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

Meredith A. M. Gillespie

Jeffrey Derevensky

Rina Gupta

Affiliation: International Centre for Youth Gambling Problems and High-Risk Behaviors, Montreal, Quebec, Canada. E-mail: merdith.gillespie@mail.mcgill.ca

For correspondence: Meredith Gillespie, International Centre for Youth Gambling Problems and High-Risk Behaviors, McGill University, 3724 McTavish Street, Montreal, Quebec, Canada H3A 1Y2.

Meredith Gillespie, MA, is currently a doctoral student at McGill University's International Centre for Youth Gambling Problems and High-Risk Behaviors. She has received several master's and doctoral fellowships and has coauthored several papers and chapters concerning youth gambling problems.

Jeffrey L. Derevensky, PhD, is a professor of School/Applied Child Psychology, Department of Educational and Counselling Psychology, McGill University, and associate professor, Department of Psychiatry, McGill University. He is co-director of the McGill University Youth Gambling Research & Treatment Clinic and the International Centre for Youth Gambling Problems and High-Risk Behaviors. He is a child psychologist

who has published widely in the field of youth gambling and is on the editorial board of several journals. E-mail: jeffrey.derevensky@mcgill.ca

Rina Gupta, PhD, is a child psychologist and an assistant professor (part-time) in the School/Applied Child Psychology program at McGill University. She is on the editorial board of the *Journal of Gambling Studies* and is co-director of the McGill University Youth Gambling Research & Treatment Clinic and the International Centre for Youth Gambling Problems and High-Risk Behaviors. Her research and clinical work has been focused on understanding, preventing, and treating gambling problems in youth. Dr. Gupta has provided expert testimony before a number of government committees and national and international commissions and was the recipient of the Young Scientist Award by the National Center for Responsible Gaming. E-mail: rina.gupta@mcgill.ca

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.

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 ($\alpha = .86$), self-enhancement ($\alpha = .81$), and money ($\alpha = .78$)—and two negative outcome expectancies—overinvolvement ($\alpha = .91$) and emotional impact ($\alpha = .85$). 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 http://gateway.ut.ovid.com /gw1/ovidweb.cgi#52#52(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.

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.

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).

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).

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.

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).

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

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.

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.

References

Ajzen, I.. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th Ed.). Washington, DC: Author.

Becker, M. H.. (1974). The health belief model and personal health behavior. *Health Education Monographs*, 2, 324–473.

Blaszczynski, A.. Steel, Z.. McConaghy, N.. (1997). Impulsivity in pathological gambling: The antisocial impulsivist. *Addiction*, 92, 75–87.

Brown, S. A.. Christiansen, B. A.. Goldman, M. S.. (1987). The Alcohol Expectancy Questionnaire: An instrument for the assessment of adolescent and adult alcohol expectancies. *Journal of Studies on Alcohol*, 48, 483–491.

Clayton, R. R.. (1992). Transition to drug use: Risk and protective factors. In Glantz, M.. & Pickens, R.. (Eds.), *Vulnerability to drug use* (pp. 15–51). Washington, DC: American Psychological Association.

Cruz, I. Y.. Dunn, M. E.. (2003). Lowering risk for early alcohol use by challenging alcohol expectancies in elementary school children. *Journal of Consulting and Clinical Psychology*, 71, 493–503.

Darkes, J.. Goldman, M. S.. (1993). Expectancy challenge and drinking reduction: Experimental evidence for a mediational process. *Journal of Consulting and Clinical Psychology*, 61, 344–353.

Davis, L.. Offord, K.. (1997) Logistic regression. *Journal of Personality Assessment*, 68, 497–507.

Derevensky, J.. Gupta, R.. (2000). Prevalence estimates of adolescent gambling: A comparison of SOGS-RA, DSM-IV-J, and the GA 20 Questions. *Journal of Gambling Studies*, 16, 227–252.

Derevensky, J.. Gupta, R.. (2004). Adolescents with gambling problems: A synopsis of our current knowledge. *eGambling: The Electronic Journal of Gambling Issues*, 10. Available at http://www.camh.net/egambling/issue10/ejgi_10_derevensky_gupta.html

Dickson, L. M.. Derevensky, J. L.. Gupta, R.. (2002). The prevention of gambling problems in youth: A conceptual framework. *Journal of Gambling Studies*, 18, 97–159.

Fisher, S.. (1992). Measuring pathological gambling in children: The case of fruit machines in the U.K. *Journal of Gambling Studies*, 8, 263–285.

Fisher, S.. (2000). Developing the DSM-IV-MR-J criteria to identify adolescent problem gambling in non-clinical populations. *Journal of Gambling Studies*, 16, 253–273.

Fromme, K.. D'Amico, E. J.. (2000). Measuring adolescent alcohol outcome expectancies. *Psychology of Addictive Behaviors*, 14, 206–212.

Gillespie, M. A. M.. Derevensky, J.. Gupta, R.. (2006, previous article). I. Adolescent problem gambling: Developing a gambling expectancy instrument. Journal of Gambling Issues.

Goldberg, J.. Fischhoff, B.. (2000). The long-term risks in the short-term benefits: Perceptions of potentially addictive activities. *Health Psychology*, 19, 299–303.

Goldberg, J. H.. Halpern-Felsher, B. L.. Millstein, S. G.. (2002). Beyond invulnerability: The importance of benefits in adolescents' decision to drink alcohol. *Health Psychology*, 21, 477–484.

Griffiths, M.. Delfabbro, P.. (2001). The biopsychosocial approach to gambling: Contextual factors in research and clinical interventions. *eGambling: The Electronic Journal of Gambling Issues*, 5. Available at http://www.camh.net/egambling/issue5/feature/index.html

Gupta, R.. Derevensky, J.. (1996). The relationship between gambling and video game playing in children and adolescents. *Journal of Gambling Studies*, 12, 375–394.

Gupta, R.. Derevensky, J.. (1998a). Adolescent gambling behavior: A prevalence study and examination of the correlates associated with excessive gambling. *Journal of Gambling Studies*, 14, 319–345.

Gupta, R.. Derevensky, J.. (1998b). An empirical examination of Jacobs' General Theory of Addictions: Do adolescent gamblers fit the theory? *Journal of Gambling Studies*, 14, 17–49.

Gupta, R.. Derevensky, J.. (2004). A treatment approach for adolescents with gambling problems. In Derevensky, J.. & Gupta, R.. (Eds.), *Gambling problems in youth: Theoretical and applied perspectives*. New York: Kluwer Academic/Plenum Publishers.

Hodgins, D. C.. Makarchuk, K.. (1997). *Becoming a winner: Defeating problem gambling.* Calgary, AB: Alberta Alcohol and Drug Abuse Commission.

Hosmer, D. W.. Lemeshow, S.. (1989). *Applied logistic regression*. New York: Wiley.

Jessor, R.. (1998). New perspectives on adolescent risk behaviour. In Jessor, R.. (Ed.), *New perspectives on adolescent risk behaviour*. Cambridge, UK: Cambridge University Press.

Johnston, L. D.. (2003). Alcohol and illicit drugs: The role of risk perceptions. In Romer, D.. (Ed.), *Reducing adolescent risk: Towards an integrated approach* (pp. 56–74). London: Sage Publications.

Johnston, L. D.. O'Malley, P. M.. Bachman, J. G.. (2001). *National survey results on drug use from the Monitoring the Future study, 1975-2000. Vol. I: Secondary school students*(NIH Publication No. 01-4924). Bethesda, MD: National Institute on Drug Abuse.

Leigh, B. C.. Stacy, A. W.. (1993). Alcohol outcome expectancies: Scale construction and predictive utility in higher order confirmatory models. *Psychological Assessment*, 5, 216–229.

Marget, N.. Gupta, R.. Derevensky, J.. (1999, August). The psychosocial factors underlying adolescent problem gambling. Poster presented at the annual meeting of the American Psychological Association, Boston.

Moore, S. M.. Gullone, E.. (1996). Predicting adolescent risk behavior using a personalized cost-benefit analysis. *Journal of Youth and Adolescence*, 25, 343–359.

National Research Council (NRC). (1999). *Pathological gambling: A critical review*. Washington, DC: National Academy Press.

Neighbours, C.. Lostutter, T. W.. Cronce, J. M.. Larimer, M. E.. (2002). Exploring college student gambling motivation. *Journal of Gambling Studies*, 18, 361–370.

Nower, L.. Derevensky, J.. Gupta, R.. (2004). The relationship of impulsivity, sensation seeking, coping and substance use in youth gamblers. *Psychology of Addictive Behaviors*, 18, 49–55.

Parke, A.. Griffiths, M.. Irwing, P.. (2004). Personality traits in pathological gambling: Sensation-seeking, deferment of gratification and competitiveness as risk factors. *Addiction Research and Theory*, 12, 201–212.

Powell, J.. Hardoon, K.. Derevensky, J.. Gupta, R.. (1999). Gambling and risk-taking behavior among university students. *Substance Use and Misuse*, 34, 1167–1184.

Shaffer, H. J.. Hall, M. N.. (1996). Estimating the prevalence of adolescent gambling disorders: A quantitative synthesis and guide toward standard gambling nomenclature. *Journal of Gambling Studies*, 12, 193–214.

Stacy, A. W.. Widaman, K. F.. Marlatt, G. A.. (1990). Expectancy models of alcohol use. *Journal of Personality and Social Psychology*, 58, 918–928.

Stinchfield, R.. (2004). Demographic, psychosocial, and behavioral factors associated with youth gambling and problem gambling. In Derevensky, J.. & Gupta, R.. (Eds.), *Gambling problems in youth: Theoretical and applied perspectives* (pp. 27–40). New York: Kluwer Academic/Plenum Publishers.

Tabachnick, B. G.. Fidell, L. S.. (1996). *Using multivariate statistics* (3rd Ed.). New York: Harper Collins College Publishers.

Tulving, E.. (1983). *Elements of episodic memory*. New York: Oxford University Press.

Vitaro, F.. Arseneault, L.. Tremblay, R. E.. (1999). Impulsivity predicts problem gambling in low SES males. *Addiction*, 94, 565–575.

Vitaro, F.. Wanner, B.. Ladouceur, R.. Brendgen, M.. Tremblay, R. E.. (2004). Trajectories of gambling during adolescence. *Journal of Gambling Studies*, 20, 47–69.

Volberg, R. H.. (1998). Gambling and problem gambling among adolescents in New York. Report to the New York Council on Problem Gambling. Albany, NY.

Tables

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

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

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

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

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.			

Table 6

Classification table for direct logistic regression model for male gamblers

Observed	Predicted		Percentage Correct (%)
	Social gambler	Problem gambler	
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)

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.

Table 8

Classification table for direct logistic regression for female gamblers

Observed	Predicted		Percentage correct (%)
	Social gambler	Problem gambler	
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)

Keywords:

Keywords

youth gambling

,

outcome expectancy

,

perceived benefits and risks

.

Related Article(s):