the new law nothwithstanding. Neteller, a third-party processor of credit card payments for the on-line gambling industry based in the Isle of Man, similarly announced its intention of staying in the U.S. market. These announcements point toward a future in which U.S. demand for on-line gambling will not be supplied by regulated, publicly traded businesses but surreptitiously, by unlicensed, privately owned operators beyond the reach of regulatory control.

The decision to prohibit Internet gambling that is so puzzling to other countries is readily intelligible in the context of traditional American responses to activities unacceptable to the religious right and to moral reformers, and the federal response to gambling that is the subject of *Cutting the Wire* is easier to understand in this context. Of particular relevance in this regard is the 19th-century Temperance Reform movement, which culminated in the 18th Amendment to the United States Constitution and the enforcing Volstead Act of 1919, making the manufacture, sale, and distribution of alcoholic beverages federal crimes. The

Noble Experiment, as fervent supporters called it, was ridiculed in other countries as unworkable, but Prohibition spoke to deeply felt American emotional needs. The millenarian rhetoric with which Prohibition was hailed is exemplified in a speech by William Jennings Bryan, a fundamentalist Christian and sometime ally of secular Reform who in later life famously opposed Darwin's theory of evolution: "They are dead, that sought the child's life! They are dead! They are dead! King Alcohol has slain more children than Herod ever did. The revolution that rocked the foundations of the Republic will be felt all over the earth. As we grow better and stronger through the good influence of Prohibition, we will be in a position to give greater aid to the world." Bryan's words were echoed, consciously or not, by supporters of Internet gambling prohibition three quarters of a century later, who justified prohibition in part on the grounds that it would save the U.S.'s children from the evils of gambling.

The Volstead Act's practical effect was to transfer the alcoholic beverage industry from licensed and regulated legitimate businesses to criminal organizations, which determined federal enforcement efforts were unable to eradicate. The effects of that enforcement effort on American society were horrific, and Prohibition, generally considered the worst domestic public policy in modern American history, was repealed in 1933. Among the 18th Amendment's unintended consequences is the paradox that Demon Rum, illicit but ubiquitous, was perhaps never so visible a presence in American life as it was during the decade to which Prohibition gave the name by which it is still remembered: the Roaring Twenties.

The American response to alcohol has continuing relevance for readers of *Cutting the Wire*, for the organized crime that the Wire Act was meant to be used against is a legacy of Prohibition. Having created modern criminal organizations with one law, the Volstead Act, Congress sought to rectify the matter with another law, the Wire Act; finding the Wire Act ineffective in controlling Internet gambling Congress again resorted to prohibition with the Unlawful Internet Gambling Enforcement Act of 2006. The pattern is consistent: gambling and alcohol are demons that must be cast out of American society by prohibitory laws. Mortal threats demand extreme measures, and no measures are too extreme in view of the mortal threat to moral and religious values human appetites for gambling and drinking represent.

That in spite of prohibition these appetites persist and exert continuing economic power is irrelevant. Rational discourse about demons is a contradiction in terms, which is why rational public policy in these areas has been so difficult for Americans to formulate. *The Economist*, a weekly British newsmagazine, puzzling over the decision of Congress to experiment yet again with prohibition, observed in an editorial (in the October 5, 2006, issue) that "there is a case to be made that online gambling is worse than the real-world sort. Internet sites encourage gambling among youngsters who would normally be kept out of casinos. In legal joints regulators can bar the most addictive sorts of gambling machines. Online casinos, on the other hand, often try to make their games as compulsive as they can. And the whole business is, critics argue, overshadowed by criminality. Because the punters in online casinos may have no idea who is on the other end of the line, they are vulnerable to swindles and crooks; they may be ripped off by rigged games; they may have their credit-card details stolen; and so on." These are, however, *The Economist* continued, "arguments for regulating online gambling, not banning it." The gulf between the United States and secular societies like the United Kingdom implicit in this observation is probably too wide to ever be bridged.

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[1]January 17, 1920, at a public rally in Washington, D.C., the day Prohibition took effect.